

DONOFRO ARCHITECTS

2910 Caledonia Street Marianna, Florida 32446
Phone (850) 482-5261

ADDITIONS AND RENOVATIONS

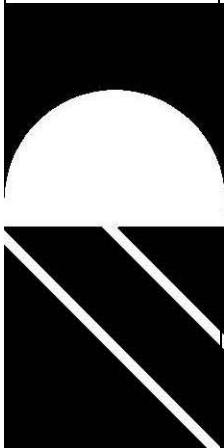
**HOLMES COUNTY
COUNCIL ON AGING**



210 W Kansas Avenue
Bonifay, Florida

Job # M-2021-04

April 20, 2024



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PROJECT DIRECTORY

OWNER: Holmes County Council on Aging
210 W Kansas Avenue
Bonifay, Florida

ARCHITECT: Donofro Architects
2910 Caledonia St./ P.O. Box 861
Marianna, FL 32446/32447
Phone: (850) 482-5261
Paul A. Donofro, Jr., AIA Architect, A.O.R
FL License AR0011148

CIVIL ENGINEER: DHM, Melvin Engineering, Inc.
4428 Lafayette Street
Marianna, Florida 32446
Phone: (850) 482-3045
David Melvin, PE
FL License PE#38734

STRUCTURAL ENGINEER: Barkley Consulting Engineers
2840 Remington Green, Suite E
Tallahassee, Florida 32308
Phone (850)297-0440
Douglas R Barkley, M.S., PE
Florida License # 8710

MECHANICAL ENGINEER: Watford Engineering, Inc
2872 Madison Street
Marianna, Florida 32448
Phone: (850) 526-3447
David N. Watford, PE

ELECTRICAL ENGINEER: Watford Engineering, Inc
2872 Madison Street
Marianna, Florida 32448
Phone: (850) 526-3447
Anthony Davis, PE

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DIVISION I
BIDDING CONDITIONS

INVITATION TO BID

Bids will be received by the Holmes County Council of Aging, Bonifay, Florida, until **2:00 p.m. CT on _____, 2024** in the _____, at which time and place all bids received will be officially opened and read aloud for furnishing all labor and materials for the construction of:

ADDITIONS AND RENOVATIONS HOLMES COUNTY COUNCIL ON AGING

All work shall be done according to plans and specifications prepared by Donofro Architects, 2910 Caledonia Street, Marianna, Florida 32446. Plans are on file and open to inspection in the office of the Architect, 2910 Caledonia Street, Marianna, Florida.

Drawings and specifications may be viewed at the office of the Architect at 2910 Caledonia Street, Marianna, Florida 32446. Drawings, specifications, and addendums may also be viewed through the Dropbox link upon request to karen@donofroarchitects.com

Each bid must be accompanied by a bid bond or a cashier's check, made payable to Holmes County Council on Aging, Bonifay, Florida, in the sum of 5% of the base bid as a guarantee and with an agreement that the bidder will not revoke or cancel his bid or withdraw from the competition for a period of thirty (30) days after the opening of bids, and that in the event the contract is awarded to the bidder, he will within ten (10) consecutive days after it is submitted, enter into written contract with the Holmes County Council on Aging, Bonifay, Florida, per the accepted bid. The bond cost will be included in the bidder's base-bid proposal.

The Owner reserves the right to waive informalities in any bid, to reject any or all bids, or to accept any bid and any combination of alternates or separate bid prices that, in their judgment, will be in the best interest of Holmes County Council on Aging, Bonifay, Florida,

NOTE: There will be a Mandatory Pre-Bid Conference held on _____, 2024, at 9:00 a.m. at the

**Holmes County Council on Aging, Bonifay, Florida
BY: /s/
Bonifay, Florida**

SECTION B

INSTRUCTIONS TO BIDDERS

B-1 INTENT OF INSTRUCTIONS:

Instructions of bidders are included in the contract documents to amplify the Advertisement and the Proposal Form and to give other details which interested parties must or should know to prepare their bid properly.

B-2 PROJECT DESCRIPTION:

Generally, this project can be described as an addition and renovation project aimed at expanding and improving the community meeting space, the food service kitchen area, and the multi-station toilet rooms. Additionally, this project will refurbish some of the existing spaces within the existing building footprint by providing new interior finishes.

B-3 EXAMINATION OF CONTRACT DOCUMENTS AND SITE PRIOR TO THE WORK:

Before submitting a proposal for the work, the bidders shall carefully examine the contract documents, visit the sites, and satisfy themselves as to the nature and location of the work and the general and local conditions, including weather, the general character of the site, any other work being performed thereon at the time of the submission of their bids. They shall obtain full knowledge of transportation, disposal, handling, and storage of materials, availability of water, electric power, and all other facilities in the area, which will have a bearing on the performance of the work for which they submit their proposals. The submission of a proposal shall be prima facie evidence that the bidder has made such an examination and visit and has judged for and satisfied himself as to the conditions to be encountered and the materials and equipment to be furnished, and as to the contract requirements and contingencies involved.

B-4 EXPLANATIONS AND INTERPRETATIONS:

Should any bidder observe any ambiguity, discrepancy, omission, or errors in the drawings and specifications, or any of the contract documents, or be in doubt as to the intention and meaning thereof, he should at once report such to the Architect and request clarification, preferably in writing, from the Architect.

Clarification will be made by Addenda and sent to all prospective bidders as time permits. No addendum will be sent out 24 hours before the time that bids are to be received nor faxed to those who have received bid documents from this office 24 hours before the time of receipt of bids. Each bidder is requested to report such questions before that time.

Neither the Owner nor the Architect will be responsible in any manner for verbal answers regarding the intent or meaning of the contract documents or any verbal instructions, by whomsoever made, before the award of the contract. Bidders, for their protection, should demand answers or instructions in writing concerning any matter affecting their bids. Should conflict occur in or between drawings and specifications, the bidder will be deemed to have estimated the more expensive way of doing the work involved unless they have asked for and obtained the written decision of the Architect before submitting

their proposal as to the method or equipment, which will be required.

B-5 SUBSTITUTIONS:

No substitution will be considered unless a written request has been submitted to the Architect (pauljr@donofroarchitects.com) for approval at least five (5) days before the date for receipt of bids. Each such request shall include a complete description of the proposed substitute, the name of the material or equipment for which it will be substituted, drawings, cuts, performance and test data, and any other information necessary for a complete evaluation.

B-6 DRAWINGS AND SPECIFICATIONS:

Consider complementary to the other. What is called for by one shall be as binding as if called for by both. Where conflicts occur between the drawings and specifications or within the drawings or within the specifications, secure written clarification from the Architect before bidding, otherwise provide the more expensive quality and quantity. Follow figures in preference to scale dimensions and verify all dimensions and existing conditions.

B-7 FAMILIARITY WITH LAWS:

The bidder is assumed to be familiar with all federal, state, and local laws, ordinances, rules, and regulations, that may in any manner affect the work. Ignorance on the part of the bidder will in no way relieve him from responsibility.

B-8 PREPARATION AND SUBMISSION OF BIDS:

A. Procedure: Proposals shall be submitted on the Proposal Form as bound with these specifications or a reproduced form. Any erasures or other corrections in the proposal must be explained or noted over the bidder's signature. Proposals containing any conditions, omissions, unexplained erasures, alterations, items not called for, or irregularities of any kind may be rejected by the Owner.

Proposals must be submitted in duplicate.

Each bid must give the full business name and address of the bidder and state whether he is an individual, corporation, or partnership. Proposals by a corporation must be signed with the legal name, and proposals by partnerships shall show the names of all partners and must be signed in the partnership name by one of the partners. Bidders shall be licensed as Contractors by the Florida Construction Industry Licensing Board.

Proposals with the bid guarantee shall be enclosed in a sealed envelope, which shall be marked:

"SEALED BID FOR THE ADDITIONS AND RENOVATIONS FOR THE HOLMES COUNTY COUNCIL ON AGING, BONIFAY, FLORIDA"

B. Irregular Proposals: Proposals may be rejected if they contain any omissions, alterations of forms, additions not called for, incomplete bids, erasures, or irregularities of any kind.

C. Errors in Bid: In case of discrepancies between the prices shown in the figures and in words, the

words govern.

B-9 WITHDRAWAL OF BIDS:

Bids may be withdrawn by written request from the bidders prior to the time fixed for opening. Negligence on the part of the bidder in preparing their bid confers no right for the withdrawal of the bid after it has been opened.

B-10 RECEIPT AND OPENING OF BIDS:

Bids will be opened publicly at the time and place stated in the Advertisement for Bids. The officer whose duty it is to open them will decide when the specified time has arrived, and no bids received thereafter will be considered. No responsibility will be attached to any officer for the premature opening of a bid not properly addressed and identified. At the time fixed for the opening of bids, their contents will be made public for the information of bidders and others interested who may be present.

B-11 BID MODIFICATIONS:

Bid modifications will be accepted from bidders if addressed as indicated in the Advertisement for Bids and if received before the opening of bids. No bid modification will be accepted after the close for receiving bids has been announced. Modifications may be in telegraphic or other written or printed form. Modifications shall be submitted in separate sealed envelopes, or the modifications may be written or printed on the outside of the sealed bid envelope. **An authorized representative of the bidder must sign all bid modifications.** Modifications will be read by the officer in charge prior to the opening of bids.

B-12 BID CUT OFF TIME:

Bidders will abide by a two-hour cut-off in receiving bids from subcontractors and suppliers. Contractors will not receive prices from subcontractors and suppliers two hours before the time for the opening of bids.

B-13 REJECTION OF BIDS:

The Owner reserves the right to reject any and / or all bids when such rejection is in the interest of the Owner, and to reject the bid of a bidder who is not able to perform the contract. The Owner reserves the right to waive informalities in any bid, and to reject any or all bids, or to accept any bid and any combination of alternates or separate bid prices that, in their judgement, will be to the best interest of the Holmes County Council on Aging.

B-14 QUALIFICATION OF BIDDERS:

To be qualified, a bidder must be able to present evidence that he/she is registered or licensed to perform the work as shown on the drawings and specifications in the State and / or County where the work will be carried on.

Furthermore, the agreement will only be entered into with responsible contractors, found to be

satisfactory by the Owner, qualified by experience and in a financial position to do the work specified.

To facilitate the execution of the agreement, the bidder shall submit with their proposal a list and brief description of similar work satisfactorily completed, with location, date of contracts, together with names and address of owners.

B-15 DISQUALIFICATION OF BIDDERS:

Any bidder using the same or different names for submitting more than one proposal upon any unit, portion, part, or section of work will be disqualified from further consideration on that part of the work. Evidence that any bidder is interested as a principal in more than one proposal for the work (example: bidding in partnership, association or individual) will cause the rejection of any such proposal. A bidder may, however, submit a proposal as a principal and as a subcontractor to some other principals, as he desires and by so doing will not be liable for disqualification. If there is any reason for believing there is collusion among the bidders, any or all proposals may be rejected and participants in such collusion may not be considered in future proposals for the same work. Proposals in which prices are obviously unbalanced or unresponsive to the Advertisement may be rejected.

The right is reserved to reject a proposal from a bidder who has not paid for or satisfactorily settled all bills due for labor and materials on former contracts in force at the time of letting.

B-16 MANDATORY PRE-BID CONFERENCE:

NOTE: There will be a Pre-Bid Conference held on, 2024, at a.m. CT at the Holmes County Council on Aging in Bonifay, Florida 32446 for all general contractors, suppliers, subcontractors, bidders, and any others who may have questions regarding this project.

The Pre-Bid Conference will be mandatory for all General Contractors proposing to submit a bid. All bidders must attend the Pre-Bid Conference, and failure to attend will result in their bid being disqualified.

B-17 BID GUARANTEE:

Bids shall be accompanied by a bid guarantee of not less than five percent (5%) of the amount of the bid, which may be a certified check or bid bond made payable to the Owner. Such check or bid bond shall be submitted with the understanding that it shall guarantee that bidder will not withdraw their bid for a period of thirty (30) days after the scheduled closing time for receipt of bids; that if their bid is accepted, he will enter into a written contract with the Owner in accordance with the form of agreement included as a part of the contract documents, and that the required performance and payment bonds will be given and that in the event of the withdrawal of said bid within said period, or failure to enter into said agreement and give said bonds within ten (10) days after he has received notice of acceptance of their bid, the bidder shall be liable to the Owner for the full amount of the bid guarantee in any particular thereof. The bid bond or check shall be returned to all except the lowest two bidders after the formal opening of bids. The remaining bid bonds or checks will be returned to the two lowest bidders after the Owner and the accepted bidder have executed the agreement and performance bond has been approved by the Owner. If the required agreement and bond have not been executed within thirty (30) days after the date of opening of bids, then the bid bond or check of any bidder will be returned upon their request, provided he has not been notified of the acceptance of their bid prior to the date of such request.

B-18 AWARD OF CONTRACT:

The contract will be awarded as soon as possible to the lowest responsible bidder, provided their bid is reasonable and it is in the interest of the Owner to accept it.

The Owner reserves the right to waive any informality in bids received when such waiver is in the interest of the Owner.

Each bidder shall, if requested by the Owner, present evidence of their experience, qualifications, and ability to carry out the terms of the contract, including a financial statement.

B-19 TIME OF COMPLETION, NOTICE TO PROCEED, AND LIQUIDATED DAMAGES:

The work to be performed under the contract shall be commenced within ten (10) calendar days after the date of the Notice to Proceed, and work for the total project shall be substantially completed within two hundred forty (240) calendar days from the date of the Notice to Proceed.

The "Notice to Proceed Date" will be established after the contract has been awarded. **A copy of the building permit showing the date issued shall be submitted to the Architect for their records.**

In as much as the failure to complete the work within the time fixed in the agreement will result in substantial injury to the Owner, and damages arising from such failure cannot be calculated with any degree of certainty, it is hereby agreed that if the work is not substantially completed under the provisions of the contract documents the contractor shall pay the Owner as liquidated damages for such delay, and not as a penalty, five hundred dollars (\$500.00) for each calendar day lapsing between the date fixed for substantial completion, and the date such substantial completion shall have been fully accomplished. The Owner shall deduct this amount from the final estimate and shall be retained by the Owner out of monies otherwise due the contractor in the final payment under the Provisions of Article 8, of the General Conditions and shall not exclude the recovery of damages by the Owner under other provisions of the contract documents, except for contractor's delays.

This provision for liquidated damages for delay shall not affect the Owner's right to terminate the contract as provided in Article 14 of the General Conditions or elsewhere in the contract documents. The Owner's exercise of the right to terminate shall not release the contractor from his obligation to pay said liquidated damages in the amounts set out in the agreement.

It is further agreed that the Owner may deduct from the balance retained by the Owner the liquidated damages stipulated therein or such portion thereof as the said retained balance will cover.

B-20 DIRECT PURCHASE OF MATERIALS BY OWNER: N.A.

B-21 PUBLIC ENTITY CRIMES:

Any person submitting a bid or proposal in response to this Invitation must execute the Form PUR 7068, as included in these Specifications, SWORN STATEMENT UNDER SECTION 287.133(A), FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES, including proper check(s), in the space(s) provided, and enclose it with the Bid/Proposal.

B-22 JESSICA LUNSFORD ACT: N.A.

B-23 TEMPORARY CONSTRUCTION FENCING:

The contractor will be allowed to fence off areas as required to provide safety for the persons in and around the construction activities and as required to protect segregated stored materials on the ground.

Although the General Contractor is solely responsible for the job site safety, the Owner, Architect, and Contractor shall jointly determine the route and location of fencing to provide maximum protection and safety for any persons close to this project.

B-24 BUILDING PERMIT COSTS:

The Owner will pay for all costs associated with all required permits, including but not limited to the General Contractor's building construction permit, reroofing permit, mechanical permit, plumbing permit, electrical permit, fire alarm permit, and development order permit. **No permit cost shall be included in the bid.**

B-25 OWNER CONTINGENCY:

Each bidder shall include in bid price a lump sum amount of **\$50,000.00** to be used by the Owner as a contingency fund to compensate the contractor for the execution of any unforeseen work not included as part of the work scope designated in these bid documents.

The expenditure of these contingency dollars can only occur after a written scope of work by the Architect and a written price proposal by the Contractor have been reviewed and approved by the Owner in the form of an approved contingency change notification (CCN) form.

At the project's closeout, any unexpended contingency funds shall be deducted from the contract amount via a deductive change order.

B-26. SEPARATE COSTS / PRICE: N.A.

B-27. UNIT COSTS:

Unit Cost A: The Contractor shall provide a unit cost (\$/ 1 Cu. Yd.) for excavating, removing from the site, and disposing of 1 cubic yard of any existing soils determined as being unsuitable for use as bearing soil material for supporting new building or vehicle parking/drive construction. The amount of material to be excavated, removed, and disposed of shall be mutually determined and agreed to by the Architect, Project Manager, Contractor, and Soil Testing Lab before initiating excavation. The method to be used to determine the amount of excavated material that the contractor will be compensated for will be the volume of the excavated area in cubic yards increased by 25% as a conversion rate times the Unit Cost A.

Unit Cost B: The Contractor shall provide a unit cost (\$/1 Cu. Yd) for importing and compacting to a specified density one cubic yard of suitable sand clay fill as required to infill the excavated area due to excavation of unsuitable soil material. The method of determining the amount of fill material needed to infill the excavated volume shall be the volume of the excavated area in cubic yards increased by 40% for compaction, times the Unit Cost B.

END OF SECTION.

PROPOSAL FORM
(May be reproduced by the Bidder)

DATE: _____
TIME: _____

TO: HOLMES COUNTY COUNCIL ON AGING
BONIFAY, FLORIDA

Sir:

The undersigned, hereinafter called "Bidder", having visited the site of the proposed project, familiarized himself with the local conditions, nature and extent of the work, the drawings, specifications and contract and bond requirements, proposes to furnish all labor, materials, and equipment necessary and to complete all work required for:

**ADDITIONS AND RENOVATIONS
HOLMES COUNTY COUNCIL ON AGING
BONIFAY, FLORIDA**

in full accordance with the Advertisement for Bids, Instructions to Bidders, contract and contract documents relating thereto, on file in the office of the Architect, Marianna, Florida, for the following bid prices:

BASE BID PRICE including **\$50,000.00 contingency:**
Dollars (\$ _____)

Unit Cost A: The Contractor shall provide a unit cost (\$/ 1 Cu. Yd.) for excavating, removing from the site, and disposing of 1 cubic yard of any existing soils determined as being unsuitable for use as bearing soil material for supporting new building or vehicle parking/drive construction. The amount of material to be excavated, removed, and disposed of shall be mutually determined and agreed to by the Architect, Contractor, and Soil Testing Lab prior to initiating excavation. The method to be used to determine the amount of excavated material that the contractor will be compensated for will be the volume of the excavated area in cubic yards increased by 25% as a conversion rate times the Unit Cost A.

_____ Dollars (\$ _____ /Cu. Yd.)

Unit Cost B: The Contractor shall provide a unit cost (\$/1 Cu. Yd) for importing and compacting to a specified density one cubic yard of suitable sand clay fill as required to infill the excavated area because of excavation of unsuitable soil material. The method of determining the amount of fill material needed to infill the excavated volume shall be the volume of the excavated area in cubic yards increased by 40% for compaction, times the Unit Cost B.

_____ Dollars (\$ _____ /Cu. Yd.)

There is enclosed a cashier's check or bid bond in the amount of _____

_____ Dollars (\$ _____), which is not less than 5% of the base bid, payable to Holmes County Council on Aging, Bonifay, Florida as the
M-2022-03 C-1 May 10, 2024

required bid deposit as a guarantee and for the purposes set out in your Advertisement for Bids and Instructions to Bidders.

The bidder hereby agrees that:

- A. The above proposal shall remain in full force and effect for a period of thirty (30) calendar days after the time of the opening of this proposal. That bidder will not revoke or cancel his proposal or withdraw from the competition within the said thirty (30) calendar days.
- B. In the event the contract is awarded to this bidder, he will enter into a formal written contract with the Owner per the accepted bid within ten (10) calendar days after the said contract is submitted to you and will furnish to the Owner a Contract Performance and Material Payment bond with good and sufficient sureties, satisfactory to the Owner, in the amount of 100% of the accepted bid. The bidder further agrees that in the event of the bidder's default or breach of any of the agreements of this Proposal, the said bid deposit shall be forfeited as liquidated damages.

The bidder agrees to substantially complete all work from the date of "Notice to Proceed" within TWO HUNDRED FORTY (240) calendar days.

Acknowledgment is hereby made of receipt of the following addenda issued during the bidding period.

Addendum No. _____ Dated _____
Addendum No. _____ Dated _____
(Add further addenda as necessary)

IN WITNESS WHEREOF, the bidder has hereunto set his signature and affixed this seal this

_____ day of _____, AD, 20____.

BY: _____

TITLE: _____

SECTION D

LIST OF SUBCONTRACTORS

NOTICE:

Each bidder shall submit with his Proposal, a list of his subcontractors as shown below in duplicate. The list of subcontractors submitted by the apparent low General Contractor bidder will be read aloud at the bid opening. No change may be made in the subcontractor list submitted except upon written approval of the Owner / Architect. This form must be submitted in duplicate.

All subcontractors must be listed and noted on this form and attached to and with the bid form. Failure to complete this form will be cause for rejection of bid.

This list is attached to, and is an integral part of the proposal submitted by:

NAME: _____

ADDRESS: _____

FOR: **ADDITIONS AND RENOVATIONS
HOLMES COUNTY COUNCIL ON AGING
BONIFAY, FLORIDA**

The undersigned, hereinafter called the bidder, lists below the names of the subcontractors who will perform the indicated phase of the work.

1A	Termite Control Treatment	Name: _____
		Address: _____
		Contact No. _____
		Email: _____
1B	Rodent Proofing	Name: _____
		Address: _____
		Contact No. _____
		Email: _____
3A	Concrete Subcontractor	Name: _____
		Address: _____
		Contact No. _____
		Email: _____
4A	Masonry Subcontractor	Name: _____
		Address: _____
		Contact No. _____
		Email: _____

5A	Framing Subcontractor	Name: _____
		Address: _____
		Contact No. _____
		Email: _____
5E	Prefabricated Wood Roof Trusses Manufacturer	Name: _____
		Address: _____
		Contact No. _____
		Email: _____
6A	Carpentry, Millwork, Insulation Sub	Name: _____
		Address: _____
		Contact No. _____
		Email: _____
8A	Glass, Glazing, and Storefront	Name: _____
		Address: _____
		Contact No. _____
		Email: _____
9A	Flooring Subcontractor	Name: _____
		Address: _____
		Contact No. _____
		Email: _____
9D	Acoustical Ceiling Subcontractor	Name: _____
		Address: _____
		Contact No. _____
		Email: _____
9E	Painting Contractor	Name: _____
		Address: _____
		Contact No. _____
		Email: _____
22	Plumbing Contractor	Name: _____
		Address: _____
		Contact No. _____
		Email: _____

23	HVAC Contractor	Name: _____
		Address: _____
		Contact No. _____
		Email: _____
23	Testing and Balancing (Independent Contractor)	Name: _____
		Address: _____
		Contact No. _____
		Email: _____
26	Electrical Contractor	Name: _____
		Address: _____
		Contact No. _____
		Email: _____

The undersigned declares that he has fully investigated each subcontractor listed and has received, and has in his files, evidence that the subcontractor is properly and currently licensed in the place where required by local or state laws, has been engaged successfully in his line of work and his organization is capable, technically, and financially, of performing the pertinent work, and that he has made similar installations in a satisfactory manner.

IN WITNESS WHEREOF, the bidder has hereunto set his signature and affixed his seal this

_____ day of _____, AD, 20_____

By: _____ (SEAL)

DIVISION II
CONTRACTUAL CONDITIONS

SECTION E

AIA DOCUMENT A-201-2017

**GENERAL CONDITIONS OF
THE CONTRACT FOR CONSTRUCTION**

(Dated 2017)

The General Conditions, AIA Document A-201, dated 2017, or most current edition, shall apply to and form a part of these Specifications as if written in full herein.

A printed copy of A-201 will be made available upon request and payment of two dollars (\$2.00), or they may be viewed in the office of the Architect and / or the Owner, who will have a copy available to any bidder.

SECTION F

SUPPLEMENTARY AND SPECIAL CONDITIONS

F-01 GENERAL:

The General Conditions, Section D, AIA Document A-201, dated 1997, or latest edition, shall apply to and form a part of this Section as if written in full herein.

F-02 SCOPE:

This Section sets forth all modifications and additions to the General Conditions, Section D.

F-03 ARTICLE 1 GENERAL PROVISIONS:

Add the following to Paragraph 1.1.5:

Should the drawings disagree in themselves or with the specifications, the contractor shall estimate and furnish the more expensive, better quality, greater amount of work, and/or materials unless otherwise instructed in writing by the Architect. Should minor omissions occur between or within the drawings or the specifications, the Contractor will furnish the item to meet the general intent and/or scope of the project documents.

Add the following to Paragraph 1.1.5:

Drawings and Specifications: Consider each as complementary to the other. What is called for by one shall be as binding as if called for by both. Where conflicts occur, secure clarification from the Architect in advance of bidding, otherwise provide the more expensive quality and quantity. Follow figures in preference to scale dimensions, verify all dimensions and existing conditions.

F-04 ARTICLE 2 OWNER:

Add the following to Paragraph 2.1.1 Definition:

Where the term "Owner" is used on the drawings or in the specifications, it shall refer to Holmes County Council on Aging, Bonifay, Florida.

F-05 ARTICLE 3 CONTRACTOR:

Add the following to Paragraph 3.1, Definition:

Where the words "The Contractor" are used, they shall be understood to refer to the contractor operating under the specifications of which these General Conditions are a part, unless particularly noted otherwise. In using the pronoun designation, the contractor, the third person singular is adopted herein, whether the contract is in the hands of an individual, a firm, a corporation, or their successors.

Paragraph 3.9.1, add the following:

Should the Architect find any person employed on the project incompetent or unfit for his duties, and so certified the facts to the contractor, the contractor shall immediately dismiss the employee from this project and said employee shall not be re-employed on this project without written consent of the Architect.

Add the following to Paragraph 3.18, Indemnification:

Indemnification by the Contractor shall be in the full dollar amount of the Contract.

F-06 ARTICLE 4 ADMINISTRATION OF THE CONTRACT:

Add the following to Paragraph 4.1 Architect:

Where the words "The Architect" are used, they shall be understood to refer to Donofro Architects, Marianna, Florida, or an authorized representative of that firm.

F-07 ARTICLE 7 CHANGES IN THE WORK:

Add the following to Paragraph 7.3.3:

Change orders under this contract, whether adding to or deducting from the contract sum, will be based as follows for overhead and profit:

- For all work done by his own organization or subsidiaries of his own organization, the contractor may add 10% of his actual costs for combined overhead and profit.
- For all work done by his subcontractors, the respective subcontractors may add 10% of their actual costs for combined overhead and profit, and the Contractor may add 10% of the above subcontractor's cost for his overhead and profit.
- The above percentages shall be considered a reasonable allowance for overhead and profit due to the contractors.
- Labor costs for the subcontractors and / or the Contractor may include supervision, estimation, layout, mechanics, and labor wages, including payroll taxes, assessments, and insurance provisions. Costs may also include material and equipment rental costs, which shall be the trade discount plus sales tax where applicable. Other items of cost may include freight or other transportation, special permits, or fees, and unusual or excessively high expenses for communication, special testing, or other transportation of personnel. Any of the above costs shall be itemized and shall be reasonable.
- A bond cost of 2% of the total amount of added costs will be allowed the contractor as a legitimate item of cost. No bond costs will be allowed for subcontractor bond costs.
- All proposals for change orders shall be in written form itemizing all costs included in the change order and submitted to the Architect. If required by the Architect, the contractor shall submit receipts, invoices for materials and other evidence showing his costs and his right to the payment claims.

ARTICLE 9 PAYMENTS AND COMPLETION:

Add the following to Paragraph 9.2.1:

The contractor shall within ten (10) days from date of contract deliver to the Architect three (3) copies of Schedule of Contract Values according to Sections of specifications and addition of item, profit and overhead showing values for all items listed, the total of which shall equal the contract price.

This schedule shall be for use of the Owner, at his discretion, in checking requisitions for payments, but it shall not be binding against the judgement of the Owner. The Unit Schedule shall also contain a chart giving the estimated time schedule for each portion of the contract.

The following form is given as a guide for the contractor's use in preparing the Unit Schedule Cost Breakdown and Payment Requests required under these Supplementary General Conditions. Monthly Pay Requests shall be submitted in triplicate.

SCHEDULE OF COSTS

Project Name and Location

Contractors Name: Date:

ITEM	UNIT	QUANTITY	MATERIAL	LABOR	TOTAL
1.	General Conditions				
	Bond		L.S.		
	Office and Sheds		L.S.		
	Taxes & Insurance		L.S.		
	Utilities				
	Etc.				
2.	Excavation & Grading		L.S.		
	Clear Area		L.S.		
	Machine Excav.		C.Y.		
	Footing Excav.		C.Y.		
	Etc.				
3.	Concrete Work				
	Footings		C.Y.		
	Walls		C.Y.		
	Cols.		C.Y.		
	Forms-Ftgs.		S.F.		
	Walls		S.F.		
	Etc.				
	Reinf. Steel		Tons		
	Reinf. Mesh		S.F.		
4.	Masonry Work		M		
	Slumped Brick		M		

Conc. Block-6"	M
Conc. Block-8"	M
Etc.	

5. Dampproofing &
Waterproofing
Etc.

NOTE: With each division broken down into appropriate items.

TOTAL CONTRACT AMOUNT _____ Dollars
\$ _____).

F-09 ARTICLE 9 PAYMENTS AND COMPLETION:

Add the following to Paragraph 9.3.1:

The Contractor shall submit with his second monthly request for payment, and with every request for monthly payments thereafter, a Certificate of Partial Payment as included in these specifications. AIA document G702 & G703 (1992 Edition) will be acceptable. Certificates shall be notarized affirming that all subcontractors, suppliers, labor, etc., that have earned payment shown on the immediately previous monthly estimate have been paid in full accordance with the contract that exists between the Contractor and that or those agencies. Pay requests will not be approved by the Architect without submission of this certificate.

Each payment request shall be for the cost of work done and the value of materials suitably stored at the site since the time of the last previous request for payment. The Architect shall certify a payment of 90% of the value of the work and materials as above noted according to his best judgement of the correct amount.

Requests for payment shall be itemized in the same subdivisions as "Unit Schedule," and all pay requests shall be submitted in triplicate.

Add the following to Paragraph 9.3.1.2.:

Five (5%) percent of the total contract amount shall be retained until the project is complete and has been accepted by the Owner.

Add the following to Paragraph 9.3.2.:

The Owner's approval regarding payment for materials stored off site will not be unreasonably withheld. **For payment of materials delivered and stored offsite the contract shall be furnished with his monthly pay request documentation showing that the materials have been delivered and received and location noted where stored.**

F-10 ARTICLE 11 INSURANCE AND BONDS:

Article 11 shall be amended as follows:

A. Contractor's Liability Insurance: The contractor shall not commence work under this contract until he has obtained all insurance required under this paragraph and such insurance has been approved by the Owner, nor shall the contractor allow any

subcontractor to commence work on his subcontract until all similar insurance required of the subcontractor has been so obtained and approved. All insurance policies shall be with insurers qualified and doing business in Florida.

1. Workmen's Compensation Insurance: The contractor shall take out and maintain during the life of this contract, workmen's compensation, and in case any work is sublet, the contractor shall require the subcontractor to similarly provide workmen's compensation insurance for all the latter's employees unless such employees are covered by the protection afforded by the contractor. Such insurance shall comply with the Florida Workmen's Compensation Law. In case any class of employees engaged in hazardous work under the contract at the site of the project is not protected under the Workmen's Compensation Statute, the contractor shall provide and cause each subcontractor to provide adequate insurance, satisfactory to the Owner, for the protection of his employees not otherwise protected. Workmen's compensation policy shall include employer's liability in an amount of not less than:

Body Injury by Accident; Each Accident.....	\$ 500,000
Bodily Injury by Disaster; Each Employee.....	\$ 500,000
Bodily Injury by Disease; Policy Limit.....	\$ 500,000

2. Public Liability and Property Damage Insurance: The contractor shall take out and maintain for the life of the contract, such public liability and property damage insurance as shall protect him and any subcontractor performing work covered by this contract from claims for damages, for personal injury, including accidental death, as well as from claims for property damages, which may arise from operations under this contract, whether such operations be by himself or either of them. The policy shall include comprehensive general liability, contractual liability, employer's liability, and products and completed operations liability. Automobile property damage liability shall include coverage for Owners, non-owners, and hired vehicles under the Contractor's Business Auto Policy.

The Holmes County Council on Aging, Bonifay, Florida shall be named as the insured, and the Architect shall be named as the additional insured. Units shall be set as follows:

Combined single limit per occurrence.....	\$1,000,000
Products and completed operations.....	\$1,000,000
Personal Injury Liability.....	\$ 500,000
Fire Legal Liability.....	\$ 50,000
Medical Payments.....	\$ 5,000
Automobile Liability Combined Single Limit.....	\$1,000,000

The insurance clause for both bodily injury and property damage shall be amended to provide coverage on an occurrence basis.

The contractor shall also carry an Owners and Contractors protective liability insurance policy for **Holmes County Council on Aging, Bonifay, Florida** and shall be in the same amounts as stipulated above for the contractor's liability insurance policy.

3. Fire and Extended Coverage Insurance: The contractor shall take out and maintain a "Builders Risk Policy," completed value form, during the life of this

contract. The policy shall include malicious mischief and vandalism. This policy shall be obtained from an insurance company approved by the Owner. The coverage shall be in the amount of 100 percent of the values at risk.

4. Proof of Carriage of Insurance: The contractor shall furnish the Owner with satisfactory proof of carriage of the insurance required. **The Owner shall be notified of cancellation at least thirty (30) days prior to cancellation of policy by return-receipt, certified mail.** No other form of notification will relieve the Insurance Company, its agents, or its representatives of responsibility.

B. Paragraph 11.2.1 - **DELETE.**

F-11 ARTICLE 11 INSURANCE AND BONDS:

Add the following to Paragraph 11.4, Performance and Payment Bonds:

The contractor shall furnish the Owner with a 100% Performance and a Labor and Material Payment Bond written by a surety company acceptable to the Owner and authorized to do business in the State of Florida.

The cost of the Performance Bond shall be borne by the Contractor. The bond shall be accompanied by a duly authenticated or certified document, in duplicate, evidencing that the person executing the bond on behalf of the surety had the authority to do so on the date of the bond. In the usual case the conferring of that authority has occurred prior to the date of the bond, and the document showing the date of appointment and enumeration of powers have not been revoked and remain in effect. The date of that certification cannot be earlier than the date of the bond. The bond shall be dated not earlier than the agreement. The life of the Performance Bond shall extend one year from the date of final acceptance as a maintenance guarantee. The Labor and Material Payment Bond shall extend until all labor and materials have been paid for in full.

Add the following to Paragraph 11.5:

The successful contractor shall, before commencing with any work, record in the Public Records of the County, where the work is taking place, the Payment and Performance Bond with a Surety Insurer authorized to do business in the State of Florida and in compliance with the Florida Statutes Section 255.05(1)(a).

F-12 ARTICLE 12 UNCOVERING AND CORRECTION OF WORK:

Article 12 shall be amended as follows:

- A. Guarantee of Work: Except as otherwise specified, all work shall be guaranteed by the contractor against defects resulting from the use of inferior materials, equipment or workmanship for one year from the date of final completion of the contract, or from full occupancy, or use of the project (for which it was designed) by the Owner, whichever is earlier.
- B. If, within any guarantee period, repairs or changes are required in connection with the guaranteed work, which in the opinion of the Architect or engineer is rendered necessary as the result of the use of materials, equipment or workmanship, which are defective,

inferior, or not in accordance with the terms of the contract, the contractor shall, promptly upon receipt of notice from the Owner, and without expense to the Owner:

1. Place in a satisfactory condition in every aspect of such guaranteed work, correct all defects therein; and
 2. Make good all damage to the structure of site, or equipment or contents thereof, which in the opinion of the Architect or engineer is the result of the use of equipment, materials, or workmanship which are inferior, defective, or not in accordance with the terms of the contract; and
 3. Make good any work or materials, or the equipment and contents of structures or site disturbed in fulfilling any such guarantee.
- C. In any case where in fulfilling the requirements of the contract or any guarantee, embrace in or required thereby, the contractor disturbs any work guaranteed under the contract, he shall restore such disturbed work in a condition satisfactory to the Architect or the engineer and guarantee such restored work to the same extent as it was guaranteed under other such contract.
- D. If the contractor, after notice, fails to proceed promptly with the terms of the guarantee, the Owner may have the defects corrected and the contractor and his surety shall be liable for all expenses incurred.
- E. All special guarantees applicable to definite parts of the work that may be stipulated in the specifications or other papers forming a part of the contract shall be subject to the terms of this paragraph during the first year of the life of such special guarantee.
- F. Deliver to the Owner as part of the closeout documents, three loose leaf binders, each containing all guarantees, warranties, waivers of liens, contractors final certificate of completion, list of subcontractors and supplies, with addresses, phone and fax numbers, maintenance and service representatives for all items of equipment, maintenance manuals and test and balance report. Maintenance and service representatives for all items of equipment shall be authorized by the manufacturer, service the respective type of equipment for at least five (5) years and maintain an office within 200 miles of the project.

F-13 ADDITIONAL ARTICLES, ARTICLE 15:

- 15-1 Manufacturers Specifications: Where the name of a concern or manufacturer is mentioned in reference to his required service or product, and no qualifications or specification or such is included on drawings or in specifications, then the material gauges, details or manufacturer finish, etc., shall be in accordance to his standard practice or directions or specifications. The contractor shall be responsible for any infringement of patents, royalties, or copyrights, which may be incurred thereby.
- 15-2 Reference to ASTM and Federal Specifications: Where reference is made to the Standard Specifications of the American Society of Testing Materials (ASTM); the United States Government Federal Specifications, or to other standard specifications of associated manufacturers organizations, or trades in connection with the required quality of materials, methods, etc., then the applicable specifications shall be of the latest revised edition.

- 15-3 Approval of Materials: A list of all materials, equipment, etc., together with manufacturer's drawings and catalog information shall be submitted to the Architect for approval prior to ordering material or equipment. Information submitted shall show capacity, operating conditions and all engineering data and descriptive information necessary for comparison and to enable the Architect to determine whether same meets specifications. The Architects' approval will not relieve the contractor of the responsibility for performance of any terms of the contract.

Approval in writing of all materials, equipment, etc., must be obtained from the Architect before any material or equipment is delivered or installed on the job. The Architect will determine the quality of any material or item.

Where one manufacturer's name is listed in the Specifications with "an equal" clause, it is used to establish a standard of quality and design, and to give a general description of the type of item or material desired. Equal items, materials, or equipment will be acceptable, provided approval is received in accordance with the Instruction to Bidders (Substitutions).

Where three (3) or more manufacturer's names are listed, for an item or material, substitutions will not be acceptable.

- 15-4 Asbestos Containing Materials: **No asbestos containing materials shall be used in the construction of this project.**

The contractor shall provide as part of his close out documents and incorporate with his guarantee an affidavit stating that no asbestos containing materials have been used in the construction of this project.

- 15-5 Shop Drawings: Shop drawings shall be submitted for all manufactured or fabricated materials and/or as called for in the separate specification sections. Drawings shall be fully identified by project name, location, suppliers name, date, drawing number, specification section reference, etc. The contractor shall submit, with such promptness as to cause no delay in his work, or in that of any other contractor, four (4) copies (in addition to those copies necessary for his own requirements) of all shop drawings and schedules, required for the work of the various trades, to the Architect for approval. The contractor shall make no deviation from the approved drawings, and the changes made thereto by the Architect, Engineer, if any.

It shall be the responsibility of the contractor to properly schedule the submission of shop drawings for approval to allow adequate time for checking of drawings, manufacture and shipment of items to the job site in sufficient time to prevent delay in progress schedule.

It shall also be the responsibility of the contractor to coordinate the preparation of shop drawings of items which will be furnished by more than one manufacturer but are designed to interface when installed.

Shop drawings submitted to the Architect-Engineer for his approval shall first be checked and approved by the Contractor, the prima facie evidence of which shall be a "checked" stamp marked "Approved" or "Approved as Noted" on each copy of each shop drawing, placed thereon by the contractor. Shop drawings received without the contractor's "checked" stamp shall be cause for immediate return without further action.

The subcontractors for all phases of the contract shall submit through the contractor complete brochures covering all materials and/or equipment proposed for use in the execution of the work as required by their respective divisions of the specifications. These brochures shall be indexed and properly cross-referenced to the plans and specifications for easy identification.

All shop drawings, setting drawings, material brochures, samples and/or color selection of materials which are required are not included in the foregoing shall be submitted via the Contractor. Insofar as is possible or practical, all shop drawings or descriptive literature of equipment for the mechanical or electrical trades shall be submitted in a complete brochure for each trade as soon as possible after notice to proceed is executed.

The Owner will not grant time extension based on delays due to improper scheduling of work, and the Owner, at his discretion, may withhold progress payments until such time as these requirements are fully satisfied.

15-6 Product Approval: Submittals for the following products (materials) shall be included with the submittal, as well as the product approval numbers and other supporting documentation showing compliance with Chapter 17 of the Florida Building Code.

- Exterior Doors and Frames
- Exterior Wall Mounted HVAC Louvers
- Exterior Windows
- Roof Panels

15-7 Pre-Construction Conference: Before beginning work at the site the Contractor shall attend a preconstruction conference and bring with him the superintendent employed for this project and any other subcontractor or supplier as may be requested by the Architect or Owner. In the event the contractor is unable to attend he shall send a letter of introduction to the superintendent in which he advises the superintendent's full name and states that he is assigned to the project and will be in full responsible charge. At this time, all parties concerned will discuss the project under contract and prepare a program of procedure in keeping with requirements of the drawings and specifications. The superintendent shall henceforth make every effort to expeditiously coordinate all phases of the work, including the required reporting procedure, to obtain the result within the full purpose and intent of the plans and specifications for the project.

15-8 Job Superintendent: This project will require a full-time job superintendent. The superintendent shall always be on the job site during normal working hours. He shall be responsible for this project only and no change of superintendent may be made during the construction of this project without the approval of the Architect.

15-9 Storage and Work Areas: The Owner will make available work and storage areas within the building site. At the start of the operation the contractor shall make arrangements with the Architect's field representative and Owner's representatives for the assignment of the area. During construction, the contractor shall maintain the building and storage areas in a neat condition.

15-10 Permits, Licenses, Etc.: The Owner will pay for all costs associated with all required permits including but not limited to the General Contractor's building construction permit, mechanical permit, plumbing permit, electrical permit, fire alarm permit, and

development order permit. **No permit cost shall be included in the bid.**

15-11 Codes: Construction and renovation of facilities designated for work in these documents shall conform to and comply with the Florida Building Code 2023. All or portions of the following codes and requirements are incorporated.

- a. Florida Building Code, 2023, including Section 423 (State requirement for Educational Facilities)
- b. Florida Plumbing Code, 2023,
- c. National Electrical Code, 2023,
- d. Florida Mechanical Code, 2023,
- e. Florida Gas Code, 2023,
- f. NFPA 101 Life Safety Code 2023,
- g. Florida Fire Prevention Code 2023,

NOTE: Where compliance with the Florida Building Code 2023 is indicated elsewhere in these specifications, **all** supplements must be included.

In case of conflicting requirements, the more or the most stringent shall apply. Where conflicts occur between a code and contract drawings or specifications, the most stringent requirements shall apply.

15-12 Temporary Utilities: The contractor, if readily available, will be allowed to use water and electricity at the buildings. Connections to these sources are to be coordinated with the Owner's representative.

15-13 Safety and Protection: Safety Procedures shall be the sole responsibility of the contractor. The contractor shall provide for the safety and protection of his workers and the public, and shall be held liable for any injury to any of the above by lack of, or inadequate, protection. Workers, tenants, and visitors to the job site shall be protected from any damage from falling material, tools or equipment, or any other damage that might be caused from this operation, by means of adequate covering, barricades, fencing, scaffolds, etc., as may be required. The contractor's attention is called to Article 10 of the AIA General Conditions referenced in this specification. The Contractor shall inform the Owner and the Architect at the pre-construction conference either verbally or by drawing his plans for safety and protection around the site of new construction.

15-14 Indemnification: It is understood and agreed by the Contractor, that the Architect has no constructive use of Owner's site; has no control or authority over the means, methods and sequences of construction; and therefore, has no ongoing responsibility whatsoever for construction site safety, a responsibility that is wholly vested in the Contractor or others engaged in the construction of this project. Notwithstanding the above, the Architect has a duty to preserve and protect public health, safety, and welfare. Accordingly, it is his professional responsibility to take what he believes are prudent measures, should he encounter situations that he believes create a danger to public health, safety, or welfare. Contractor understands this situation and agrees to defend the Architect and hold him harmless from claims arising from claims arising from his exercise of professional responsibility in this regard.

It is further understood that the Architect's observation of safety violations is casual and not of primary consideration during site visits.

15-15 Coordination: The contractor will coordinate all his work with the various trades. All work to

be done will be accomplished from areas approved at the Pre-Construction Conference and the Contractor will coordinate access and restrict traffic in and/or through the property.

- 15-16 Phone Requirement: **The job superintendent shall be required to have a handheld cellular phone, and it shall always be kept on his person during working hours, from the starting date of construction through completion of the project.** A truck installed cellular phone is not acceptable as an equivalent.
- 15-17 Toilet Accommodations: Toilet accommodations will be provided for by the contractor for use by workmen at the construction site. The portable temporary toilet areas shall be kept in a clean and sanitary condition. Provide sewer and water connections if required. Remove on completion of the project and leave the premises clean.
- 15-18 Dress and Restrictions: Workers will always be fully clothed and with hard hats on during working hours. No cut-offs, bare tops, or profanity will be allowed within the construction areas. Eating, except in a designated area outside the building, will not be allowed. **The work area will be policed daily, with all trash removed and the area left broom clean.**
- 15-19 Project Drawings: Prior to beginning any work, the contractor shall indicate conspicuously and plainly in the field set of drawings and at appropriate paragraphs in the specifications, all changes or corrections made by addenda and change orders as they are required.
- 15-20 Record Drawings: One set of drawings shall be kept clean and in good condition to serve as a "Record Set" of drawings. Any changes in conduit runs, piping, sewer work, drainage, locations of clean-outs, and existing underground lines not indicated on contract drawings shall be plainly marked on this set, which shall not be used for other purposes. **At the completion of the work and with a request for final payment, this set of drawings shall be turned over to the Owner for file reference. The final pay request will not be processed before delivery of the "Record Set" of drawings.**
- 15-21 Progress Reports: Written reports of all site visits by the Architect or his representative will be sent to the contractor and the Owner after each site visit. The Contractor will distribute these reports to his subs and job superintendent. Items listed for correction will be corrected quickly and within a reasonable time. Uncorrected work, under the provisions of the contract (paragraph 9.5.1), will be the basis for withholding approval of monthly estimates.
- 15-22 Final Payment and Retainage: Final payment (retainage) will be approved for payment only after all of the following has been completed:
- a. All warranties and guarantees received. **Each contain waiver of lien. AIA document G706-A (1994)**
 - b. Record set of drawings received.
 - c. Final inspection made, and all items noted on final inspection report completed and/or corrected and letter received from Contractor stating completion and verification of completion by Architect.
 - d. Certificate of Final Inspection received from the State Department of Education or U.B.C. inspector, and completion and/or correction of all items listed on Certificate.
 - e. Receipt of completed Statement of Contract Completion as included in these

specifications.

Substantial completion and occupancy of any of the spaces will not warrant a reduction in the amount of, or payment of, the retain monies.

- 15-23 Existing Work: The Contractor shall be responsible for checking all existing conditions in relation to the work, whether shown or not, and shall remove, relocate or modify any existing work as may be required to complete the new work as shown and/or specified. Any mechanical or electrical items, equipment, fixtures, etc., or structural items that may interfere with the new work shall be relocated, modified, etc., as may be required to complete the work as implied or shown on the drawings.

The Contractor shall be responsible for the protection of any existing areas due to construction of this project. This shall include protection against damage from weather, water and damage incurred from work being carried on in the area.

If damage occurs due to negligence or failure to provide proper protection by the contractor, the contractor shall correct the damage and restore or refinish the area to its prior state and to the satisfaction of the Owner and/or Architect.

- 15-24 Existing Utilities: Where required for this project, existing on-site utilities are shown on the drawings; however, all below-grade water, gas, sewage, and electrical (bell, sound, fire alarm, data communication) have been determined by field inspection and drawings from previous building projects and may not be either entirely accurate or comprehensive. Other buried utility lines that are not shown or known may be encountered, and **the Contractor is cautioned to be extremely careful during any excavating** so as not to damage any buried utility lines. Before any new utility excavations, the contractor and the respective subcontractor shall communicate and coordinate proposed excavation areas with Mr. Michael Brown to determine the location of any existing buried utilities in the area to minimize the risk of damage to said utility. Any buried utility lines damaged during construction shall be repaired and/or replaced by the Contractor responsible.

- 15-25 Cutting and Patching: All penetrations through fire rated construction shall be fire stopped as per N.E.C. 300-21, using a through penetration fire stop system (XHE2) as listed in the Underwriters Lab Fire Resistant Directory.

- 15-26 Protection of Existing Areas: During the course of demolition and construction, the contractor shall make all arrangements for the protection of existing areas, outside the areas of construction, from dust and debris to the satisfaction of the Owner and those working in the unaffected areas.

- 15-27 Penetrations Through Existing Construction: Where new work necessitates the cutting through or modifying of existing construction, the contractor shall do all patch work as required to match existing materials, details, etc. and to make for a first-class job. This includes penetration through existing roofs, exterior and interior walls, ceilings, and floors.

- 15-28 Salvageable and Obsolete Items: The contractor, in connection with this work, shall remove all items, materials, equipment, etc. necessary to complete the work described on the drawings and it these specifications. All items deemed obsolete shall be removed. All salvageable items are to remain the property of the Owner. All else is to be removed from the site. Salvageable items shall be stockpiled in one area, designated by the

Owner, within the construction area. The Architect or the Owner will determine what items are salvageable.

- 15-29 Scheduling of Work: The contractor shall take all precautions in carrying out his work so that a minimum of disturbance or disruption is caused in the adjacent areas. The contractor will keep the designated parties advised at all times of the type and areas where work will be carried on and shall make all attempts to coordinate his work and work areas to ensure that traffic on adjacent roadways is not impeded or negatively impacted.
- 15-30 Direct Purchase of Materials by Owner: See Section B-20.
- 15-31 Cleaning: All debris, unused material, etc., shall be removed from the site because of this work. The Contractor shall make every effort to keep the work areas clean at each day's end as a condition of safety and for neatness.
- 15-32 Workmanship: The workmanship of all trades shall be first class, regardless of the quality of material used. All materials called for and/or shown shall be new.
- 15-33. Contract Provisions for Non-Federal Entity Contracts Under Federal Awards:
- A. Equal Employment Opportunity: The general contractor operating under this contract must provide equal employment opportunity in accordance with Executive Order 11246 "Equal Employment Opportunity (30FR 12319, 12935, 3CFRPart, 1964-1965 Comp., p. 339) as amended by Executive Order 11375, "Amending Executive Order 11246 relating to Equal Employment Opportunity," and implementing regulations at 41CFR Part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."
 - B. Contract Work Hours and Safety Standards Act (40U.S.C. 3701-3708): General contractors and subcontractors operating under this contract employing mechanics or laborers shall comply with 40 U.S.C. 3702 and 3704 as supplemented by the Department of Labor Regulations (29 CFR Part 5). Under 40 U.S.C. 3702 each contractor must be required to compute wages of every mechanic and laborer based on a standard work week of 40 hours. Work in excess of a standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. Requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no mechanic or laborer be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous. These requirements do not apply to the purchase of supplies, materials, or articles ordinarily available on the open market.
 - C. Clean Air Act: General contractors and subcontractors operating under this contract shall agree to comply with all applicable standards, orders, or regulations issued pursuant to the Clean Air Act (42 U.S.C 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C 1251-1387). Violations must be reported to the Federal Awarding Agency and the Regional Office of the Environmental Protection Agency.
 - D. Debarment and Suspension (Executive Orders 12549 and 12689): The Owner (Holmes County Council on Aging) will be prohibited from entering into a contract with any party listed on the government wide exclusions list in the System for Award Management (SAM), in accordance with the OMB Guidelines at 2CFR 180 that implement Executive Orders 12549 (3 CFR Part 1986 Comp., p 189) and 12689 (3 CFR Part 1989 Comp., p 235), Debarment and Suspension.
 - E. Bryd-Anti-Lobbying Amendment (31 U.S.C. 1352): Requires that general contractors and

subcontractors operating under this contract to file a certification certifying that it will not and has not used any federally appropriated funds to pay any person or any organization for influencing or attempting to influence an office or an employee of any agency, a member of congress, an officer or an employee of congress or an employee of a member of congress in connection with obtaining any federal contract, grant, or any other award covered by 31 U.S.C. 1352.

- F. Buy American Products; Domestic Preference Procurement: The general contractor and subcontractors operating under this contract are encouraged to the extent permitted by law to maximize the use of goods, products, and materials produced in the United States when procuring goods and services following executive order "Buy American, Hire American."

END OF SECTION.

STATEMENT OF CONTRACT COMPLETION



Certificate of Substantial Completion

PROJECT: (Name and address): SAMPLES
PROJECT NUMBER: /
CONTRACT FOR: General Construction
CONTRACT DATE:

OWNER:
ARCHITECT:
CONTRACTOR:
FIELD:
OTHER:

TO OWNER: (Name and address):
TO CONTRACTOR: (Name and address):

PROJECT OR PORTION OF THE PROJECT DESIGNATED FOR PARTIAL OCCUPANCY OR USE SHALL INCLUDE:

The Work performed under this Contract has been reviewed and found, to the Architect's best knowledge, information and belief, to be substantially complete. Substantial Completion is the stage in the progress of the Work when the Work or designated portion is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion of the Project or portion designated above is the date of issuance established by this Certificate, which is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below:

Warranty **Date of Commencement**

ARCHITECT **BY** **DATE OF ISSUANCE**

A list of items to be completed or corrected is attached hereto. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Unless otherwise agreed to in writing, the date of commencement of warranties for items on the attached list will be the date of issuance of the final Certificate of Payment or the date of final payment.

Cost estimate of Work that is incomplete or defective: \$ 0.00

The Contractor will complete or correct the Work on the list of items attached hereto within Zero (0) days from the above date of Substantial Completion.

CONTRACTOR **BY** **DATE**

The Owner accepts the Work or designated portion as substantially complete and will assume full possession at (time) on (date).

OWNER **BY** **DATE**

The responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance shall be as follows:
(Note: Owner's and Contractor's legal and insurance counsel should determine and review insurance requirements and coverage.)

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User Notes: (1231581271)

STATEMENT OF CONTRACT COMPLETION

STATEMENT OF THE ARCHITECT

PROJECT:

To the best of my knowledge, information, and belief, the work under the above-named contract has been satisfactorily completed under the terms of the contract; that the project is recommended for occupancy by the owning agency; that the contractor has submitted satisfactory evidence that he has paid all labor, materials, and other charges against the project in accordance with the terms of the contract.

	DATE	DAYS
Contract Date:		
Contractor Notified to Proceed:		
Days Allowed by Contract:		
Extensions Granted by Change Order:		
Total Days Allowable:		
Work Began:		
Project Substantially Completed:		
Days to Complete:		
Under Run / Over Run		

A/E Firm Name: **DONOFRO ARCHITECTS**

DATE: _____ BY: _____.

STATEMENT OF ACCEPTANCE BY OWNER

To the best of my knowledge and belief, the statements made above is true, and the project is satisfactorily completed under the terms of the contract and is hereby accepted for occupancy, operation and maintenance.

OWNER: _____.

BY: _____.

DATE: _____ TITLE: _____.

STATEMENT OF CONTRACT COMPLETION

STATEMENT OF THE CONTRACTOR

PROJECT: _____

CONTRACTOR: _____

CONTRACT FOR: _____

CONTRACT DATE: _____ CONTRACT AMOUNT \$ _____

I solemnly affirm that the work under the above named contract and all amendments thereto have been satisfactorily completed; that all amounts payable for materials, labor and other charges against the project have been paid; that no liens have been attached against the project; that no suits are pending for any reason of work on the project under the contract; that all Workmen's Compensation claims are covered by Workmen's Compensation Insurance as required by law; that all public liability claims are covered by insurance.

CONTRACTOR: _____

SEAL

TITLE: _____

DATE: _____

STATE OF _____ COUNTY OF _____

Personally appeared before me this _____ day of _____, 20 __, known (or made known) to me to be the _____ of (Owner/Partner/Corp Off.)

Contractor(s), who being by me duly sworn, subscribed to the foregoing affidavit in my presence.

_____(SEAL)

Notary Public

Type Name:

My Commission Expires:

CONTRACTOR'S REQUEST FOR PARTIAL PAYMENT



Application and Certificate for Payment

TO OWNER: PROJECT: _____ APPLICATION NO: _____ **Distribution to:**
 PERIOD TO: _____ OWNER:
 CONTRACT FOR: _____ ARCHITECT:
 CONTRACT DATE: _____ CONTRACTOR:
 PROJECT NOS: / / FIELD:
 OTHER:

FROM CONTRACTOR: VIA ARCHITECT: _____

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract. Continuation Sheet, AIA Document G703, is attached.

1. ORIGINAL CONTRACT SUM \$ _____
2. Net change by Change Orders \$ _____
3. CONTRACT SUM TO DATE (Line 1 ± 2) \$ _____
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703) \$ _____
5. RETAINAGE:
 - a. 0 _____ % of Completed Work (Column D + B on G703) \$ _____
 - b. 0 _____ % of Stored Material (Column E on G703) \$ _____
 Total Retainage (Lines 5a + 5b or Total in Column I of G703) \$ _____
6. TOTAL EARNED LESS RETAINAGE \$ _____ (Line 4 Less Line 5 Total.)
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT \$ _____ (Line 6 from prior Certificate)
8. CURRENT PAYMENT DUE \$ _____
9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 6 less Line 8) \$ _____

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	\$ _____	\$ _____
Total approved this Month	\$ _____	\$ _____
TOTALS	\$ _____	\$ _____
NET CHANGES by Change Order	\$ _____	\$ _____

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR: _____ Date: _____
 BY: _____
 State of: _____
 County of: _____
 Subscribed and sworn to before me this _____ day of _____

Notary Public: _____
 My Commission expires: _____

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED \$ _____
 Amount application if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.

ARCHITECT: _____ Date: _____
 BY: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

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User Release: 1992005-021

Section I

CDBG Supplemental Conditions

CDBG Supplemental Conditions

CDBG Supplemental Conditions for Construction Contracts

The supplemental conditions contained in this section are intended to cooperate with, to supplement, and to modify the general conditions and other specifications. In case of disagreement with any other section of this contract, the Supplemental Conditions shall govern.

1. Termination (Cause and Convenience)
2. Access to Records
3. Retention of Records
4. Remedies
5. Environmental Compliance (Clean Air Act and Clean Water Act)
6. Energy Efficiency
7. Special Equal Opportunity Provisions
8. Conflict of Interest
9. Utilization of Minority and Women’s Businesses
10. Federal Labor Standards Provisions (Davis-Bacon, Copeland, and Contract Work Hours Act)
11. Guidance to Contractor for Compliance with Labor Standards Provisions
12. E-Verify

=====

1. Termination (Cause and Convenience)

- A. This contract may be terminated in whole or in part in writing by either party in the event of substantial failure by the other party to fulfill its obligations under this contract through no fault of the terminating party, provided that no termination may be effected unless the other party is given:
 - (1) not less than ten (10) calendar days written notice (delivered by certified mail, return receipt requested) of intent to terminate; and
 - (2) an opportunity for consultation with the terminating party prior to termination.
- B. This contract may be terminated in whole or in part in writing by the local government for its convenience, provided that the other party is afforded the same notice and consultation opportunity specified in l(a) above.
- C. If termination for default is effected by the local government, an equitable adjustment in the price for this contract shall be made, but
 - (1) no amount shall be allowed for anticipated profit on unperformed services or other work, and
 - (2) any payment due to the contractor at the time of termination may be adjusted to cover any additional costs to the local government because of the contractor’s default.

If termination for convenience is effected by the local government, the equitable adjustment shall include a reasonable profit for services or other work performed for which profit has not already been included in an invoice.

For any termination, the equitable adjustment shall provide for payment to the contractor for services rendered and expenses incurred prior to receipt of the notice of intent to terminate, in addition to termination settlement costs reasonably incurred by the contractor relating to commitments (e.g., suppliers, subcontractors) which had become firm prior to receipt of the notice of intent to terminate.

- D. Upon receipt of a termination action under paragraphs (a) or (b) above, the contractor shall (1) promptly discontinue all affected work (unless the notice directs otherwise) and (2) deliver or otherwise make available to the local government all data, drawings, reports specifications, summaries and other such information, as may have been accumulated by the contractor in performing this contract, whether completed or in process.

- E. Upon termination, the local government may take over the work and may award another party a contract to complete the work described in this contract.
- F. If, after termination for failure of the contractor to fulfill contractual obligations, it is determined that the contractor had not failed to fulfill contractual obligations, the termination shall be deemed to have been for the convenience of the local government. In such event, adjustment of the contract price shall be made as provided in paragraph (c) above.

2. Access to Records

The local government, the Florida Department of Economic Opportunity, the U.S. Department of Housing and Urban Development, the Comptroller General of the United States, the Chief Financial Officer of the State of Florida, the Auditor General of the State of Florida, the Florida Office of Program Policy Analysis and Government Accountability, and any of their duly authorized representatives, shall have access to any books, documents, papers, and records of the contractor which are directly pertinent to this contract for the purpose of making audit, examination, excerpts, and transcriptions.

3. Retention of Records

The contractor shall retain all records relating to this contract for six years after the local government makes final payment and all other pending matters are closed.

4. Remedies

Unless otherwise provided in this contract, all claims, counter-claims, disputes and other matters in question between the local government and the contractor, arising out of or relating to this contract, or the breach of it, will be decided by arbitration, if the parties mutually agree, or in a Florida court of competent jurisdiction.

5. Environmental Compliance

If this contract exceeds \$100,000, the contractor shall comply with all applicable standards, orders, or requirements issued under section 306 of the Clean Air Act (42 USC 1857(h)), section 508 of the Clean Water Act (33 USC 1368), Executive Order 11738, and U.S. Environmental Protection Agency regulations (40 CFR Part 15). The contractor shall include this clause in any subcontracts over \$100,000.

6. Energy Efficiency

The contractor shall comply with any mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Public Law 94-163).

7. Special Equal Opportunity Provisions

A. **Activities and Contracts Not Subject to Executive Order 11246, as Amended**

(Applicable to Federally assisted construction contracts and related subcontracts \$10,000 and under.)

During the performance of this contract, the contractor agrees as follows:

- (1) The contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor shall take affirmative action to ensure that applicants for employment are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

CDBG Supplemental Conditions for Construction Contracts

- (2) The contractor shall post in conspicuous places, available to employees and applicants for employment, notices to be provided by Contracting Officer seeking forth the provisions of this nondiscrimination clause. The contractor shall state that all qualified applicants be considered without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- (3) Contractors shall incorporate foregoing requirements in all subcontracts.

B. Executive Order 11246, as Amended (through 2014), Section 202 Equal Opportunity Clause (Applicable to contracts/subcontracts above \$10,000)

During the performance of this contract, the contractor agrees as follows:

- (1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.
- (2) The contractor will, in all solicitations or advancements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- (3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information."
- (4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (5) The contractor will comply with all provisions of Executive Order No. 11246 of Sept. 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- (6) The contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be cancelled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order No. 11246 of Sept. 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

CDBG Supplemental Conditions for Construction Contracts

- (8) The contractor will include the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

(C) Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246). (Applicable to contracts/subcontracts exceeding \$10,000.)

- (a) The Offerer's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.
- (b) The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Female participation: 6.9% (statewide)

Minority participation (See Appendix at CDBG-25 for goals for each county)

These goals are applicable to all Contractor's construction work (whether or not it is federally-assisted) performed in the covered area. If the Contractor performs construction work in a geographic area located outside of the covered area, it shall apply the goals established for such geographic area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3 (a), and its efforts to meet the goals established or the geographic area where the contract resulting from his solicitation is to be performed. The hours of minority and female employment or training must be substantially uniform throughout the length of the contract and in each trade the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order, and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

- (c) The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.
- (d) As used in this Notice, and in the contract resulting from the solicitation, the "covered area" is the county in which the contract work is being undertaken.

(D) 41 CFR 60-4.3. Equal Opportunity Clauses

- (a) The equal opportunity clause published at 41 CFR 60-1.4(a) of this chapter is required to be included in, and is part of, all nonexempt Federal contracts and subcontracts, including construction contracts and subcontracts. The equal opportunity clause published at 41 CFR 60-1.4(b) is required to be included in, and is a part of, all nonexempt federally assisted construction contracts and subcontracts. In addition to the clauses described above, all Federal contracting officers, all applicants and all nonconstruction contractors, as applicable, shall include the specifications set forth in this section in all Federal and federally assisted construction contracts in excess of \$10,000 to be performed in geographical areas designated by the Director pursuant to § 60-4.6 of this part and in construction subcontracts in excess of \$10,000 necessary in whole or in part to the performance of nonconstruction Federal contracts and subcontracts covered under the Executive order.

Standard Federal Equal Employment Opportunity Construction Contract Specifications (Executive Order 11246).

1. As used in these specifications:
 - A. “Covered area” means the geographical area described in the solicitation from which this contract resulted;
 - B. “Director” means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
 - C. “Employer identification number” means the Federal Social Security number used on the Employer’s quarterly Federal Tax Return, U. S. Treasury Department Form 941.
 - D. “Minority” includes:
 - (i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
 - (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
 - (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Island); and
 - (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
2. Whenever the contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.
3. If the contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U. S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each contractor or subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other contractors or subcontractors toward a goal in an approved Plan does not excuse any covered contractor’s or subcontractor’s failure to take good faith efforts to achieve the Plan goals and timetables.

CDBG Supplemental Conditions for Construction Contracts

4. The contractor shall implement the specific affirmative action standards provided in paragraphs 7.A. through P. of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction contractors performing construction work in geographical areas where they do not have a federal or federally-assisted construction contract shall apply the minority and female goals established for the geographic area where the contract is being performed. Goals are published periodically in the Federal Register in notice form and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.
5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.
6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the contractor during the training period, and the contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U. S. Department of Labor.
7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:
 - (a) Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the contractor's employees are assigned to work. The contractor, where possible, will assign two or more women to each construction project. The contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
 - (b) Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.
 - (c) Maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source, or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the contractor by the union or, if referred, not employed by the contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the contractor may have taken.
 - (d) Provide immediate written notification to the Director when the union or unions with which the contractor has a collective bargaining agreement has not referred to the contractor a minority person or woman sent by the contractor, or when the contractor has other information that the union referral process has impeded the contractor's efforts to meet its obligations.

CDBG Supplemental Conditions for Construction Contracts

- (e) Develop on-the-job training opportunities and/or participate in training programs for the areas which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the contractor's employment needs, especially those programs funded or approved by the Department of Labor. The contractor shall provide notice of these programs to the sources compiled under 7.(b) above.
- (f) Disseminate the contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
- (g) Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions including specific review of these items with on-site supervisory personnel such as superintendents, general foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.
- (h) Disseminate the contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the contractor's EEO policy with other contractors and subcontractors with whom the contractor does or anticipates doing business.
- (i) Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female recruitment students and to minority and female recruitment and training organizations serving the contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
- (j) Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a contractor's work force.
- (k) Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR 60-3.
- (l) Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
- (m) Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the contractor's obligations under these specifications are being carried out.
- (n) Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
- (o) Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
- (p) Conduct a review, at least annually, of all supervisors' adherence to and performance under the contractor's EEO policies and affirmative action obligations.

CDBG Supplemental Conditions for Construction Contracts

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations 7.(a) through (p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7.(a) through (p) of these specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the contractor. The obligation to comply, however, is the contractor's and failure of such a group to fulfill an obligation shall not be a defense for the contractor's noncompliance.
9. A single goal for minorities and separate single goal for women have been established. The contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the contractor has achieved its goals for women generally, the contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).
10. The contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.
11. The contractor shall not enter into any subcontract with any person or firm debarred from government contracts pursuant to Executive Order 11246.
12. The contractor shall carry out sections and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
13. The contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensively as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its effort to ensure equal employment opportunity. If the contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.
14. The contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee, the name, address, telephone numbers, construction trade, union affiliation, if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.
15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance and upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

E. Certification of Non-Segregated Facilities (Contracts over \$10,000)

The contractor does not maintain or provide for its employees any segregated facilities at any of its establishments, and does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The contractor certifies further that it will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it will not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The contractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this contract.

As used in this certification, “segregated facilities” mean any waiting rooms, work areas, rest rooms and wash rooms, restaurants, and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise.

The contractor further agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause; that it will retain such certifications in its files; and that it will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods) .

F. Civil Rights Act of 1964

Under Title VI of the Civil Rights Act of 1964, no person shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.

G. Section 109 of the Housing and Community Development Act of 1974

No person in the United States shall on the grounds of race, color, national original, religion or sex be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with funds made available under this title.

H. “Section 3” Compliance in the Provision of Training, Employment and Business Opportunities

- (1) The work to be performed under this contract is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 USC 1701u (Section 3). The purpose of Section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by section 3, shall, to the greatest extent feasible, be directed to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.
- (2) The parties to this contract agree to comply with HUD's regulations in 24 CFR Part 135, which implement Section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the Part 135 regulations.

- (3) The contractor agrees to send to each labor organization or representative of workers with which the contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the contractor's commitments under this Section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the Section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.
- (4) The contractor agrees to include this Section 3 clause in every subcontract subject to compliance with regulations in 24 CFR Part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this Section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR Part 135. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR Part 135.
- (5) The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR Part 135 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR Part 135.
- (6) Noncompliance with HUD's regulations in 24 CFR Part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.
- (7) With respect to work performed in connection with Section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act (25 USC 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be given to Indians, and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of section 3 and section 7(b) agree to comply with Section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

I. Section 503 Handicapped (Contracts \$2,500 or more)

- (1) The Contractor will not discriminate against any employee or applicant for employment because of physical or mental handicap in regard to any position for which the employee or applicant for employment is qualified. The Contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified handicapped individuals without discrimination based upon their physical or mental handicap in all employment practices such as the following: employment, upgrading, demotion or transfer, recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.
- (2) The Contractor agrees to comply with the rules, regulations and relevant orders of the Secretary of Labor issued pursuant to the Act.
- (3) In the event of the Contractor's noncompliance with the requirements of this clause, actions for noncompliance may be taken in accordance with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.
- (4) The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices in a form to be prescribed by the Director, provided by or through the contracting officer. Such notices shall state the Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified handicapped employees and applicants for employment, and the rights of applicants and employees.

- (5) The contractor will notify each labor union or representative of workers with which it has a collective bargaining agreement or their contract understanding, that the contractor is bound by the terms of Section 503 of the Rehabilitation Act of 1973, and is committed to take affirmative action to employ and advance in employment physically and mentally handicapped individuals.
- (6) The contractor will include the provisions of this clause in every subcontract or purchase order of \$2,500 or more unless exempted by rules, regulations, or orders of the Secretary issued pursuant to Section 503 of the Act, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the Director of the Office of Federal Contract Compliance Programs may direct to enforce such provisions, including action for noncompliance.

J. Age Discrimination in Employment Act of 1967, as Amended

It shall be unlawful for an employer-

- (1) to fail or refuse to hire or to discharge any individual or otherwise discriminate against any individual with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's age;
- (2) to limit, segregate, or classify his employees in any way which would deprive or tend to deprive any individual of employment opportunities or otherwise adversely affect his status as an employee, because of such individual's age; or
- (3) to reduce the wage rate of any employee in order to comply with this chapter.

K. Title II of the Genetic Information Nondiscrimination Act of 2008 (GINA)

- (1) Under Title II of the Genetic Information Nondiscrimination Act, it is illegal to discriminate against employees or applicants because of genetic information. Employers are prohibited from using genetic information in making employment decisions. GINA restricts employers and other entities covered by Title II (employment agencies, labor organizations and joint labor-management training and apprenticeship programs - referred to as "covered entities") from requesting, requiring or purchasing genetic information, and strictly limits the disclosure of genetic information.

The law forbids discrimination on the basis of genetic information when it comes to any aspect of employment, including hiring, firing, pay, job assignments, promotions, layoffs, training, fringe benefits, or any other term or condition of employment.

- (2) "Genetic information" includes information about an individual's genetic tests and the genetic tests of an individual's family members, as well as information about the manifestation of a disease or disorder in an individual's family members (i.e. family medical history). Family medical history is included in the definition of genetic information because it is often used to determine whether someone has an increased risk of getting a disease, disorder, or condition in the future.

8. Conflict of Interest of Officers or Employees of the Local Jurisdiction, Members of the Local Governing Body, or Other Public Officials

No officer or employee of the local jurisdiction or its designees or agents, no member of the governing body, and no other public official of the locality who exercises any function or responsibility with respect to this contract, during his/her tenure or for one year thereafter, shall have any interest, direct or indirect, in any contract or subcontract, or the proceeds thereof, for work to be performed. Further, the contractor shall cause to be incorporated in all subcontracts the language set forth in this paragraph prohibiting conflict of interest.

9. Utilization of Minority and Women Firms (M/WBE)

The contractor shall take all necessary affirmative steps to assure that M/WBE firms are utilized when possible as suppliers and/or subcontractors, as applicable. Prior to contract award, the contractor shall document efforts to utilize M/WBE firms, including identifying what firms were solicited as suppliers and/or subcontractors, as applicable. Information regarding certified M/WBE firms can be obtained from:

- Florida Department of Management Services, Office of Supplier Diversity,
- Florida Department of Transportation (construction services, particularly highway),
- Minority Business Development Center in most major cities, and
- Local government M/WBE programs in many large counties and cities.

A firm recognized as an M/WBE by any of the above agencies is acceptable for the CDBG program.

10. Federal Labor Standards Provisions

(Davis-Bacon Act, Copeland Act, and Contract Works Hours & Safety Standards Act) The Project to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

- A. (1) (a) Minimum Wages. All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein; provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

- (b) (i) Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits; therefore, only when the following criteria have been met:
- (1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

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- (2) The classification is utilized in the area by the construction industry; and
 - (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
- (ii) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, employment Standards Administration, U. S. Department of Labor, Washington, D. C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB control number 1215-0140.)
 - (iii) In the event that the Contractor, the laborers or mechanics to be employed in the Classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designed for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that the additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)
 - (iv) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (b)(ii) or (iii) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.
- (c) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
 - (d) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program. Provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)
- (2) Withholding. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, HUD, or its designee may, after written notice to the contractor, sponsor, applicant, or owners, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

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- (3) (a) Payrolls and Basic Records. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017).
- (b) (i) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, sponsor, or owners, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR Part 5.5(a)(3)(I). This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal Stock Number 029-005-00014-1), U. S. Government Printing Office, Washington, DC 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149).
- (ii) Each payroll submitted shall be accompanied by a “Statement of Compliance”, signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
- (1) That the payroll for the payroll period contains the information required to be maintained under 29 CFR Part 5.5 (a)(3)(I) and that such information is correct and complete;
 - (2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3;
 - (3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- (iii) The weekly submission of a properly executed certification set forth on the reverse side of Option Form WH-347 shall satisfy the requirement for submission of the “Statement of Compliance” required by paragraph A(3)(b)(ii) of this section.

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- (iv) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.
- (c) The contractor or subcontractor shall make the records required under paragraph A(3)(a) of this section available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request to make such records available may be grounds for debarment action pursuant to 29 CFR Part 5.12.
- (4) (a) Apprentices and Trainees.
 - (i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U. S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program, shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with the determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

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- (ii) **Trainees.** Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U. S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee’s level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program the contract will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (iii) **Equal Employment Opportunity.** The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.
- (5) **Compliance with Copeland Act Requirements.** The contractor shall comply with the requirements of 29 CFR Part 3 which are incorporated by reference in this contract.
- (6) **Subcontracts.** The contractor or subcontractor will insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as HUD or its designee may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contract shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR Part 5.5.
- (7) **Contract Termination, Debarment.** A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.
- (8) **Compliance with Davis-Bacon and Related Act Requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3 and 5 are herein incorporated by referenced in this contract.
- (9) **Disputes Concerning Labor Standards.** Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U. S. Department of Labor (USDOL) set forth in 29 CFR Parts 5, 6 and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and HUD or its designee, the USDOL, or the employees or their representatives.
- (10) (a) **Certification of Eligibility.** By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor’s firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

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- (b) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.
 - (c) The penalty for making false statements is prescribed in the U. S. Criminal Code, 18 USC 1001. Additionally, U.S. Criminal Code, Section 1010, Title 18, USC, “Federal Housing Administration transactions”, provides in part “Whoever, for the purpose of ... influencing in any way the action of such Administration ... makes, utters or publishes any statement, knowing the same to be false ... shall be fined not more than \$5,000 or imprisoned not more than two years, or both.”
- (11) Complaints, Proceedings, or Testimony by Employees. No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this contract are applicable shall be discharged or in any other manner discriminated against by the contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this contract to his employer.
- B. Contract Work Hours and Safety Standards Act. As used in the paragraph, the terms “laborers” and “mechanics” include watchmen and guards.
- (1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
 - (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in subparagraph (1) of this paragraph, the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in subparagraph (1) of this paragraph.
 - (3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contract, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act , which is held by the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2) of this paragraph.
 - (4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.
- C. Health and Safety
- (1) No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

- (2) The contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 (formerly part 1518) and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act (Public Law 91-54.83 State 96).
- (3) The contractor shall include the provisions of this Article in every subcontract so that such provisions will be binding on each subcontractor. The contractor shall take such action with respect to any subcontract as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

11. Guidance to Contractor for Compliance with Labor Standards Provisions

A. Contracts with Two Wage Decisions

If the contract includes two wage decisions, the contractor, and each subcontractor who works on the site, must submit either two separate payrolls (one for each wage decision) or one payroll which identifies each worker twice and the hours worked under each wage decision. One single payroll, reflecting each worker once, may be submitted provided the Contractor uses the higher rate in the wage decisions for each identical job classification. However, where a job classification is not listed in a wage decision and is needed for that portion of the work, the classification **must** be added to the wage decision. A worker may not be paid at the rate for a classification using the hourly rate for that same classification in another wage decision. After the additional classification is approved, the contractor may pay the higher of the two rates and submit one payroll, if desired.

B. Complying with Minimum Hourly Amounts

- (1) The minimum hourly amount due to a worker in each classification is the total of the amounts in the “Rates” and “Fringe Benefits” (if any) columns of the applicable wage decision.
- (2) The contractor may satisfy this minimum hourly amount by any combination of cash and bona fide fringe benefits, regardless of the individual amounts reflected in the “Rates” and “Fringe Benefits” columns.
- (3) A contractor payment for a worker which is required by law is not a fringe benefit in meeting the minimum hourly amount due under the applicable wage decision. For example, contractor payments for FICA or unemployment insurance are not a fringe benefit; however, contractor payments for health insurance or retirement are a fringe benefit. Generally, a fringe benefit is bona fide if (a) it is available to most workers and (b) involves payments to a third party.
- (4) The hourly value of the fringe benefit is calculated by dividing the contractor’s annual cost (excluding any amount contributed by the worker) for the fringe benefit by 2080. Therefore, for workers with overtime, an additional payment may be required to meet the minimum hourly wages since generally fringe benefits have no value for any time worked over 40 hours weekly. (If a worker is paid more than the minimum rates required by the wage decision, this should not be a problem. As long as the total wages received by a worker for straight time equals the hours worked times the minimum hourly rate in the wage decision, the requirement of the Davis-Bacon and Related Acts has been satisfied.)

C. Overtime

For any project work over 40 hours weekly, a worker generally must be paid 150% of the actual hourly cash rate received, not the minimum required by the wage decision. (The Davis-Bacon and related acts only establish minimum rates and does not address overtime; the Contract Work Hours Act contains the overtime requirement and uses “basic rate of pay” as the base for calculation, not the minimum rates established by the Davis-Bacon and related acts.)

D. Deductions

Workers who have deductions, not required by law, from their pay must authorize these deductions in writing. The authorization must identify the purpose of each deduction and the amount, which may be a specific dollar amount or a percentage. A copy of the authorization must be submitted with the first payroll containing the deduction. If deducted amounts increase, another authorization must be submitted. If deducted amounts decrease, no revision to the original authorization is needed. Court-ordered deductions, such as child support, may be identified by the responsible payroll person in a separate document. This document should identify the worker, the amount deducted and the purpose. A copy of the court order should be submitted.

E. Classifications Not Included in the Wage Decision

If a classification not in the wage decision is required, please advise the owner’s representative in writing and identify the job classification(s) required. In some instances, the State agency may allow the use of a similar classification in the wage decision.

Otherwise, the contractor and affected workers must agree on a minimum rate, which cannot be lower than the lowest rate for any trade in the wage decision. Laborers (including any subcategory of the laborer classification) and truck drivers are not considered a trade for this purpose. If the classification involves a power equipment operator, the minimum cannot be lower than the lowest rate for any power equipment operator in the wage decision. The owner will provide forms to document agreement on the minimum rate by the affected workers and contractor.

The USDOL must approve the proposed classification and rate. The contractor may pay the proposed rate until the USDOL makes a determination. Should the USDOL require a higher rate, the contractor must make wage restitution to the affected worker(s) for all hours worked under the proposed rate.

F. Supervisory Personnel

Foremen and other supervisory personnel who spend at least 80% of their time supervising workers are not covered by the Davis-Bacon and Related Acts. Therefore, a wage decision will not include such supervisory classifications and their wages are not subject to any minimums under the Davis-Bacon and Related Act or overtime payments under the Contract Work Hours and Safety Standards Act. However, foremen and other supervisory personnel who spend less than 80% of their time engaged in supervisory activities are considered workers/mechanics for the time spent engaged in manual labor and must be paid at least the minimum in the wage decision for the appropriate classification(s) based on the work performed.

G. Sole Proprietorships/Independent Contractors/Leased Workers

The nature of the relationship between a prime contractor and a worker does not affect the requirement to comply with the labor standards provisions of this contract. The applicability of the labor standards provisions is based on the nature of the work performed.

If the work performed is primarily manual in nature, the worker is subject to the labor standards provisions in this contract. For example, if John Smith is the owner of ABC Plumbing and performs all plumbing work himself, then Mr. Smith is subject to the labor standards provisions, including minimum wages and overtime. His status as “owner” is irrelevant for labor standards purposes.

If a worker meets the IRS standards for being an independent contractor, and is employed as such, this means that the worker must submit a separate payroll as a subcontractor rather than be included on some other payroll. The worker is still subject to the labor standards provisions in this contract, including minimum wages and overtime.

If a contractor or subcontractor leases its workers, they are subject to the labor standards provisions in this contract, including minimum wages and overtime. The leasing firm must submit payrolls and these payrolls must reflect information required to determine compliance with the labor standards provisions of this contract, including a classification for each worker based on the nature of the work performed, number of regular hours worked, and number of overtime hours worked.

H. Apprentices/Helpers

A worker may be classified as an apprentice **only if participating in a federal or state program**. Documentation of participation must be submitted. Generally, the apprentice program specifies that the apprentice will be compensated at a percentage of the journeyman rate. For Davis-Bacon Act purposes, the hourly rate cannot be lower than the percentage of the hourly rate for the classification in the applicable wage decision.

If the worker does not participate in a federal or state apprentice program, then the worker must be classified according to duties performed. This procedure may require classification in the “trade” depending on tools used, or as a laborer if specialized tools of the trade are not used. The contractor may want to consult with the Wage and Hour Division of the U.S. Department of Labor located in most large cities regarding the appropriate classification.

Presently, no worker may be classified as a “helper”. As with apprentices not participating in a formal apprentice program, the worker must be classified according to duties performed and tools used.

12. E-Verify

Contractors and subcontractors performing work funded by CDBG subgrants are required to enroll in the U.S. Department of Homeland Security’s E-Verify system to verify the employment eligibility of all new employees that they hire during the term of their contracts under Executive Order 11-116, signed by the Governor of Florida on May 27, 2011.

- (a) E-Verify is an Internet-based system that allows businesses to determine the eligibility of their employees to work in the United States. A contractor or subcontractor that has not signed up for E-Verify and executed a memorandum of understanding with the Department of Homeland Security can enroll in the E-Verify system on the Department of Homeland Security’s website listed below:

<http://www.uscis.gov/e-verify/e-verify-enrollment-page>

- (b) Contractors and subcontractors shall enroll in the E-Verify system prior to hiring any new employee after the effective date of their contracts to perform work on CDBG-funded projects. The address for obtaining an Employer Memorandum of Understanding is:

<http://www.uscis.gov/sites/default/files/USCIS/Verification/E-Verify/E-Verify Native Documents/MOU for E-Verify Employer.pdf>

- (c) The Department of Homeland Security offers tutorials and other assistance at the web address below:

<http://www.uscis.gov/e-verify/you-start>

Appendix
Minority Participation Goals

These are the goals, by county, for meeting the minority participation portion of Section 7-B(2)(b) of the CDBG Supplemental Conditions. These are contractor workforce goals, not goals for subcontracting to minority and women firms. Solicitation of minority and women firms as subcontractors is a separate federal requirement which the contractor must document compliance with.

<u>Tampa-St. Petersburg Area</u>	<u>Percentage</u>
Hillsborough, Pinellas, Pasco.....	17.9
Charlotte, Citrus, Collier, DeSoto,.....	17.1
Hardee, Hernando, & Highlands (all seven counties)	
Lee	15.3
Manatee	15.9
Polk	18.0
Sarasota.....	10.5

<u>Tallahassee Area</u>	
Leon, Wakulla.....	24.3
Calhoun, Franklin, Gadsden, Jackson,	29.5
Jefferson, Liberty, Madison, & Taylor (all eight counties)	

<u>Pensacola - Panama City Area</u>	
Bay.....	14.1
Escambia, Santa Rosa.....	18.3
Gulf, Holmes, Okaloosa,.....	15.4
Walton, & Washington (all five counties)	

<u>Jacksonville Area</u>	
Alachua	20.6
Baker, Clay, Duval, Nassau, & St. Johns.....	21.8
Bradford, Columbia, Dixie, Gilchrist	22.2
Hamilton, Lafayette, Levy, Marion, Putnam, Suwannee, & Union (all 11 counties)	

<u>Orlando - Daytona Beach Area</u>	<u>Percentage</u>
Volusia	15.7
Brevard	10.7
Orange, Osceola, & Seminole (all three counties).....	15.5
Flagler, Lake, & Sumter (all three counties)	14.9

<u>Miami - Fort Lauderdale Area</u>	
Dade.....	39.5
Broward.....	15.5
Palm Beach	22.4
Glades, Hendry, Indian River, Monroe,.....	30.4
Okeechobee, Martin, & St. Lucie (all seven counties)	

Certifications



Certification Regarding Debarment, Suspension, and Other Responsibility Matters (Primary Covered Transactions)

April, 2015

Recipient: **Holmes County** Contract Number: **22CV-S06**

Name of Company Selected as a Prime Contractor: _____

DUNS Number: _____

- 1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:
 - (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
 - (b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 - (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1)(b) of this certification; and
 - (d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
- (2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Authorized Signature

Date

Name Typed

Title

Street Address

City, State, Zip

(24 CFR 24.510 and 24 CFR, Part 24, Appendix A)



Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion (Subcontractor)

April, 2015

Recipient: Holmes County Contract Number: 22CV-S06

Name of Subcontractor: _____

DUNS Number: _____

Lower Tier Covered Transactions

- (1) The prospective lower tier participant certifies, by submission of this document, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- (2) Where the prospective lower tier participant is unable to certify to the above statement, the prospective participant shall attach an explanation to this form.

Authorized Signature

Date

Name Typed

Title

Street Address

City, State, Zip

(24 CFR 24.510 and 24 CFR, Part 24, Appendix A)

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 AND MINISTER OATHS.

1. This sworn statement is submitted to Holmes County BOCC
[print name of the public entity]
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 a 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 preceding 36 months shall be considered an affiliate.
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 laws 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, or which otherwise transacts or applies to transact business with 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 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 THE 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]

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

Personally known _____

Or Produced identification _____

(Type of Identification)

Notary Public – State of _____

My commission expires _____

(Printed, typed or stamped
commission name of notary public)

MBE/WBE

DOCUMENTATION OF MBE AND WBE SUBCONTRACTORS

All Bidders are required in accordance with 24 CFR 85.36 (e) (2) (vi) to document efforts to solicit minority-owned and women owned subcontractors if subcontracts are to be let. Failure to document these efforts and complete this certification will cause the bid to be declared non-responsive and possibly rejected.

At a minimum, bidders are required to take the following action:

Assuring that minority businesses and women's business enterprises are solicited whenever they are potential sources by including written documentation of such action with the bid proposal. Written documentation may include, for example (1) written quotes from MBEs and WBEs; (2) letters of solicitation prepared by the bidder and sent to MBEs and WBEs who may be potential sources; or (3) written accounts of telephone solicitations of MBEs and WBEs. Such accounts must include the name of the MBE or WBE firm, mailing address, telephone number and contact person at the MBE or WBE firm.

I hereby certify that no subcontracts will be let on this project.

Name of firm

Signature of representative

Print or type name

Date

IF SUBCONTRACTS ARE TO BE LET, COMPLETE THE CERTIFICATION ON THE FOLLOWING PAGE

I hereby certify that the **attached documentation** of efforts to solicit MBE and WBE subcontractors is to the best of my knowledge true and accurate. Furthermore, I understand that the **attached documentation** will be verified by the Owner prior to awarding a contract.

Name of firm

Signature of representative

Print or type name

Date

Davis-Bacon

NOTICE TO ALL BIDDERS

THIS PROJECT IS SUBJECT TO
DAVIS-BACON WAGE RATES.
BOTH PRIME AND SUBCONTRACTORS WILL BE
REQUIRED TO SUBMIT WEEKLY PAYROLLS
VERIFYING THAT ALL EMPLOYEES ON THIS JOB
WERE PAID AT DAVIS-BACON WAGE RATES
OR HIGHER.

IT IS THE RESPONSIBILITY
OF THE PRIME CONTRACTOR
TO INSURE THAT ALL SUBCONTRACTORS
PROVIDE WEEKLY PAYROLLS AND
TO WITHHOLD PAYMENT FROM SUBCONTRACTORS
IF THEY ARE NOT PROVIDED ON A TIMELY BASIS.

IN ADDITION, PRIME CONTRACTORS ARE SUBJECT
TO "SECTION 3" PROVISIONS FOR HIRING LOCAL
LOW AND MODERATE INCOME PERSONS AND
AFFIRMATIVELY SOLICITING AND DOCUMENTING
THE SOLICITATION OF MINORITY AND WOMEN
OWNED BUSINESS SUBCONTRACTORS.

Placeholder for Wage Rates

Section 3

SECTION 3 CONTRACT CLAUSE

All Section 3 covered contracts and subcontracts must include the following clause:

- I. The work to be performed under this contract is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 USC.1701u (Section 3). The purpose of Section 3 is to ensure that employment and other economic opportunities generated by HUD assistance, or HUD-assisted projects covered by Section 3, shall to the greatest extent feasible be directed to low and very low-income persons, particularly persons who are recipients of HUD assistance for housing.
- II. The parties to this contract agree to comply with HUD's regulations in 24 CFR part 75, which implement Section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the part 75 regulations.
- III. The contractor agrees to send to each labor organization or representative of workers with which the contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the contractor's commitments under this Section 3 Clause and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the Section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.
- IV. The contractor agrees to include this Section 3 Clause in every subcontract subject to compliance with regulations in 24 CFR part 75, and agrees to take appropriate actions, as provided in an applicable provision of the subcontract or in this Section 3 Clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR part 75. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR part 75.
- V. The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR part 75 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR part 75.
- VI. Noncompliance with HUD's regulations in 24 CFR part 75 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.
- VII. With respect to work performed in connection with Section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act (25 USC 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be given to Indians and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of Section 3 and section 7(b) agree to comply with Section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

CONTRACTOR SECTION 3 PLAN

_____ (Contractor) agrees to implement affirmative steps to comply with the Section 3 requirements set forth at 24 CFR 75 directed at increasing the utilization of lower income residents and businesses within the City or County of **Holmes**.

- A. To implement Section 3 requirements by seeking the assistance of local officials in determining the exact boundaries of the applicable project area.
- B. To attempt to recruit from within the City/County the necessary number of lower income residents through local advertising media, signs placed at the proposed site for the project, and community organizations and public or private institutions operating within or serving the project area.
- C. To maintain a list of all lower income residents who have applied either on their own or on referral from any source, and to employ such persons, if otherwise eligible and if a vacancy exists.
- D. To insert this Section 3 plan in all bid documents, and to require all bidders to submit a Section 3 affirmative action plan including utilization goals and the specific steps planned to accomplish these goals.
- E. To formally contact unions, subcontractors and trade associations to secure their cooperation for this program.
- F. To maintain records, including copies of correspondence, memoranda, etc., which document that all the above affirmative action steps have been taken.
- G. To appoint or recruit an executive official of the company or agency as Equal Opportunity Officer to coordinate the implementation of this Section 3 plan.
- H. To list all permanent workforce for this project by job title.
- I. To list all projected workforce needs for this project by job classification and time frame for potential hire.

As officers and representatives of _____
(Name of Bidder)

We, the undersigned, have read and fully agree to the above and become a party to the full implementation of this program.

_____ Signature

_____ Title _____ Date

**CERTIFICATION OF BIDDER
REGARDING SECTION 3
AND SEGREGATED FACILITIES**

Name of Proposed Contractor

Holmes County CDBG 22CV-S06
Project Name and Number

The undersigned hereby certifies that:

- a. Section 3 provisions are included in the Contract.
- b. A written Section 3 plan was prepared and submitted as part of the bid proceedings
- c. No segregated facilities will be maintained.

Signer Name _____

Title _____

Signature

Date



Documentation for Business Claiming Section 3 Status

Name of Business: _____

DUNS Number of Business: _____

Address of Business: _____

- Type of Business:
- | | |
|--|--|
| <input type="checkbox"/> Corporation | <input type="checkbox"/> Partnership |
| <input type="checkbox"/> Sole Proprietorship | <input type="checkbox"/> Joint Venture |

Attached is the following documentation as evidence of our Section 3 status:

For a business claiming status as a Section 3 resident-owned enterprise

- | | |
|---|---|
| <input type="checkbox"/> Copy of resident lease | <input type="checkbox"/> Copy of receipt of public assistance |
| <input type="checkbox"/> Copy of evidence of participation in a public assistance program | <input type="checkbox"/> Other evidence |

For a business claiming Section 3 status by subcontracting 25 percent of the dollar amount awarded to qualified Section 3 businesses

- List of Section 3 subcontractor(s) and subcontract amount(s).

For a business claiming Section 3 status based on at least 30 percent of their workforce currently qualifying as Section 3 residents or having been qualified as Section 3 eligible residents within three years of date of first employment with the business

- List of all current full-time employees, and
- List of employees claiming Section 3 status and for each such employee:
- PHA/IHA Residential lease less than three years from date of employment, or
 - Other evidence of Section 3 status less than three years from day of employment.

I certify that the above information is correct.

Signature

Type Name and Title

Date

Note: The local government shall maintain this form and supporting documentation in the CDBG project files for review during monitoring.



Section 3 Participation Report
(Construction Prime Contractor)

April, 2015

Local Government: **Holmes County** CDBG Contract #: **22CV-S06**

This form must be completed by the prime contractor for any construction contract over \$100,000. Voluntary reporting for contracts under \$100,000 is encouraged.

Contractor's Name: _____

Contractor's DUNS Number: _____ Contract Amount: \$ _____

1. Does the business qualify as a "Section 3 Business Concern" because	
a) It is at least <u>51%</u> owned by Section 3 residents*, or	<input type="checkbox"/> Yes <input type="checkbox"/> No
b) At least 30% of its <u>permanent full-time employees</u> are	
i) Currently Section 3 residents*, or	<input type="checkbox"/> Yes <input type="checkbox"/> No
ii) Were Section 3 residents* within first three years of employment, or	<input type="checkbox"/> Yes <input type="checkbox"/> No
c) Will at least 25% (dollar value) of construction subcontracts (no material/supplies/equipment vendors unless they are also installing same) be to businesses meeting (a) or (b) above?	<input type="checkbox"/> Yes <input type="checkbox"/> No
If <i>yes</i> , list any Section 3 subcontractors and subcontract amount:	
Subcontractors	Subcontract Amount
	\$
	\$
	\$
2. Will the contractor be hiring any additional staff (office or field) for this project? <input type="checkbox"/> Yes <input type="checkbox"/> No	
• If <i>yes</i> , what types of jobs will be filled, and how many additional hires are estimated in each job type?	

***Section 3 resident means:**

- (1) A public housing resident; or
- (2) An individual who resides in the metropolitan area or nonmetropolitan county in which the section 3 covered assistance is expended, and who is:
 - (i) A *low-income person*, as this term is defined in section 3(b)(2) of the 1937 Act (42 U.S.C. 1437a(b)(2)). Section 3(b)(2) of the 1937 Act defines this term to mean families (including single persons) whose incomes do not exceed 80 per centum of the median income for the area, as determined by the Secretary, with adjustments for smaller and larger families, except that the Secretary may establish income ceilings higher or lower than 80 per centum of the median for the area on the basis of the Secretary's findings that such variations are necessary because of prevailing levels of construction costs or unusually high or low-income families; or
 - (ii) A *very low-income person*, as this term is defined in section 3(b)(2) of the 1937 Act (42 U.S.C. 1437a(b)(2)). Section 3(b)(2) of the 1937 Act (42 U.S.C. 1437a(b)(2)) defines this term to mean families (including single persons) whose incomes do not exceed 50 per centum of the median family income for the area, as determined by the Secretary with adjustments for smaller and larger families, except that the Secretary may establish income ceilings higher or lower than 50 per centum of the median for the area on the basis of the Secretary's findings that such variations are necessary because of unusually high or low family incomes.
- (3) A person seeking the training and employment preference provided by section 3 bears the responsibility of providing evidence (if requested) that the person is eligible for the preference.

Note: This contract is funded with federal funds, and this information is required for construction contracts over \$100,000 for reporting purposes. See Section 3 portion of *CDBG Supplemental Conditions for Construction Projects* for additional information.



Section 3 Participation Report (Construction Subcontractor)

April, 2015

Local Government: Holmes County

CDBG Contract #: 22CV-S06

This form must be completed by construction subcontractors when the prime contract is at least \$100,000. (Do not include the cost of equipment or material supplies unless you are installing also.) Voluntary reporting is encouraged when the prime contract is under \$100,000.

Subcontractor's Name: _____

Subcontractor's DUNS Number: _____ Subcontract Amount: \$ _____

1. Does the business qualify as a "Section 3 Business Concern" because	
a) It is at least <u>51% owned</u> by Section 3 residents*, or	<input type="checkbox"/> Yes <input type="checkbox"/> No
b) At least 30% of its <u>permanent full-time employees</u> are	
i) Currently Section 3 residents*, or	<input type="checkbox"/> Yes <input type="checkbox"/> No
ii) Were Section 3 residents* within first three years of employment, or	<input type="checkbox"/> Yes <input type="checkbox"/> No
2. Will the subcontractor be hiring any additional staff (office or field) for this project?	
<input type="checkbox"/> Yes <input type="checkbox"/> No	
• If <i>yes</i> , what types of jobs (e.g., laborer, equipment operator) will be filled, and how many additional hires are estimated in each job type?	

***Section 3 resident means:**

- (1) A public housing resident; or
- (2) An individual who resides in the metropolitan area or nonmetropolitan county in which the section 3 covered assistance is expended, and who is:
 - (i) A **low-income person**, as this term is defined in section 3(b)(2) of the 1937 Act (42 U.S.C. 1437a(b)(2)). Section 3(b)(2) of the 1937 Act defines this term to mean families (including single persons) whose incomes do not exceed 80 per centum of the median income for the area, as determined by the Secretary, with adjustments for smaller and larger families, except that the Secretary may establish income ceilings higher or lower than 80 per centum of the median for the area on the basis of the Secretary's findings that such variations are necessary because of prevailing levels of construction costs or unusually high or low-income families; or
 - (ii) A **very low-income person**, as this term is defined in section 3(b)(2) of the 1937 Act (42 U.S.C. 1437a(b)(2)). Section 3(b)(2) of the 1937 Act (42 U.S.C. 1437a(b)(2)) defines this term to mean families (including single persons) whose incomes do not exceed 50 per centum of the median family income for the area, as determined by the Secretary with adjustments for smaller and larger families, except that the Secretary may establish income ceilings higher or lower than 50 per centum of the median for the area on the basis of the Secretary's findings that such variations are necessary because of unusually high or low family incomes.
- (3) A person seeking the training and employment preference provided by section 3 bears the responsibility of providing evidence (if requested) that the person is eligible for the preference.

Note: This contract is funded with federal funds, and this information is required for reporting purposes for projects costing over \$100,000. See Section 3 portion of *CDBG Supplemental Conditions for Construction Contracts* for additional information.

DIVISION III

TECHNICAL, PRODUCT, AND MATERIAL SPECIFICATIONS

SECTION 1A

TERMITE CONTROL TREATMENT

1A-01. **GENERAL CONDITIONS:**

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

1A-02. **SCOPE:**

The compacted soil under all new interior concrete floor slabs and around all foundation walls shall be chemically treated prior to vapor barrier being placed. Materials, applications, and standards shall comply with the Florida Building Code 2023, Section 1816.

1A-03. **MATERIALS:**

Shall be Termidor or a chemical that is approved by the State of Florida for pretreatment. Proof shall be provided that no toxic effects to humans or beneficial plant or animal life will result from its use.

1A-04. **RATES OF APPLICATION:**

- A. Rate of application shall be as per manufacturer's label for chemical use at full label rate.
- B. Treatment shall be full coverage below the concrete slabs and along the inside of all foundation walls or interior partitions, and around any openings in the interior of the slab cut or left for pipes, conduits, etc.

1A-05. **MATERIAL SAMPLE:**

Prior to application of the chemical, if required by Architect, this contractor shall, in the presence of the Architect, fill a sealable sample bottle of at least 8 fluid oz. of the mixture to be applied. Testing of the mixture shall be by the Entomology Department, State of Florida Department of Agriculture. Label of the mixture used shall be provided with the sample of mixture.

1A-06. **APPLICATION TECHNIQUE:**

Treatment shall not be made when the soil is excessively wet or immediately after heavy rains to avoid surface flow of the toxicant from the application site. Unless the treated soil is to be promptly covered with drainage fill and vapor barrier, adequate precautions must be taken to prevent disturbances of the treatment and human or animal contact with the treated soil.

1A-07. **POST TREATMENT:**

Upon completion of construction and completion of all grading around the building and in

accordance with material label a final application shall be made entirely around the perimeter of the building and at the rate as directed on the materials label. **Post treatment shall be done at the time of the substantial completion inspection and the Architect shall be present.**

1A-08. SUBMITTAL:

Prior to application, submit all information showing type of chemical and rate of application for approval.

1A-09. WARRANTY:

After all the above has been done, the termite control subcontractor shall provide the Owner a written five (5) year warranty fully guaranteeing his work and providing any treatment and repairs necessary during that period. Five-year warranty shall include all inspections that may be required under the warranty.

END OF SECTION

SECTION 1B
RODENT PROOFING

1B-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

1B-02. SCOPE:

Buildings or structures and the walls enclosing habitable or occupied rooms and spaces in which persons live, sleep or work or in which feed, food or foodstuffs are stored, prepared, processed, served, or sold, shall be constructed in accordance with the provisions of this section.

1B-03. FOUNDATION WALL VENTILATION OPENINGS: N.A.

1B-04. FOUNDATION AND EXTERIOR WALL SEALING:

Annular spaces around pipes, electric cables, conduits, or other openings in the walls shall be protected against the passage of rodents by closing such openings with cement mortar, close cell spray foam, concrete masonry, or non-corrosive metal. It shall be the contractor's responsibility to inspect all existing exterior wall surfaces as required to determine that there are no unprotected openings in the existing wall surfaces. If unprotected openings are observed, these openings shall be protected against the passage of rodents, as noted above.

1B-05. DOORS:

Hollow metal doors and doors on which metal protection has been applied shall be hinged to be free swinging. When closed, the maximum clearance between any door, door jambs, and sills shall not be greater than 3/8" inch (9.5mm).

1B-06. WINDOWS AND OTHER OPENINGS:

Windows and other openings for light or ventilation located in exterior walls within 2 feet (610mm) above the existing ground level immediately below such openings shall be covered for their entire height and width, including frame, with hardware cloth of at least 0.035-inch (0.89mm) wire or heavier.

- A. Rodent-Accessible Openings: Windows and other openings for the purpose of light and ventilation in the exterior walls not covered in this chapter, accessible to rodents by way of exposed pipes, wires, conduits and other appurtenances, shall be covered with wire cloth of at least 0.035 inch (0.89mm) wire. In lieu of wire cloth covering, said pipes, wired, conduits and other appurtenances shall be blocked from rodent usage by installing solid sheet metal guards 0.024 inch (0.61mm) thick or heavier.

Guards shall be fitted around pipes, wires, conduits, or other appurtenances. In addition, they shall be fastened securely to and shall extend perpendicularly from the exterior wall for a minimum distance of 12 inches (305mm) beyond and on either side of pipes, wires, conduits, or appurtenances.

1B-07. PIER AND WOOD CONSTRUCTION:

- A. Sill less than 12 inches above ground: Buildings not provided with a continuous foundation shall be provided with protection against rodents at grade by providing either an apron in accordance with Section F101.6.1.1 or a floor slab in accordance with Section F101.6.1.2
1. **F101.6.1.1 Apron.** Where an apron is provided, the apron shall not be less than 8 inches (203mm) above, nor less than 24 inches (610mm) below grade. The apron shall not terminate below the lower edge of the siding material. The apron shall be constructed of an approved non-decayable, water-resistant rodent-proofing material of required strength and shall be installed around the entire perimeter of the building. Where constructed of masonry or concrete materials, the apron shall not be less than 4 inches (102mm) in thickness.
 2. **F101.6.1.2. Grade Floors.** Where continuous concrete grade floor slabs are provided, open spaces shall not be left between the slab and walls, and openings in the slab shall be protected.
- B. Sill at or above 12 inches above ground: Buildings not provided with a continuous foundation and which have sills 12 or more inches (305mm) above the ground level shall be provided with protection against rodents at grade in accordance with any of the following:
1. Section F101.6.1.1 or F101.6.1.2:
 2. By installing solid sheet metal collars at least 0.024 inch (0.6mm) thick at the top of each pier or pile and around each pipe, cable, conduit, wire or other item which provides a continuous pathway from the ground to the floor; or
 3. By encasing the pipes, cables, conduits, or wires in an enclosure constructed in accordance with Section F101.6.1.1

END OF SECTION

SECTION 2A

SITE WORK

2A-01. GENERAL CONDITIONS:

The General and Special Conditions included in Division II, Section E & F of these specifications shall apply to and form a part of this Section as if written in full herein.

2A-02. SCOPE:

The work contemplated includes all the clearing, excavating, filling, grading, backfilling, as required for the construction of the new building and associated site development. The work includes all exterior below grade utility lines and storm water retention / detention areas.

Grading areas are limited to work shown on the drawings.

2A-03. WORK BY OTHERS:

All excavating, shoring, draining, or pumping and backfilling required to install the mechanical work will be done by the respective sub-contractors.

Removal and relocation of active below grade and overhead utilities within the building area will be by the General Contractor and the respective sub-contractors.

2A-04. VISITING THE SITE:

Before submitting a bid, the contractor shall visit the site and fully inform himself as to the conditions of the site, as the Owner will pay no extras due to any unforeseen or special conditions at the site.

After notice to proceed, the contractor shall verify all dimensions and grades before commencing work and shall in case of discrepancies report such to the Architect and obtain instructions from him prior to proceeding with the work.

2A-05. EXISTING UTILITIES:

Existing on-site utilities, to the extent of what has been noted by the topographic survey, and what has been determined by field inspection are shown on the drawings. These may not be accurate or comprehensive. Any buried utility lines (water, sanitary, waste, data, etc.) that are abandoned are to be removed, unless noted otherwise.

Prior to any and clearing and excavation, it is recommended that a comprehensive utility line locate be executed to field identify all existing on-site utilities.

2A-06. TREES:

All trees not located within building, grading and drive areas or specifically noted not to be removed shall be protected from damage. Such protection to include root area. This contractor shall remove all trees located in all areas required for new construction and grading and any other trees designated on the drawings to be removed. This contractor shall also be responsible for trimming or removing branches from existing trees where such foliage or overhangs interferes with new construction. Where branches or limbs are sawn, treat cut areas of tree with black pitch. See "Site Plan" drawings for trees designated to be removed other than those within the building area.

2A-07. GEOTECHNICAL REPORT:

Due to existing conditions, a Geotechnical Soil Investigation has not been conducted for this project. Please see Division 2, Supplementary Instructions to Bidders, for the provision of unit cost for removing and replacing unsuitable soil encounters.

2A-08. SITE GRADING:

- A. SITE PREPARATION - Prior to proceeding with construction, all topsoil and vegetation, trees and associated root systems, and any other deleterious non-soil materials found to be present (including the existing asphalt pavement section as well as any remaining substructures associated with the former development of this property) should be stripped from the proposed building footprint. Clean topsoil may be stockpiled and subsequently re-used in landscaped areas. Debris-laden materials should be excavated, transported, and disposed of off-site in accordance with appropriate solid waste rules and regulations. All existing utility locations should be reviewed to assess their impact on the proposed construction and relocated/grouted in-place as appropriate.

The soils exposed at the stripped grade elevation should be compacted to a minimum soil density of at least 95 percent of the maximum dry density as determined by the Modified Proctor test method (ASTM D-1557).

The Architect should observe the compaction of the subgrade to locate soft, weak, or excessively wet fill or existing soils present at the time of construction. Any unstable materials observed during the evaluation and compaction operations should be undercut and replaced with structural fill or stabilized in place by scarifying and re-densifying.

See Division II, Supplemental Instructions to Bidders, for contractors to provide a unit price for remediating unstable soil zones through their chosen means and methods. The Architect recommends that bidding contractors make arrangements with the Owner to thoroughly investigate the subsurface conditions and satisfy themselves with existing conditions so as to be able to determine costs for subgrade stabilization if required.

- B. FILL PLACEMENT: Fill materials should be low plasticity soil (i.e., Liquid Limit less than 30 and Plasticity Index less than 15) with fines contents below 30% that are free of non-soil materials and rock fragments larger than 3 inches in any one dimension. Based on visual examination, the near-surface strata of fine-grained slightly silty sands (SP/SM) should be suitable for use as structural fill/backfill, and the fine-grained clayey sands (SC) may or may not be suitable depending on the fines and moisture contents of excavated soils falling under this classification. Prior to construction, bulk samples of proposed fill materials should be laboratory-tested to confirm their suitability.

All materials to be used for backfill or compacted fill construction should be evaluated and, if necessary, tested by an independent testing lab prior to placement to determine if they are suitable

for their intended use. Any off-site materials used as fill should be approved by an independent testing lab prior to acquisition. Organic and/or debris-laden material is not suitable for re-use as structural fill.

- C. **SOIL COMPACTION:** Fill should be placed in thin, horizontal loose lifts (maximum 12-inch depth) and compacted to a minimum soil density of at least 95 percent of the Modified Proctor maximum dry density (ASTM D-1557), and subsequent footing excavations should be compacted to at least 98 percent. In confined areas, such as utility trenches, portable compaction equipment and thinner fill lifts (3 to 4 inches) may be necessary.

Fill materials used in structural areas should have a target maximum dry density of at least 100 pounds per cubic foot (pcf). If lighter-weight fill materials are used, a geotechnical engineer should be consulted to assess the impact on design recommendations.

Soil moisture content should be maintained within 2 percent of the optimum. We recommend that the grading contractor have equipment on-site during earthwork to dry and wet-fill soils. Moisture control may be difficult during rainy weather.

Filling operations should be observed by an independent soil technician, who can confirm the suitability of the material used and the uniformity and appropriateness of compaction efforts. He/she can also document compliance with the specifications by performing field density tests using thin-walled tube, nuclear, or sand cone testing methods. (ASTM D-2937, D-6938, or D-1556, respectively)

One test per 2,500 square feet within the proposed structure footprint should be performed in each lift of fill, with test locations well distributed throughout the fill mass. When filling in small areas, at least one test per day per area should be performed. One (1) test at conventional spread foundations, one (1) test per lift at each planned column footing area, and one (1) test per 75 linear feet at continuous strip foundations are also recommended.

- D. **GROUNDWATER CONTROL:** Groundwater is not expected to adversely impact the planned development of this property, although the potential exists for shallow perched/laterally flowing water/stormwater conditions to be present during construction, particularly if the site is not properly graded during construction to prevent the accumulation of stormwater runoff during and shortly following significant rain events from perching on the underlying low permeability silty to clayey sand soils.

Maintaining proper grades (i.e., positive drainage paths) during the construction phase of this project will be critical to avoid the development of "bird baths" within the proposed building footprint, which would degrade the underlying clayey soils and require undercutting to more firm underlying soils. Should perched groundwater conditions be encountered during the earthwork phase of this development, most likely localized dewatering efforts (e.g., construction ditches, temporary sumps, etc.) will suffice to allow for earthwork operations to be performed in the dry. Permanent dewatering measures are not anticipated as being necessary for this development.

- E. **FOUNDATION RECOMMENDATIONS:** The planned development will include the construction of a single-story medical office building. The structure will be a CMU block supported by a shallow foundation system. We have assumed that isolated interior column and continuous load-bearing wall loads will not exceed 40 kips per column and 3 kips per linear foot, respectively, for the planned structure.

Foundation excavations shall be evaluated by an independent testing lab prior to reinforcing steel placement to observe foundation subgrade preparation and confirm bearing pressure capacity. Foundation excavations should be level and free of debris, ponded water, mud, and loose, frozen, or

water-softened soils. Concrete should be placed as soon as is practical after the foundation is excavated, and the subgrade evaluated.

Foundation concrete should not be placed on frozen or saturated soil. If a foundation excavation remains open overnight, or if rain or snow is imminent, a 3 to 4-inch thick "mud mat" of lean concrete should be placed in the bottom of the excavation to protect the bearing soils until reinforcing steel and concrete can be placed.

The conditions exposed at subgrade levels will vary across the site and may include structural fill or densified in-situ soils. The slab-on-grade may be adequately supported on these subgrade conditions subject to the recommendations in this report. The slab-on-grade should be jointed around columns and along walls to reduce cracking due to differential movement. An impermeable vapor barrier is recommended beneath finished spaces to reduce dampness. Once grading is completed, the subgrade can be exposed to adverse construction activities and weather conditions during the period of sub-slab utility installations. The subgrade should be well drained to prevent the accumulation of water. If the exposed subgrade becomes unstable, excessively wet or exhibits excessive rutting or pumping, the geotechnical engineer should be consulted.

Foundation excavations should be level and free of debris, ponded water, mud, and loose, frozen, or water-softened soils. An independent testing lab should evaluate all foundation excavations before reinforcing steel placement to observe foundation subgrade preparation and assess bearing pressure capacity. Due to variable site subsurface and construction conditions, some adjustments in isolated foundation bearing pressures, foundation depth, undercutting, and replacement with controlled structural fill may be necessary.

Once site grading is completed, the subgrade may be exposed to adverse construction activities and weather conditions. The subgrade should be well-drained to prevent the accumulation of water. If the exposed subgrade becomes saturated or frozen, an independent testing lab an independent testing lab should be consulted.

See Civil Drawings included as part of the construction documents for all required site development including grading, site utilities, sidewalks, and new vehicular parking.

2A-09. ROCK EXCAVATION:

The price bid shall be based on earth excavation; extra compensation will be allowed if rock is encountered. Shale or rotten or stratified rock that can be loosened with a pick shall not be construed as rock.

When rock is encountered it shall be stripped of earth and the Architect notified and given proper time to measure same before blasting. All rock removed which has not been previously measured by the Architect will not be estimated as rock excavation.

Measurement for rock excavation will be omitted to six inches on either side of the outside of the footings, and no extra will be allowed for bank slope. Only rock requiring blasting and boulders ½ cubic yard or more will be estimated as rock excavation.

All blasting, the use, transportation, and storage of explosives shall be in accordance with national and local codes for the transportation, storage, and use of explosives. The contractor shall be responsible for damage or injury to persons or property resulting from the blasting.

2A-10. SHORING AND PROTECTION:

- A. Shore excavations where required to maintain them and/or adjoining structures in good order and safe working conditions.
- Keep excavations free from accumulating mud and water, by pumping or draining until backfilling is authorized by the Architect.
- B. The following shall be required where trench excavation or footing pit depth excavation exceeds 5 FT depth.
1. Comply with OSHA Standard 29 CFR, Section 1926.650 Subpart P.
 2. The Contractor shall provide written assurance of compliance with this law.
 3. A separate cost item identifying the cost of compliance.
 4. A trench safety system shall be designed by the Contractor.

2A-11. EROSION AND SILTATION CONTROL:

- A. During construction, the Contractor shall be responsible for providing control measures for erosion and siltation in compliance with the Local and/or County requirements and shall provide, if required, an Erosion and Siltation Plan.
- B. Soil stockpiles shall be protected from erosion. Dust from soil stockpiles shall be controlled.
- C. Storm drainage inlets shall be protected by hay bales, sod screens and/or any other measures to prevent siltation during construction and to prevent any construction debris from preventing proper flow of water to inlets.
- D. Sediment basins, sediment traps, perimeter berms, filter fabric fences, hay bales and other measures shall be installed as a first step in site preparation.

2A-12. FINISH GRADING:

Upon completion of all exterior work, apply a minimum of 6" of topsoil over rough grades left bare by building construction and excavation. Before topsoil is placed the areas shall be cleared of debris, building material, broken brick and block, and other materials that interfere with proper growth of vegetation. Topsoil shall be placed in all areas disturbed by construction under this contract including all areas not covered by paving. Topsoil shall be installed around building area to bring finish grade to 8" below finish floor at building, and sloped to existing grade.

Stockpiled topsoil shall be used and any additional amount of topsoil that will be required to bring grades up to levels shown or to provide proper drainage and slope away from the building, and toward drainage structures shall be furnished by the contractor.

Finish grading around building shall be as shown on the drawings and sloped away to existing grades at a minimum to prevent washing. The contractor shall be responsible for installing swales around the building area to direct surface water away from new construction, or adjacent existing buildings.

SECTION 3A

CONCRETE AND CEMENT FINISH WORK

3A-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

3A-02. SCOPE:

Work includes entire concrete operation consisting generally of footings, walls, grade beams, floor slabs, tie beams as shown on drawings, together with metal reinforcement rods and wire fabric, wood form, expansion joints and other required items to completely furnish all materials and labor for all concrete work. All reinforced concrete shall comply with the latest editions of ACI 301, Specifications for Structural Concrete for Buildings, and ACI 318-14, Requirements for Reinforced Concrete.

3A-03. MATERIALS:

- A. All materials specified in this Section shall conform to ASTM Designation specified, latest revision.
- B. Cement shall be an approved branch of Portland, meeting requirements of ASTM Standard Specification C-150. Type 1 cement shall be used.
- C. Fine Aggregate shall consist of natural sand; sand shall be clean, hard, strong, durable, uncoated, and free from loam, clay, organic matter, or other deleterious substances in excess quantities, shall meet the requirements of ASTM Designation C-33.
- D. Coarse Aggregate shall consist of crushed stone or gravel, conforming to ASTM Specification C-33, having hard, strong, durable and uncoated particles, well graded from fine to a maximum size not larger than 3/4".
- E. Water used in mixing concrete shall be clean and free from any deleterious substances. Water used in mixing concrete shall be potable.
- F. Anchorage Items: Slots, inserts, clips and other devices for anchoring masonry, wood, steel, and mechanical items to concrete of standard manufacture of approved types as required to engage and anchor work specified under other Sections.

Embedded items of structural steel as specified under Section of Structural Steel.
- G. Forms: All contact forms for concrete exposed to view shall be new 5/8" thick, oil impregnated plywood, attached to the supports.
- H. Form Oil: Approved colorless non-staining mineral oil, free of kerosene.
- I. Form Ties: Approved design, fixed or adjustable length, free of devices that leave holes or depressions larger than 7/8" diameter in concrete surface or metal with 1" of finished surface.

- J. Reinforcing Bars: Shall be new billet steel conforming to ASTM A-615, Grade 60, deformed and shall be free of kinks and non-shop bends in accordance with Section 26.6.3.1.b ACI 318-14 and should also be free of mud, oil, corrosion or anything that will impair proper bonding with concrete in accordance to 26.6.1.2.d ACI 318-14.
- K. Reinforcing Mesh: Welded wire fabric shall conform to ASTM A-1064 and unless otherwise noted shall be sized as follows:
- For 4" Slabs 6 x 6 - W 1.4 x W 1.4 or W2.9 x 2.9
For 5" Slabs 6 x 6 - W 2.9 x W 2.9
For 6" Slabs 6 x 6 - W 4.0 x W 4.0
- L. Metal Accessories: Metal accessories to support and space reinforcing bars shall be furnished in wire sizes and quantities in accordance with CRSI Code of Standard Practice.
- M. Expansion Joint Material: Shall be 1/2" thick, premolded expansion filler strips conforming to Federal Specification No. HHF 334, Type 1, Class "B".
- N. Sheet Vapor Retarder: ASTM E 1745, Class B (10 mils thick). Include manufacturer's recommended adhesive or pressure-sensitive tape.

3A-04. STORAGE OF MATERIALS:

- A. Cement and Aggregate: Shall be stored to prevent deterioration or intrusion of foreign matter. Material deteriorated or damaged shall not be used for concrete.
- B. Reinforcing Bars: Must be kept in racks off ground until used.

3A-05. DESIGN OF CONCRETE MIX AND PROPORTIONS:

- A. The concrete shall be composed of Portland Cement, fine aggregate, coarse aggregate, water and at the contractor's option, water-reducing admixture. Proportion concrete in accordance with ACI 211-91 of the ACI to be homogeneous, readily placeable and uniformly workable.
- B. Except for sidewalks, all concrete shall be of such quality as to develop a minimum compressive strength of 3000 psi at 28 days for building slab-on-grade, foundations, and footings and 4000 psi for all beams, columns, and elevated slabs. The maximum permissible slump shall be 4" plus or minus 1" at the time of placing concrete. Concrete for sidewalks may have minimum compressive strength of 2500 psi at 28 days.
- C. All concrete shall be a controlled mix concrete, and tests made to determine the exact amount of cement and proper proportion and grading of aggregate together with quantity of water required for strength of concrete shown above.
- D. The concrete mix for 3000 psi and 4000 psi concrete shall be designed by an independent testing laboratory. The mixture design shall be submitted to the Architect for approval prior to any concrete work being done.

After approval, the mixture design shall be furnished to the mixing plant and shall be adhered to strictly. Cost for design mix shall be paid for by the General Contractor.

- E. The exact proportions of all materials entering the concrete shall be as determined by the design mixture. The proportions will be changed whenever, in the opinion of the Architect, such change becomes necessary to obtain the specified strength, and the desired density, uniformity, and workability. The contractor shall not be compensated because of such change.

A minimum mix of 5.3 bags of cement per yard shall be used. The use of fly ash is allowable up to 20% of the design mix.

Unless approved otherwise by the Architect, aggregate used in all concrete mixes shall be no larger than No. 89 aggregate for concrete placed via a mechanical pump. All other concrete mix shall use No. 57 aggregate.

Concrete used for exterior concrete walks may contain fly ash as part of the mixture but not more than 10% of the total cement weight.

3A-06. SAMPLING AND TESTING:

- A. Cement: Will be accepted based on manufacturer's mill certificate of compliance to ASTM Designation C-150.
- B. Reinforcement: Mill tests reports for the material used shall be furnished to Architect and shall be furnished either before or at the time of submittal of reinforcing shop drawings.
- C. Tests on Concrete:
1. (a) Four (4) 4" ϕ x 8" long test cylinders shall be made during each day's pour, or approximately each 50 yards or 1 per every 5 trucks by an independent testing laboratory. Selection of testing laboratory will require approval of the Architect.
 - (b) The cylinders shall be given identification marks and recorded for reference. Specimens shall be made and cured in accordance with current compression and flexural test specimens in the field.
 - (c) Cylinders shall be shipped to an approved testing laboratory for testing. During the first 24-hour after molding the cylinders, the contractor shall provide suitable means for maintaining the temperature immediately adjacent to the specimens within the range of 60 °F to 80 °F and prevent loss of moisture from the specimens. After the initial curing period the test specimens shall be transported in a damp condition to the testing laboratory in a manner to prevent damage to the specimens. Strict adherence to this requirement is necessary in achieving accurate cylinder test results. Acceptance of concrete cylinder tests shall be as per ACI 318 Chapter 26, Section 12 (ACI 318 26.12).
 - (d) One cylinder shall be broken at seven days, and three cylinders shall be broken at 28 days. The results of the cylinders broken at 28 days shall be the average results and the results of the test sent to the Architect in triplicate and shall equal or exceed the ultimate concrete strength f'_c and no individual strength test or average of any two strength

tests shall be less than f'c by more than 500 psi. Laboratory testing of cured specimens (concrete cylinders) shall be in accordance with ACI 318 26.12.3, 26.12.4 and 26.12.5 laboratory testing of cured specimens (concrete cylinders).

- (e) Payment for cylinder tests shall be by the General Contractor. Invoices for concrete testing shall be sent directly to the General Contractor.
- 2. Slump tests shall be made on each batch (truck load) and tests shall be in accordance with current ASTM Designation C-143. Slump shall not exceed 4" plus or minus 1". Each slump test shall be made by an independent testing laboratory approved by the Architect. Making of slump tests by other than a designated technician from an approved testing lab will not be allowed. Payment for slump tests shall be by the General Contractor.
- 3. In addition, where there are questions as to the quality of the concrete in the structure, the Architect may require tests in accordance with the "Standard Methods of Securing, Preparing and Testing Specimens of Hardened Concrete for Compressive and Flexural Strengths; (ASTM Designation C-42)" or on order load test for that portion of structure where the questionable concrete has been placed.
- 4. Both cylinder and slump test reports shall be sent to the Architect. 7 and 28 day test reports shall be sealed and signed by a Florida Registered Professional Engineer as soon as the tests have been performed. Test results shall be sent as soon as the lab results are recorded.

3A-07. READY-MIXED CONCRETE:

- A. All ready-mixed concrete shall conform to ASTM C-94.
- B. Certificate shall be furnished by the mixing plant certifying that methods, materials and proportions used by the plant for concrete to be used on this project meet the requirements of the specification, if requested by the Architect.

3A-08. CONVEYING, PLACING AND VIBRATION:

- A. Conveying: Concrete shall be transported from the mixer to forms as rapidly as practicable by methods which shall prevent separation, loss of ingredients, or the displacement of reinforcement and forms. Concrete shall be placed in the forms immediately after mixing, and under no circumstances shall concrete that has partially hardened be deposited in the work. Deposit as nearly as practical in its final position to avoid re-handling.

Ready mix or transit-mix equipment may be used provided that each batch of concrete shall be mixed, when using a truck mixer load to its maximum capacity, not less than 70 or more than 100 revolutions at stated mixing speed and remainder of mixing shall be at stated agitating speed. When a truck mixer or truck agitator is used to transport concrete that has been completely mixed in a stationary mixer, mixing shall be at the speed designated by the manufacturer of the equipment as agitating speed. Mixing and/or agitation of the concrete shall not continue for more than 16 minutes after the

cement has been intermingled with the aggregate.

When air temperature is between 85 and 90 degrees F mixing and delivery time shall be no more than 75 minutes. When air temperature is above 90 degrees F, mixing and delivery time shall be no more than 60 minutes.

- B. Placing: Concrete shall have a temperature of not more than 90 degrees F, nor less than 50 degrees F, when placed in the forms. Concrete placement shall not be permitted when in the opinion of the Architect conditions prevent proper placement and consolidation.

Upon commencement of placement operation, operation shall be continuous until the placing of a panel or section as determined by its boundaries has been completed in accordance to Section 26.5.2.1.j ACI 318-14.

Concrete shall not be placed when the atmospheric temperature is below 40 degrees F, or it is likely to fall below 40 degrees F, during the 24-hour period after placing, except when approved in writing by the Architect. Salt or other chemicals for the prevention of freezing shall not be used, and when necessary, the concrete materials shall be heated before mixing. No frozen materials shall be used in the concrete. The contractor shall assume all risk for unsatisfactory concrete and such concrete shall be rejected when and as directed by the Architect. Permission to place concrete will in no way relieve the contractor of the responsibility for satisfactory results; the contractor shall break out, remove, and replace rejected concrete at no cost to Owner.

Concrete shall be deposited over firm, clean, damp surfaces free from frost, ice, standing or running water, and never upon soft mud, dry porous earth, or upon fills that have not been subjected to approved rolling and tamping so that the ultimate settlement has been obtained.

Concrete shall be deposited in layers not to exceed 18" in thickness, unless directed otherwise by the Architect. The placing of concrete shall generally be done by such means that the concrete deposited in one spot may be efficiently vibrated into a layer not exceeding 18" in thickness with the minimum amount of lateral movement. Concrete shall be deposited in forms as near its final location as practicable. Pre-handling and flowing of the concrete shall be as directed by the Architect only. As far as practicable, the contractor shall avoid splashing concrete on the form face and shall remove such coatings as have set before the concrete is placed there.

Concrete that has been splashed and dried on reinforcing prior to embedment shall be cleaned off by rubbing and brushing.

Concrete shall be placed to avoid segregation of materials in accordance with Section 26.5.2.1.f.3 ACI 318-14.

The use of contaminated or retempered concrete is prohibited in accordance to Sections 26.5.2.1.g and 26.5.2.1.h ACI 318-14.

Concrete placement operation shall ensure that concrete is always plastic in accordance with Section 5.10.2 ACI 318-14.

No concrete shall be placed until the Architect has inspected the area of placement and approved the reinforcement.

- C. Vibration: Concrete shall be compacted with the aid of mechanical vibrating equipment. Internal vibrators shall be used in all sections sufficiently large to accommodate them.

The vibration shall be of such intensity to cause the concrete to settle readily into place.

A sufficient number of vibrators shall be used so that efficient vibration throughout the entire volume of each layer of concrete is obtained. Extra vibrators shall be kept available in the placement area so that there will be no interruptions in the consolidation of the concrete.

The vibration shall be of sufficient duration to accomplish thorough compaction of the concrete, and when necessary, shall be supplemented by forking and spading by hand adjacent to the forms in areas that cannot be effectively vibrated. The concrete shall be compacted and worked in an approved manner into all corners and angles of the forms and around reinforcement and embedded fixtures. No vibrator shall be immersed in one location long enough to draw a pool of grout from the surrounding concrete. Systematic spacing of points of vibration should be established to ensure that no portions of the concrete are missed. Care must be exercised that concrete is not over-vibrated and that vibrators are not used as a transportation facility. Care shall be taken to avoid hitting the forms of any embedded objects with sufficient force to cause damage.

3A-09. FINISHES OF CONCRETE OTHER THAN FLOORS & SLABS:

- A. General: Directly after removal of forms, remove the wires in surface to be left exposed and cut ties flush with all finished surfaces. Patch slight honeycomb and minor imperfect areas in exposed areas with 1:2 mortar that will cure out same color as concrete and give one of the finishes indicated or specified. Remove fins and rough edges.
- B. Rubbed Finish: Carefully remove fins, other projections, level offsets, repair damaged places, then rub with Carborundum stones and water, leaving surface uniformly smooth and clean. Use no mortar or grout in rubbing. This finish is to be applied to all exposed stair surfaces.
- C. Smooth Finish: Immediately after removing forms, smooth off joint marks, remove blemishes, thoroughly dampen surface, brush coat with fine sand grout, filling all air bubbles and holes, rub with wood or corn float. Permit grout to partially set then remove excess with sponge rubber float without pulling grout from holes. Rub floated finish with burlap and keep damp by fog spraying. This finish is to be applied to all concrete surfaces to be left exposed.
- D. Rough Finish: Remove fins and rough edges. Patch honeycombs. This finish is required of surfaces to be concealed by earth, etc.

3A-10. FLOOR FINISH:

Concrete floor slabs shall have a monolithic finish.

Monolithic Finish: Tamp with suitable tools to force coarse aggregate below surface, screed with straight edge, float to required finish level or grade showing no variations greater than 1/8" in ten (10) feet. While surface is still green, but will bear man's weight without appreciable imprint, trowel surface smooth and leave free from tool marks. Troweling shall be minimum amount to gain a smooth dense surface and shall not be done until the concrete has gained a smooth dense surface and shall not be done until the concrete has hardened sufficiently to prevent excess fine material from being worked to the surface. Dusting with sand cement or cement to facilitate troweling is prohibited.

3A-11. SIDEWALKS:

- A. Construction: Sidewalks unless otherwise shown shall be 4" thick, reinforced with 6 x 6 W 1.4 x W 1.4 reinforcing mesh and the edges shall be turned down an additional 4" x 4". Construction joints shall be placed no more than 30 ft. on center and shall be tooled. Control joints shall be placed no more than 5 ft. on center and shall be saw cut.
- B. Finish: Concrete finish on sidewalks shall be a light broom finish. Concrete for sidewalks shall be tamped with proper tools to force coarse aggregate below the surface, then screeded with a straight edge, and while surface is still green the surface shall be steel troweled. After steel troweling, the surface shall be broomed lightly perpendicular to the edge of the walk. Sample section shall of at least 5'-0" x 5'-0" be finished for approval by the Architect prior to any sidewalk concrete being poured. Concrete walks shall be poured and finished by bonafide and experienced concrete subcontractors
- C. Construction Joints: Construction Joints shall be placed no more than 30FT on center and shall be tooled. Control joints shall be placed no more than 5FT on center and shall saw cut.
- D. Expansion Joints: Sidewalk expansion joints shall not exceed 120' in accordance to FDOT specifications.

3A-12. PATCHING:

Surface defects that require repair and holes from form ties shall be promptly attended to by the contractor. Repairs of defective concrete shall be completed before the adjacent concrete is four (4) days old where possible. Ridges and bulges shall be removed by careful chipping or tooling followed by rubbing with a grinding stone. Honeycomb and other defective concrete shall be chipped out in such a manner as to key the filling in place. All holes shall be moist prior to filling. The smaller holes shall be patched with 1.2 volume sand-cement dry mortar. The mortar shall be well compacted into the hole, and the surface shall be given a texture to match that of adjoining concrete. For major repairs, the filling shall be not less than 3" thick and shall also be doweled to the old concrete. As far as practicable, all patches shall be kept wet during the curing period of the surrounding concrete, and in no case less than seven days. Patching shall be done at the contractor's expense. A non-shrinking grout admixture shall be used for patching at such locations as shown by the Architect.

3A-13. CURING:

- A. All concrete shall be protected from loss of moisture due to the sun or artificial heat. Fresh concrete shall be protected from rains, running water and mechanical injury. Tarpaulin sufficiently to cover fresh concrete sections shall always be available for prompt use. Wood forms left in place to assist curing shall be kept wet.
- B. All concrete floor slabs shall be sealed as soon as possible with concrete curing and sealing compound equal to Sure Seal 25 for exterior use and VOCOMP-25 for interior use as manufactured by W.R. Meadows which is clear UV resistant solvent based (exterior use) and water-based (interior use), respectively, ready to use formula which seals and hardens freshly placed concrete. Curing compound shall be applied in strict accordance to manufacturer's recommendations.

- C. Whenever the temperature of the surrounding air is below 40 degrees F, all freshly poured concrete shall be maintained at a temperature of not less than 50 degrees F, for at least 72 hours for normal concrete. No dependence shall be placed on salt or other chemicals for the prevention of freezing.
- D. Floor slabs shall be protected throughout the entire construction period from damages.

3A-14. FORMS:

- A. Construct forms to shape, form line and grade required and maintain sufficiently rigid to prevent deformation under load. Unless otherwise specified, construct forms and casework in conformity with A.C.I. 318-14, with leak-proof joints, arranged vertically and horizontally to design pattern. Make removable without injury to concrete.
- B. Coating: Coat forms for exposed concrete surfaces with oil before placing reinforcement, remove surplus oil on form surfaces and any oil on reinforcing steel.

Forms for unexposed surfaces only may be thoroughly wetted immediately before placing concrete in lieu of oiling, except that in freezing weather oiling is mandatory.
- C. Removal: When permission of the Architect has been obtained remove forms without damage to concrete. Leave load-supporting forms and shoring in place at least until seven-day tests indicate strength adequate to safely support superimposed load.
- D. If any forms bulge or show deflection, which in the opinion of the Architect is excessive, concrete shall be removed, and work rebuilt.
- E. Footing Forms: If local conditions are favorable, the Architect will permit use of earth forms for grade beams. These shall be inspected and approved by the Architect before pouring.

3A-15. REINFORCING STEEL:

- A. Shop Drawings: To include placing drawings as well as detail of all bars as to size, shape and/or dimensions, and shall be submitted to Architect for approval. All detailing and fabrication shall be in accordance with ACI 318-14. Fabrication shall not begin until drawings are approved.
- B. Reinforcing shall be placed accurately and secured in position in accordance with CRSI 59 of the C.R.S.I. by use of chairs, bolsters, spacers and/or tie wires.
- C. Footing reinforcing shall be supported by plastic chairs equal to Grade Chair with Base manufactured by Rebar Support Products. Pieces of wood block or other material subject to decay shall not be used for support of bars. Brick bats or concrete brick or block will not be acceptable as support for reinforcing bars.
- D. Reinforcing in all concrete tie beams and footings shall be continuous around corners with additional bars (size and number to match reinforcing), bend 2'-0" each way around corners. Where wall footings step, reinforcing shall be continuous in step. Reinforcing steel shall be free of kinks and non-shop bends. Field bend only as permitted by Architect. Do not field bend any bars set in hardened concrete. Reinforced concrete masonry units shall be reinforced at each side of all openings with one No. 5 bar from bottom steel of footing to top steel of tie beam as per Paragraph 4A-14 of these specifications.

- E. In no case shall the clear distance between bars be less than one bar diameter, 1" nor less than 1-1/3 times the maximum size of the coarse aggregate. Where reinforcement in beams or girders is placed in two or more layers, the clear distance between layers shall be not less than 2", and the bars in the upper layers shall be placed directly above those in the bottom layer.
- F. Unless otherwise noted on the drawings, do all splicing in accordance with the recommendations of the C.R.S.I. Splices shall not be made at points of maximum stress unless specifically shown on the drawings. All reinforcing bar lap splices at footings shall be lapped a minimum of 36 bar diameters, except laps in reinforced masonry units shall be a minimum of 48 bar diameters. All other lap splices shall be spliced per drawing schedule. The Architect shall approve character and location of all splices.
- G. Protective concrete cover for reinforcing shall be as noted on the drawings. ACI 318-14 shall govern where not specifically shown or noted on the drawings.
- H. Adjacent sheets of welded wire mesh shall be lapped at least 6" and securely tied together. Mesh shall be placed at 1/3 times depth of the slab from the top of slab by placing the mesh on chairs prior to concrete pouring. All slabs on grade not otherwise noted on the drawings are to be reinforced with welded wire mesh of the size stated previously.
- I. Reinforcing shall not under any circumstances be covered with concrete until placement has been inspected and approved by the Architect's representative. The Architect shall be notified a minimum of 24 hours in advance and sufficient time allowed for inspection before pouring of concrete. Reinforcing steel shall be free of mud, oil, corrosion, or other coatings that would impair proper bond with concrete.

3A-16. EMBEDDED ITEMS:

- A. All embedded items shall be firmly and securely fastened in place as indicated. They shall be thoroughly clean and free from coatings or foreign matter. The embedment of wood shall be avoided.
- B. Anchor bolts, pipe sleeves, and other embedded items shall be accurately set and rigidly held to prevent displacement. Threads and sleeves of anchor bolts shall be oiled or greased. All embedded items shall be checked by the Architect for location and security prior to pouring concrete.
- C. Upon removal of forms, care shall be taken not to harm projecting items, such steps as required to assure continued protection during remaining construction operations shall also be taken.

3A-17. VAPOR-RETARDER INSTALLATION:

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
 - 1. Lap joints 6 inches and seal with manufacturer's recommended tape.

3A-18. EXPANSION JOINTS:

Expansion joints shall be equal to Fiber expansion joint material as manufactured by W.R. Meadows, composed of cellular fibers bonded together and uniformly distributed with asphalt to ensure longevity.

3A-19. CONSTRUCTION JOINTS:

- A. The use and location of monolithic construction joints shall be subject to prior approval of the Architect. Where construction joints are necessary in self-supporting slabs and beams they shall be placed at the center of the clear span of the member with key-ways provided at the bulkhead. Construction joints shall not be placed in beams supporting concentrated loads.
- B. The surface of the concrete shall be roughened, except where key-ways are required, thoroughly cleaned, and all laitance removed. Joints shall be thoroughly wetted and slushed with a coat of neat cement grout immediately before placing of new concrete.
- C. At least two (2) hours must elapse after depositing concrete in columns or walls before depositing in beams, girders or slabs supported thereon. Beams, girders, brackets, column capitals, and haunches shall be considered as part of the floor system and shall be placed monolithically unless otherwise specifically indicated on drawings.

3A-20. SAW CUT JOINTS:

Saw cut joints (contraction joints) if indicated on the drawings shall be made between 4 and 12 hours after the concrete hardens or final finish. Saw cuts shall not be made after 12 hours from concrete finishing. Depth of the joint shall be 1/3 the depth of the slab, the depth shall be consistent, and the joint shall be straight.

3A-21. CONCRETE FLOOR SEALER:

- A. Where noted on the Finish Schedule for concrete floors to be sealed, the floors shall be chemically treated for sealing, hardening, and dustproofing. Material shall be REZ-SEAL, Acrylic Copolymer as manufactured by the Euclid Chemical Co., Cleveland, Ohio
- B. Application: Application shall be immediately after finishing operation has been completed. Application shall be by short nap roller and coverage shall be no more than 300 SF per gallon.

Do not apply when temperature is below 50°F.

Follow all manufacturer's directions in applying product.

3A-22. PAINTED CONCRETE FLOORS:

See Room Finish Schedule on drawing for concrete floors to be painted. Painting of these floor areas will be as specified in the painting section of these specifications.

END OF SECTION.

SECTION 4A

MASONRY WORK AND BLOCK

4A-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

4A-02. SCOPE:

- A. Furnish all labor, materials, equipment, and services and perform all operations necessary to complete all masonry work as shown on the drawings and as specified.
- B. All reinforced masonry construction shall comply with ACI 530-13 and the Florida Building Code 2017.

4A-03. MATERIALS:

- A. Face Brick: Face Brick: All face brick shall be standard size brick (2 ¼" x 3 ½" x 7 ½") and types shall be as follows: **(submit samples for each type of brick called for)** for approval.
 - 1. Brick shall be as selected by the Owner, and the Architect shall include an allowance of \$400.00 per 1000 bricks for the purchase price as a basis for submittal and selection.
- B. Concrete Masonry Units: Sizes and shapes as shown and detailed shall be even in color, weight, texture, and composition. They shall be approved normal weight block units to meet ASTM Specifications ASTM C-90, Grade N. Net area compressive strength for concrete masonry units shall be a minimum of 2,800 PSI.
- C. Face Block Units: Shall be 8" x 8" x 16" and 8" x 8" x 16" one side vertical scored concrete masonry units (CMU).
- D. Concrete Brick: N.A.
- E. Special Rated Concrete Masonry Units: Shall be 8" x 8" x 16" concrete block with extra wall thickness and rated for two (2) hour fire rating. Where used, block to go from floor slab to underside of roof deck.
- F. Wall Reinforcement: Shall be hot dipped galvanized DUR-O-WAL Ladder Type Reinforcement in 4", 6", 8", 12" and 16" widths as required and shown. Where both face brick and veneer CMU are indicated as composite wall construction, width of ladder type reinforcing shall be required to anchor brick to CMU masonry block wall. DUR-O-WAL shall be standard type No. 9 (W1.7) side rods and No. 9 (W1.7) cross rods. Rods shall be deformed and welded at points of connection. **Furnish L and T sections for corners and wall intersections.**
- G. Submittals:

- b. Submit brick sample panel for approval. Submit material information for brick ties and wall reinforcement for review and approval.
- c. For concrete masonry units submit the following items for review and approval:
 - i. Product data for each type of product.
 - ii. Shop drawings for reinforcing steel detailing bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315.
 - iii. Material Certificates for each type and size of product. Include data on material properties and material test reports substantiating compliance with requirements.
 - iv. Mix designs for each type of mortar and grout. Include description of type and proportions of ingredients.

Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement

- H. Mortar: Mortar materials for all masonry work shall be measured by volume, separately, and be thoroughly mixed dry in a clean mortar box or mixer, before adding water.

Water shall be added only as needed, using only enough to bring the mixture to a smooth, even consistency. **No retempered mortar shall be used.**

It shall be the contractor's responsibility to see that mortar for the whole project is of one brand, and all shipped from the same batch. It will also be the contractor's responsibility to see that all mortar is mixed on the job to the same consistency to prevent varying joint colors within one wall area.

- 1. Mortar Mix: (all concrete masonry and face brick)
 - a. Materials:
 - 1. Mortar shall be Type S complying with ASTM C270 for block masonry and type N for Brick.
 - 2. Water shall be clean and free and fit for drinking.
 - 3. Sand shall comply to ASTM C-144.
 - b. Proportioning: Mortar shall be proportioned with one part by volume of Portland Cement; 3 to 2 part by volume of hydrated lime; and not less than 2-3 nor more than 3 times the sum of volumes of cement and lime used for the volume of sand.
 - c. Physical Requirements: Compressive strength of mortar shall be not less than 1800 psi at 28 days for Type S mortar and not less than 750 psi at 28 days for Type N mortar.
- 2. Pre-Mixed Mortar: All block and brick work shall be equal to Magnolia Mortar Mix, Type S, or Type N color to match existing. Premixed mortars of the same color as manufactured by Lehigh Portland Cement Company or Coosa Mortar are acceptable.

4A-04. MOCKUP PANEL: N.A.

4A-05. LAYING BLOCK:

A. Concrete Block:

1. Erect concrete block walls, partitions, chases where indicated. Bed each course solidly in mortar, with vertical joints in line. Bond each course at corners or intersections. Where block cannot be keyed into or bonded into adjacent and abutting walls, anchors as described above shall be used, unless noted otherwise. Block walls shall be laid in running bond except at exposed mechanical yard screen walls, block shall be laid in stack bond with tooled concave joints. **Note: It is important that the cavity remain clean and free from all excess mortar, therefore, the masons will be required to exercise caution when laying exterior walls.**
2. Where concrete block walls noted to be fire rated, masonry block is to be carried up to underside of deck, unless noted otherwise, and fire safing applied to seal top of block and underside of deck.

B. Wall Reinforcement: On stacked block walls, install every course (**8" o.c. vertically**). On running bond, install in first and second bed joints and in every other bed joint (**16" o.c. vertically**) throughout remainder of structure or as directed by Architect.

At wall corners and wall intersections L's and T's sections shall be used.

On stacked concrete block and brick walls, 7" wide wire reinforcing may be used at 16" o.c. vertically alternating with 11" wide reinforcing in every other course. Where block extends above ceilings, block may be set in running bond.

Reinforcing to be run in first and second block courses above and below all openings and carried two (2) feet past opening on each side.

C. Brick Ties: (**Other than in block and brick construction**) Shall be spaced 16" o.c. horizontally and no less than every sixth course (16") vertically.

4A-06. LAYING MASONRY IN FREEZING WEATHER:

When temperature is below 50°F, or likely to freeze within 24 hours from time masonry is laid, no masonry work shall be done unless approved by Architect and provision is made to prevent mortar from freezing before it has set.

4A-07. MASONRY FILL INSULATION: N.A.

4A-08. PROTECTION:

Masonry shall be well protected when not being worked upon as well as during hot weather, frost, and rain, by substantial waterproof covering securely held in place. Other parts of the work such as sill, pavement, etc., shall be protected against falling mortar, etc., by protecting with suitable substantial covering. **All block and brick shall be delivered to the site on wood pallets and shall be covered with visqueen until ready for use. Block with excessive chipped corners shall be returned to manufacturer.**

4A-09. CONTROL JOINTS:

Where noted on the drawings and at all exterior walls abutting existing construction, and at all wall

expansion joints, equal to Dur-O-Wal Rapid Control Joint, No. 8, wide flange joint for 8" walls and No. 12 for 12" block and brick walls.

4A-10. FLASHING:

Where called for on the drawings, approved flashing equal to Phoenix Type A, "Cop-R-Flash", 3 oz., or Nervastral 56 shall be installed as the work progresses. Where laps occur in flashing, a lock joint shall be formed to insure water tightness. At heads and sills of windows, extend flashing 12" beyond jamb line and turn up with folded corner to lead all moisture to exterior.

4A-11. BUILDING IN ANCHORS, ETC.:

Build in all anchors, beams, lintels, frames, pipes, sleeves, hangers, inserts, plugs, and any other accessories indicated or necessary for installation of connections of adjoining work. Nailing plugs shall be crimped galvanized, spaced not less than 16" o.c.

Any wood blocks or nailers set in masonry shall be treated with approved wood preserver.

Build in all metal flashing and fabric flashing as indicated on drawings or specified.

Fill in all spaces between the masonry and door bucks with mortar. Exterior door frames shall be 3" reveal between frame and brick to permit caulking. Interior frames shall have right, full joints unless otherwise detailed.

Consult all other trades in advance and make provisions for installation of their work to avoid cutting and patching. Any cutting and patching required to accommodate the work of others shall be done by the mason.

4A-12. CUTTING AND PATCHING:

Consult all other trades in advance and make provisions for their work to avoid cutting and patching. Any cutting and patching required to accommodate work of others shall be done by the mason.

4A-13. POINTING UP:

The contractor shall be responsible for pointing up, grouting, etc., around all piping that passes through the walls, especially those pipes that pass-through chase walls are to be pointed up around so that there is no space between the masonry units and the pipe for the full thickness of the wall.

4A-14. REINFORCED MASONRY UNITS:

Reinforced masonry shall be grouted and reinforced as shown on the structural plans with reinforcing steel from bottom (hooked) of footing to top steel (hooked) of tie beam. In addition, one cell reinforced masonry unit shall be located at jambs of all interior windows and door openings and a minimum of two cells reinforced at jambs of all exterior windows and door openings. **Reinforcing shall be lapped per the structural plans.**

Reinforced masonry units shall comply with ACI 530-13 and FBC 2017.

Concrete for filling shall be 3,000 psi, 8" - 10" slump plus or minus 1". **Lifts shall not be over 4 FT in height.**

Reinforcement Requirements:

- A. Uncoated-Steel Reinforcing Bars: ASTM A 615/A 615M, Grade 60.
- B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.
 - 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. Dur-O-Wal; a Hohmann & Barnard company.
 - b. Heckmann Building Products, Inc.
 - c. Hohmann & Barnard, Inc.
 - d. Wire-Bond.

4A-15 FIELD QUALITY CONTROL:

- A. Testing and Inspecting: Engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
- B. Inspections: Special inspections according to Level B in TMS 402/ACI 530/ASCE 5.
 - 1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
 - 2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
 - 3. Place grout only after inspectors have verified proportions of site-prepared grout.
- C. Testing Prior to Construction: One set of tests.
- D. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.
- E. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.
- F. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.
- G. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

4A-16. CLEANING:

At completion of masonry work, all brick surfaces shall be cleaned with a stiff fiber brush using a product equal to Vanatrol as manufactured by Prosoco, Inc., Kansas City, Kansas. Use of pressure treating equipment shall **not** be permitted. Job site mixed muriatic acid and water shall not be used in the brick cleaning process.

END OF SECTION

SECTION 5E

WOOD ROOF TRUSSES

5E-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

5E-02. SCOPE:

This section of the specifications includes the furnishing of all materials, equipment and labor necessary for the pre-fabrication, delivery and permanent setting of the wood roof trusses. It shall include all the miscellaneous parts, including; bridging, temporary and permanent bracing and all related items of hardware, connectors, hangers, and anchors.

5E-03. MANUFACTURER:

Wood roof trusses shall be equal to gang-nail wood trusses as designed and/or approved by Automated Building Components, Inc., and fabricated by a franchised gang-nail truss manufacturer.

5E-04. MATERIALS:

A. Design and fabrication criteria of wood trusses shall meet with the "National Design Specifications for Stress Grade Lumber and its Fastenings", by National Forest Products Association (latest edition); "Timber Construction Standards", by American Institute of Timber Construction (latest edition); and "Design Specifications for Light Metal Plate Connected Wood Trusses", by Truss Plate Institute (latest edition), the same as if those specifications and all their references were set out in full herein.

B. Lumber: All lumber used for truss members shall conform to the published stress ratings for the species and grades as set out in the official grading rules of the appropriate lumber association or as listed in the reference specifications. Wherever this specifications, or notes on the plans or truss engineering design calls for lumber which exceeds the minimum set forth therein, the specifications, plans, and/or truss engineering designs shall be applicable, and information stated or shown in one shall be applicable the same as if in all of them.

At the time of fabrication, the moisture content of all lumber shall be within the proper limits, as stated in the reference specifications.

All lumber shall conform to the species and fully recognized nominal sizes shown on the plans or truss engineering designs. All members shall be cut from lumber which bear the proper grade mark stamps of a recognized grading association or licensed lumber inspection agency. No lumber shall be used which does not appear to conform to the proper dimensions and/or grades.

Lumber shall be a minimum No. 2 kiln dried Southern Pine.

- C. Connectors: All truss connector plates shall be manufactured from ASTM Z446-72 Grade A prime commercial quality galvanized sheet steel of no less than 20 gauge thickness which has a minimum yield of 33,000 PSI and a minimum ultimate tensile strength of 45,000 PSI. The corrosion resistant coating shall be ASTM A525 "Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, General Requirements", Coating Designation G90 or G60, or ASTM A591, "Standards Specification for Electrolytic Zinc Coated Steel Sheets", Coating Class C, or such treatment as will give equivalent corrosion protection. This protective coating may be applied to the sheet steel before the connector plates are stamped out; it is not necessary to recoat the connectors after the stamping operation. All metal connectors shall be Gang-Nail Connectors, and shall be marked "Gang-Nail". The connectors shall have a series of nail-like projections which are designed to separate the fibers of the wood into which they are pressed, in accordance with accepted nailing practices.

Where field assembly of truss sub-components is necessary, the connections shall be in accordance with the details shown on the truss design drawings, approved by a Professional Engineer and the Architect.

5E-05. FABRICATION:

- A. All trusses and other roof structural components shall be fabricated in a properly equipped manufacturing facility of a permanent nature. They shall be manufactured by experienced workmen, using precision cutting and truss fabricating equipment, under the direct supervision of a qualified foreman. All trusses shall be fabricated under strict rules of inspection and quality control.
- B. All truss members shall be accurately cut to length, angle and be true to line to assure tight joints for finished truss.
- C. All truss members and connector plates shall be properly placed in special jogs and the members tightly clamped in place, remaining in that position until the connector plates have been pressed into the lumber simultaneously on both sides of the joints.
- D. Camber shall be built into the trusses, as noted on the engineering truss designs, by properly positioning the members in the fabricating jig.
- E. Each truss shall be stamped with the name and address of the Gang Nail Truss Manufacturer.
- F. Bottom and top chord shall be stock of species and stress called for.

5E-06. HANDLING, ERECTION AND BRACING:

- A. Fabricated trusses and sub-components shall be so handled and stored that they are not subject to damage. If the trusses are to be stockpiled prior to erection, sufficient bearing points and/or bracing shall be provided to prevent excessive lateral bending or tipping over.
- B. Framing anchors and/or truss hangers shall be provided by the contractor in accordance with the architectural plans.

- C. Field erection of the trusses, including items such as proper handling, safety precautions, temporary bracing to prevent toppling or dominoing of the trusses during erection, and any other safeguards or procedures consistent with good workmanship and good building erection practices, shall be the responsibility of the Erection Contractor.
- D. During the entire construction period, all contractors shall provide means for adequate distribution of concentrated loads so that the carrying capacity of any one truss and/or other component is not exceeded.
- E. Proper erection bracing shall be installed to hold the trusses true and plumb and in safe condition until permanent truss bracing and bridging can be solidly nailed in place to form a structurally sound roof framing system. All erection and permanent bracing shall be installed and all components permanently fastened before the application of any loads.
- F. The permanent structural cross-bracing to ensure the overall rigidity of the roof system, shall be in accordance with the architectural plans of the building structure.

5E-07. SHOP DRAWINGS:

- A. Shop drawings shall be prepared by and shall bear the seal and signature of a professional engineer who holds a valid license to practice in the State of Florida. Shop drawings shall also show that the design of the roof trusses comply with the Florida Building Code 2023 for wind requirements. Wind speed will be 130 mph.
- B. Truss drawings shall include: The pitch, span, dimensions, and spacing of truss. Truss bearing sizes and locations. Design loading of truss and allowable stress increase. Axial forces in each truss member. Nominal sizes and location of connector plates at all joints. Size, species, and stress of grade of lumber for all truss members. Camber. Permanent lateral bracing as required by design to reduce buckling length of individual truss members only. Handling and erection recommendations.
- C. Three (3) copies of the truss designs and/or shop drawings shall be submitted to the Architect for approval prior to the fabrication of any components.

END OF SECTION.

SECTION 6A

CARPENTRY, MILLWORK, AND INSULATION

6A-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

6A-02. SCOPE:

The contractor shall furnish all labor and materials for carpentry, millwork and case work as indicated on drawings or specified, or reasonably required to finish the work. Work under this heading shall be properly coordinated with all other trades. The carpenter shall do all cutting and fitting for carpentry and millwork, and render all such other assistance required for other branches of the work, making good after other mechanics.

6A-03. LUMBER, IN GENERAL:

All lumber shall be thoroughly seasoned and dried to a moisture content of not over 10% for framing lumber and not over 12% for millwork, and when delivered shall be stored and protected to keep same dry.

All lumber for any purpose shall be dressed four (4) sides, unless otherwise noted and be free from holes, large loose knots, bark and large pitch streaks, regardless of grade.

Grading shall be according to grading rules of the Southern Pine Inspection Bureau under which it is manufactured and each piece of bundle, if bundled stock, shall bear an Inspection Bureau's mark, indicating the grade.

Doors, trim, and millwork in general shall not be stored in the building while the building is damp or in any damp storage location.

6A-04. LUMBER GRADES:

All trim shall be No. 1 Fir. All blocking "cant" strips, grounds or nailers shall be pressure treated No. 2 grade, Yellow Pine; wood studs and wood joists shall be Fir or Yellow Pine structural grade.

6A-05. TREATED LUMBER:

- A. Structural Lumber: Give all nailers, blocking and wood grounds in contact with exterior masonry, concrete, roof slabs or steel, pressure preventative treatment in closed retort as per FS TT-W-571; minimum net preservatives as specified herein. Any of the following preservatives will be acceptable:

<u>Preservative</u>	<u>Lbs. Per Cu. Ft.</u>
Pentachlorophenol (5% solution in oil)	Solution 6.0
Zinc Chloride	Dry Salt 1.0
Zinc Metal Arsenite (ZMA)	Dry Salt .03
Wolman Salts (Tanalith)	Dry Salt 0.3
Chromated Zinc Chloride	Dry Salt 0.75

After using the salt treatment, reduce lumber moisture content to not over 10%. Brush coat surfaces of lumber sawed, bored or cut, after treatment with same preservative used at plant. Accompany lumber with certificates from lumber treatment company, certifying treatment amount, moisture percentage after kiln drying. Architect reserves the right to apply method for determining penetrating as per manual issued by the American Wood Preserver's Association. Treatment shall be arsenic free.

6A-06. METAL GLASS STOPS:

All wood doors shown or noted with glass lights shall have metal stops. Stops shall be Type FGS75 for single glazing and shall be as manufactured by Anemostat Door Products. **Install stops with stainless steel through bolts.**

6A-07. MILLWORK:

Millwork shall be of material and manufacturer hereinafter specified and as indicated on the drawings and shown on details. In all cases millwork shall be of good standard construction. All joints shall be made in approved manner perfectly fitted. Secure with finishing nails with heads set for putty, and with screws and glue where required. All surfaces sanded smooth.

All trim and moldings shall be mitered at joints and corners and in full lengths within the limits of the material.

No sheet plywood shall be less than 1/4" thick, exposed surfaces, Grade A. Frames shall be primed on all sides at the mill with clear primer.

6A-08. TRIM:

Trim shall be as indicated on drawings or if not noted shall match specie of doors, siding, and paneling used. All other trim shall be as specified above, No. 1 Fir. All cuts in trim shall be painted with clear Rez during erection. All trim work including bonding on cabinets and cabinet work shall have mitered corners.

6A-09. PLASTIC LAMINATE:

Surfaces where detailed shall be standard grade plastic laminate, 1/16" thickness, furniture finish, color as selected. Edges are to be covered with laminate. Counter top sheet shall overlap counter edge and corners ground to a 45-degree angle. Laminate shall be Formica, Micarta, Wilson Art, or equal. Colors shall be of solid colors as selected. **Other than manufactured casework items, all millwork, window sills, and other surfaces shown with plastic laminate, plastic laminate shall be field applied.**

6A-10. ROUGH HARDWARE:

The contractor shall furnish all nails, screws, bolts and fittings required to fabricate and install his work in place of the character required and best suited to the conditions of the work.

6A-11. APPLICATION OF FINISH HARDWARE:

Finish hardware is specified under another Section. Fit and apply all finish hardware to wood doors and leave same in operating order. All mortises, sinkages and cuts shall be accurately made to fit or be covered by hardware. Screws shall be counter sunk or counter bored and plugged as specified. All screws shall be screwed in place and not hammered. (After the finish hardware has been fitted, remove same until the painter has applied the last coat of paint on every surface, then reset in place.) See Carpet Section and Finish Hardware Section for aluminum saddles at doors between corridors and rooms.

6A-12. DOOR LOUVERS:

All door louvers to be furnished by others and installed by this Contractor.

6A-13. CAULKING:

Where backsplashes and/or counter tops finish against plastic walls, the joint shall be caulked with a Thiokol caulking compound before painting.

6A-14. PLYWOOD:

All plywood shall have markings stamped on sheets for grades and thicknesses called for. Where used for exterior applications, plywood is to be exterior grade with exterior glue.

6A-15. ROOF ASSEMBLY TAPERED ROOF INSULATION: N.A.

6A-16. EXTERIOR WALL INSULATION: As indicated on architectural drawings.

6A-17. INTERIOR WALL SOUND BATTS:

Install interior wall sound batts at interior metal stud framed wall construction as shown in drawings equal to un-faced sound attenuation batts fiber glass as manufactured by Owens Corning with the following characteristics:

<u>Thickness:</u> 3 ½"	<u>Width:</u> 16"	<u>Length:</u> 96"	
<u>Surface Burning Characteristics / Rating:</u>		Flame Spread Rating	10
		Smoke Developed Rating	10
<u>Acoustical Performances:</u>	N.R.C. (Noise Reduction Coefficient)		1

6A-18. INTERIOR CEILING SOUND BATTS:

Install interior ceiling sound batts at interior ceilings as indicated on drawings equal to un-faced Sono Batts Insulation Fiberglass as manufactured by Owens Corning with the following characteristics:

Thickness:	3 ½"	Width:	24"	Length:	48"	
Surface Burning Characteristics / Rating:		Flame Spread Rating				10
Smoke Developed Rating						10
Acoustical Performances:		N.R.C. (Noise Reduction Coefficient)				1
Thermal Performance:		R-Value				11
Thickness:	6 ¼"	Width:	24"	Length:	48"	
Surface Burning Characteristics / Rating:		Flame Spread Rating				10
Smoke Developed Rating						10
Thermal Performance:		R-Value				19
Thickness:	9 ½"	Width:	24"	Length:	48"	
Surface Burning Characteristics / Rating:		Flame Spread Rating				10
Smoke Developed Rating						10
Thermal Performance:		R-Value				30

6A-19. CLEAN-UP:

The Contractor shall remove all debris, scrap, etc., from the site upon completion of his work. Tile shall be free of fingerprints, smudges, and present a uniform color, clean and level. Any tile found to contain smudges, chips, etc., shall be removed and replaced with new tile.

6A-20. GUARANTEE:

This contractor shall guarantee in writing the materials and workmanship for a period of two (2) years after final acceptance of the building.

END OF SECTION.

SECTION 7A

METAL ROOFING, FASCIA & WALL PANELS

7A-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications, shall apply to the form part of this Section as if written in full herein.

7A-02. SCOPE OF WORK

- A. Furnish all labor, material, equipment and incidentals necessary for installing all new roofing and fascia panels, including required trim, flashing, framing and supports for new metal roofing and fascia panels, and other related items as indicated on the drawings and as specified, and/or as required to complete the work.

Generally, the roofing system will consist of installing a standing seam 24-gauge metal panel roofing over a loadmaster or light gauge framing system as shown on the drawings for each of the three buildings.

7A-03. INCIDENTAL WORK:

All work which is incidental to the installation of the roof and fascia shall be done by this Contractor. This includes flashing, trim, gutter and downspouts and any other items related to the above roofing areas, fastening and any support work required to complete the installation.

7A-04. METAL ROOF AND FASCIA COVERING AND ACCESSORIES:

- A. Manufacturers: Metal roofing and fascia panels shall be one of the manufacturers listed below. Panels from other manufacturers will be acceptable providing they conform to the same shape, size, gauge, method of fastening and type of finish. **Contractors proposing to use roof panels other than as specified shall submit sample panel showing fastening system and panel specifications prior to receipt of bids for approval.** (See Section B, paragraph B-5, Substitutions, these Specifications)

All roof and fascia panels as listed below, shall be flat panels and shall be 16" wide and have a 2" high standing seam and of 24 gauge galvanized steel. All roofing materials shall be labeled Class "A" per ASTM 108 and shall be certified by a nationally recognized independent testing laboratory. All roofing systems shall be installed within the limitations of the test procedure for surfaces, deck cross slope and combustibility.

Insulation, moisture protection, roofing, thermal requirements, fireproofing and fire stopping shall be designed and constructed in compliance with the Florida Building Code and the Florida Fire Prevention Code as adopted by the State Fire Marshall.

All newly installed materials shall be protected from moisture and sealed for moisture protection at the end of each day. The contractor shall provide the Architect / Engineer of record a final statement of compliance for the Board.

B. Acceptable Manufacturers:

1. VSR Roof System, Butler Standing Seam, 16" wide, 2" high seam, Butler Manufacturing Company.
2. American Loc-Seam Panel, 16" wide, 2" high seam, American Buildings Company.
3. Berridge Zee-Lock Panel, 16" wide, 2" high seam, Berridge Manufacturing Co.
4. M and M Series 300 Style 316.
5. ARS, Architectural Roof Systems, 16" wide, 2" high seam.
6. Englert KR 24 Panel, 16" wide, 2" high 90° seam, Englert, Inc.
7. Battenlok 16" wide x 2" high rib panels as manufactured by MBCI Metal Roofing and Wall Systems.

C. Roof and Fascia Panels:

1. Roof and fascia panels shall be a manufactured non-embossed structural, 24-gauge panel of 50,000 psi minimum yield steel, with a material Galvalume coating, conforming to ASTM A792. Panels shall be 16" wide and have a minimum of 2" deep male and female rib. All panels shall be a mechanically seamed rib panel.

All panels shall be full lengths from ridge to top of fascia as detailed. End splices will not be acceptable on any of the portions to be roofed. Furnish with end inserts to close batten void at end of panel and C closer at top of panels.

2. Fastening of roof panels to support framing shall be by a concealed fastener system, so no screws penetrate the face of the roofing panel nor are any screws visible. Where shown on the drawings, thermal spacers shall be installed between the insulation and bottom face of the panel to provide a positive thermal break between the roof panels and supporting members.

Concealed Z clip shall be a minimum 2" long, 3" high of not less than 24 gauge aluminized steel (min. yield 48,000 psi).

3. Sealant shall be either factory or field applied in longitudinal female rib of all panels regardless of roof panel manufacturer. Sealant shall be an extrudable non-drying, non-skidding synthetic elastomer material.
4. Finish: Exterior finish of roof and fascia panels and trim pieces for the metal roofing system shall be a fluoropolymer Kynar 500 coating, minimum of 1 mil nominal thickness. Color will be selected by the Architect.

D. Roof Panel Penetrations:

1. Plumbing vents and stacks shall be extended through new metal roofing panels and flashed with new EPDM flashing to make for watertight installation.
2. Flashing for exhaust fan curbs and for any penetrations shall be as per manufacturer's details for flashing.

E. Sealants:

1. Closer Strips: The corrugations of the roof and wall panels shall be filled with solid or closed cell, preformed, rubber or neoprene closures along with eave ridge and rake when required for weather-tightness.
2. Sealer: All roof panels side laps and end laps shall be sealed with 3/16" diameter mastic. The sealer shall be a gray elastic compound of synthetic base and fibrous filler and shall have good adhesion to metal. The material shall be non-staining, non-corrosive, non-shrinking, non-oxidizing, non-toxic and non-volatile. The service temperature will be from -30° F to -200° F and the flash point must be above 400° F. The material shall meet or surpass the requirements of Specification Mil-C-18969B, Type II, Class B, and shall be equal to that manufactured by Presstite Division of Interchemical Corporation.
3. Gutter Sealer: All gutter joints shall be sealed with aluminum pigmented 3M Gutter Seal or equal.

F. Fascia Panel Installation: As shown on the drawings and noted above the roof panels shall be constructed at eave so that ribs of fascia panels are in line with roof panels.

7-05. FINISHES:

- A. Roof and Fascia Panels: Finish with corrosion - resistant metallic coating, Kynar 500, 1 mil (.001") thick, factory applied prior to fabrication. Color to be selected by the Architect.
- B. Samples of roof and wall panel colors to be submitted for color selection.

7A-06. FASTENINGS:

All fastenings shall be of the type, length and spacing that will secure the framing and support members directly into the existing and/or new structural system and as recommended by the metal building panel manufacturer. **Fastenings shall be of stainless steel.**

The contractor shall submit, to the Architect prior to starting any work, a complete list of the fastenings he proposes to use for each framing system, showing by size, type, and spacing, etc. joist structural system. Metal roof panels applied over this system shall have fasteners penetrating either the steel joist or through the heavy- duty steel decking. See roof deck systems section, these specifications, for deck system.

7A-07. MISCELLANEOUS:

- A. Ridge Vent: Where shown, furnish and install continuous gravity type ridge vent as detailed. Sheet metal parts shall be of 22 gauge. Finish and color to be same as roof panels.
- B. Drip and Trim Pieces: To be in shapes, sizes and gauges as shown on the drawings. All metal for trim pieces to be minimum 24 gauge, in same finish and color as roof

panels where panels are called for with color finish. Where galvalume finish is called for, drip and trim gutter and downspout to be painted color as selected by Architect. Drip shall be installed as detailed with continuous cleat and joints shall be butted and 4" wide joint covers installed over using same material, gauge, finish, etc.

- C. Curbs: This contractor is to furnish and install all roof curbs that are required for Mechanical roof mounted exhaust fans air intake hoods, and gravity vents that penetrate this metal roof. Fan and air intake hood dimensions will be provided by the mechanical contractor. Gravity vents will be furnished by the general contractor.

7A-08. GUTTERS AND DOWNSPOUTS:

- A. Where shown on the drawings, furnish and install gutters and downspouts. Gutters and downspouts will be constructed in shapes and sizes as detailed and of 24-gauge steel. Finish shall be Kynar 500 finish in color selection from PEMB System manufacturer's standard colors.
- B. Downspouts terminate will terminate into a downspout elbow diverter as required to divert roof water away from building.
- C. All workmanship shall be first class. Gutters and downspouts shall be straight and true and all components shall be properly anchored.
- D. Anchorage for downspouts to building wall shall be as shown and detailed on the drawings.

7A-09. METAL SOFFIT PANELS:

Panels shall be equal to MBCI Metal Roof and Wally Systems Artisan Series L 12, 12" wide, 1" deep, R24 gauge galvanized steel fully perforated. Finish shall Kynar 500 in color as selected by Architect.

Furnish submittal with specifications and color samples for color selection.

7A-10. DESIGN REQUIREMENTS:

Design for the metal roofing system, metal soffit system and corrugated metal siding panels shall be for an ultimate wind speed of 130 mph as per ASCE 7-22 and the State of Florida Building Code 2023.

Shop drawings shall be signed, dated and sealed by a Florida Registered Engineer, and it shall be stated by the Engineer that the system will comply with the uplift requirements as state herein.

Metal roofing and fascia system shall contain product approval numbers and information showing product complies with the Florida Building Code 2023, Section 17. See Supplementary and Special Conditions, Paragraph 15-6

7A-11. GUARANTEES AND ONE YEAR INSPECTION:

A. The following guarantees shall be furnished to the Owner at completion of project, dated the Date of Acceptance, for each Metal Roof System.

1. Manufacturer's Warranty: Warranting the finish of the panels against blistering, peeling, cracking, or chipping and also against significant color change, for a period of Twenty (20-Yrs.) Years.
2. Manufacturer's Twenty (20 Yr.) Year Warranty: For weather tightness of the total metal roofing system, both classroom building and pavilion.

If not implied or stated on this Warranty, the Roofing Contractor shall furnish separate Guarantee in writing, to the Owner, his Workmanship and Materials Guarantee, guaranteeing the weather tightness of his work for a period of three (3) years, from Date of Acceptance.

B. Manufacturer's One Year Inspection: The roof shall be inspected by the manufacturer's representative within one year of the project's completion and acceptance of the Board.

END OF SECTION

SECTION 7C

WATERPROOFING, DAMPPROOFING, AND CAULKING

7C-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this section as if written in full herein.

7C-02. SCOPE:

The contractor shall furnish all labor and materials for waterproofing, dampproofing and caulking indicated on the drawings, as specified, and here reasonably required to make work watertight.

7C-03. WORK BY OTHERS:

All admix or liquid waterproofing of masonry and all sheet metal, water or dampproofing will be done by the respective sub-contractors.

7C-04. WALL FLASHING:

Exterior masonry walls shall be dampproofed with fabric flashing installed at mortar "cant," over top of foundation walls, over window heads, glazed panels, and openings, as indicated on drawings or required to provide such protection. "Fabric Flashing" in the above locations shall be Type A-3 oz. flashing as manufactured by AFCO Products, Inc., or Nervastral 56 as manufactured by Nervastral Waterproofing Products.

The flashing shall be in long lengths lapped 4" at all joints and sealed watertight. At heads and sills, **extend 8" beyond jamb line** and turn up with folded corner to lead all moisture to the exterior.

All metal flashing and counter flashing shall be as indicated on drawings and as specified under "Roofing and Sheet Metal Work".

7C-05. EXTERIOR WALL WATERPROOFING: N.A.

7C-06. FLOOR SLAB WATERPROOFING: (vapor barrier)

Under all interior floor slabs, install one layer of .010 "Natural Visqueen" or equal over carefully prepared porous fill, by a suitable method to prevent damage or rupturing of film. Lap all joints 8" with the top lap in the direction of the spreading of the concrete. Cut carefully around all pipe, conduit, etc., and apply pressure sensitive tape to all joints to ensure maximum barrier effectiveness as recommended by the manufacturer. Turn up at exterior walls to insure enveloping and trim after concrete pour. Inspect all surfaces after mesh is laid and repair all damage.

7C-07. METAL ROOF UNDERLAYMENT:

Roofing Underlayment shall be a 40-mil thick, peel and stick, SBS (Styrene butadiene styrene) modified, rubberized asphalt sheet waterproofing underlayment equal to Grace Ice and Water shield underlayment as manufactured by Grace Construction Products. With an internally reinforced non-woven polyester fabric, Roofing Underlayment shall have a white reflective topping for added foot safety as well as heat reduction on the deck and protection against short term. Ultra Violet damage. A removable release film shall be on the membrane under side for ease of application.

7C-08. CAULKING:

- A. Scope: Caulk all joints between masonry and the perimeter of exterior door and window frames and similar locations in exterior walls of building wherever **indicated or specified or necessary to make weather tight.**
- B. Materials: Caulking compound shall be Dow Corning 785 Silicone Building Sealant, or G.E. Construction 1200 Sealant. Substitutes other than these are acceptable with approval by the Architect prior to being shipped to the work.
- C. Caulking: Joints and spaces shall be thoroughly clean and dry.

Caulking around frames of exterior openings and as may be required in masonry shall be not less than ½" deep and joints shall be raked clean and prepared to receive the compound and shall be filled. Finish joints smoothly and slightly concave.

Caulking around windows in areas where special concrete coating is to be applied shall be done prior to concrete coating. Caulking shall be left slightly recessed.

Joints having depth more than ¾" shall be packed with oakum to within ½" of the surface and carefully and filled with compound and thoroughly worked in. Material shall finish neatly against adjoining surfaces, smooth and of uniform width.

The method of application will be by means of a pressure caulking gun; in locations where a caulking gun cannot be used, the compound shall be applied with hand caulking tools.

The color of caulking shall be as selected by Architect.

Metal Thresholds: Unless otherwise specifically indicated on drawings, shall be set in full beds of caulking compound.

7C-09. THRESHOLDS AND WEATHER STRIPPING:

Covered in Finish Hardware Section, these specifications.

END OF SECTION

SECTION 8A

GLASS, GLAZING, AND STOREFRONT

8A-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

8A-02. SCOPE:

Furnish all labor, materials, and equipment and perform all operations necessary for the complete installation of all glass, glazing, windows, and store front as noted in these specifications and as shown on the drawings.

8A-03. GLAZING:

All glazing shall be done by experienced glaziers. Only high-grade glazing compound shall be used. G.E. Silglaze 2400 Silicone Sealant. All surfaces to be glazed shall be clean and dry and no glazing shall be done in freezing weather. Face putty shall be smooth and of uniform width, without ripples and all corners shall be cut clean and sharp.

Rebates of glazed panels and doors shall be primed before installing glass and all glass shall be back puttied and bedded on all sides except as noted for plate glass. Heat absorbing glass shall be set as to allow free expansion and contraction of the material.

Each piece of glass shall bear the manufacturer's label of quality and the labels shall remain in place until after inspection and approval of Architect. After inspection and approval, the labels shall be removed and glass cleaned and polished, both sides.

8A-04. SAFETY STANDARDS:

All glazing shall comply with Safety Standards for Architectural Glazing 16CFR as issued by the Consumer Safety Commission. **All windows shall meet requirements for 128 mph ultimate wind speed as per the 2022 Florida Building Code and ASCE 7-22.**

8A-05. NON-SECURITY LEVEL GLASS:

PART 1 -GENERAL

1.1 SECTION INCLUDES

- A. Glass and glazing units for the following products and applications, and glazing requirements referenced by other sections:
 - 1. Windows.
 - 2. Doors.
 - 3. Interior borrowed lites.

4. Glazed entrances.
5. Storefront framing.
6. Glazed curtain walls.
7. Skylights.

B. Glazing accessories.

1.2 RELATED SECTIONS

- A. Division 08 Section 'Decorative Glass Glazing.'
- B. Division 08 Section 'Mirrors.'
- C. Division 08 Section 'Plastic Glazing.'
- D. Division 08 Section 'Security Glazing.'

1.3 REFERENCES

- A. American Architectural Manufacturers Association:
 1. AAMA 800 - Voluntary Specifications and Test Methods for Sealants.
- B. ASTM International (ASTM):
 1. **ASTM C 509** - Specification for Elastomeric Cellular Preformed Gasket and Sealing Material.
 2. **ASTM C 864** - Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
 3. **ASTM C 920** - Specification for Elastomeric Joint Sealants.
 4. **ASTM C 1036** - Specification for Flat Glass.
 5. **ASTM C 1048** - Specification for Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.
 6. **ASTM C 1087** - Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems.
 7. **ASTM C 1115** - Specification for Dense Elastomeric Silicone Rubber Gaskets and Accessories.
 8. **ASTM C 1172** - Specification for Laminated Architectural Flat Glass.
 9. **ASTM C 1281** - Specification for Preformed Tape Sealants for Glazing Applications.
 10. **ASTM C 1330** - Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
 11. **ASTM C 1376** - Specification for Pyrolytic and Vacuum Deposition Coatings on Glass.
 12. **ASTM E 774** - Specification for the Classification of the Durability of Sealed Insulating Glass Units.
 13. **ASTM E 1300** - Practice for Determining Load Resistance of Glass in Buildings.
 14. **ASTM E 2190** - Standard Specification for Insulating Glass Unit Performance and Evaluation.
- C. Code of Federal Regulations:
 1. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials.
- D. Glass Association of North America (GANA):
 1. Glazing Manual.
 2. Laminated Glass Design Guide.
 3. Engineering Standards Manual.
- E. The Insulating Glass Manufacturers Alliance (IGMA):
 1. IGMA TB-3001 - Sloped Glazing Guidelines.
 2. IGMA TM-3000 - Glazing Guidelines for Sealed Insulating Glass Units.

- F. Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; Building Technologies Department; Windows & Daylighting Group, windows.lbl.gov/software:
 - 1. **"LBNL Window 5.0 (or higher) - A PC Program for Analyzing Window Thermal and Optical Performance.**
- G. National Fenestration Rating Council (NFRC):
 - 1. NFRC 100 - Procedure for Determining Fenestration Product Thermal Properties.
 - 2. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficients at Normal Incidence.
 - 3. NFRC 300 - Procedures for Determining Solar Optical Properties of Simple Fenestration Products.
- H. National Fire Protection Association (NFPA):
 - 1. NFPA 80 - Fire Doors and Windows.
 - 2. NFPA 252 - Fire Tests of Door Assemblies.
 - 3. NFPA 257 - Fire Test for Window and Glass Block Assemblies.

1.4 DEFINITIONS

- A. Manufacturers of Primary Glass: Firms that produce primary glass, as defined in referenced industry publications.
- B. Manufacturers/Fabricators of Glass Products: Firms that utilize primary glass in the production of glass products that may include coated glass, laminated glass, and insulating glass.
- C. Sealed Insulating Glass Unit Surfaces:
 - 1. Surface 1: Exterior surface of outer lite.
 - 2. Surface 2: Interspace-facing surface of outer lite.
 - 3. Surface 3: Interspace-facing surface of inner lite.
 - 4. Surface 4: Interior surface of inner lite.

1.5 PERFORMANCE REQUIREMENTS

- A. General: Provide glazing systems that will withstand indicated loads and normal thermal movement without failure, including loss or glass breakage resulting from defective manufacture, fabrication, or installation; failure of glazing systems to remain watertight and airtight; or deterioration of glazing materials.
- B. Glass Design: Glass thicknesses indicated are minimums. Select actual glass lite thicknesses by analyzing loads and conditions. Provide glass lites in the thicknesses and in strengths required to meet or exceed the following criteria:
 - 1. Glass Thicknesses: Comply with ASTM E 1300, as follows:
 - a. Specified Design Wind Loads: As indicated.
 - b. Probability of Breakage for Vertical Glazing: 8 lites per 1000 for lites set within 15 degrees of vertical and under wind load for a load duration of [3] seconds.
 - c. Probability of Breakage for Sloped Glazing: 1 lite per 1000 for lites set more than 15 degrees off vertical and under wind and snow loads for a duration of [30] days.
 - d. Thickness of Tinted Glass: Provide the same thickness for each tint color for all applications.

- C. Thermal Movements: Allow for thermal movements of glazing components and glass framing members resulting from a temperature change range of 120 deg F ambient and 180 deg F material surfaces.
- D. Thermal and Optical Performance Properties: Provide glass meeting specified performance properties, based on manufacturer's published test data for units of thickness indicated, and the following:
 - 1. Center-of-Glass Values: Per LBNL Window 5.0 (or higher) analysis, as follows:
 - a. U-Factors: NFRC 100 expressed as Btu/sq. ft. x h x deg F.
 - b. Solar Heat Gain Coefficient: NFRC 200.
 - c. Solar Optical Properties: NFRC 300.

1.6 SUBMITTALS

- A. Product Data: Manufacturer's data sheets for each glass product and glazing material.
- B. Samples: 12-inch-square, for each type of glass product, other than monolithic clear float glass [or clear float glass only set in insulated glass units].
- C. Glazing Schedule: Prepare schedule using designations used on Drawings.
- D. Product Certificates: Signed by manufacturers/fabricators of glass products certifying that products furnished comply with project requirements.
- E. Preconstruction Adhesion and Compatibility Test Report: From glazing sealant manufacturer, based on submitted samples or acceptable data from previous testing of current formulations with equivalent products.
- F. Qualification Information: For Installer firm and Installer's manufacturer/fabricator-trained field supervisor.
- G. Warranties: Submit sample meeting warranties requirements of this Section.

1.7 QUALITY ASSURANCE

- A. Manufacturer/Source: Obtain each type of glass product from a single primary glass manufacturer and a single manufacturer/fabricator for each glass product type.
 - 1. For glass sputter-coated with solar-control low-e coatings, obtain glass products in fabricated units from a manufacturer/fabricator certified by the primary glass manufacturer.
- B. Installer Qualifications: Experienced Installer with minimum of 5 successful completed projects of similar materials and scope, approved by glass product manufacturer/fabricator.
- C. Preconstruction Adhesion and Compatibility Testing: Submit glass units, glazing materials, and glass-framing members with applicable finish to elastomeric glazing sealant manufacturer for determination of sealant compatibility, priming, and preparation requirements for optimum adhesion and performance.
- D. Glazing for Fire-Rated Door and Window Assemblies: Glazing tested per NFPA 252 and NFPA 257, as applicable, for assemblies complying with NFPA 80 and listed and labeled per requirements of authorities having jurisdiction.
- E. Safety Glazing Products: Comply with size, glazing type, location, and testing requirements of 16 CFR 1201 for Category I and II glazing products, and requirements of authorities having jurisdiction.
- F. Glazing Industry Publications: Comply with glass product manufacturers' recommendations and the following:

1. GANA Publications: GANA Laminated Division's 'Laminated Glass Design Guide' and GANA's 'Glazing Manual.'
 2. IGMA Publication for Insulating Glass: IGMA TM-3000, 'Glazing Guidelines for Sealed Insulating Glass Units.'
- G. Insulating-Glass Certification Program: Indicate compliance with requirements of Insulating Glass Certification Council on applicable glazing products.
- H. Mockups: Prior to installing glazing, build mockups to demonstrate materials and workmanship. Coordinate with mockup requirements of related sections.
- I. Preinstallation Conference: Conduct conference at Project site in compliance with Division 01 requirements.
- 1.8 DELIVERY, STORAGE, AND HANDLING
- A. Protect glazing materials during shipping, handling, and storage to prevent breakage, scratching, damage to seals, or other visible damage. Deliver, unload, store, and erect glazing materials without exposing panels to damage from construction operations.
1. Comply with manufacturer's venting and sealing recommendations for shipping and handling of insulating glass units exposed to substantial altitude change.
- 1.9 WARRANTY
- A. Warranty for Coated-Glass Products: Manufacturer's standard form, signed by coated-glass product primary manufacturer or manufacturer/fabricator, as applicable, agreeing to replace coated-glass units that display peeling, cracking, and other deterioration in metallic coating under normal use, within [10] years of date of Substantial Completion.
- B. Warranty for Laminated Glass: Manufacturer's standard form, signed by laminated-glass product manufacturer/fabricator, agreeing to replace laminated-glass units that display edge separation, delamination, and blemishes exceeding those allowed by ASTM C 1172, within [five] years of date of Substantial Completion.
- C. Warranty for Insulating Glass: Manufacturer's standard form, signed by insulating-glass product manufacturer/fabricator, agreeing to replace insulating-glass units that exhibit failure of hermetic seal under normal use evidenced by the obstruction of vision by dust, moisture, or film on interior surfaces of glass, within [10] years of date of Substantial Completion.
- D. Installer's Warranty: Form acceptable to Owner, signed by glass product Installer, agreeing to replace glass products that deteriorate, or that exhibit damage or deterioration of glass or glazing products due to faulty installation, within [2] years of date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Glass product selections are based upon the primary glass manufacturer below. Provide basis of design product [, or comparable product of a listed manufacturer approved by the Architect prior to bid]:
1. Vitro Architectural Glass, Cheswick, PA, (888) 774-4332, Email: ideascaples@ppg.com, <http://www.vitroglazings.com>.

2.2 GLASS PRODUCTS

- A. Annealed Float Glass, General: ASTM C 1036, Type I, Quality-Q3, class indicated.

- B. Annealed Ultra-Clear (Low Iron) Float Glass: Class I (clear).
 1. Basis of Design Product: Vitro Architectural Glass, Starphire.
 2. [Specifier: insert manufacturer of comparable product if required]
- C. Heat-Treated Float Glass, Heat-Strengthened: ASTM C 1048; Type I (transparent flat glass); Quality-Q3; Kind HS, of class and condition indicated: where indicated, where needed to resist thermal stresses and where required to comply with performance requirements.
- D. Heat-Treated Float Glass, Fully Tempered: ASTM C 1048; Type I (transparent flat glass); Quality-Q3; Kind FT, of class and condition indicated: where safety glass is indicated. Safety glazing must comply with ANSI Z97.1 and CPSC 16CFR-1201
- E. Pyrolytic-Coated Float Glass: ASTM C 1376, float glass with metallic-oxide coating applied by pyrolytic deposition process during primary glass product manufacture.
- F. Sputter-Coated Float Glass: ASTM C 1376, float glass with metallic-oxide or -nitride coating deposited by vacuum deposition process following primary glass product manufacture.
- G. Ceramic-Coated Vision Glass: Float glass with silk-screened ceramic enamel application, per ASTM C 1048, Condition B, Type I, Quality-Q3, and Specification No. 95-1-31 in GANA 'Engineering Standards Manual.'
- H. Ceramic-Coated Spandrel Glass: ASTM C 1048, Condition B, Type I, Quality-Q3 and GANA 'Engineering Standards Manual' 66-9-20 Specification for Heat-Strengthened or Fully Tempered Ceramic Enameled Spandrel Glass for Use in Building Window/Curtain Walls and Other Architectural Applications.
- I. Coated Spandrel Float Glass: Float glass complying with ASTM C 1048, GANA 'Engineering Standards Manual' 89-1-6 Specification for Environmental Durability of Fully Tempered or Heat-Strengthened Spandrel Glass with Applied Opacifier and other requirements specified, with manufacturer's standard opacifier material on coated second surface of lites.
- J. Laminated Glass: ASTM C 1172, with manufacturer's standard polyvinyl butyral or cured resin interlayer.
- K. Insulating-Glass Units: Factory-assembled units consisting of dual-sealed lites of glass separated by a dehydrated interspace, with manufacturer's standard spacer material and construction, per ASTM E 2190.

2.3 GLAZING ACCESSORIES

- A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- B. Glazing Tape: Butyl-based elastomeric tape with integral resilient tube spacer, 10 to 15 Shore A durometer hardness, black color, coiled on release paper; widths required for specified installation, complying with ASTM C 1281 and AAMA 800 for application.
- C. Glazing Tape: Closed cell polyvinyl chloride foam, maximum water absorption by volume 2 percent, designed for 25 percent compression percent for air barrier and vapor retarder seal, black color, coiled on release paper over adhesive on two sides; widths required for specified installation, and complying with AAMA 800.
- D. Glazing Gaskets:

1. Dense Compression Gaskets: ASTM C 864, neoprene or EPDM, or ASTM C 1115, silicone, or thermoplastic polyolefin rubber, as recommended by glazing product manufacturer for application, molded or extruded shape to fit glazing channel retaining slot; black color.
 2. Soft Compression Gaskets: ASTM C 509, Type II, black, molded, or extruded, neoprene, EPDM, silicone, or thermoplastic polyolefin rubber, of profile and hardness required to maintain watertight seal.
- E. Setting Blocks: ASTM C 864, neoprene, 80 to 90 Shore A durometer hardness; length 4 inches, width of glazing rabbet space less 1/16-inch, height required for glazing method, pane weight, and pane area.
- F. Spacer Shims: ASTM C 864, neoprene, 50 to 60 Shore A durometer hardness; length 3 inches, one half height of glazing stop, thickness required for application, one face self-adhesive.
- G. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- H. Glazing Sealants: ASTM C 920, type recommended by glazing product manufacturer for application indicated, complying with requirements of Division 07 Section 'Joint Sealants,' color as selected by Architect.
- I. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.
- J. Smoke Removal Unit Targets: Adhesive targets for application to glass, identifying glass units designed for removal for smoke control.

2.4 FABRICATION OF GLAZING UNITS, GENERAL

- A. Fabricate glazing units in dimensions required, with edge and face clearances, edge and surface conditions, and bite in accordance with glazing product manufacturer/fabricator's instructions and referenced glazing publications.

2.5 INSULATING-GLASS UNIT(S)

- A. Double Glazed Tinted Solar Control Insulating Glass Unit [Solarban® 60 on Solargray® 6mm (2) | Air 1/2" (12.7mm) | Clear 6mm]
1. Conformance: ASTM E 2190
 2. Outdoor Lite: Solargray® Tinted Float Glass as manufactured by Vitro Architectural Glass
 - a. Conformance: ASTM C 1036, Type 1, Class 2, Quality q3.
 - b. Glass Thickness: 6mm (1/4")
 - c. Magnetic Sputter Vacuum Deposition Coating (MSVD): ASTM C 1376.
 - d. Coating: Solarban® 60 on Surface # 2
 - e. Heat-Treatment: Heat-strengthened, ASTM C 1048, Kind HS.
 3. Interspace Content: Air 1/2" (12.7mm)
 4. Indoor Lite: Clear float glass as manufactured by Vitro Architectural Glass
 - a. Conformance: ASTM C 1036, Type 1, Class 1, Quality q3.
 - b. Heat-Treatment: Heat-strengthened, ASTM C 1048, Kind HS.
 - c. Glass Thickness: 6mm (1/4")
 5. Performance Requirements:
 - a. Visible Light Transmittance: 35 percent minimum.
 - b. Winter Nighttime U-Factor: 1.55 (W/m²*°C) maximum.
 - c. Summer daytime U-Factor: 1.55 (W/m²*°C) maximum.

- d. Shading Coefficient: 0.29 maximum.
- e. Solar Heat Gain Coefficient: 0.25 maximum.
- f. Outdoor Visible Light Reflectance: 6 percent maximum.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that glazing channels are clean and ready to accept glazing installation, and that weeps are unobstructed. Confirm that minimum required face and edge clearances will be maintained. Do not proceed with glazing until unsatisfactory conditions have been corrected.
- B. Examine glazing units prior to setting. Reject units that display edge or face damage that may impede performance of unit or that will be visible when installed.

3.2 PREPARATION

- A. Clean glazing channels with recommended solvent and wipe dry. Apply primers to joint surfaces to ensure adhesion of sealants, unless preconstruction sealant-substrate testing indicates no primer is required.

3.3 GLAZING INSTALLATION

- A. General: Install glass and glazing materials in accordance with instructions of manufacturers and requirements of GANA Glazing Manual.
 - 1. Install setting blocks of size and in location required by glass manufacturer. Set blocks in bed of approved sealant.
 - 2. Provide spacers for glass lites as recommended, based upon size of glass unit.
 - 3. Comply with glass manufacturer's limits on edge pressures.
 - 4. Ensure that glazing units are set with proper and consistent orientation of glass units toward interior and exterior.
 - 5. Provide edge blocking where recommended.
 - 6. Install sealants in accordance with requirements of Division 07 Section 'Joint Sealants.'
- B. Tape Glazing: Place tapes on fixed stops positioned to be flush or protrude slightly when compressed by glass. Install tapes continuously. Form butt joints at corners and where required, and seal tape joints with approved sealant.
 - 1. Apply heel bead of glazing sealant along intersection of permanent stop and frame for continuity of air and vapor seal.
 - 2. Set glass lites centered in openings on setting blocks.
 - 3. Install removable stops, and insert dense compression gaskets at corners, working toward centers of lites, compressing glass against tape on fixed stops.
 - 4. Apply cap bead of elastomeric sealant over exposed edge of tape or gasket on exterior of glass unit.
- C. Sealant Glazing: Install continuous spacers between glass lites and glazing stops. Install cylindrical sealant backing where recommended, in width and depth recommended to provide proper depth and width of sealant bead. Ensure sealant cannot block weep system.
 - 1. Install sealant under pressure to completely fill glazing channel without voids, with full bond to glass and channel surfaces.
 - 2. Tool sealant bead to proper profile providing wash away from glass.
- D. Sealant Glazing for Butt Glazing:
 - 1. Brace glass in position for duration of glazing process

2. Mask edges of glass at adjoining glass edges and between glass edges and framing members.
 3. Secure small diameter non-adhering foamed rod on back side of joint.
 4. Apply sealant to open side of joint in continuous operation; completely fill joint without displacing foam rod; tool sealant surface smooth to concave profile.
 5. Allow sealant to cure, then remove foam backer rod.
 6. Apply sealant to opposite side; tool sealant smooth to concave profile.
 7. Remove masking tape.
- E. Gasket Glazing: Fabricate gaskets to fit openings exactly. Allow for stretching of gaskets during installation.
1. Set soft compression gasket against fixed stop or frame, secure, with bonded miter cut joints at corners.
 2. Set glass lites centered in openings on setting blocks.
 3. Install removable stops, and insert dense compression gaskets at corners, working toward centers of lites, compressing glass against soft compression gaskets and to produce a weathertight seal. Seal joints in gaskets. Allow gaskets to protrude past face of glazing stops.

3.4 CLEANING AND PROTECTION

- A Protect installed glass from damage. Attach streamers or warning tape to framing members, away from contact with glass. Remove nonpermanent labels.
- B Protect glass from contact with contaminating substances during construction. Immediately clean glass exposed to contamination using methods recommended by glass manufacturer.
- C Within 5 working days prior to inspection for Substantial Completion, clean all exposed glass surfaces using methods recommended by manufacturer. Remove glazing compounds from framing surfaces.
- D Remove and replace broken or damaged glass.

8A-06. SECURITY LEVEL GLAZING N.A.

8A-07. ALUMINUM STOREFRONT AND SASH:

- A General: All aluminum tubing shown for fixed glass windows and windows shall be equal to Kawneer TriFab II 451 Series, 2" x 4 ½" or Vista Wall Series 3000 2" x 4 ½". Finish shall be Class 1 – clear anodized. Aluminum storefront shall be for Thermopane glazing.
- B Materials: All framing members shall be extruded aluminum of 6063-T6 alloy and temper. Exterior glazing gasket shall be E.P.D.M. and interior glazing seal shall be closed cell PVC foam sealant tape. All mullions and horizontals for 1" glazing (except butt glazed) shall be thermally isolated from the pressure plate by a rigid vinyl separator.
- C Installation: All openings shall be prepared plumb and square by others and shall be of sufficient size to provide clearance at jambs, head and sill as shown on the Architectural drawings. Experienced technicians shall perform installation, glass and glazing according to the manufacturer's recommended procedures. All units shall be securely anchored with all joints fully caulked to issue a watertight seal. Sills shall be laid in full bed of caulking and jambs and heads shall be caulked as shown on the drawings and specified elsewhere in these specifications. Installation shall be by skilled, well trained mechanics. Fastenings shall be Phillips Head Machine Screws counter sunk and of stainless steel.

- D Finish: All exposed surfaces shall be free of unsightly scratches and blemishes. The exposed surfaces shall receive a caustic etch followed by an architectural class I clear anodized coating conforming to AA-M12C22A44 Vista wall 740-EC.
- E Cleaning: Upon completion of construction, the General Contractor shall be responsible for cleaning all aluminum, employing methods recommended by the manufacturer as follows Anodized aluminum shall be cleaned with plain water containing a mild detergent, or a petroleum product such as white gasoline, kerosene, or distillate. No abrasive agent shall be used.
- F Warranty: Provide standard limited two-year warranty from the date of substantial completion.
- G See drawings for locations for store front and fixed glass windows.

8A-08 GLAZED ALUMINUM CURTAIN WALLS: N.A.

8A-09. ALUMINUM FRAME ENTRANCE DOORS: N.A.

8A-10. ALUMINUM WINDOWS N.A.

8A-11. SKYLIGHTS: N.A.

8A-12. SHOP DRAWINGS:

Glass and glazing contractor shall furnish complete shop drawings for all items this Section for approval prior to fabrication showing all details, sizes, shapes, dimensions, etc.

Shop Drawings shall show calculations, signed, and sealed by an engineer registered in the State of Florida, that all exterior glazing, windows, and store front comply with 130 mph ultimate wind speed as per the 2023 Florida Building Code and ASCE 7-10.

Shop Drawings shall also include product approval number and additional test data that is required to comply with the 2023 Florida Building Code. See Supplementary and Special Conditions, Paragraph 15-6.

8A-13. CLEANING:

After Final Inspection, all remaining glazing compound and smears shall be cleaned from the glass, the sash and frames, and the glass washed clean. Broken glass shall be removed and replaced at no expense to the Owner.

END OF SECTION.

**SECTION 8B
EXTERIOR AND INTERIOR DOORS**

8B-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

8B-02. SCOPE:

Furnish all labor, materials, and equipment and perform all operations necessary for the complete installation of all glass, glazing, windows, and storefront as noted in these specifications and as shown in the drawings.

8B-03. CHAIN OPERATED SERVICE DOOR: N.A.

8B-04. HOLLOW METAL DOORS: See Section 8C of these specifications.

8B-05 WOOD DOORS:

All wood doors shall be sized as scheduled on the drawings and shall be equal to the following specifications for door types.

- A. Hollow Core Doors: Shall be Graham seven-ply hollow core doors, 1-3/4" thick conforming to US Commercial Standard CS 171-58, including all amendments. Type I waterproof glue for exterior doors and Type II water resistant for interior doors. Hollow core doors shall be flush panel, Birch Veneer. Furnish one-year industry guarantee.
- B. Solid Core Doors: Shall be Graham exterior or interior solid lumber staved core doors, 1- 3/4 " thick, of sizes as noted on drawings. Doors noted for 20-minute rating shall be DGS-20 staved core. Doors shall conform to U.S.

Commercial Standard CS 171-58 including all amendments. Face veneer shall be Birch premium grade. Exterior doors shall be guaranteed for two (2) years after installation, interior doors for life of installation. Top and bottom edges to be at least 2 _" minimum hardwood, side edges to be 1 3/4" minimum Beech.

- C. Fire Doors: Where noted on the drawings, rated or label wood doors shall be equal to Weyerhaeuser staved core DFM-60 fire door for a one-hour fire rating, conforming to industry standards I.S. 1-73. Door shall carry appropriate UL Label. Finish shall be Birch premium grade.
- D. Acceptable manufacturers are US Plywood, Roddis, or Eggers Hardwood Company; supplier to furnish submittal data showing all specifications of doors to be furnished for approval by Architect.

8B-06. METAL GLASS STOPS:

All wood doors shown or noted with glass lights shall have metal stops. Stops shall be Type FGS75 for

single glazing and shall be as manufactured by Anemostat Door Products. **Install stops with stainless steel through bolts.**

8B- 07. ALUMINUM FRAME ENTRANCE DOORS: N.A.

8B-08. BULLET RESISTANT WOOD DOORS: N.A.

8B-09. PUSH UP COUNTER DOOR: N.A.

8B-10. PRODUCT APPROVAL NUMBERS: (METAL DOORS AND FRAMES)

Submittals for exterior hollow metal doors, metal door frames, exterior roll up doors, and exterior hollow metal window frames to have Florida Product Approval Numbers and information showing product complies with the Florida Building Code 2022. See Supplementary and Special Conditions, Paragraph 15-6 for this requirement.

Approval numbers shall be for the entire assembly (frames, doors, and hardware) including gauges of materials, set backs of hardware anchorage and installation of all components.

END OF SECTION

SECTION 08C

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

1. Standard and custom hollow metal doors and frames.
2. Steel sidelight, borrowed lite and transom frames.
3. Louvers installed in hollow metal doors.
4. Light frames and glazing installed in hollow metal doors.

- B. Related Sections:

1. Division 01 Section "General Conditions".
2. Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
3. Division 08 Section "Flush Wood Doors".
4. Division 08 Section "Glazing" for glass view panels in hollow metal doors.
5. Division 08 Section "Door Hardware".
6. Division 08 Section "Access Control Hardware".
7. Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal doors and frames.
8. Division 28 Section "Access Control Hardware".

- C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
6. ANSI/SDI A250.13 - Testing and Rating of Severe Windstorm Resistant Components for Swing Door Assemblies.
7. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
8. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
9. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

10. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
11. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
12. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes.
13. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
14. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
15. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
16. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
17. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
18. TAS-202-94 - Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components using Uniform Static Air Pressure.
19. TAS-203-94 - Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.
20. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
21. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.
- B. Maintenance manual must be provided for tornado/hurricane storm shelter impact protective systems.
- C. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.
- D. Shop Drawings: Include the following:
 1. Elevations of each door design.
 2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 4. Locations of reinforcement and preparations for hardware.
 5. Details of anchorages, joints, field splices, and connections.
 6. Details of accessories.
 7. Details of moldings, removable stops, and glazing.
 8. Details of conduit and preparations for power, signal, and control systems.
- E. Samples for Verification:
 1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.
- F. Informational Submittals:
 1. Hurricane Resistant Openings (State of Florida): Within the State of Florida, provide copy of current State of Florida Product Approval as proof of compliance that doors, frames and hardware for exterior opening assemblies have been tested and approved for use at the design pressure level and debris impact resistance requirements specified for the Project.
 - a. Hurricane Resistant Components (State of Florida): Within the State of Florida, provide copy of independent, third-party certified listing conforming to ANSI A250.13.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.
- B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".
- C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40" above sill) or UL 10C.
 - 1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.
 - 2. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
 - 3. Smoke Control Door Assemblies: Comply with NFPA 105.
 - a. Smoke "S" Label: Doors to bear "S" label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.
- D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.
- E. Hurricane Resistant Exterior Openings (State of Florida including High Velocity Hurricane Zone (HVHZ): Provide exterior hollow metal doors and frames as complete and tested assemblies, or component assemblies, including approved hardware specified under Section 087100 "Door Hardware", to meet the design pressures, debris impact resistance, and glass and glazing requirements as detailed in the current State of Florida building code sections applicable to the Project.
 - 1. Each unit to bear third party permanent label in accordance with Florida Building Code requirements.
- F. Storm Shelter Openings: Provide complete door systems for hurricane or tornado storm shelters, and other areas of refuge, complying and tested according to ICC 500 (2014/2020), ICC/NSSA Standard for the Design and Construction of Storm Shelters.
 - 1. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.
- G. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.

- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.
 - 1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 COORDINATION

- A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.
- B. Building Information Modeling (BIM) Support: Utilize designated BIM software tools and obtain training needed to successfully participate in the Project BIM processes. All technical disciplines are responsible for the product data integration and data reliability of their Work into the coordinated BIM applications.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
- B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames from a SDI Certified manufacturer:
 - 1. CECO Door Products (C).
 - 2. Curries Company (CU).

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

- C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 HOLLOW METAL DOORS

- A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.

- B. Exterior Doors: Face sheets fabricated of commercial quality hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Design: Flush panel.
2. Core Construction: Manufacturer's standard polystyrene. Where indicated, provide doors fabricated as thermal-rated assemblies with a minimum R-value of 2.8 or better.
3. Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), Minimum 16 gauge (0.053-inch - 1.3-mm) thick steel, Model 2.
4. Vertical Edges: Vertical edges to have the face sheets joined by a continuous weld extending the full height of the door. Welds are to be ground, filled and dressed smooth. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).
5. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.
6. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
7. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

- C. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Design: Flush panel.
2. Core Construction: Manufacturer's standard kraft-paper honeycomb, or one-piece polystyrene core, securely bonded to both faces.
 - a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.
3. Level/Model: Level 2 and Physical Performance Level B (Heavy Duty), Minimum 18 gauge (0.042-inch - 1.0-mm) thick steel, Model 2.
4. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
5. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
6. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

- D. Manufacturers Basis of Design:

1. Curries Company (CU) - Polystyrene Core - 707 Series.

2.4 HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Exterior Frames: Fabricated of hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60.
 - 1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
 - 2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
 - 3. Manufacturers Basis of Design:
 - a. Curries Company (CU) – M Series.
- C. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.
 - 1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
 - 2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
 - 3. Manufacturers Basis of Design:
 - a. Curries Company (CU) - C Series.
 - b. Curries Company (CU) - M Series.
- D. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.
- E. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.5 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
 - 2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
 - 3. Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.
 - 4. Hurricane Opening Anchors: Types as tested and required for indicated wall types to meet specified design pressure and impact rating criteria.
- B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.
- C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.6 LOUVERS

- A. Metal Louvers: Unless otherwise indicated provide louvers to meet the following requirements.
 - 1. Blade Type: Vision proof inverted V or inverted Y.
 - 2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

- B. Louvers for Fire Rated Doors: Metal louvers with fusible link and closing device, listed and labeled for use in doors with fire protection rating of 1-1/2 hours and less.
 - 1. Manufacturers: Subject to compliance with requirements, provide louvers to meet rating indicated.
 - 2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

2.7 LIGHT OPENINGS AND GLAZING

- A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator's shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.
- B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.
- C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.
- D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

2.8 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.9 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.
- C. Hollow Metal Doors:
 - 1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.
 - 2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
 - 3. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
 - 4. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".

D. Hollow Metal Frames:

1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
 - a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
3. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
5. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
7. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
8. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
9. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches on-center and as follows:
 - 1) Two anchors per jamb up to 60 inches high.
 - 2) Three anchors per jamb from 60 to 90 inches high.
 - 3) Four anchors per jamb from 90 to 120 inches high.
 - 4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
 - b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches high.
 - 2) Four anchors per jamb from 60 to 90 inches high.
 - 3) Five anchors per jamb from 90 to 96 inches high.
 - 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
 - 5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.
 - c. Storm Shelter Openings: Provide jamb, head, and sill anchors in accordance with manufacturer's certified assembly listings.
10. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".
11. Bituminous Coating: Where frames are fully grouted with an approved Portland Cement based grout or mortar, coat inside of frame throat with a water based bituminous or asphaltic emulsion coating to a

minimum thickness of 3 mils DFT, tested in accordance with UL 10C and applied to the frame under a 3rd party independent follow-up service procedure.

E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.10 STEEL FINISHES

A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.
- C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.
- E. Verify tolerances against manufacturers installations instructions for tornado and hurricane storm shelter openings.

3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.
 - 1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
 - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
 - 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
 - 4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.
- C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - 1. Non-Fire-Rated Standard Steel Doors:
 - a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
 - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
 - 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow metal work immediately after installation.
- C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

3.5 FIELD QUALITY CONTROL

- A. Field Inspection (Punch Report): Reference Division 01 Sections "Closeout Procedures". Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

END OF SECTION 081113

SECTION 08D DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes commercial door hardware for the following:

- 1. Swinging doors.
- 2. Sliding doors.
- 3. Other doors to the extent indicated.

- B. Door hardware includes, but is not necessarily limited to, the following:

- 1. Mechanical door hardware.
- 2. Electromechanical door hardware.
- 3. Cylinders specified for doors in other sections.

- C. Related Sections:

- 1. Division 01 Section "Closeout Procedures"
- 2. Division 08 Section "Operations and Maintenance".
- 3. Division 08 Section "Door Schedule".
- 4. Division 08 Section "Hollow Metal Doors and Frames".
- 5. Division 08 Section "Flush Wood Doors".
- 6. Division 08 Section "Aluminum-Framed Entrances and Storefronts".
- 7. Division 28 Section "Access Control Hardware Devices".

- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

- 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
- 2. ANSI/SDI A250.13 - Testing and Rating of Severe Windstorm Resistant Components for Swing Door Assemblies.
- 3. ASTM E1886 - Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Shutters Impacted by Missiles and Exposed to Cyclic Pressure Differentials.
- 4. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure difference.
- 5. ICC/IBC - International Building Code.
- 6. NFPA 70 - National Electrical Code.
- 7. NFPA 80 - Fire Doors and Windows.
- 8. NFPA 101 - Life Safety Code.
- 9. NFPA 105 - Installation of Smoke Door Assemblies.
- 10. TAS-202-94 - Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components using Uniform Static Air Pressure.
- 11. TAS-203-94 - Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.

12. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.
5. ANSI/UL 437- Key Locks.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

- a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
 - b. Complete (risers, point-to-point) access control system block wiring diagrams.
 - c. Wiring instructions for each electronic component scheduled herein.
2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.
- D. Proof of Qualification: Provide copy of manufacturer(s) Factory Trained Installer documentation indicating proof of status as a qualified installer of tornado or hurricane storm shelter assemblies.
- E. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
- F. Informational Submittals:
- 1. Hurricane Resistant Openings (State of Florida): Within the State of Florida, provide copy of current State of Florida Product Approval as proof of compliance that doors, frames and hardware for exterior opening assemblies have been tested and approved for use at the wind load and design pressure and debris impact resistance level requirements specified for the Project.
 - a. Hurricane Resistant Components (State of Florida): Within the State of Florida, provide copy of independent, third party certified listing to ANSI A250.13.
 - 2. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- G. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).
- C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC)

available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

- E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
 - 1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
 - 2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

- F. Hurricane Resistant Exterior Openings (State of Florida including the High Velocity Hurricane Zone (HVHZ)): Provide exterior door hardware as complete and tested assemblies, or component assemblies, including approved doors and frames specified under Section 081113 "Hollow Metal Doors and Frames", to meet the design pressures, debris impact resistance, and glass and glazing requirements as detailed in the current State of Florida building code sections applicable to the Project.
 - 1. Each unit to bear third party permanent label in accordance with the Florida Building Code requirements.

- G. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

- H. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 - 1. Function of building, purpose of each area and degree of security required.
 - 2. Plans for existing and future key system expansion.
 - 3. Requirements for key control storage and software.
 - 4. Installation of permanent keys, cylinder cores and software.
 - 5. Address and requirements for delivery of keys.

- I. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
 - 1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
 - 2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
 - 3. Review sequence of operation narratives for each unique access controlled opening.
 - 4. Review and finalize construction schedule and verify availability of materials.
 - 5. Review the required inspecting, testing, commissioning, and demonstration procedures

- J. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Electrical component defects and failures within the systems operation.
- C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
- C. Please note that ASSA ABLOY is transitioning the Yale Commercial brand to ASSA ABLOY ACCENTRA. This affects only the brand name; the products and product numbers will remain unchanged. The brand transition is expected to be complete in or about May of 2024, and products shipping after that time will be branded ASSA ABLOY ACCENTRA.
- D. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 BUTT HINGES

- A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
1. Quantity: Provide the following hinge quantity:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
 - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
 4. Hinge Options: Comply with the following:
 - a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
 5. Manufacturers:
 - a. McKinney (MK) - TA/T4A Series, 5-knuckle.

2.3 CONTINUOUS HINGES

- A. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 continuous geared hinge. with minimum 0.120-inch thick extruded 6063-T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:
 - a. Pemko (PE).

2.4 POWER TRANSFER DEVICES

- A. Electrified Quick Connect Transfer Hinges: Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets with a 1-year warranty. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:
 - a. McKinney (MK) - QC (# wires) Option.

- B. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:
 - a. McKinney (MK) - Electrical Connecting Kit: QC-R001.
 - b. McKinney (MK) - Connector Hand Tool: QC-R003.
2. Manufacturers:
 - a. McKinney (MK) - QC-C Series.

2.5 DOOR OPERATING TRIM

- A. Flush Bolts and Surface Bolts: Provide products conforming to ANSI/BHMA A156.3 and A156.16, Grade 1.
1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
 2. Furnish dust proof strikes for bottom bolts.
 3. Surface bolts to be minimum 8" in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
 4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
 5. Manufacturers:

- a. Rockwood (RO).
- B. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
- 1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
 - 2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
 - 3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
 - 4. Pulls, where applicable, shall be provided with a 10" clearance from the finished floor on the push side to accommodate wheelchair accessibility.
 - 5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
 - 6. Manufacturers:
 - a. Rockwood (RO).

2.6 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
- 1. Manufacturers:
 - a. ASSA ABLOY ACCENTRA, formerly known as Yale (YA).
 - b. Corbin Russwin Hardware (RU).
 - c. Sargent Manufacturing (SA).
- B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:
- 1. Threaded mortise cylinders with rings and cams to suit hardware application.
 - 2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 - 3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
 - 4. Tubular deadlocks and other auxiliary locks.
 - 5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
 - 6. Keyway: Manufacturer's Standard.
- C. Large Format Interchangeable Cores: Provide removable cores (LFIC) as specified, core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware.
- D. Patented Cylinders: ANSI/BHMA A156.5, Grade 1 Certified Products Directory (CPD) listed cylinders employing a utility patented and restricted keyway requiring the use of a patented key. Cylinders are to be protected from unauthorized manufacture and distribution by manufacturer's United States patents. Cylinders are to be factory keyed with owner having the ability for on-site original key cutting.
- 1. Patented key systems shall not be established with products that have an expired patent. Expired systems shall only be specified and supplied to support existing systems.
 - 2. Manufacturers:
 - a. ASSA ABLOY ACCENTRA, formerly known as Yale (YA) - Keymark.

- b. Corbin Russwin (RU) - Access 3 AP.
 - c. Sargent (SA) - Degree DG1.
- E. Keying System: Each type of lock and cylinders to be factory keyed.
 - 1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
 - 2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
 - 3. New System: Key locks to a new key system as directed by the Owner.
- F. Key Quantity: Provide the following minimum number of keys:
 - 1. Change Keys per Cylinder: Two (2)
 - 2. Master Keys (per Master Key Level/Group): Five (5).
 - 3. Construction Keys (where required): Ten (10).
- G. Construction Keying: Provide construction master keyed cylinders.
- H. Construction Keying: Provide temporary keyed construction cores.
- I. Key Registration List (Bitting List):
 - 1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
 - 2. Provide transcript list in writing or electronic file as directed by the Owner.

2.7 KEY CONTROL

- A. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.
 - 1. Manufacturers:
 - a. Lund Equipment (LU).
 - b. MMF Industries (MM).
 - c. Telkee (TK).

2.8 MORTISE LOCKS AND LATCHING DEVICES

- A. Mortise Locksets, Grade 1 (Heavy Duty): Provide ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed mortise locksets. Listed manufacturers shall meet all functions and features as specified herein.
 - 1. Provide locksets with functions and features as follows:
 - a. Heavy duty 12-gauge wrought steel case.
 - b. Stainless steel 3/4" one-piece anti-friction reversible latchbolt with a one-piece hardened stainless steel 1" projection deadbolt.
 - c. Where required by code, provide knurling or abrasive coating on all levers leading to hazardous areas.

- d. Meets UL and CUL Standard 10C Positive Pressure, Fire Test of Door Assemblies with levers that meet A117.1 Accessibility Code.
- e. Meets Florida Building Code FL2998 and UL Certification Directory ZHEM.R21744 for latching hardware for hurricane requirements.
- f. Meets UL Certification Directory ZHLL.R21744 for products used in windstorm rated assemblies.
- g. Status indicators inside, outside, or on both sides of doors as specified; available with wording for "locked/unlocked", "vacant/occupied" or custom wording options. Indicator to be located above the cylinder with the inside thumb-turn not blocking the visibility of the indicator status.
- h. Ten-year limited warranty for mechanical functions.

2. Manufacturers:

- a. ASSA ABLOY ACCENTRA, formerly known as Yale (YA) - 8800FL Series.
- b. Corbin Russwin Hardware (RU) - ML2000 Series.
- c. Sargent Manufacturing (SA) - 8200 Series.

2.9 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
 - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 - 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 - 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
 - 4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
- B. Standards: Comply with the following:
 - 1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 - 2. Strikes for Bored Locks and Latches: BHMA A156.2.
 - 3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
 - 4. Dustproof Strikes: BHMA A156.16.

2.10 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
 - 1. Exit devices shall have a five-year warranty.
 - 2. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
 - 3. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
 - 4. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

5. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
 6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
 - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
 - b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
 7. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
 8. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
 9. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
 10. Rail Sizing: Provide exit device rails factory sized for proper door width application.
 11. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.
- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed exit devices. Listed manufacturers shall meet all functions and features as specified herein.
1. Provide exit devices with functions and features as follows:
 - a. Where required by code, provide knurling or abrasive coating on all levers leading to hazardous areas.
 - b. Meets UL and CUL Standard 10C Positive Pressure, Fire Test of Door Assemblies with levers that meet A117.1 Accessibility Code.
 - c. Meets Florida Building Code FL2998 and UL Certification Directory ZHEM.R21744 for latching hardware for hurricane requirements.
 - d. Meets UL Certification Directory ZHLL.R21744 for products used in windstorm rated assemblies.
 - e. Five-year limited warranty for mechanical features.
 2. Electromechanical exit devices shall have the following functions and features:
 - a. Universal Molex plug-in connectors that have standardized color-coded wiring and are field configurable in fail safe or fail secure and operate from 12vdc to 24vdc regulated.
 - b. EcoFlex or equivalent technology that reduces energy consumption up to 92% as certified by GreenCircle.
 - c. Options to be available for request-to-exit or enter signaling, latchbolt and touchbar monitoring.
 - d. Field configurable electrified trim to fail-safe or fail-secure that operates from 12-24VDC.
 - e. Five-year limited warranty for electromechanical features.
 3. Manufacturers:
 - a. ASSA ABLOY ACCENTRA, formerly known as Yale (YA) - 7000 Series.
 - b. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
 - c. Sargent Manufacturing (SA) - 80 Series.

2.11 DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:
1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
 2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
 3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
 4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
 5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
 6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.
- B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.
1. Heavy duty surface mounted door closers shall have a 30-year warranty.
 2. Manufacturers:
 - a. ASSA ABLOY ACCENTRA, formerly known as Yale (YA) - 4400 Series.
 - b. Corbin Russwin Hardware (RU) - DC6000 Series.
 - c. Norton Rixson (NO) - 7500 Series.
 - d. Sargent Manufacturing (SA) - 351 Series.

2.12 ARCHITECTURAL TRIM

- A. Door Protective Trim
1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
 2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
 3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
 4. Protection Plates: ANSI/BHMA A156.6 protection plates (kick, armor, or mop), fabricated from the following:

- a. Stainless Steel: 300 grade, 050-inch thick.
- 5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
- 6. Manufacturers:
 - a. Rockwood (RO).

2.13 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
 - 1. Manufacturers:
 - a. Rockwood (RO).
- C. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.
 - 1. Manufacturers:
 - a. Norton Rixson (RF).
 - b. Rockwood (RO).
 - c. Sargent Manufacturing (SA).

2.14 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
 - 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NFPA 252, Standard Methods of Fire Tests of Door Assemblies.

- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Manufacturers:
 - 1. Pemko (PE).

2.15 ELECTRONIC ACCESSORIES

- A. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.
 - 1. Manufacturers:
 - a. Securitron (SU) - DPS Series.
- B. Switching Power Supplies: Provide power supplies with either single or dual voltage configurations at 12 or 24VDC. Power supplies shall have battery backup function with an integrated battery charging circuit and shall provide capability for power distribution, direct lock control and Fire Alarm Interface (FAI) through add on modules. Power supplies shall be expandable up to 16 individually protected outputs. Output modules shall provide individually protected, continuous outputs and/or individually protected, relay controlled outputs.
 - 1. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.
 - 2. Manufacturers:
 - a. Securitron (SU) - AQD Series.
- C. Intelligent Switching Power Supplies: Provide power supplies with single, dual or multi-voltage configurations at 12 and/or 24VDC. Power Supply shall have battery backup function with an integrated battery charging circuit. The power supply shall have a standard, integrated Fire Alarm Interface (FAI). The power supply shall provide capability for secondary voltage, power distribution, direct lock control and network monitoring through add on modules. The power supply shall be expandable up to 16 individually protected outputs. Output modules shall provide individually protected, continuous outputs and/or individually protected, relay controlled outputs. Network modules shall provide remote monitoring functions such as status reporting, fault reporting and information logging.
 - 1. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.
 - 2. Manufacturers:
 - a. Securitron (SU) - AQL Series.

2.16 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.17 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. DHI TDH-007-20: Installation Guide for Doors and Hardware.

3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection (Punch Report): Reference Division 01 Sections "Closeout Procedures". Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.
 1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

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

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

B. Manufacturer’s Abbreviations:

1. MK - McKinney
2. PE - Pemko
3. RO - Rockwood
4. SA - SARGENT
5. RF - Rixson
6. OT - Other
7. SU - Securitron

Hardware Sets

Set: 1.0

Doors: 101

Description: EXTERIOR ENTRANCE

3 Hinge, Full Mortise, Hvy Wt	T4A3386	US32D	MK
1 Deadbolt	487	US26D	SA
1 Passage Latch	10XU15 LL	US26D	SA
1 Cylinder	match existitng key	US32D	SA
1 Surface Closer	1431 CPS	EN	SA
1 Kick Plate	K1050 8" x LAR	US32D	RO
1 Threshold	2005AT		PE
1 Gasketing	303AS		PE
1 Rain Guard	346C		PE
1 Sweep	315CN		PE

Notes: All exterior doors on this project shall meet FBC standards for windstorm. The door hardware specified is listed as a basis of design. If alternate hardware is proposed, please provide third-party test results and compliance information to architect.

Set: 2.0

Doors: 101.1

Description: EXTERIOR ENTRANCE PAIR

6 Hinge, Full Mortise, Hvy Wt	T4A3386	US32D	MK
2 Surface Bolt	988	Bright Zinc	SA
1 Deadbolt	487	US26D	SA
1 Passage Latch	10XU15 LL	US26D	SA
1 Cylinder	match existng key	US32D	SA
2 Surface Closer	1431 CPS	EN	SA
2 Kick Plate	K1050 8" x LAR	US32D	RO
1 Threshold	2005AT		PE
1 Gasketing	303AS		PE
1 Rain Guard	346C		PE
2 Sweep	315CN		PE
2 Astragal	303AS		PE

Notes: All exterior doors on this project shall meet FBC standards for windstorm. The door hardware specified is listed as a basis of design. If alternate hardware is proposed, please provide third-party test results and compliance information to architect.

Set: 3.0

Doors: 103,

Description: SGL – Mechanical

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK 087100
1 Passage Latch	10XU15 LL	US26D	SA 087100
1 Door Stop	409 or 446 as required	US32D	RO 087100
1 Gasketing	S88BL (Head & Jambs)	PE	087100

Set: 4.0

Doors: 104 & 105

Description: MULTI-STALL RESTROOM

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Passage Latch	10XU15 LL	US26D	SA
1 Surface Closer	1431 O / P9	EN	SA
1 Kick Plate	K1050 8" x LAR	US32D	RO
1 Door Stop	409 / 441CU / OH Stop	US26D	RO
1 Gasketing	S88D		PE
3 Silencer	608-RKW		RO

Set: 5.0

Doors: 113 & 114

Description: OFFICE

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Entry/Office Lock	10XG05 LL	US26D	SA
1 KIL Cylinder	match existing key	US15	SA
1 Door Stop	409 / 441CU / OH Stop	US26D	RO
3 Silencer	608-RKW		RO

SECTION 8E

ALUMINUM LOUVERS AND BRICK VENTS

8E-01. ALUMINUM LOUVERS AND BRICK VENTS:

- A. Manually operated louvers: Shall be in sizes and shapes as shown on the drawings equal to Construction Specialties, Inc., Aluminum Model 4830 M for manual operation. Louver blades to be storm proof type center pivoted with two reinforcing bosses. Furnish with aluminum insect screen on exterior side and an aluminum expanded metal screen on the interior side. Expanded metal shall be equal to ½", 081 standard expanded aluminum and set in a screened or heavy duty extruded aluminum frame.

Finish to be C/S Kynar 500 coating in color as selected by Architect.

- B. Louvers (Fixed): Furnish and install at locations shown and in sizes and shapes shown, aluminum fixed louvers equal to Construction Specialties Model 4110 storm proof for louver widths or diameters up to 24" and Model 4130 storm proof for louver widths or diameters over 24".

All louvers to be furnished complete with C/S insect screen and an aluminum expanded metal screen on the interior side set in a screwed on heavy duty extruded frame. The expanded metal shall be equal to .081 standard expanded aluminum.

Frames and blades to be 6063-T52 alloy minimum .081" for 4110 louvers and .125" for 4130 louvers, with reinforcing bosses. Heads, jambs, and sills to be one piece structural members and to have integral caulking slot and retaining bead. All fastenings to be stainless steel.

Structural supports to be designed by C/S to carry a wind load of not less than 20 pounds p.s.f.

Finish to be C/S Kynar 500 coating in color as selected by Architect.

- C. Brick Vents: Shall be in sizes as shown on the mechanical drawings and equal to Construction Specialties, Inc., Aluminum Brick Vent.

Model 22EX for 16 x 4-7/8 vents

Model 23EX for 16 x 7-3/4 vents

Vents shall include 7 x 7 mesh aluminum screen, continuous drip top and bottom, weep holes and minimum wall thickness of .125".

Coordinate with mechanical contractor for exact location and installation for proper connection to FIA duct.

Finish shall be Kynar 500 finish in color selected by Architect.

- D. Motorized Louvers: N.A.

END OF SECTION

SECTION 9A

CERAMIC TILE

9A-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

9A-02. SCOPE:

Furnish all labor, materials, equipment and services necessary and/or required to install all ceramic floor tile and base where scheduled on the drawings and as indicated. All tile patterns and colors shall be as approved and selected by the Architect. Tile work shall be performed in accordance with the Standards of the Tile Council of American

9A-03. SAMPLES AND CERTIFICATES OF GRADE:

The Contractor shall submit to the Architect for approval three (3) samples of each type of tile he proposes to use. Package shall be branded with a shipping mark stating grade and shall be subject to the inspection of the Architect.

9A-04. CERAMIC FLOOR TILE:

A. Materials:

1. In Areas where noted and where shown on the Room Finish Schedule:
 - a. Floor Tile: Shall be American Olean Unpolished terra pavers. In Community Room size of new tile shall match size of existing tile. In kitchen and toilet rooms tile size shall be 8" x 8" (7 7/8" x 7 7/8" x 5/16"). Floor tile shall be Price Range One. Floor tile shall be non-slip
 - b. Base: Shall be 6" high coved base
 - c. Grout: Grout to be equal to Bonsal Epoxy Grout for tile and a sanded grout for wall tile.
 - d. Tile and grout colors will be as selected by Architect.

NOTE: In some areas two colors of tile may be used, Architect will provide the pattern to the successful bidder.

B. Installation:

1. Floor Tile: Shall be laid with a thin set grout over both new floors and existing concrete floor slab with a 1/4" grout joint and installed in accordance with ATC F112-93.

Floor tile laid in rooms with floor drains to be installed so positive slope to floor

drains are provided.

3. It will be the responsibility of the ceramic tile subcontractor to ensure that the new concrete floors are satisfactory to properly receive new floor tile. If new concrete floors are not appropriate for new tile installation the Project Manager shall be notified immediately and Project Architect.

9A-05 CERAMIC WALL TILE: N.A.

9A-06. QUARRY TILE: N.A.

9A-07. MARBLE THRESHOLDS:

The tile contractor shall furnish and install a marble threshold at every door opening or location where ceramic tile or quarry tile abut a different type of flooring and/or at any location noted on the drawings.

The marble threshold shall be 1 3/8" thick and width as required. The threshold shall be beveled and installed so the bottom of the bevel projects no more than 1/4" above the surface of either adjoining flooring material.

9A-08. TOILET ACCESSORIES:

See Miscellaneous Specialties Section.

9A-09 SUBMITTAL:

The contractor is to submit samples of each material specified in this section along with the manufacturer's catalog and specifications for each of the materials.

9A-09. CLEANING:

On completion of tile work the floor and wall tile shall be thoroughly cleaned and polished. Before any traffic is permitted on the floor the walls and floor shall be sealed in an approved two-coat application, and when sealer is dry, the entire floor area covered with 20# building paper which shall be maintained in good condition until removal just prior to the Final Inspection. Sealer shall be equal to "Clear Bond" by Guardian Chemical Company.

9A-10. GUARANTEE:

This Contractor shall furnish guarantee of all ceramic and quarry tile materials and workmanship for a period of one (1) year from date of final acceptance of building.

END OF SECTION.

SECTION 9B

RESILIENT TILE, CARPET TILE, AND RUBBER BASE

9B-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F, of these specifications shall apply to and form a part of this Section as if written in full herein.

9B-02. SCOPE:

Provide all labor, materials and equipment necessary to install new floor covering and base where shown and scheduled on the drawings and as specified.

9B-03. RESILIENT TILE FLOORING

1) GENERAL

(1) RELATED DOCUMENTS

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

(2) SUMMARY

- (a) Section Includes:

- (i) Solid vinyl floor tile.

(3) ACTION SUBMITTALS

- (a) Product Data: For each type of product.

- (b) Sustainable Design Submittals:

- (i) Product Data: For adhesives, indicating VOC content.
 - (ii) Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.
 - (iii) Laboratory Test Reports: For flooring products, indicating compliance with requirements for low-emitting materials.

- (c) Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.

- (i) Show details of special patterns.

- (d) Samples: Full-size units of each color and pattern of floor tile required.
- (e) Product Schedule: For floor tile. [Use same designations indicated on Drawings.]

(4) INFORMATIONAL SUBMITTALS

- (a) Qualification Data: For Installer.

(5) CLOSEOUT SUBMITTALS

- (a) Maintenance Data: For each type of floor tile to include in maintenance manuals.

(6) MAINTENANCE MATERIAL SUBMITTALS

- (a) Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - (i) Floor Tile: Furnish one box for every 100 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

(7) QUALITY ASSURANCE

- (a) Installer Qualifications: A qualified installer with a minimum of 5 years commercial resilient flooring installation experience, and who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
 - (i) Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.
- (b) Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - (i) Build mockups for floor tile including resilient base and accessories.
 1. Size: Minimum 100 sq. ft. (9.3 sq. m) for each type, color, and pattern and locations as shown on drawings.
 - (ii) Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - (iii) Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

(8) DELIVERY, STORAGE, AND HANDLING

- (a) Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store floor tiles on flat surfaces.

(9) FIELD CONDITIONS

- (a) HVAC system should be operational and running for a minimum of 7 days prior to resilient tile installation and remain running after resilient tile installation.
- (b) Maintain ambient temperatures within range recommended by manufacturer, but not less than 65 deg F (18 deg C) or more than 85 deg F (29 deg C), in spaces to receive floor tile during the following time periods:
 - (i) 48 hours before installation.
 - (ii) During installation.
 - (iii) Permanently after installation.
- (c) Close spaces to traffic during floor tile installation.
- (d) Close spaces to traffic, all heavy rolling loads, and point loads for 48 to 72 hours after floor tile installation.
- (e) Install floor tile after other finishing operations, including painting, have been completed.

(10) WARRANTY

- (a) Special Warranty for Resilient Tile; Manufacturer agrees to repair or replace defective material within specified warranty period.
 - (i) Warranty does not include installer's workmanship.
 - (ii) Resilient tile must be installed and maintained according to manufacturer's recommendations.
 - (iii) Warranty Period:
 1. Manufacturing Defects Warranty: 10 years.
 2. Limited Commercial Wear Warranty: 10 years.
 3. Under bed Warranty: 10 years. (Requires Shaw 4100 or S150 adhesive.)

2) PRODUCTS

(1) PERFORMANCE REQUIREMENTS

- (a) Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - (i) Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
- (b) Flooring products shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

(2) SOLID VINYL FLOOR TILE

- (a) Basis-of-Design Product: Subject to compliance with requirements, provide Patcraft Typeface I312V.
- (b) Tile Standard: ASTM F 1700.
 - (i) Class: Class III, printed film vinyl tile.
 - (ii) Type: A Smooth.
- (c) Overall Thickness: 0.098 inch (2.5 mm).
- (d) Wear Layer: 20 mil (0.5 mm) ExoGuard™ Quatrz Enhanced Urethane.
- (e) Wear Layer Thickness: 0.020 inch (0.5 mm).
- (f) Size: 23-5/8 by 23-5/8 inches (600mm by 600 mm).
- (g) Colors and Patterns: As selected by Architect from full range of manufacturer's designations.
- (h) Test Data:
 - (i) Slip Resistance: ASTM D 2047, ADA Compliant.
 - (ii) Static Load, ASTM F 970: 2000 psi (lbs.sq.in) – 0.005 in.
 - (iii) Residual Indentation, ASTM 1914: Passes <8%
 - (iv) Flexibility, ASTM F 137: Passes.
 - (v) Dimensional Stability: Federal Standard #501A, Method 6211 >0.02"/ft.
 - (vi) Resistance to Heat, ASTM F 1514: Passes.
 - (vii) Resistance to Light, ASTM F 1515: Passes.
 - (viii) Resistance to Chemicals, ASTM 925: Passes.
 - (ix) Resistance to Fungi, ASTM G 21: Passes, Rate zero (Rate zero: Fungi Free).
 - (x) Antibacterial Activity, AATCC 147: Passes, resists the propagation of bacteria.
 - (xi) Radiant Flux, ASTM E 648: greater than 0.45 watts/cm, NFPA Class I.

(xii)Smoke Density, ASTM E 662: less than 450, Passes.

(3) INSTALLATION MATERIALS

- (a) Trowel-able Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.
- (b) Adhesives: Water-resistant adhesive such as the Shaw 4100 or Shaw S150 to suit floor tile and substrate conditions indicated.
 - (i) Adhesives shall have a VOC content of 50 g/L or less.
 - (ii) Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- (c) Floor Polish: Floor Finish is optional. If floor finish is desired, provide protective, neutral pH liquid floor-polish products recommended by floor tile manufacturer.

3) EXECUTION

(1) EXAMINATION

- (a) Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - (i) Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
- (b) Proceed with installation only after unsatisfactory conditions have been corrected.

(2) PREPARATION

- (a) Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- (b) Concrete Substrates: Prepare according to ASTM F 710.
 - (i) Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - (ii) Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using

mechanical methods recommended by floor tile manufacturer. Do not use solvents.

(iii) Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 10 pH.

(iv) Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:

1. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates are below 90 percent relative humidity level.

(c) Fill cracks, holes, and depressions in substrates with trowel-able leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

(d) Do not install floor tiles until they are the same temperature as the space where they are to be installed.

- (i) At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

(e) Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

(3) FLOOR TILE INSTALLATION

(a) Comply with manufacturer's written instructions for installing floor tile.

(b) Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

- (i) Lay tiles square with room axis.

(c) Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.

- (i) Lay tiles in pattern of colors and sizes indicated.

(d) Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

(e) Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

- (f) Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- (g) Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- (h) Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

(4) CLEANING AND PROTECTION

- (a) Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- (b) Perform the following operations immediately after completing floor tile installation:
 - (i) Remove adhesive and other blemishes from exposed surfaces.
 - (ii) Sweep and vacuum surfaces thoroughly.
 - (iii) Damp-mop surfaces to remove marks and soil.
- (c) Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- (d) Optional Floor Polish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.
- (e) Cover floor tile until Substantial Completion.

9B-04. CARPET TILE

(1) RELATED DOCUMENTS

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

(2) SUMMARY

- (a) Section includes modular, [**tufted**] [**needle-punched**] carpet tile.
- (b) Related Requirements:

- (i) Section 024119 "Selective Demolition" for removing existing floor coverings.
- (ii) Section 096513 "Resilient Base and Accessories" for resilient wall base and accessories installed with carpet tile.
- (iii) Section 096816 "Sheet Carpeting" for carpet roll goods.

(3) PREINSTALLATION MEETINGS

- (a) Preinstallation Conference: Conduct conference at project site.
 - (i) Review methods and procedures related to carpet tile installation including, but not limited to, the following:
 1. Review delivery, storage, and handling procedures.
 2. Review ambient conditions and ventilation procedures.
 3. Review subfloor preparation procedures.
 4. Follow manufacturer's modular carpet installation guidelines and/or Carpet & Rug Institute Installation Standard 104 where applicable.

(4) ACTION SUBMITTALS

- (a) Product Data: For each type of product.
 - (i) Include manufacturer's written specifications and lab documents for any physical testing.
 - (ii) Include manufacturer's written installation recommendations for each type of substrate as specified in carpet manufacturer's installation guidelines and/or Carpet & Rug Institute Installation Standard 104, where applicable.
 - (iii) Include carpet maintenance recommendations as outlined by the carpet manufacturer.
 - (iv) Carpet Manufacturer shall also submit a plan for recycling the specified carpet at the end of the useful life of the carpet.
- (b) Sustainable Design Submittals:
 - (i) Product Data: For adhesives, indicating VOC content.
 - (ii) Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.
 - (iii) Laboratory Test Reports: For flooring products, indicating compliance with requirements for testing and product requirements of CRI's "Green Label Plus" testing program.
 - (iv) Laboratory Test Reports: For flooring products, indicating compliance with requirements for low-emitting materials.
- (c) Shop Drawings: For carpet tile installation, plans showing the following:
 - (i) Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
 - (ii) Carpet tile type, color, and dye lot.
 - (iii) Type of subfloor.
 - (iv) Type of installation.
 - (v) Pattern of installation.

- (vi) Pattern type, location, and direction.
 - (vii) Installation method (monolithic, quarter turn, ashlar, brick random, interactive patterning).
 - (viii) Type, color, and location of insets and borders.
 - (ix) Type, color, and location of edge, transition, and other accessory strips.
 - (x) Transition details to other flooring materials.
- (d) Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
- (i) Carpet Tile: Full-size Sample.
 - (ii) Exposed Edge, Transition, and Other Accessory Stripping: 12-inch- (300-mm-) long Samples.
- (e) Samples for Initial Selection: For each type of carpet tile.
- (i) Include Samples of exposed edge, transition, and other accessory stripping involving color or finish selection.
- (f) Samples for Verification: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
- (i) Carpet Tile: Full-size Sample.
 - (ii) Exposed Edge, Transition, and Other Accessory Stripping: 12-inch- (300-mm-) long Samples.
- (g) Product Schedule: For carpet tile. Use same designations indicated on Drawings.
- (h) Sustainable Product Certification: Provide ANSI/NSF 140 certification for carpet products.

(5) INFORMATIONAL SUBMITTALS

- (a) Qualification Data: For Installer.
- (b) Product Test Reports: For carpet tile, for tests performed by a qualified independent testing agency.

(6) CLOSEOUT SUBMITTALS

- (a) Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:
 - (i) Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
 - (ii) Precautions for cleaning materials and methods that could be detrimental to carpet tile.

(7) MAINTENANCE MATERIAL SUBMITTALS

- (a) Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
- (i) Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than **10.67 sq. yd. (8.9 sq. m)**.

(8) QUALITY ASSURANCE

- (a) Manufacturer Qualifications: Carpet manufacturer shall have no less than 5-years experience of producing recyclable carpet tile and shall have published product literature clearly indicating compliance with requirements of this section.
 - (i) Certification: ISO 9001 and ISO 14001 certified manufacturer.
 - (ii) Commitment to Sustainability: Carpet manufacturer must practice environmental responsibility through programs of recycling, reuse, conservation, and source reduction. Manufacturer should have a public demonstration of such efforts through reporting documents such as an annual sustainability report that contains third party verification and confirmation.
 - (iii) Carpet manufacturer must take back modular carpet tile to be recycled free of charge for quantities of **500 sq. yards (418 sq. m)** or more within continental U.S. Program variations exists for other some geographical locations.
- (b) Installer Qualifications: An installer with a minimum of 5 years commercial carpet installation experience, and who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.
- (c) Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
 - (i) Build mockups at locations and in sizes shown on Drawings.
 - (ii) Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

(9) DELIVERY, STORAGE, AND HANDLING

- (a) Comply with carpet manufacturer's installation recommendations and the Carpet & Rug Institute Installation Standard 104 where applicable.

(10) FIELD CONDITIONS

- (a) Comply with carpet manufacturer's installation recommendations and the Carpet & Rug Institute Installation Standard 104 for temperature, humidity, and ventilation limitations.

- (b) Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels planned for building occupants during the remainder of the construction period.
- (c) HVAC system should be operational and running prior to carpet installation and remain running after carpet installation.
- (d) Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to allow bond between adhesive and concrete. Concrete slabs should have moisture and pH readings that are within the specified tolerance of the adhesive to be used.
- (e) Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

(11) WARRANTY

- (a) Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
 - (i) Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
 - (ii) Failures include, but are not limited to, the following:
 1. More than 10 percent face fiber loss, and edge raveling.
 2. Dimensional instability.
 3. Excess static discharge.
 4. Loss of tuft-bind strength.
 5. Delamination.
 6. Where face fiber is 100 percent solution dyed, in ability to remove acid based stains.
 7. Lack of colorfastness to atmospheric contaminants.
 - (iii) Warranty Period: Lifetime Commercial Limited Warranty.

2) PRODUCTS

(1) CARPET TILE

- (a) Basis-of-Design Product: Subject to compliance with requirements; **Patcraft, I0239 Speak In Color** or comparable product by one of the following:
 - (i) [Interface, LLC](#).
 - (ii) J&J Invision; J&J Industries, Inc.
 - (iii) [Mannington Mills, Inc.](#)
 - (iv) [Tandus; a Tarkett company](#).

- (b) Source Limitations:
 - (i) Single Source Responsibility: Provide products that have components manufactured by a single source. Fiber and backing, as well as final carpet product, should be manufactured and warranted by same company.
 - (ii) Commitment to sustainability: Carpet manufacturer must practice environmental responsibility through programs of source reduction, recycling, reuse, and conservation.
- (c) Color: **As selected by Architect from manufacturer's full range**
- (d) Pile Characteristics: **Multi Level Pattern Loop** pile.
- (e) Fiber Content: **Nylon - 100 percent trilobal, minimum 24 denier per filament DPF nylon 6. Fiber must contain a minimum of 25 percent recycled content.**
- (f) Fiber Name: **Eco Solution Q Nylon**
- (g) Dye Method: **100 percent Solution Dye.**
- (h) Gauge: **1/12 ends per inch (mm)>.**
- (i) Stitches: **10 stitches per inch (mm)>.**
- (j) Surface Pile Weight: **18 oz./sq. yd. (g/sq. m)>.**
- (k) Density: **7200 oz./cu. yd. (g/cu. cm)>.**
- (l) Primary Backing: Nonwoven synthetic.
- (m) Secondary Backing: High performance precoat laminated to a proprietary thermoplastic polyolefin compound with a fiberglass reinforced layer. Backing must contain a minimum of 40 percent recycled content and be SCS NSF 140 Gold certified. Backing should be recyclable, PVC free, free of 4-PCH, brominated flame retardants, and phthalate plastizers.
 - (i) Total Backing Weight: Not to exceed **80 oz./sq yd (339.1 g/sq m).**
- (n) Backing System: Non PVC.
- (o) Applied Treatments:
 - (i) Soil-Resistance Treatment: **[Other] [None].**
- (p) Total Weight: **91 oz./sq. yd.** for finished carpet tile.
- (q) Size: **[24 by 24 inches (610 by 610 mm)] [18 by 36 inches (457 by 914 mm)].**
- (r) Texture Appearance Retention Rating (T.A.R.R.):
 - (i) Appearance Retention Rating (T.A.R.R.): **Severe.**

(s) Recycling Requirements:

(i) Total Carpet Product Recycled Content:

1. Pre-Consumer Recycled Content: **36.200000000000003** percent.
2. Post-Consumer Recycled Content: **0** percent.
3. Total Recycled Content: **36.200000000000003** percent.

(ii) Recycled Content: Preference will be given to manufacturer's recycling reclaimed carpet tile backing into new carpet tile, thus backing to backing.

(iii) Carpet Disassembly and Recycling: Carpet capable of disassembly and recycling, with nylon being recycled and backing being recycled into new backing.

(iv) Carpet product must meet guidelines of Presidential Executive Order 13101, and must meet the spirit of section 6002 of the Resource and Recovery Act (RCRA).

(t) Sustainable Design Requirements:

(i) Sustainable Product Certification: Gold level certification according to ANSI/NSF 140.

(ii) Carpet and cushion shall comply with testing and product requirements of Carpet & Rug Institute's "Green Label Plus" testing program.

(u) Performance Characteristics:

(i) Critical Radiant Flux Classification, Flooring Radiant Panel ASTM E 648: Not less than 0.45 W/sq. cm.

(ii) Smoke Density: Less than 450 per ASTM E662.

(iii) Methanamine Pill Test CPSC FF1-70: Must pass pill test.

(iv) Tuft Bind: Not less than **8 lbf (36 N)** according to ASTM D 1335.

(v) Delamination: Not less than **3.5 lbf/in. (0.6 N/mm)** according to ASTM D 3936.

(vi) Dimensional Tolerance: Within **1/32 inch (0.8 mm)** of specified size dimensions, as determined by physical measurement.

(vii) Dimensional Stability: 0.119 percent or less according to ISO 2551 (Aachen Test).

(viii) Colorfastness to Crocking: Not less than 4, wet and dry, according to AATCC 129 and AATCC 164.

(ix) Colorfastness to Light: Not less than 4 after 60 AFU (AATCC fading units) according to AATCC 16, Option E.

(x) Electrostatic Propensity: Less than 3.5 kV according to AATCC 134.

(2) INSTALLATION ACCESSORIES

(a) Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

(b) Trowelable Adhesives: Water-resistant, mildew-resistant, nonstaining, premium grade pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation using a premium pressure sensitive adhesive where slab moisture does not exceed 85

percent per ASTM F 2170 or 5 lbs (2.27 kg) per ASTM F 1869. Where slab moisture does not exceed 85 percent and antimicrobial protection is needed to pass AATCC 174, use a mill specified antimicrobial adhesive. Where moisture exceeds 85 percent or 5 lbs (2.27 kg) but does not exceed 90 percent or 10 lbs (4.56 kg), use a mill specified primer.

- (i) Adhesives shall have a VOC content of [50] <Insert value> g/L or less.
 - (ii) Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - (iii) Adhesives shall comply with the testing and product requirements of the Carpet and Rug Institute Green Label Plus Program.
- (c) Non-Trowelable Adhesive: Water-resistant, mildew-resistant, non-staining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation using a non trowelable adhesive where slab moisture does not exceed 95 percent per ASTM F 2170 or 10 lbs (4.56 kg) per ASTM F 1869. Each carpet tile must be adhered to the subfloor.
- (d) Metal Edge/Transition Strips: Extruded aluminum with mill finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

3) EXECUTION

(1) EXAMINATION

- (a) Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance.
- (b) Examine carpet tile for type, color, pattern, and potential defects prior to installation. See manufacturer's requirements for substrate conditions and ambient conditions.
- (c) Concrete Slabs: Verify that finishes comply with requirements specified in Section 033000 "Cast-in-Place Concrete" and that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.
 - (i) Lightweight concrete and gypcrete subfloors may require a liquid latex primer to reduce surface porosity.
 - (ii) Where previous surface treatments are unknown, or where other concerns exist as to the ability of the adhesive to bond to the substrate, a 24 hour bond test is recommended.
- (d) Wood Subfloors: Verify the following:

- (i) Underlayment over subfloor complies with requirements specified in Section 061600 "Sheathing."
 - (ii) Underlayment surface is free of irregularities and substances that may interfere with adhesive bond or show through surface.
 - (iii) Unfinished wood should be primed using a liquid latex primer.
- (e) Metal Subfloors: Verify the following:
- (i) Underlayment surface is free of irregularities and substances that may interfere with adhesive bond or show through surface.
- (f) Painted Subfloors: Perform bond test recommended in writing by adhesive manufacturer.
- (i) Access Flooring Systems: Verify the following:
 - (ii) Access floor substrate is compatible with carpet tile and adhesive if any.
 - (iii) Underlayment surface is flat, smooth, evenly planed, tightly jointed, and free of irregularities, gaps greater than [1/8 inch (3 mm)], protrusions more than 1/32 inch (0.8 mm), and substances that may interfere with adhesive bond or show through surface.
- (g) Proceed with installation only after unsatisfactory conditions have been corrected.

(2) PREPARATION

- (a) General: Comply with Carpet & Rug Institute Installation Standard 104 and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.
- (b) Use trowelable leveling and patching compounds that contain a cementitious base with a latex additive, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch (3 mm) wide or wider, and protrusions more than 1/32 inch (0.8 mm) unless more stringent requirements are required by manufacturer's written instructions.
- (c) Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.
- (d) Metal Substrates: Clean grease, oil, soil and rust, and prime if recommended in writing by adhesive manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.
- (e) Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

(3) INSTALLATION

- (a) General: Comply with CRI's "Carpet & Rug Institute Installation Standard 104, "Modular Carpet" and with carpet tile manufacturer's written installation instructions.
- (b) Installation Method: Glue down; install every tile with full-spread, releasable, pressure-sensitive adhesive. Any non-spreadable adhesive system must adhere the carpet to the substrate.
- (c) Maintain dye-lot integrity. Do not mix dye lots in same area unless the specific carpet style is manufactured as a merge-able dye lot product.
- (d) Maintain pile-direction patterns as recommended in writing by carpet tile manufacturer.
- (e) Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- (f) Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- (g) Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device.
- (h) Install pattern parallel to walls and borders.
- (i) Roll the entire installation with a 75 lb roller once installation is completed.
- (j) Access Flooring: Stagger joints of carpet tiles so carpet tile grid is offset from access flooring panel grid. Do not fill seams of access flooring panels with carpet adhesive; keep seams free of adhesive.

(4) CLEANING AND PROTECTION

- (a) Perform the following operations immediately after installing carpet tile:
 - (i) Remove excess adhesive and other surface blemishes using cleaner recommended by carpet tile manufacturer.
 - (ii) Remove yarns that protrude from carpet tile surface.
 - (iii) Vacuum carpet tile using commercial machine with face-beater element.
- (b) Protect installed carpet tile to comply with Carpet & Rug Institute Installation Standard 104, "Protecting Indoor Installations."
- (c) When construction or move-in activities will continue where new carpet is installed, provide non-staining building material paper to protect carpet. Do not use plastic sheeting as it can trap moisture, and self-sticking plastic sheeting can transfer adhesive residue to carpet that will attract soil.

- (d) When heavy objects are moved over carpet within 24 hours of installation, use plywood over carpet to prevent buckling and wrinkling.
- (e) Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

9B-05. RUBBER BASE:

Where noted, base shall be 4" high **rubber** base equal to Roppe or Johnsonite. **Internal and external corners shall be premolded.** Apply with full bed of mastic so base adheres uniformly to wall surface. Color to be selected by Architect.

9B-06. GUARANTEES:

This Contractor shall furnish a 2-Year Guarantee for workmanship and installation and defective materials for the installation of all the floor covering specified in this section, and in addition, shall furnish a 10-Year Warranty from the carpet manufacturer for delamination, edge ravel and excessive wear. Guarantees to be dated date of acceptance of building.

9B-07. RESILIENT ATHLETIC FLOORING: N.A.

END OF SECTION.

SECTION 9D

ACOUSTICAL TREATMENT

9D-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

9D-02. SCOPE:

The work to be done under this heading includes the furnishing of all labor, equipment, services, and materials necessary for, or reasonably incidental to, making a complete installation of the suspended acoustical tile ceilings in strict accordance with these specifications and/or as indicated on the drawings. No deviation from these specifications shall be allowed unless approved by the Architect in writing prior to bid date. All acoustical materials and suspension systems shall be installed by a subcontractor thoroughly experienced in this type of work and approved by the manufacturer. **It shall be the responsibility of the acoustical contractor to provide adequate support for the light fixtures and it shall be this contractor's responsibility to coordinate his work with the electrical and mechanical contractors. This contractor is to arrange for adequate anchorage to the frame system.**

9D-03. NON-BEVELED EDGE SUSPENDED GRID LAY IN TILE CEILING SYSTEM:

A. Grid System: Shall be Prelude XL 15/16" suspended exposed tee grid as manufactured by Armstrong World Industries, Inc.

1. Components: All main beams and cross tees shall be commercial - quality hot dipped galvanized steel. Exposed surfaces chemically cleansed, capping prefinished in baked polyester pain. Main beams and cross tees are double-web steel construction with 15/16" type exposed flange design column strength and staked-on end detail allowing easy cross tee removal and remounting. Main beams shall be 1 ½" spaced not more than 4'0" o.c. Cross tees shall be 1 ½". Wall molding shall be #7800 with ½ " exposed flange. Hanger wire shall be 12-gauge galvanized carbon steel.
2. Finish: All steel roll-formed parts, including cap, shall be chemically cleansed. Capping shall be prefinished in a baked polyester paint finish. Color shall be WHITE and match the actual color of the selected ceiling tile, unless other specified. Off white not acceptable.

B. Ceiling Lay-in Tile Units:

- 1 Lay-in tile units shall be Armstrong Mineral Fiber Ceiling Tile Units, Georgian #764 Pattern with and exposed grid system, Humiguard Plus, 24" x 24" x 5/8". Tile units shall be Class "A". Have a light reflectance of LR-1 (over 75%), and N.R.C. range of .50-.60, and an STC range of 35-29.

9D-04. BEVELED EDGE SUSPENDED GRID LAY IN TILE CEILING SYSTEM: N.A.

9D-05. KITCHEN ZONE, SUSPENDED GRID LAY IN TILE CEILING SYSTEM:

A. Grid System: Shall be Prelude XL 15/16" suspended exposed tee grid as manufactured by Armstrong World Industries, Inc.

1. Components: All main beams and cross tees shall be commercial - quality hot dipped galvanized steel. Exposed surfaces chemically cleansed, capping prefinished in baked polyester pain. Main beams and cross tees are double-web steel construction with 15/16" type exposed flange design column strength and staked-on end detail allowing easy cross tee removal and remounting. Main beams shall be 1 1/2" spaced not more than 4'0" o.c. Cross tees shall be 1 1/2". Wall molding shall be #7800 with 7/8" exposed flange. Hanger wire shall be 12-gauge galvanized carbon steel.
2. Finish: All steel roll-formed parts, including cap, shall be chemically cleansed. Capping shall be prefinished in a baked polyester paint finish. Color shall be WHITE and match the actual color of the selected ceiling tile, unless other specified. Off white not acceptable.

B. Ceiling Lay-in Tile Units:

- 1 Lay-in tile units shall be Armstrong Kitchen Zone, Smooth Texture Square Lay-in Tile #673, 24" x 24" x _" with the following characteristics:

Acoustical Performance	CAC Rating 33
Fire Rating	Class A
Light Reflectance	0.89
Anti-Mold & Mildew	Bio-Block High Level of Performance
Sag Resistance	Humi Guard High level of Performance
VOC Emissions	Certified Low Level
Durability	Water Repel. Scratch Resistant, Soil Buildup Resistant, & Washable
Warranty	30 years

9D-06. ACOUSTICAL CEILING TILE TRIM: N.A.

9D-07. INSTALLATION AND COORDINATION:

Main "T" runners shall be of not more than 48" centers and supported by 12-gauge wire to joist or structural system members (no hanging from ducts, piping, etc.); use unistrut members where required. Each corner of light fixture shall also be supported by hanger wires. "T" spline intersecting moldings shall be locked in place. All runners and splines shall be straight or in alignment and flush at intersections. **Edge molding shall be mitered at all corners, internal and external.**

Exterior doors shall be hung, and all doors and windows glazed and all wet work completely dry before starting this work. Areas shall be broom clean before proceeding with this work.

The contractor shall extend complete coordination to and with the mechanical and electrical contractors in coordination of the work. Tile shall be centered one room and lighting fixtures, and ceiling grilles shall be centered in tiles. A reflected ceiling plan is included in the architectural drawings, and it is the responsibility of the ceiling sub- contractor to verify their accuracy and to bring to the Architect's attention any areas that will create shifting of grid or

mechanical or electrical items.

9D-08. EXTRA TILE: **N.A.**

9D-09. ACOUSTICAL WALL PANELS: **N.A.**

9D-10. ACOUSTICAL BARREL DIFFUSERS N.A.

9D-11. CLEAN-UP:

The Contractor shall remove all debris, scrap, etc., from the site upon completion of his work. Tile shall be free of fingerprints, smudges, and present a uniform color, clean and level. Any tile found to contain smudges, chips, etc., shall be removed and replaced with new tile.

9D-12. GUARANTEE:

This contractor shall guarantee in writing the materials and workmanship for a period of two (2) years after final acceptance of the building.

9D-13 EGG CRATE CEILING: **N.A.**

END OF SECTION.

SECTION 9E

PAINING

9E-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

9E-02. SCOPE:

Furnish all labor, materials, equipment and services necessary and/or incidental to do all painting and decorating under this Contract.

In general, but not limited to, this contractor will include:

- A. Three (3) coats of paint on all new work exterior and interior, including plaster, stucco, sheetrock, block masonry walls, trim, and metal.
- B. Finishing of all cabinet work and paneling except that which is covered by plastic laminate, or that which is finished at the mill.
- C. Epoxy coating of all walls and ceilings where called for on the schedule.
- D. Painting of concrete floors where called for on the drawings.

9E-03. GENERAL REQUIREMENTS:

Mix all paints at least seventy-two (72) hours before using, keeping the containers covered during this period. Mix well before using. All paint to come to the job in their original containers, and to be Sherwin- Williams, ICI Coatings, Pittsburgh, or Pratt and Lambert.

Painter to mix samples of stains and colors and have Architect's approval before applying. All surfaces to receive paint, varnish, etc., shall be clean, smooth, free from dust, scratches, and to be thoroughly dry before applying paint.

The edges including the top and bottom edges of all doors which paint at the job site shall be finished as called for, and shall be touched up after the carpenter has made the final adjustments.

No paint shall be applied to wet or damp surfaces, nor shall any paint be applied to any surface when the temperature is below 50 degrees F.

All painting and decorating to be done by experienced workmen, and the finished work shall be free from runs, sags, scratches, and brush marks, and shall be uniform in color.

Application of a paint by spray not allowed other than glaze or multicolor coats as called for. All wood and trim to be painted by brush only.

9E-04. APPLICATION:

- A. No coat shall be applied until the preceding one is thoroughly dry, and no paint shall be applied when temperature is 50 degrees F., or below, or when surfaces are damp. All paint shall be evenly spread and well brushed or sprayed as noted, or so as to accomplish best results. All paints, stains, etc., shall be mixed and applied according to manufacturer's directions, and each coat shall be sanded as required before the succeeding coat is applied.
- B. All raw spots of wood frames, interior millwork, to be primed at mill shall be touched up with similar material immediately after being placed. All knots, sap, and pitch streaks shall be brush coated with shellac before priming coat is applied. Prime all wood which is to be covered with metal unless same has been treated with wood preserver.
- C. Concrete masonry walls where called for to be painted shall be first examined for excess mortar, pointing up of joints, etc.
- D. All rust spots, scratches, blemishes, etc., on metal door frames and exposed metal work through the building, shall be worked to the base metal with steel wool, the spots primed, and when dry.
- E. Natural finish wood doors surfaces to be sanded with #320 wet or dry paper and rubbed with 4/0 steel wool between each coat.
- F. Epoxy Coating Finish: Where called for on the finish schedule, epoxy coating shall be as per Paragraph 16-11, this section.

9E-05. PUTTYING:

After the priming coat has been applied, all nail holes and voids of any kind are to be puttied flush with the surfaces. Excess putty shall be removed from the surfaces before succeeding coats of paint are applied.

9E-06. EXTERIOR PAINTING:

- A. All exposed metal, trim, frames, doors, miscellaneous steel and iron, galvanized iron:
 - 1. One Coat Primer: ICI Devoe Coatings DevGuard 4160 Multi-Purpose Tank and Structural Primer or one coat of Sherwin Williams Kerm Kromik Metal Primer and one coat of Sherwin Williams Galvite for Galvanized Irons.
 - 2. Two Coats Finish: ICI Devoe Coatings DevGuard 4308 Alkyd Gloss Enamel. Or two coats of Sherwin Williams Industrial Enamel B-54.
- B. All exposed wood and wood trim:
 - 1. One Coat Primer: ICI Ultra-Hide Durus 2110 Exterior Alkyd Primecoat or one coat of Sherwin Williams A-100 Primer.
 - 2. Two Coats Finish: ICI Dulux Professional 2402 Exterior 100% Acrylic Satin Finish or Sherwin Williams K33W100 Satin Latex House.

- C. Exposed concrete block, concrete, and cement stucco:
1. One Coat Primer: (for concrete block only) ICI Ultra-Hide 3010-1200, Interior Exterior Vinyl Acrylic Block Filler or Sherwin Williams Heavy Duty Acrylic Block Filler B42W46.
 2. Two Coats Finish: ICI Dulux Professional 2402 Exterior 100% Acrylic Satin Finish or Sherwin Williams A24W351 Satin Latex House Paint.

9E-07. INTERIOR PAINTING:

A. Exposed Iron and Steel Metals:

1. One Coat Primer: ICI Ultra-Hide 1120-1200 Oil / Alkyd Interior Enamel Undercoater or Sherwin Williams Kem Kromik Metal Primer.
2. Two Coats Finish: ICI Ultra-Hide 1416 Latex Semi-Gloss Interior Wall and Trim Enamel or two coats Sherwin Williams Promar 200 Latex Semi-Gloss Enamel.

B. Wood Trim (other than natural finish):

1. One Coat Primer: ICI Ultra-Hide 1120-1200 Oil / Alkyd Interior Enamel Undercoater or Sherwin Williams Classic Wall and Wood Primer B28-W101.
2. Two Coats Finish: ICI Ultra-Hide 1416 Latex Semi-Gloss Interior Wall and Trim Enamel or Sherwin Williams Promar B-31 200 Semi-Gloss.

C. Sheetrock Walls:

1. One Coat Primer: ICI Ultra-Hide 1030-1200 PVA Interior Primer Sealer or Sherwin Williams Promar 200 Series B-28.
2. Two Coats Finish: ICI Ultra-Hide 1412 Latex Eggshell Interior Wall and Trim or Sherwin Williams Promar 200 Latex Semi-Gloss Enamel B-31.

D. Exposed Masonry Block:

1. One Coat Primer: ICI Ultra-Hide 3010-1200 Interior / Exterior Vinyl Acrylic Blockfiller or Sherwin Williams Heavy Duty Acrylic Block Filler B42W46.
2. Two Coats Finish: ICI Ultra-Hide 1412 Latex Eggshell Interior Wall and Trim Enamel or Sherwin Williams Promar 200 Latex Semi-Gloss Enamel B-31.

- E. Epoxy Coating Finish: Where called for on the finish schedule, epoxy coating shall be as per Paragraph 16-11, this section.

9E-08. NATURAL FINISH:

- A. Where selected or called for on wood trim or doors or millwork items:

1. One coat of Lacquer Sealer and two coats of Gloss Lacquer or two coats of ICI Woodpride 1902 Interior Polyurethane High Gloss Varnish.

9E-09. STAINED FINISH:

- A. Where selected or called for on wood trim or wood doors or millwork items:
1. One Coat: ICI Woodpride 1900 Interior Oil Wood Finishing Stain or one coat of Olympic Clear Interior Stain.
 2. One Coat: Lacquer Sealer or Sanding Sealer Well Sanded.
 3. Two Coats: ICI Woodpride 1902 Interior Polyurethane High Gloss Varnish or two coats of Gloss Lacquer.

9E-10. SEALED CONCRETE FLOORS:

- A. Where called for on the drawings and finish schedule concrete floors shall be painted with H&C shield plus paint as manufactured by the Sherwin-Williams Company Cleveland, Ohio. (Technical Service Phone - 1-800/867-8246) or two coats of Anvil Concrete 1900 Siliconized Acrylic Concrete Stain.
- B. Concrete floor areas to receive paint shall be at least 45 days old, shall be clean and completely free of all grease, oil, loose or chalking paint, chalking concrete, dirt, etc.
- Floor areas to be first cleaned with detergent and degreaser and thoroughly rinsed.
- C. Apply first coat of paint, let dry two (2) hours and apply 2nd coat. Paint maybe applied by brush, roller, or airless sprayer.

Do not apply in temperature below 50 degrees F or above 90 degrees F.

- D. Color to be selected by Architect.

9E-11. EPOXY COATING FINISH: N.A.

9E-12. SANDING AND FINISHING:

It will be the responsibility of the painting contractor to hand sand all surfaces to be painted and otherwise prepare them to provide a smooth finish paint job. All corners to be "eased", nail holes filled and painted surfaces prepared and approved after prime coat is applied. The second coat of paint must be completed and approved before final coat is started in any area. Repainting of any area required because of poor coverage, sags, voids, poorly prepared surfaces, etc., will require the repainting of the entire wall area. No patch painting will be accepted.

9E-13. APPLICATION OF COATS:

Work shall be limited to specific areas of construction to facilitate inspection and progress, and no succeeding coat will be applied in any area until the prime coat or first coat has been inspected and approved for the entire area.

Prime coat will be white. Second coat tinted toward color, and final coat from can in color selected.

9E-14. SUBMITTAL:

Painting contractor to submit technical information for the various types of paint used along with color sample box for color selection.

9E-15. GUARANTEE:

Painting contractor shall guarantee in writing his material and application for a period of one year from date of acceptance of building.

END OF SECTION.

SECTION 10A

MISCELLANEOUS SPECIALTIES

10A-01. GENERAL CONDITIONS:

The General Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

10A-02. SCOPE:

Work under this heading includes necessary labor and materials required to install items listed in this Section or shown on the contract drawings.

10A-03. ACCESS PANELS AND DOORS:

Access panels for access to mechanical or electrical items shall be furnished to the general contractor by the respective subcontractor and installation shall be by the General Contractor.

All other areas which require access, access panels shall be furnished and installed by the General Contractor. Doors shall be suitable for wall or ceiling finish involved. Opening size shall be as required or as indicated and fire rated where rated walls or ceilings are penetrated. Units shall be equal to those manufactured by Milcor, Philip Carey, Zurn, or other approved equal.

10A-04. PAIRED OPERABLE PARTITION: N.A.

10A-05. ALUMINUM LETTERS: N.A.

10A-06. ALUMINUM PLAQUE:

A. The Contractor shall include in his bid, the cost for the furnishing and installation of an aluminum plaque. Plaque shall be manufactured by A.R.K. Ramos Company, Oklahoma City, OK.

B. Size of plaque to be **approximately** 18" x 24" and will include the following:

Project Name
Project Date
Holmes County Council on Aging Director
Board of County Commissioners
Architect – Donofro Architects
Construction Firm Name - TBD

C. Plaque will contain both raised and engraved letters. Where engraved, background will be polished aluminum, where raised and polished, background will be Black Pebble

Finish. Mounting will be by concealed method. Design of plaque to be furnished by the Architect. Shop drawings will be required for approval prior to casting.

10A-07. ALUMINUM ACCESS LADDER: N.A.

10A-07. ALUMINUM THRESHOLDS:

See Finish Hardware Section, these specifications. All thresholds to be set in full bed of mastic.

10A-08. ALUMINUM & STEEL MISCELLANEOUS SHAPES:

Furnish and install all aluminum or steel angles, channels, break metal shapes, in sizes and shapes and at locations as shown on drawings, or as required for support, bracing, anchoring, etc. of incidental items whether shown or not.

10A-09. BATHROOM ACCESSORIES:

Furnish and install the following accessories in locations as stated. Exact locations will be as directed by the Architect.

A. Accessories:

1. Surface Mounted Paper Towel Dispenser: To be Bradley Model 2441-110000 Stainless Steel. Quantity required: five (5). Two each in two (2) toilet rooms and one (1) in kitchen.
2. Mirrors: Bradley Model 780 ¾" x ¾" satin finish stainless steel frame. All welded construction. 18-gauge wall hanger and theft resistant mounting bracket. 18" x 24" or sizes as shown on the interior elevations and drawings. 18"x24" two (2) required, one (1) each at toilet room H/C stall lavatory.
3. Toilet Tissue Holder: Bradley Model 5106 surface mounted toilet tissue holder fabricated from 304 stainless steel. Quantity required five (5). One each full vanity width (2) required, (1) each at toilet room vanities
4. Grab Bars: Bradley 1 ½" O.D., S.S. Series 812, sanitary safe grey finish 059 configuration and 001 configuration grab bar installation for concealed mounting. Quantity required two pairs (2 prs.) One in each toilet room.

10A-10. CHAIN LINK FENCE:

- A. Furnish and install at locations shown on the drawings, vinyl coated chain link fence. Height of fence and size of access gate shall be as shown on drawings.
- B. All materials for permanent fence shall be new. Fabric to be vinyl covered No. 9 gauge heavy zinc coated or hot galvanized by hot dip process after weaving. Fabric to be 2" chain link diamond mesh.

Line posts and end posts shall be 2" o.d., .140 wall, 2.72 LBS./FT. Maximum distance between post shall be 6'-0".

Top rail 1-5/8" o.d., 2.27 LBS./FT.

Tension wire No. 7 gauge.

Gate frames of 1-5/8" o.d., 2.27 LBS./FT.

- C. **Methods of Construction:** All posts and fabric shall be installed in accordance with the manufacturer's recommendations and as shown on the plans. Post spacing shall not exceed six (6') feet. Posts shall be set in concrete to a depth of 24". Minimum hole size shall not be less than 4 times the diameter of the post.

All materials and workmanship shall be first-class in every respect and shall conform to the specifications.

Provide caps on all posts and provide all accessories to make for completion installation.

- D. **Furnish shop drawings showing size, gauges, etc., of materials and description of construction for review and approval.**

- E. See supplementary and special conditions for temporary construction fencing.

10A-11. **FIRE EXTINGUISHERS:**

Furnish and install at locations shown and indicated on the drawings, 10 lb. capacity fire extinguishers equal to "J L Industries Cosmic 10E A B C with U.L. rating 4A-60BC.

Provide complete with metal hanger. The exact location will be as directed by Architect. Mounting height to be so top of extinguisher not more than 5'-0" A.F.F. Prior to final inspection, each extinguisher shall be inspected by the local fire inspector and tagged with inspection sticker showing the unit fully charged, date, and signature of the inspector.

10A-12. **HANDRAILS/ GUARDRAILS:** See drawings.

10A-13. **HAT CHANNELS:**

Furnish and install 1 1/2" and 3/4" galvanized hat channels for framing and installation of metal fascia and medal siding panels as shown and noted on the drawings. Light gauge framing for installation of fascia system shall be as shown on the drawings and specified in Section 11 of these specifications.

10A-14. **CORRIDOR LOCKERS:** N.A.

10A-15. **P.E. ATHLETIC LOCKERS:** N.A.

- 10A-16. ATHLETIC LOCKERS: N.A.
- 10A-17. MARKER BOARDS AND TACK BOARDS: N.A.
- 10A-18. MOP HOLDERS: N.A.
- 10A-19. PRECAST CONCRETE SILLS / WALL CAPS: N.A.

10A-20. SIGNAGE:

A. Furnish and install plastic room signs **as indicated on door schedule** Signs shall be equal to Best Manufacturing Sign Systems, Montrose, Colorado; (303) 249-0223.

B. Signs shall be 6 x 6 x ¼ MP and shall contain room number, room name, and raised braille copy. Numbers and names shall be engraved. All signs are to be ADA-compliant.

Type style shall be Helvetica Medium, and the finish of the background shall be non-glare. Colors of letters and background will be as selected by Architect.

Signs for restrooms shall have separate integral handicapped pictorial insignia.

The Architect will furnish room numbers and names.

C. Install door signs 60" A.F.F., to the centerline of the sign, on the wall adjacent to the latch side of the door. The signs are to be installed with stainless steel screws.

D. See mechanical and electrical drawings and specifications for engraved signs located at exhaust fan switches and emergency cut-offs. Signs to be red background, white letters. Signs to be installed for gas, water, electrical emergency cut off and for exhaust fans.

E. Furnish shop drawings for approval and color samples for color selection.

10A-21. RECESSED SPECIMEN PASS THRU CABINET: N.A.

10A-22. TRANSACTION WINDOW DEAL TRAY: N.A.

10A-23. SPLASH BLOCKS: N.A.

10A-24. TROPHY CASE ACCESSORIES: N.A.

10A-25. BULK SHELVING: N.A.

END OF SECTION

SECTION 11B

APPLIANCES

11B-01. **GENERAL:**

The General and Special Conditions, Division II, Sections E and F of these Specifications shall apply to and form part of this section as if written in full herein.

11B-02. **SCOPE:**

The work described in this Section shall consist of the furnishing and installing of all appliances as specified herein and any incidentals that may be required to satisfactorily complete the work as intended, and shown on the drawings.

All sinks shown to be furnished by supplier shall be furnished with faucets and lever handle waste drain fittings.

Items designated (N.I.C.) Shall have utilities (water, waste, electric, gas) run to the item and capped off for future connections to the equipment items by the Owner. Other items specified as part of this contract will be connected as per the Plumbing, HVAC and Electrical sections of these specifications.

11B-03. **SHOP DRAWINGS:**

The Contractor shall furnish shop drawings and submittal data for all equipment, for approval. Copies of submittals shall be bound and shall include drawing showing layout, sizes, capacities, position, etc. with each item numbered and corresponding to the specification and cut sheets for each individual item.

Minor adjustments may be permitted providing the general arrangement is maintained, and variations in sizes of any manufactured item adjacent to a custom cabinet or counter shall require the necessary size change in the custom item in order to maintain a continuous well-spaced job.

11B-04. **MANUFACTURER'S STANDARDS:**

Where the name of a manufacturer is mentioned in reference to his required service or product, and no qualification or specification of such is included on the drawings or in the specifications, then the materials, gauges, details of manufacturer, finish, etc. shall be in accordance with this manufacturer's standards, or his current (catalog) specifications. Also, unless otherwise noted, the application or installation of such shall be according to his current standard practice or directions, or specifications.

The use of one manufacturer's name and catalog number is intended to set up a standard of manufacturer and performance and is not restrictive unless so indicated. Bids are desired on comparable lines of equipment, except any items bid as comparable to an item specified shall be pre-approved, in writing, prior to the bid date as outlined in the Instructions to Bidders.

All equipment including sinks shall be N.S.F. approved and shall carry the N.S.F. Label.

If items from another manufacture than those specified, are submitted and accepted as equal, it will be the manufacturers responsibility to verify and coordinate utility connections and locations (water, waste, gas and electrical) to comply with those items that are different from these specified.

11B-05. SETTING, INSTALLATION AND ADJUSTMENTS:

This Contractor shall do all setting, installation and adjusting, and shall be responsible for securing all field measurements and correlating same to make the equipment fit together and into the space allowed. Final mechanical and electrical connections and roughing in for the equipment will be by others.

This Contractor shall provide and install all internal piping required for connecting to stub ups near the floor line for water, gas, steam, waste lines, and electrical, but final connections will be done as specified under other sections of these specifications.

11B-06. UTILITIES:

It will be the responsibility of the Contractor to verify and coordinate all electrical characteristics and plumbing supply and waste lines with information shown on the respective drawings. All items called for 240V 3-Phase shall be furnished for balanced loads.

11B-07. GUARANTEE:

Each manufacturer shall guarantee that all pieces of equipment furnished by him are of the correct capacity and design to coordinate one with the other and that they will operate as specified in all respects. The manufacturer shall also guarantee that the equipment shall be without defects and that he will replace any part or parts of the equipment found defective due to inferior workmanship or materials, without change for a period of one year from final acceptance of the building. Any piece of equipment not properly operating will necessitate the manufacturer to send a factory mechanic to make the required repairs upon notice by the Owner through the Architect and this Contractor.

Guarantees for all appliance items shall be bound in a loose leaf binder separate from other guarantees and each item to have included specifications, literature, instructions etc. for each item. Also include a One Year Guarantee by this Contractor against workmanship and defective materials.

11B-08. SCHEDULE OF APPLIANCES:

Item No 1 Master-Bilt Outdoor Walk-in Freezer

Model #QODF771014-C

Size	10'x14'x17'7"
Finish	Fingerprint Resistant Stainless

Item No. 2: CPC Cooking Performance Group - Liquid Propane Open Pot Food Fryer

Model # FFOP40

Description 40 lb Stainless Steel

Dimensions 15 3/4"W X 32"D x 46"H

Item No. 3: Avantco Stainless Steel Solid Door Reach-In Refrigerator

Model # SS-2R-HC

Dimensions 54"W x 32 3/16"D x 82 1/2" H

Item No. 4: Avantco Stainless Steel Solid Door Reach-In Freezer

Model #SS-3F-HC

Dimensions 81 5/16"W x 32 3/16"D x 82 1/2" H

Item No. 5: Regency Stainless Steel Commercial Work Table

Model #304

Dimensions 30" x 84"

Item No. 6: Regency Stainless Steel Wall Mounted Hand Sink

Model

Dimensions 17" x 15" Provide Gooseneck Faucet with Side Spray

Item No. 7: Cooking Performance Group Full Size Electric Convection Oven

Model # FEC-100-D

Dimensions 38 1/8"W x 41 1/2"D x 54 1/8"H

Item No. 8: Regency 3-Compartment Stainless Steel Sink

Model # Regency 88

Dimensions

Item No. 9: Cooking Performance Group Range and Griddle

Model # S60 636-L

Dimensions

60"W x 32 5/8"D x 60"H

Item No. 10: Existing Ice Maker

Model #

Dimensions

Item No. 11: Regency Work Table

Model # 600 ES2436

Dimensions

24" x 36"

Item No. 12: Exhaust Hood – See Mechanical

END OF SECTION

SECTION 20A

MECHANICAL GENERAL

1 GENERAL

1.1 The work covered by this division consists of providing all labor, equipment and materials and performing all operations necessary for the installation of the mechanical work as herein called for and shown on the drawings.

1.2 Related Documents:

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

1.2.2 This is a Basic Mechanical Requirements Section. Provisions of this section apply to work of all Division 20, 21, & 22 sections.

1.2.3 Review all other contract documents to be aware of conditions affecting work herein.

1.2.4 Definitions:

1.2.4.1 Provide: Furnish and install, complete and ready for intended use.

1.2.4.2 Furnish: Supply and deliver to project site, ready for subsequent requirements.

1.2.4.3 Install: Operations at project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar requirements.

1.3 Permits and Fees: Contractor shall obtain all necessary permits, meters, and inspections required for his work and pay all fees and charges incidental thereto.

1.4 Verification of Owner's Data: Prior to commencing any work the Contractor shall satisfy himself as to the accuracy of all data as indicated in these plans and specifications and/or as provided by the Owner. Should the Contractor discover any inaccuracies, errors, or omissions in the data, he shall immediately notify the Architect/Engineer in order that proper adjustments can be anticipated and ordered. Commencement by the Contractor of any work shall be held as an acceptance of the data by him after which time the Contractor has no claim against the Owner resulting from alleged errors, omissions or inaccuracies of the said data.

1.5 Delivery and Storage of Materials: Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. All material shall be stored to provide protection from the weather and accidental damage.

1.6 Extent of work is indicated by the drawings, schedules, and the requirements of the specifications. Singular references shall not be constructed as requiring only one device if multiple devices are shown on the drawings or are required for proper system operation.

1.7 Field Measurements and Coordination:

- 1.7.1 The intent of the drawings and specifications is to obtain a complete and satisfactory installation. Separate divisional drawings and specifications shall not relieve the Contractor or subcontractors from full compliance of work of his trade indicated on any of the drawings or in any section of the specifications.
- 1.7.2 Verify all field dimensions and locations of equipment to insure close, neat fit with other trades' work. Make use of all contract documents and approved shop drawings to verify exact dimension and locations.
- 1.7.3 Coordinate work in this division with all other trades in proper sequence to insure that the total work is completed within contract time schedule and with a minimum cutting and patching.
- 1.7.4 Locate all apparatus symmetrical with architectural elements. Install to exact height and locations when shown on architectural drawings. When locations are shown only on mechanical drawings, be guided by architectural details and conditions existing at job and correlate this work with that of others.
- 1.7.5 Install work as required to fit structure, avoid obstructions, and retain clearance, headroom, openings and passageways. Cut no structural members without written approval.
- 1.7.6 Carefully examine any existing conditions, piping, and premises. Compare drawings with existing conditions. Report any observed discrepancies. It shall be the Contractor's responsibility to properly coordinate the work and to identify problems in a timely manner. Written instructions will be issued to resolve discrepancies.
- 1.7.7 Because of the small scale of the drawings, it is not possible to indicate all offsets and fittings or to locate every accessory. Drawings are essentially diagrammatic. Study carefully the sizes and locations of structural members, wall and partition locations, trusses, and room dimensions and take actual measurements on the job. Locate piping, ductwork, equipment and accessories with sufficient space for installing and servicing. Contractor is responsible for accuracy of his measurements and for coordination with all trades. Contractor shall not order materials or perform work without such verification. No extra compensation will be allowed because field measurements vary from the dimensions on the drawings. If field measurements show that equipment or piping cannot be fitted, the Architect/Engineer shall be consulted. Remove and relocate, without additional compensation, any item that is installed and is later found to encroach on space assigned to another use.

1.8 Guarantee:

- 1.8.1 The Contractor shall guarantee labor, materials and equipment for a period of one (1) year from Final Completion, or from Owner's occupancy, whichever is earlier. Contractor shall make good any defects and shall include all necessary adjustments to and replacement of defective items without expense to the Owner.
- 1.8.2 Owner reserves right to make emergency repairs as required to keep equipment in operation without voiding Contractor's Guarantee Bond nor relieving Contractor of his responsibilities during guarantee period.

1.9 Approval Submittals:

- 1.9.1 When approved, the submittal control log and submittals shall be an addition to the specifications herewith, and shall be of equal force in that no deviation will be permitted except with the approval of the Architect/Engineer.
- 1.9.1.1 Shop drawings, product literature, and other approval submittals will only be reviewed if they are submitted in full accordance with the General and Supplementary Conditions and Division 1 Specification sections and the following.
- 1.9.1.1.1 Submittals shall be properly organized in accordance with the approved submittal control log.
- 1.9.1.1.2 Submittals shall not include items from more than one specification section in the same submittal package unless approved in the submittal control log.
- 1.9.1.1.3 Submittals shall be properly identified by a cover sheet showing the project name, Architect and Engineer names, submittal control number, specification section, a list of products or item names with model numbers in the order they appear in the package, and spaces for approval stamps. A sample cover sheet is included at the end of this section.
- 1.9.1.1.4 Submittals shall have been reviewed and approved by the General Contractor (or Prime Contractor). Evidence of this review and approval shall be an "Approved" stamp with a signature and date on the cover sheet.
- 1.9.1.1.5 Submittals that include a series of fixtures or devices (such as plumbing fixtures or valves) shall be organized by the fixture number or valve type and be marked accordingly. Each fixture must include all items associated with that fixture regardless of whether or not those items are used on other fixtures.
- 1.9.1.1.6 The electrical design shown on the drawings supports the mechanical equipment basis of design specifications at the time of design. If mechanical equipment is submitted with different electrical requirements, it is the responsibility of the mechanical contractor to resolve all required electrical design changes (wire and conduit size, type of disconnect or overload protection, point(s) of connection, etc.) and clearly show the new electrical design on the mechanical submittal with a written statement that this change will be provided at no additional cost. Mechanical submittals made with no written reference to the electrical design will be presumed to work with the electrical design. Any corrections required will be at no additional cost.
- 1.9.2 If the shop drawings show variation from the requirements of contract because of standard shop practice or other reasons, the Contractor shall make specific mention of such variation in writing in his letter of transmittal and on the submittal cover sheet in order that, if acceptable, Contractor will not be relieved of the responsibility for executing the work in accordance with the contract.
- 1.9.3 Review of shop drawings, product literature, catalog data, or schedules shall not relieve the Contractor from responsibility for deviations from contract drawings or specifications, unless he has in writing called to the attention of the Architect/Engineer each such deviation in writing at the time of submission, nor shall it relieve him from

responsibility for errors of any sort in shop drawings, product literature, catalog data, or schedules. Any feature or function specified but not mentioned in the submittal shall be assumed to be included per the specification.

- 1.9.4 Submit shop drawings as called for in other sections after award of the contract and before any material is ordered or fabricated. Shop drawings shall consist of plans, sections, elevations and details to scale (not smaller than 1/4" per foot), with dimensions clearly showing the installation. Direct copies of small scale project drawings issued to the Contractor are not acceptable. Drawings shall take into account equipment furnished under other sections and shall show space allotted for it. Include construction details and materials.
- 1.10 Test Reports and Verification Submittals: Submit test reports, certifications and verification letters as called for in other sections. Contractor shall coordinate the required testing and documentation of system performance such that sufficient time exists to prepare the reports, submit the reports, review the reports and take corrective action within the scheduled contract time.
- 1.11 O&M Data Submittals: Submit Operation and Maintenance data as called for in other sections. When a copy of approval submittals is included in the O&M Manual, only the final "Approved" or "Approved as Noted" copy shall be used. Contractor shall organize these data in the O&M Manuals tabbed by specification number. Prepare O&M Manuals as required by Division 1 and as described herein.. Submit manuals at the Substantial Completion inspection.

2 PRODUCTS

- 2.1 All materials shall be new or Owner-supplied reused as shown on the drawings, the best of their respective kinds, suitable for the conditions and duties imposed on them at the building and shall be of reputable manufacturers. The description, characteristics, and requirements of materials to be used shall be in accordance with qualifying conditions established in the following sections.
- 2.2 Equipment and Materials:
 - 2.2.1 Shall be new and the most suitable grade for the purpose intended. Equipment furnished under this division shall be the product of a manufacturer regularly engaged in the manufacture of such items for a period of three years. Where practical, all of the components shall be products of a single manufacturer in order to provide proper coordination and responsibility. Where required, Contractor shall furnish proof of installation of similar units or equipment.
 - 2.2.2 Each item of equipment shall bear a name plate showing the manufacturer's name, trade name, model number, serial number, ratings and other information necessary to fully identify it. This plate shall be permanently mounted in a prominent location and shall not be concealed, insulated or painted.
 - 2.2.3 The label of the approving agency, such as UL, IBR, ASME, ARI, AMCA, by which a standard has been established for the particular item shall be in full view.

- 2.2.4 The equipment shall be essentially the standard product of a manufacturer regularly engaged in the production of such equipment and shall be a product of the manufacturer's latest design.
- 2.2.5 A service organization with personnel and spare parts shall be available within two hours for each type of equipment furnished.
- 2.2.6 Install in accordance with manufacturer's recommendations. Place in service by a factory trained representative where required.
- 2.2.7 Materials and equipment are specified herein by a single or by multiple manufacturers to indicate quality, material and type of construction desired. Manufacturer's products shown on the drawings have been used as basis for design; it shall be the Contractor's responsibility to ascertain that alternate manufacturer's products, or the particular products of named manufacturers, meet the detailed specifications and that size and arrangement of equipment are suitable for installation.
- 2.2.8 Model Numbers: Catalog numbers and model numbers indicated in the drawings and specifications are used as a guide in the selection of the equipment and are only listed for the contractor's convenience. The contractor shall determine the actual model numbers for ordering materials in accordance with the written description of each item and with the intent of the drawings and specifications.
- 2.3 Requests for Substitution:
- 2.3.1 Where a particular system, product or material is specified by name, consider it as standard basis for bidding, and base proposal on the particular system, product or material specified.
- 2.3.2 Requests by Contractor for substitution will be considered only when reasonable, timely, fully documented, and qualifying under one or more of the following circumstances.
- 2.3.2.1 Required product cannot be supplied in time for compliance with Contract time requirements.
- 2.3.2.2 Required product is not acceptable to governing authority, or determined to be non-compatible, or cannot be properly coordinated, warranted or insured, or has other recognized disability as certified by Contractor.
- 2.3.2.3 Substantial cost advantage is offered Owner after deducting offsetting disadvantages including delays, additional compensation for redesign, investigation, evaluation and other necessary services and similar considerations.
- 2.3.3 All requests for substitution shall contain a "Comparison Schedule" and clearly and specifically indicate any and all differences or omissions between the product specified as the basis of design and the product proposed for substitution. Differences shall include but shall not be limited to data as follows for both the specified and substituted products:
- Principal of operation.
Materials of construction or finishes.

Thickness of gauge of materials.
Weight of item.
Deleted features or items.
Added features or items.
Changes in other work caused by the substitution.
Performance curves.

If the approved substitution contains differences or omissions not specifically called to the attention of the Architect/Engineer, the Owner reserves the right to require equal or similar features to be added to the substituted products (or to have the substituted products replaced) at the Contractor's expense.

3 EXECUTION

3.1 Workmanship: All materials and equipment shall be installed and completed in a first-class workmanlike manner and in accordance with the best modern methods and practice. Any materials installed which do not present an orderly and reasonably neat and/or workmanlike appearance, or do not allow adequate space for maintenance, shall be removed and replaced when so directed by the Architect/Engineer.

3.2 Coordination:

3.2.1 The Contractor shall be responsible for full coordination of the mechanical systems with shop drawings of the building construction so the proper openings and sleeves or supports are provided for piping, ductwork, or other equipment passing through slabs or walls.

3.2.2 Any additional steel supports required for the installation of any mechanical equipment, piping, or ductwork shall be furnished and installed under the section of the specifications requiring the additional supports.

3.2.3 It shall be the Contractor's responsibility to see that all equipment such as valves, dampers, filters and such other apparatus or equipment that may require maintenance and operation are made easily accessible, regardless of the diagrammatic location shown on the drawings.

3.2.4 All connections to fixtures and equipment shown on the drawings shall be considered diagrammatic unless otherwise indicated by detail. The actual connections shall be made to fully suit the requirements of each case and adequately provide for expansion and servicing.

3.2.5 The contractor shall protect equipment, material, and fixtures at all times. He shall replace all equipment, material, and fixtures which are damaged as a result of inadequate protection.

3.2.6 Prior to starting and during progress of work, examine work and materials installed by others as they apply to work in this division. Report conditions which will prevent satisfactory installation.

3.2.7 Start of work will be construed as acceptance of suitability of work of others.

- 3.3 Interruption of Service: Before any equipment is shut down for disconnecting or tie-ins, arrangements shall be made with the Architect/Engineer and this work shall be done at the time best suited to the Owner. This will typically be on weekends and/or holidays and/or after normal working hours. Services shall be restored the same day unless prior arrangements are made. All overtime or premium costs associated with this work shall be included in the base bid.
- 3.4 Phasing: Provide all required temporary valves, piping, ductwork, equipment and devices as required. Maintain temporary services to areas as required. Remove all temporary material and equipment on completion of work unless Engineer concurs that such material and equipment would be beneficial to the Owner on a permanent basis.
- 3.5 Cutting and Patching: Notify General Contractor to do all cutting and patching of all holes, chases, sleeves, and other openings required for installation of equipment furnished and installed under this section. Utilize experienced trades for cutting and patching. Obtain permission from Architect/Engineer before cutting any structural items.
- 3.6 Equipment Setting: Bolt equipment directly to concrete pads or vibration isolators as required, using hot-dipped galvanized anchor bolts, nuts and washers. Level equipment.
- 3.7 Painting: Touch-up factory finishes on equipment located inside and outside shall be done under Division 20. Obtain matched color coatings from the manufacturer and apply as directed. If corrosion is found during inspection on the surface of any equipment, clean, prime, and paint, as required.
- 3.8 Clean-up: Thoroughly clean all exposed parts of apparatus and equipment of cement, plaster, and other materials and remove all oil and grease spots. Repaint or touch up as required to look like new. During progress of work, contractor is to carefully clean up and leave premises and all portions of building free from debris and in a clean and safe condition.
- 3.9 Start-up and Operational Test: Start each item of equipment in strict accordance with the manufacturer's instructions; or where noted under equipment specification, start-up shall be done by a qualified representative of the manufacturer. Alignment, lubrication, safety, and operating control shall be included in start-up check.
- 3.10 Climate Control: Operate heating and cooling systems as required after initial startup to maintain temperature and humidity conditions to avoid freeze damage and warping or sagging of ceilings and carpet.
- 3.11 Record Drawings:
- 3.11.1 During the progress of the work the Contractor shall record on their field set of drawings the exact location, as installed, of all piping, ductwork, equipment, and other systems which are not installed exactly as shown on the contract drawings.
- 3.11.2 Upon completion of the work, record drawings shall be prepared as described in the General Conditions, Supplementary Conditions, and Division 1 sections.

- 3.12 Acceptance:
- 3.12.1 Punch List: Submit written confirmation that all punch lists have been checked and the required work completed.
- 3.12.2 Instructions: At completion of the work, provide a competent and experienced person who is thoroughly familiar with project, for one day to instruct permanent operating personnel in operation of equipment and control systems. This is in addition to any specific equipment operation and maintenance training.
- 3.12.3 Operation and Maintenance Manuals: Furnish four complete manuals bound in ring binders with Table of Contents, organized, and tabbed by specification section. Manuals shall contain:
- Detailed operating instructions and instructions for making minor adjustments.
 - Complete wiring and control diagrams.
 - Routine maintenance operations.
 - Manufacturer's catalog data, service instructions, and parts lists for each piece of operating equipment.
 - Copies of approved submittals.
 - Copies of all manufacturer's warranties.
 - Copies of test reports and verification submittals.
- 3.12.4 Record Drawings: Submit record drawings.
- 3.12.5 Test and Balance Report: Submit four certified copies. The Report shall be submitted for review prior to the Substantial Completion Inspection unless otherwise required by Division 1.
- 3.12.6 Acceptance will be made on the basis of tests and inspections of job. A representative of firm that performed test and balance work shall be in attendance to assist. Contractor shall furnish necessary mechanics to operate system, make any necessary adjustments and assist with final inspection.

PROJECT NAME
PROJECT NUMBER

This is a sample cover sheet. Use one for each shop drawing.

ARCHITECT/ENGINEER: Watford Engineering, Inc.

CONTRACTOR: XYZ Construction

SUBCONTRACTOR: ABC Mechanical Contractor

SUPPLIER: Jones Supply Co.

MANUFACTURER: Various

DATE: 2/15/2005

SECTION: 21-M/Hydronic Specialties

1. Vent valves - Hoffman No. 62

List each item separately

2. In-line air separators - Bell & Gossett RL-4

Typical - list mfr name & model number

3. Diaphragm type compression tanks - Bell & Gossett B-200

4. Pump suction diffusers - Bell & Gossett ED-3

5. Triple duty valves - Bell & Gossett 3D-4S

6. Shot feeders - J. Woods No. 2

7. Pressure relief valves - Watts No. 6

8. Pressure reducing valves - Bell & Gossett No. 7

General Contractor's APPROVAL stamp must be on submittal.

END OF SECTION

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SECTION 20B

CODES AND STANDARDS

1 GENERAL

1.1 The work covered by this division consists of providing all labor, equipment and materials and performing all operations necessary for the installation of the mechanical work as herein called for and shown on the drawings.

1.2 This is a Basic Mechanical Requirements section. Provisions of this section apply to work of all Division 20, 21, & 22 sections.

2 CODES

2.1 All work under Division 20, 21, & 22 shall be constructed in accordance with the codes listed herein. The design has been based on the requirements of these codes; and while it is not the responsibility of the Contractor to verify that all work called for complies with these codes, he shall be responsible for calling to the Architect/Engineer's attention any drawings or specifications that are not in conformance with these or other codes prior to ordering equipment or installing work.

2.2 Comply with regulations and codes of utility suppliers.

2.3 Where no specific method or form of construction is called for in the contract documents, the Contractor shall comply with code requirements when carrying out such work.

2.4 Where code conflict exists, generally the most restrictive requirement applies. Comply with current code edition, unless noted.

2.5 Additional codes or standards applying to a specific part of the work may be included in that section.

2.6 The following codes govern the work:

- 1) Florida Building Code 8th Edition (2023)
- 2) Florida Building Code 8th Edition (2023)-Plumbing
- 3) Florida Building Code 8th Edition (2023)-Mechanical
- 4) Florida Building Code 8th Edition (2023)-Fuel Gas
- 5) Florida Building Code 8th Edition (2023)-Energy Conservation
- 6) Florida Building Code 8th Edition (2023)-Accessibility
- 7) Florida Fire Prevention Code 8th Edition (2023)
- 8) National Electric Code (NFPA 70-2020).
- 9) Installation of Air Conditioning and Ventilation Systems (NFPA 90A-2018)
- 10) Florida Americans with Disabilities Accessibility Implementation Act (October 1, 1993) as described in Accessibility Requirements Manual, Department of Community Affairs (January 1, 1997).
- 11) Americans with Disabilities Act Accessibility Guidelines (ADAAG), 2010 Standards.

3 STANDARDS

All mechanical materials, installation and systems shall meet the requirements of the following standards, including the latest addenda and amendments, to the extent referenced:

- 1) Underwriters' Laboratories (UL)
- 2) American National Standards Institution (ANSI)
- 3) American Society of Testing Materials (ASTM)
- 4) National Fire Protection Association (NFPA)
- 5) National Electrical Manufacturers Association (NEMA)
- 6) Air Conditioning and Refrigeration Institute (ARI)
- 7) Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)
- 8) American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE)
- 9) Air Movement and Control Association (AMCA)

SECTION 20C

MECHANICAL RELATED WORK

1 DIVISION 1 - GENERAL REQUIREMENTS

- 1.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.
- 1.2 This is a Basic Mechanical Requirements section. Provisions of this section apply to work of all Division 20 sections.
- 1.3 Coordinate with the General Contractor for all cutting and patching. Contractors performing Division 20 work shall inform the General Contractor of all cutting and patching required prior to bidding and shall coordinate installation.

2 SITE WORK

- 2.1 Specific requirements for excavation and backfill for underground piping are contained in Section 20-L.
- 2.2 Refer to Sitework for:
 - 2.2.1 All water, sewer, and storm water piping greater than five feet from the building.

3 CONCRETE

- 3.1 Refer to Concrete for:
 - 3.1.1 Rough grouting in and around mechanical work.
 - 3.1.2 Patching concrete cut to accommodate mechanical work.
- 3.2 The following is part of Division 20 work, complying with the requirements of Division Concrete
 - 3.2.1 Curbs, foundations and pads for mechanical equipment.
 - 3.2.2 Basins, sumps, and vaults of mechanical work.
 - 3.2.3 Underground structural concrete to accommodate mechanical work.

4 MASONRY

- 4.1 Refer to Masonry for:
 - 4.1.1 Installation of wall louvers.

5 METALS

- 5.1 Refer to Metals for:

5.1.1 Framing openings for mechanical equipment.

5.2 The following is part of Division 20 work.

5.2.1 Supports for mechanical work.

6 WOOD AND PLASTIC

6.1 Refer to Wood for:

6.1.1 Framing openings for mechanical equipment

7 THERMAL AND MOISTURE PROTECTION

7.1 Refer to Thermal and Moisture Protection for:

7.1.1 Installation of all roof curbs and roof supports for mechanical work.

7.1.2 Caulking and waterproofing of all wall and roof mounted mechanical work.

7.1.3 Providing all roof curbs and all vent flashing for metal roofs.

7.2 The following is part of Division 20 work, complying with the requirements of Thermal and Moisture Protection Section.

7.2.1 Fire barrier penetration seals.

8 DOORS AND WINDOWS

8.1 Refer to Doors & Windows for:

8.1.1 Installation of all door grilles.

8.1.2 Providing all undercuts

9 FINISHES

9.1 Refer to Finishes for:

9.1.1 Painting exposed ductwork, piping, and equipment.

9.1.2 Painting structural metal and concrete for mechanical work.

9.1.3 Painting door grilles and access panels.

9.1.4 Painting color-coded mechanical work indicated for continuous painting. See color schedule in Division 20 section, "I. Mechanical Identification".

9.1.5 Installation of access doors in gypsum drywall.

9.2 Colors shall be selected by the Architect for all painting of exposed mechanical work in occupied spaces, unless specified herein. Do not paint insulated or jacketed surfaces.

9.3 Perform the following as part of Division 20 work:

9.3.1 Touch up painting of factory finishes.

9.3.2 Painting of all hangers.

10 SPECIALTIES

10.1 Refer to Specialties for:

10.1.1 Fire extinguishers and fire extinguisher cabinets and accessories.

11 DIVISION 26 - ELECTRICAL

11.1 Mechanical contractor shall coordinate the exact electrical requirements of all mechanical equipment being provided with the electrical contractor. Where approval submittals are required, this coordination shall be accomplished prior to making the submittals. The electrical design shown on the drawings supports the mechanical equipment basis of design. If mechanical equipment is submitted with different electrical requirements, it is the responsibility of the mechanical contractor to resolve all required electrical design changes (wire and conduit size, type of disconnect or overload protection, point(s) of connection, etc.) and clearly show the new electrical design on the mechanical submittal with a written statement that this design will be provided at no additional cost. Mechanical submittals made with no written reference to the electrical design will be presumed to work with the electrical design. Any corrections required will be at no additional cost.

11.2 Mechanical contractor shall provide all HVAC control wiring including the Energy Management Control system sensors, alarms, and input/output signals and all relays, interlocks, warning lights, and control devices, in conduit and complying with the requirements of Division 21. The intent is for the mechanical contractor to be responsible for the entire HVAC control system, including point-to-point wiring.

11.3 Electrical contractor shall provide disconnect switches, starters, and contactors for mechanical equipment unless specifically noted as being furnished as part of mechanical equipment.

11.4 Electrical contractor shall provide all power wiring, raceway and devices, and make final electrical connections to all mechanical equipment, switches, starters, contactors, controllers, and similar equipment.

11.5 All duct-mounted smoke detectors shall be furnished and wired by the electrical contractor and installed by the mechanical contractor.

END OF SECTION

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SECTION 20D

PIPES AND PIPE FITTINGS

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-20 Basic Mechanical Materials and Methods section, and is part of each Division-20, 21, & 22 section making reference to pipes and pipe fittings specified herein.
- 1.3 Extent of pipes and pipe fittings required by this section is indicated on drawings and/or specified in other Division-20, 21, & 22 sections.
- 1.4 **Codes and Standards:**
 - 1.4.1 **Welding:** Qualify welding procedures, welders and operators in accordance with ASME B31.1, or ASME B31.9, as applicable, for shop and project site welding of piping work.
 - 1.4.2 **Brazing:** Certify brazing procedures, brazers, and operators in accordance with ASME Boiler and Pressure Vessel Code, Section IX, for shop and job-site brazing of piping work.
- 1.5 **Test Report and Verification Submittals:**
 - 1.5.1 Submit welding certification for all welding installers.
 - 1.5.2 Submit brazing certification for all brazing installers.

2 PRODUCTS

- 2.1 **Piping Materials:** Provide pipe and tube of type, joint type, grade, size and weight (wall thickness or Class) indicated for each service. Where type, grade or class is not indicated, provide proper selection as determined by Installer for installation requirements, and comply with governing regulations and industry standards.
- 2.2 **Pipe/Tube Fittings:** Provide factory-fabricated fittings of type, materials, grade, class and pressure rating indicated for each service and pipe size. Provide sizes and types matching pipe, tube, valve or equipment connection in each case. Where not otherwise indicated, comply with governing regulations and industry standards for selections, and with pipe manufacturer's recommendations where applicable.
- 2.3 **Piping Materials/Products:**
 - 2.3.1 **Soldering Materials:**
 - 2.3.1.1 **Tin-Antimony (95-5) Solder:** ASTM B-32, Grade 95TA.
 - 2.3.1.2 **Silver-Phosphorus Solder:** ASTM B-32, Grade 96TS.

- 2.3.2 Pipe Thread Tape: Teflon tape.
- 2.3.3 Protective Coating: Koppers Bitumastic No. 505 or equal.
- 2.3.4 Gaskets for Flanged Joints: ANSI B16.21; full-faced for cast iron flanges; raised-face for steel flanges, unless otherwise noted.
- 2.3.5 Welding Materials: Comply with Section II, Part C, ASME Boiler and Pressure Vessel Code for welding materials. Materials shall be determined by installer to comply with installation requirements.
- 2.3.6 Brazing Materials: Silver content of not less than 15%. Materials shall be determined by installer to comply with installation requirements.
- 2.4 Copper Tube and Fittings:
 - 2.4.1 Copper Tube:
 - 2.4.1.1 Copper Tube: ASTM B88; Type K or L as indicated for each service; hard-drawn temper unless specifically noted as annealed.
 - 2.4.1.2 ACR Copper Tube: ASTM B280.
 - 2.4.1.3 DWV Copper Tube: ASTM B306.
 - 2.4.2 Fittings:
 - 2.4.2.1 Wrought-Copper Solder-Joint Fittings: ANSI B16.22.
 - 2.4.2.2 Copper Tube Unions: Provide standard products recommended by manufacturer for use in service indicated.
 - 2.4.2.3 Wrought-Copper Solder-Joint Drainage Fittings: ANSI B16.29.
 - 2.4.2.4 Cast-Copper Flared Tube Fittings: ANSI B16.26.
- 2.5 Steel Pipes and Pipe Fittings
 - 2.5.1 Pipes:
 - 2.5.1.1 Black Steel Pipe: ASTM A-53 or A-120, seamless.
 - 2.5.1.2 Galvanized Steel Pipe: ASTM A-53 or A-120, seamless.
 - 2.5.2 Pipe Fittings:
 - 2.5.2.1 Threaded Cast Iron: ANSI B16.4.
 - 2.5.2.2 Threaded Malleable Iron: ANSI B16.3; plain or galvanized as indicated.
 - 2.5.2.3 Malleable Iron Threaded Unions: ANSI B16.39; selected by installer for proper piping fabrication and service requirements including style, end connections, and metal-to-metal seats (iron, bronze or brass); plain or galvanized as indicated.

- 2.5.2.4 Threaded Pipe Plugs: ANSI B16.14.
- 2.5.2.5 Flanged Cast Iron: ANSI B16.1, including bolting.
- 2.5.2.6 Steel Flanges/Fittings: ANSI B16.5, including bolting and gasketing.
- 2.5.2.7 Wrought-Steel Buttwelding Fittings: ANSI B16.9, except ANSI B16.28 for short radius elbows and returns, rated to match connected pipe.
- 2.5.2.8 Pipe Nipples: Fabricated from same pipe as used for connected pipe; except do not use less than schedule 80 pipe where length remaining unthreaded is less than 1 ½ inches, and where pipe size is less than 1 ½ inches, and do not thread nipples full length (no close-nipples).
- 2.6 Plastic Pipes and Fittings:
 - 2.6.1 Pipes:
 - 2.6.1.1 PVC DWV Pipe: ASTM D-2665, Schedule 40.
 - 2.6.1.2 PVC Sewer Pipe: ASTM D-3034.
 - 2.6.2 Fittings:
 - 2.6.2.1 PVC Solvent Cement: ASTM D-2564.
 - 2.6.2.2 PVC DWV Socket: ASTM D-2665.
 - 2.6.2.3 PVC Sewer Socket: ASTM D-3034.
 - 2.6.2.4 PVC Schedule 40 Socket: ASTM D-2466.

3 EXECUTION

3.1 Installation

- 3.1.1 General: Install pipes and pipe fittings in accordance with recognized industry practices which will achieve permanently-leak proof piping systems, capable of performing each indicated service without piping failure. Install each run with minimum joints and couplings, but with adequate and accessible unions for disassembly and maintenance or replacement of valves and equipment. Reduce sizes (where indicated) by use of reducing fittings, not bushings. Align piping accurately at connections, within 1/16" misalignment tolerance.
- 3.1.2 Comply with ANSI B31 Code for Pressure Piping.
- 3.1.3 Locate piping runs, except as otherwise indicated, vertically and horizontally (pitched to drain) and avoid diagonal runs wherever possible. Orient horizontal runs parallel with walls and column lines. Locate runs as shown or described by diagrams, details and notations or, if not otherwise indicated, run piping in shortest route which does not obstruct usable space or block access for servicing building and its equipment. Hold piping close to walls, overhead construction, columns and other structural and

permanent-enclosure elements of building; limit clearance to 1/2" where furring is shown for enclosure or concealment of piping, but allow for insulation thickness, if any. Where possible, locate insulated piping for 1" clearance outside insulation.

- 3.1.4 Concealed Piping: Unless specifically noted as "Exposed" on the drawings, conceal piping from view in finished and occupied spaces, by locating in column enclosures, chases, in hollow wall construction or above suspended ceilings; do not encase horizontal runs in solid partitions, except as indicated.
- 3.1.5 Electrical Equipment Spaces: Do not run piping through transformer vaults and other electrical, communications, or data equipment spaces and enclosures unless shown. Install drip pan under piping that must run through electrical spaces.
 - 3.1.5.1 Cut pipe from measurements taken at the site, not from drawings. Keep pipes free of contact with building construction and installed work.
- 3.2 Piping System Joints: Provide joints of the type indicated in each piping system.
 - 3.2.1 Solder copper tube-and-fitting joints where indicated, in accordance with recognized industry practice. Cut tube ends squarely, ream to full inside diameter, and clean outside of tube ends and inside of fittings. Apply non-acid type solder flux to joint areas of both tubes and fittings. Insert tube full depth into fitting, and solder in manner which will draw solder full depth and circumference of joint. Wipe excess solder from joint before it hardens.
 - 3.2.2 Thread pipe in accordance with ANSI B2.1; cut threads full and clean using sharp dies. Ream threaded ends to remove burrs and restore full inside diameter. Apply pipe joint compound, or pipe joint tape (Teflon) where recommended by pipe/fitting manufacturer, on male threads at each joint and tighten joint to leave not more than 3 threads exposed. Paint exposed threads to retard rusting.
 - 3.2.3 Flanged Joints: Match flanges within piping system, and at connection with valves and equipment. Clean flange faces and install gaskets. Tighten bolts to provide uniform compression of gaskets. Bolts shall project 1/8" to 3/8" beyond nut face when tight.
 - 3.2.4 Weld pipe joints in accordance with recognized industry practice and as follows. Be guided by ANSI B.31.
 - 3.2.4.1 Weld pipe joints only when ambient temperature is above 0°F.
 - 3.2.4.2 Bevel pipe ends at a 37.5° angle where possible, smooth rough cuts, and clean to remove slag, metal particles and dirt.
 - 3.2.4.3 Use pipe clamps or tack-weld joints; 4 welds for pipe sizes to 10". All welds shall be open-butt.
 - 3.2.4.4 Build up welds with root pass, followed by filler pass and then a cover pass. Eliminate valleys at center and edges of each weld. Weld by procedures which will ensure elimination of unsound or unfused metal, cracks, oxidation, blow-holes and non-metallic inclusions.

- 3.2.4.5 Do not weld-out piping system imperfections by tack-welding procedures; refabricate to comply with requirements.
- 3.2.4.6 At Installer's option, install forged branch-connection fittings wherever branch pipe is less than 3" and at least two pipe sizes smaller than main pipe indicated; or install regular "T" fitting. Weld-O-Let or equal.
- 3.2.4.7 All field welding and cutting using oxygen-acetylene methods within the building shall be performed in accordance with NFPA-51B (1994).
- 3.2.5 Plastic Pipe Joints: Comply with manufacturer's instructions and recommendations, and with applicable industry standards.
 - 3.2.5.1 Solvent-cemented joints shall be made in accordance with ASTM D-2235 and ASTM F-402.
 - 3.2.5.2 PVC sewer pipe bell/gasket joints shall be installed in accordance with ASTM D-2321.
- 3.2.6 Braze copper tube-and-fitting joints where indicated, in accordance with ANSI B.31.
- 3.3 Piping Installation
 - 3.3.1 Install piping to allow for expansion and contraction.
 - 3.3.2 Isolate all copper tubing from steel and concrete by wrapping the pipe at the contact point, and for one inch on each side, with a continuous plastic sleeve. Isolate all copper tubing installed in block walls with a continuous plastic sleeve.
 - 3.3.3 Underground Piping:
 - 3.3.3.1 Provide plastic tape markers over all underground piping. Provide copper wire over all underground plastic piping. Locate markers 18" above piping.
 - 3.3.3.2 Coat the following underground (uninsulated) pipes with a heavy coat of bitumastic or provide an 8 mil polyvinyl sleeve: black steel pipe, galvanized steel pipe, copper tubing.

END OF SECTION

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SECTION 20E

VALVES

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to the work of this section.
- 1.2 This section is a Division-20 Basic Materials and Methods section, and is part of each Division-20, 21, & 22 section making reference to or requiring valves specified herein.
- 1.3 Extent of valves required by this section is indicated on drawings and/or specified in other Division-20, 21, & 22 sections.
- 1.4 Quality Assurance:
 - 1.4.1 Valve Dimensions: For face-to-face and end-to-end dimensions of flanged or welding-end valve bodies, comply with ANSI B16.10.
 - 1.4.2 Valve Types: Provide valves of same type by same manufacturer.
 - 1.4.3 Valve Listing: For valves on fire protection piping, provide UL listing.
 - 1.5 Approval Submittals: When required by other Division-20, 21, & 22 sections, submit product data, catalog cuts, specifications, and dimensioned drawings for each type of valve. Include pressure drop curve or chart for each type and size of valve. Submit valves with Division-20, 21, & 22 section using the valves, not as a separate submittal. For each valve, identify systems where the valve is intended for use.

Gate Valves. Type GA.
Check Valves. Type CK.
Ball Valves. Type BA.

- 1.6 O&M Data Submittals: Submit a copy of approval submittals. Submit installation instructions, maintenance data and spare parts lists for each type of valve. Include this data in the O&M Manual.

2 PRODUCTS

- 2.1 General: Provide factory-fabricated valves recommended by manufacturer for use in service indicated. Provide valves of types and pressure ratings indicated; provide proper selection as determined by Installer to comply with specifications and installation requirements. Provide sizes as indicated, and connections which properly mate with pipe, tube, and equipment connections.
- 2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide valves of one of the producers listed for each valve type. The model numbers are listed for contractor's convenience only. In the case of a model number discrepancy, the written description shall govern.

2.3 Gate Valves:

2.3.1 Packing: Select valves designed for repacking under pressure when fully opened, equipped with non-asbestos packing suitable for intended service. Select valves designed so back seating protects packing and stem threads from fluid when valve is fully opened, and equipped with gland follower.

2.3.2 Comply with the following standards:

Cast Iron Valves: MSS SP-70. Cast Iron Gate Valves, Flanged and Threaded Ends.

Bronze Valves: MSS SP-80. Bronze Gate, Globe, Angle and Check Valves.

Steel Valves: ANSI B16.34. Steel Standard Class Valve Ratings.

2.3.3 Types of gate (GA) valves:

- 1 Threaded Ends 2" and Smaller (GA1): Class 125, bronze body, screwed bonnet, rising stem, solid wedge. Stockham B-100. Nibco T-111. Crane 428. Milwaukee 148.
- 2 Soldered Ends 2" and Smaller (GA2): Class 125, bronze body, screwed bonnet, non-rising stem, solid wedge. Stockham B-108 or B-109. Nibco S-111. Crane 1334. Milwaukee 149.
- 3 Flanged Ends 2½" and Larger (GA3): Class 125, iron body, bronze mounted, bolted bonnet, rising stem, OS&Y, solid wedge. Stockham G-623. Nibco F617-0. Crane 465½. Milwaukee F2885.
- 4 Threaded Ends 2" and Smaller (GA4): Class 150, bronze body, screwed bonnet, rising stem, solid wedge. Stockham B-122. Nibco T-131. Crane 431. Milwaukee 1150.
- 5 Soldered Ends 2" and Smaller (GA5): Class 150, bronze body, screwed bonnet, rising stem, solid wedge. Stockham B-124. Nibco S-134. Milwaukee 1169.
- 6 Threaded Ends 2" and Smaller (GA6): 175 WWP, bronze body, screwed bonnet, rising stem, OS&Y, solid wedge, UL-listed. Stockham B-133. Nibco T-104-0.
- 7 Flanged Ends 2½" and Larger (GA7): 175 WWP, iron body, bolted bonnet, rising stem, OS&Y, solid wedge, UL listed. Stockham G-634. Nibco F-607-0TS
- 8 Threaded Ends 2" and Smaller (GA8): Class 200, bronze body, union bonnet, rising stem, solid wedge, renewable seat. Stockham B-132. Nibco T-154-SS. Milwaukee 1174.
- 9 Flanged Ends 2½" and Larger (GA9): Class 250, iron body bronze mounted, bolted bonnet, rising stem, OS&Y, solid wedge. Stockham F-667. Nibco F-667-0. Crane 7½E. Milwaukee F-2894.
- 10 Threaded Ends 2" and Smaller (GA10): Class 300, bronze body, union bonnet, rising stem, solid wedge, renewable seat. Stockham B-145. Nibco T-174-SS. Crane 634E. Milwaukee 1184.

- 11 Flanged Ends 2½" and Larger (GA11): Class 300, cast steel body, bolted bonnet, rising stem, solid wedge, seal-welded seat rings. Provide trim to match use. Stockham 30-0F. Crane 33.
- 12 Flanged Ends 2½" and Larger (GA12): 300 WWP, iron body, bolted bonnet, bronze mounted, rising stem, OS&Y, solid wedge, UL-listed. Stockham F-670. Nibco F-697-0.

2.4 Check Valves:

2.4.1 Construction: Construct valves of castings free of any impregnating materials. Construct valves with a bronze regrinding disc with a seating angle of 40° to 45°, unless a composition disc is specified. Provide stop plug as renewable stop for disc hanger, unless otherwise specified. Disc and hanger shall be separate parts with disc free to rotate. Support hanger pins on both ends by removable side plugs.

2.4.2 Comply with the following standards:

Cast Iron Valves: MSS SP-71. Cast Iron Swing Check Valves, Flanged and Threaded Ends.

Bronze Valves: MSS SP-80. Bronze Gate, Globe, Angle and Check Valves.

Steel Valves: ANSI B16.34. Steel Standard Class Valve Ratings.

2.4.3 Types of check (CK) valves:

- 1 Threaded Ends 2" and Smaller (CK1): Class 125, bronze body, screwed cap, horizontal swing, bronze disc. Stockham B-319. Nibco T-413-BY. Crane 1707. Milwaukee 509.
- 2 Soldered Ends 2" and Smaller (CK2): Class 125, bronze body, screwed cap, horizontal swing, bronze disc. Stockham B-309. Nibco S-413-B. Crane 1707S. Milwaukee 1509.
- 3 Flanged Ends 2½" and Larger (CK3): Class 125, iron body, bronze-mounted, bolted cap, horizontal swing, cast-iron or composition disc. Stockham G-931 or G-932 as applicable. Nibco F918-B. Crane 373. Milwaukee F2974 as applicable.
- 4 Threaded Ends 2" and Smaller (CK4): 200 WWP, bronze body, screwed cap, horizontal swing, regrinding type bronze disc, for fire sprinkler use. Nibco KT-403-W.
- 5 Flanged Ends 2½" and Larger (CK5): 175 WWP, iron body, bolted cap, bronze mounted, composition disc, UL listed, with ball drip if required. Stockham G-940. Nibco F-908-W.
- 6 Threaded Ends 2" and Smaller (CK6): Class 200, bronze body, screwed cap, Y-pattern swing, regrinding bronze disc. Stockham B-345. Nibco T-453-B. Crane 36. Milwaukee 518/508.
- 7 Flanged Ends 2½" and Larger (CK7): Class 250, iron body, bronze mounted, bolted cap, cast-iron disc. Stockham F-947. Nibco F-968-B. Crane 39E.

Milwaukee F2970.

- 8 Threaded Ends 2" and Smaller (CK8): Class 300, bronze body, screwed cap, Y-pattern swing, regrinding bronze disc. Stockham B-375. Nibco T-473-B. Crane 76E. Milwaukee 517/507.
- 9 Flanged Ends 2½" and Larger (CK9): Class 300, cast steel body, bolted cap, horizontal swing, seal welded seat rings, chromium stainless disc. Stockham 30-SF. Crane 159.

2.5 Ball Valves:

2.5.1 General: Select with port area equal to or greater than connecting pipe area, include seat ring designed to hold sealing material.

2.5.2 Construction: Ball valves shall be rated for 150 psi saturated steam and 600 psi non-shock cold water. Pressure containing parts shall be constructed of ASTM B-584 alloy 844, or ASTM B-124 alloy 377. Valves shall be furnished with blow-out proof bottom loaded stem constructed of ASTM B-371 alloy 694 or other approved low zinc material. Provide TFE packing, TFE thrust washer, chrome-plated ball and reinforced teflon seats. Valves 1" and smaller shall be full port design. Valves 1¼" and larger shall be conventional port design. Stem extensions shall be furnished for use in insulated piping where insulation exceeds ½" thickness.

2.5.3 Comply with the following standards:

MSS SP-72. Ball Valves with Flanged or Butt Welding Ends for General Service.

MSS SP-110. Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.

2.5.4 Types of ball (BA) valves:

- 1 Threaded Ends 2" and Smaller (BA1): Bronze two-piece full port body with adjustable stem packing. Nibco T-585-70. Stockham S216-BR-R-T. Milwaukee BA125. Apollo 77-100.
- 2 Soldered Ends 2" and Smaller (BA2): Bronze three-piece full port body with adjustable stem packing. Nibco S-595-Y-66. Milwaukee BA350. Apollo 82-200.
- 3 Threaded Ends 1" and Smaller (BA3): Bronze two-piece full port body, UL listed (UL 842) for use with flammable liquids and LP gas. Nibco T-585-70-UL.
- 4 Threaded Ends 2" and Smaller (BA4): 175 WWP, bronze two-piece body, UL listed for fire protection service. Nibco KT-585-70-UL and KT-580-70-UL.
- 5 Threaded Ends 2" and Smaller (BA5): 400 WWP, bronze two-piece body, for fire protection service. Nibco KT-580.
- 6 Threaded Ends 2½" and Smaller (BA6): 300 WWP, bronze three-piece body, gear operator with handwheel, indicator flag, accepts tamper switch, for fire protection, UL listed. Nibco T-505-4 and G-505-4.

- 7 Flanged Ends 2½" and Larger (BA7): Class 150, carbon steel full bore two-piece body with adjustable stem packing. Nibco F515-CS series. Apollo 88-240.

2.6 Valve Features:

2.6.1 General: Provide valves with features indicated and, where not otherwise indicated, provide proper valve features as determined by Installer for installation requirements. Comply with ANSI B31.1

2.6.2 Valve features specified or required shall comply with the following:

- 1 Bypass: Comply with MSS SP-45, and except as otherwise indicated, provide manufacturer's standard bypass piping and valving. Provide for gate valves 8" and larger.
- 2 Drain: Comply with MSS SP-45, and provide threaded pipe plugs complying with applicable Division-20, 21, 22, & 23 pipe or tube section. Provide for gate valves 8" and larger.
- 3 Flanged: Provide valve flanges complying with ANSI B16.1 (cast iron), ANSI B16.5 (steel), or ANSI B16.24 (bronze).
- 4 Threaded: Provide valve ends complying with ANSI B2.1.
- 5 Solder-Joint: Provide valve ends complying with ANSI B16.18.
- 6 Trim: Fabricate pressure-containing components of valve, including stems (shafts) and seats from brass or bronze materials, of standard alloy recognized in valve manufacturing industry unless otherwise specified.
- 7 Non-Metallic Disc: Provide non-metallic material selected for service indicated in accordance with manufacturer's published literature.
- 8 Renewable Seat: Design seat of valve with removable disc, and assemble valve so disc can be replaced when worn.
- 9 Extended Stem: Increase stem length by 2" minimum, to accommodate insulation applied over valve.
- 10 Mechanical Actuator: Provide factory-fabricated gears, gear enclosure, external chain attachment and chain designed to provide mechanical advantage in operating valve for all valves 4" and larger that are mounted more than 7'-0" above the floor, or are otherwise difficult to operate regardless of height.

3 EXECUTION

3.1 Installation:

3.1.1 General! Install valves where required for proper operation of piping and equipment, including valves in branch lines to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided when necessary. Install valves with stems pointed up, in vertical position where possible, but in no case with stems

pointed downward below horizontal plane.

- 3.1.2 Insulation: Where insulation is indicated, install extended-stem valves, arranged in proper manner to receive insulation.
- 3.1.3 Applications Subject to Corrosion: Do not install bronze valves and valve components in direct contact with steel, unless bronze and steel are separated by dielectric insulator.
- 3.1.4 Mechanical Actuators: Install mechanical actuators as recommended by valve manufacturer.
- 3.2 Selection of Valve Ends (Pipe Connections): Except as otherwise indicated, select and install valves with the following ends or types of pipe/tube connections:
 - 3.2.1 Tube Size 2" and Smaller: Threaded valves.
 - 3.2.2 Pipe Size 2" and Smaller: Threaded valves.
 - 3.2.3 Pipe Size 2½" and Larger: Flanged valves.
- 3.3 Non-Metallic Disc: Limit selection and installation of valves with non-metallic disc to locations indicated and where foreign material in piping system can be expected to prevent tight shutoff of metal seated valves.
- 3.4 Renewable Seats: Select and install valves with renewable seats, except where otherwise indicated.
- 3.5 Installation of Check Valves: Install in horizontal position with hinge pin horizontally perpendicular to center line of pipe. Install for proper direction flow.

END OF SECTION

SECTION 20F

PIPING SPECIALTIES

1 GENERAL

- 1.1 Drawings and general provisions of contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-20 Basic Mechanical Materials and Methods section, and is part of each Division-20, 21, & 22 section making reference to or requiring piping specialties specified herein.

2 PRODUCTS

- 2.1 **General:** Provide factory-fabricated piping specialties recommended by manufacturer for use in service indicated. Provide piping specialties of types and pressure ratings indicated for each service, or if not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide sizes as indicated, and connections, which properly mate with pipe, tube, and equipment connections. Where more than one type is indicated, selection is Installer's option.

2.2 Escutcheons:

- 2.2.1 **General:** Provide pipe escutcheons as specified herein with inside diameter closely fitting pipe outside diameter, or outside of pipe insulation where pipe is insulated. Select outside diameter of escutcheon to completely cover pipe penetration hole in floors, walls, or ceilings; and pipe sleeve extension, if any. Furnish pipe escutcheons with nickel or chrome finish for occupied areas, prime paint finish for unoccupied areas.

- 2.2.2 **Pipe Escutcheons for Moist Areas:** For waterproof floors, and areas where water and condensation can be expected to accumulate, provide cast brass or sheet brass escutcheons, solid or split hinged.

- 2.2.3 **Pipe Escutcheons for Dry Areas:** Provide sheet steel escutcheons, solid or split hinged.

- 2.3 **Dielectric Unions:** Provide standard products recommended by manufacturer for use in service indicated, which effectively isolate ferrous from non-ferrous piping (electrical conductance), prevent galvanic action and stop corrosion. .

2.4 Fire Barrier Penetration Seals:

- 2.4.1 **Provide seals for any opening** through fire-rated walls, floors, or ceilings used as passage for mechanical components such as piping or ductwork in accordance with the requirements of Division 7.

- 2.4.2 **Openings 4" or Greater:** Use sealing system capable of passing 3-hour fire test in accordance with ASTM E-814, consisting of wall wrap or liner, partitions, and end caps capable of expanding when exposed to temperatures of 250 to 350°F, UL-listed.

2.5 Fabricated Piping Specialties:

- 2.5.1 Drip Pans: Provide drip pans fabricated from corrosion-resistant sheet metal with watertight joints, and with edges turned up 2-1/2". Reinforce top, either by structural angles or by rolling top over 1/4" steel rod. Provide hole, gasket, and flange at low point for watertight joint and 1" drain line connection.
- 2.5.2 Pipe Sleeves: Provide pipe sleeves of one of the following:
 - 2.5.2.1 Sheet-Metal: Fabricate from galvanized sheet metal; round tube closed with snaplock joint, welded spiral seams, or welded longitudinal joint. Fabricate from the following gages: 3" and smaller, 20 gage; 4" to 6" 16 gage; over 6", 14 gage.
 - 2.5.2.2 Iron-Pipe: Fabricate from cast-iron or ductile-iron pipe; remove burrs.
- 2.5.3 Sleeve Seals: Provide sleeve seals for sleeves located in foundation walls below grade, or in exterior walls, of one of the following:
 - 2.5.3.1 Caulking and Sealant: Provide foam or caulking and sealant compatible with piping materials used.

3 EXECUTION

- 3.1 Pipe Escutcheons: Install pipe escutcheons on each pipe penetration through floors, walls, partitions, and ceilings where penetration is exposed to view; and on exterior of building. Secure escutcheon to pipe or insulation so escutcheon covers penetration hole, and is flush with adjoining surface.
- 3.2 Dielectric Unions: Install at each piping joint between ferrous and non-ferrous piping. Comply with manufacturer's installation instructions.
- 3.3 Fire Barrier Penetration Seals: Provide pipe sleeve as required. Fill entire opening with sealing compound. Adhere to manufacturer's installation instructions. Refer to Division 7.
- 3.4 Drip Pans: Locate drip pans under piping passing over or within 3' horizontally of electrical equipment, and elsewhere as indicated. Hang from structure with rods and building attachments, weld rods to sides of drip pan. Brace to prevent sagging or swaying. Connect 1" drain line to drain connection, and run to nearest plumbing drain or elsewhere as indicated.
- 3.5 Pipe Sleeves: Install pipe sleeves of types indicated where piping passes through walls, floors, ceilings, and roofs. Do not install sleeves through structural members of work, except as detailed on drawings, or as reviewed by Architect/Engineer. Install sleeves accurately centered on pipe runs. Size sleeves so that piping and insulation (if any) will have free movement in sleeve, including allowance for thermal expansion; but not less than 2 pipe sizes larger than piping run. Where insulation includes vapor-barrier jacket, provide sleeve with sufficient clearance for installation. Install length of sleeve equal to thickness of construction penetrated, and finish flush to surface; except floor sleeves. Extend floor sleeves 1/4" above level floor finish, and 3/4" above floor finish sloped to drain. Provide temporary support of sleeves during placement of concrete and other work around sleeves, and provide temporary closure to prevent concrete and other materials from entering sleeves.

- 3.5.1 Install sleeves in fire-rated assemblies in accordance with the listing of the assembly and the fire barrier sealant.
- 3.5.2 Install sheet-metal sleeves at interior partitions and ceilings other than suspended ceilings. Fill annular space with caulking or fire barrier sealant as required.
- 3.5.3 Install steel-pipe sleeves at floor penetrations. Fill annular space with caulking or fire barrier sealant as required.
- 3.5.4 Install iron-pipe sleeves at all foundation wall penetrations and at exterior penetrations; both above and below grade. Fill annular space with caulking or mechanical sleeve seals.

END OF SECTION

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SECTION 20G

VIBRATION ISOLATION

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-20 Basic Mechanical Materials and Methods section, and is part of each Division-20, 21, & 22 section making reference to vibration isolation equipment.
- 1.3 Extent of vibration isolation required by this section is indicated on drawings and/or specified in other Division-20, 21, & 22 sections.
- 1.4 Approval Submittals: When required by other Division-20, 21, & 22 sections, submit product data sheets for each type of vibration isolation equipment including configuration and rating data. Submit with Division-20, 21, & 22 section using vibration isolation, not as a separate submittal. Provide calculations showing supported weight, deflection, and isolator size and type for each item of supported equipment. Submit for:

Equipment Mountings. Type EM.
Hangers. Type HA.

- 1.5 O&M Data Submittals: Submit a copy of approval submittals for each type of vibration isolation equipment. Include this data in O&M Manual.

2 PRODUCTS

- 2.1 General: Provide factory-fabricated products recommended by manufacturer for use in service indicated. Provide products of types and deflections indicated; provide proper selection as determined by Installer to comply with specifications and installation requirements. Provide sizes which properly fit with equipment. All metal parts installed outside shall be hot dipped galvanized after fabrication.
- 2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide vibration isolation equipment of: Mason Industries, Keflex, Consolidated Kinetics, Vibration Mountings & Controls, Wheatley or approved equal. All vibration isolators shall be supplied by a single approved manufacturer.
- 2.3 Equipment Mountings:
- 2.3.1 Select mountings with the required deflection and fastening means. Provide steel rails or bases as required to compensate for equipment rigidity and overhang.
- 2.3.2 Types of equipment mountings (EM):
- 1 Spring Mountings (EM1): Spring isolators shall be free-standing and laterally stable without any housing. All mounts shall have leveling bolts. Spring diameter shall be not less than 0.8 of the compressed height of the spring at

rated load. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Springs shall be so designed that the ratio of horizontal stiffness to vertical stiffness is approximately one. Provide a nominal static deflection of at least 1.0". Basis of Design: Mason Industries SLFH.

- 2 Spring Mountings with Housings (EM2): Spring isolators shall consist of open, stable steel springs and include vertical travel limit stops to control extension when weight is removed. The housing of the spring unit shall serve as blocking during erection of equipment. Provide a nominal static deflection of at least 1.0". All mountings used outside shall be hot dipped galvanized. Basis of Design: Mason Industries SLR.
- 3 Spring Mountings with Housings (EM3): Spring isolators shall consist of open, stable steel springs with neoprene inserts to limit movement between upper and lower housing on start and stop. Provide a nominal static deflection of at least 1.0". Mountings shall be specifically designed for critical areas on light-weight floors. Basis of Design: Mason Industries C.
- 4 Neoprene Mountings (EM4): Double deflection neoprene-in-shear mountings shall have a minimum static deflection of 0.35". All metal surfaces shall be neoprene covered. The top and bottom surfaces shall be neoprene ribbed and bolt holes shall be provided in the base. Basis of design: Mason Industries ND.
- 5 Pads (EM5): Waffle or ribbed pattern neoprene pads shall be fabricated from 40-50 durometer neoprene. Provide rigid steel plate and mounting angles as required. Basis of design: Mason Industries Super W.

2.4 Hangers:

2.4.1 Select hangers with the required deflection. Provide all required hanger rods and fasteners.

2.4.2 Types of hangers (HA):

- 1 Hangers (HA1): Vibration hangers shall contain a steel spring set in a neoprene cup manufactured with a grommet to prevent short-circuiting of the hanger rod. The cup shall contain a steel washer designed to properly distribute the load on the neoprene and prevent its extrusion. Spring diameters and hanger box lower-hole sizes shall be large enough to permit the hanger rod to swing through a 30-degree arc before contacting the hole and short circuiting the spring. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Basis of Design: Mason Industries 30.
- 2 Hangers (HA2): Vibration hangers shall contain a laterally stable steel spring and 0.3" deflection neoprene or fiberglass element in series. A neoprene neck shall be provided where the hanger rod passes through the steel box supporting the isolator mount to prevent metal to metal contact. Spring diameters and hanger box lower hole sizes shall be large enough to permit the hanger rod to swing through a 30 degree arc before contacting the hole and short circuiting the spring. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Basis of Design: Mason Industries 30N.

- 3 Hangers (HA3): Double deflection neoprene-in-sheer or EPDM hangers. Units shall be complete with projected neoprene bushing to prevent steel-to-steel contact between hanger box and hanger rod. Average static deflection shall be not less than 0.4 inches. Basis of Design: Mason Industries HD.

3 EXECUTION

- 3.1 Install vibration isolation devices for the duty indicated and for ease of inspection, adjustment, and proper operation. Install in accordance with the manufacturer's written instructions and coordinate with shop drawings of supported equipment.
- 3.2 All connections to fixtures and equipment shown on the drawings shall be considered diagrammatic unless otherwise indicated by detail. The actual connections shall be made to fully suit the requirements of each case and adequately provide for expansion and servicing.
- 3.3 Piping, ductwork and conduit shall not be suspended from one another or physically contact one another. Vibrating systems shall be kept free from non-vibrating systems.
- 3.4 Equipment Mountings:
- 3.4.1 Unless otherwise shown or specified, all floor-mounted equipment shall be set on housekeeping equipment bases. Refer to Division-20 section "Supports, Anchors, and Seals".
- 3.4.2 No equipment unit shall bear directly on vibration isolators unless its own frame is suitably rigid to span between isolators, and such direct support is approved by the equipment manufacturer. All support frames shall be sufficiently stiff and rigid so as to prevent distortion and misalignment of components installed thereon.
- 3.4.3 Align equipment mountings for a free, plumb installation. Isolators that are binding, offset or fully compressed will not be accepted.
- 3.5 Hangers:
- 3.5.1 Position vibration isolation hangers so that hanger housing may rotate a full 360 degrees without contacting any object.
- 3.5.2 Install steel angles, channels, rods and fasteners to level equipment, piping or ductwork and to evenly distribute the supported weight.
- 3.6 Connections of Ducts: Ducts shall be connected to fan intakes and discharges by means of flexible connectors in accordance with Division-21 section "Ductwork Accessories" so that all vibrating equipment is fully isolated.

END OF SECTION

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SECTION 20H

SUPPORTS, ANCHORS, AND SEALS

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-20 Basic Materials and Methods section, and is a part of each Division-20, 21, & 22 section making reference to or requiring supports, anchors, and seals specified herein.
- 1.3 Extent of supports, anchors, and seals required by this section is indicated on drawings and/or specified in other Division-20, 21, & 22 sections.
- 1.4 Code Compliance: Comply with applicable codes pertaining to product materials and installation of supports, anchors, and seals.
- 1.5 MSS Standard Compliance:
 - 1.5.1 Provide pipe hangers and supports of which materials, design, and manufacture comply with ANSI/MSS SP-58.
 - 1.5.2 Select and apply pipe hangers and supports, complying with MSS SP-69.
 - 1.5.3 Fabricate and install pipe hangers and supports, complying with MSS SP-89.
 - 1.5.4 Terminology used in this section is defined in MSS SP-90.
- 1.6 UL Compliance: Provide products which are Underwriters Laboratories listed .

2 PRODUCTS

- 2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide supports and hangers by Grinnel, Michigan Hanger Company, B-Line Systems, or approved equal.
- 2.2 Horizontal-Piping Hangers and Supports: Except as otherwise indicated, provide factory-fabricated horizontal-piping hangers and supports complying with ANSI/MSS SP-58, of one of the following MSS types listed, selected by Installer to suit horizontal-piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Use only one type by one manufacturer for each piping service. Select size of hangers and supports to exactly fit pipe size for bare piping, and to exactly fit around piping insulation with saddle or shield for insulated piping. Provide copper-plated hangers and supports for copper-piping systems.
 - 2.2.1 Adjustable Steel Clevises: MSS Type 1.
 - 2.2.2 Steel Double Bolt Pipe Clamps: MSS Type 3.
 - 2.2.3 Adjustable Steel Band Hangers: MSS Type 7.

- 2.2.4 Steel Pipe Clamps: MSS Type 4.
- 2.2.5 Pipe Stanchion Saddles: MSS Type 37, including steel pipe base support and cast-iron floor flange.
- 2.2.6 Single Pipe Rolls: MSS Type 41.
- 2.2.7 Adjustable Roller Hanger: MSS Type 43.
- 2.2.8 Pipe Roll Stands: MSS Type 44 or Type 47.
- 2.3 Vertical-Piping Clamps: Except as otherwise indicated, provide factory-fabricated vertical-piping clamps complying with ANSI/MSS SP-58, of one of the following MSS types listed, selected by Installer to suit vertical piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Select size of vertical piping clamps to exactly fit pipe size of bare pipe. Provide copper-plated clamps for copper-piping systems.
 - 2.3.1 Two-Bolt Riser Clamps: MSS Type 8.
 - 2.3.2 Four-Bolt Riser Clamps: MSS Type 42.
- 2.4 Hanger-Rod Attachments: Except as otherwise indicated, provide factory-fabricated hanger-rod attachments complying with ANSI/MSS SP-58, of one of the following MSS types listed, selected by Installer to suit horizontal-piping hangers and building attachments, in accordance with MSS SP-69 and manufacturer's published product information. Use only one type by one manufacturer for each piping service. Select size of hanger-rod attachments to suit hanger rods. Provide copper-plated hanger-rod attachments for copper-piping systems.
 - 2.4.1 Steel Turnbuckles: MSS Type 13.
 - 2.4.2 Malleable Iron Sockets: MSS Type 16.
- 2.5 Building Attachments: Except as otherwise indicated, provide factory-fabricated building attachments complying with ANSI/MSS SP-58, of one of the following MSS types listed, selected by Installer to suit building substrate conditions, in accordance with MSS SP-69 and manufacturer's published product information. Select size of building attachments to suit hanger rods.
 - 2.5.1 Center Beam Clamps: MSS Type 21.
 - 2.5.2 C-Clamps: MSS Type 23.
 - 2.5.3 Malleable Beam Clamps: MSS Type 30.
 - 2.5.4 Side Beam Brackets: MSS Type 34.
 - 2.5.5 Concrete Inserts: MSS Type 18.

- 2.6 Saddles and Shields: Except as otherwise indicated, provide saddles or shields under piping hangers and supports, factory-fabricated, for all insulated piping. Size saddles and shields for exact fit to mate with pipe insulation.
- 2.6.1 Protection Shields: MSS Type 40; of length recommended by manufacturer to prevent crushing of insulation.
- 2.6.2 Protection Saddles: MSS Type 39; use with rollers, fill interior voids with segments of insulation matching adjoining insulation.
- 2.7 Miscellaneous Materials:
 - 2.7.1 Metal Framing: Provide products complying with NEMA STD ML 1.
 - 2.7.2 Steel Plates, Shapes and Bars: Provide products complying with ANSI/ASTM A 36.
 - 2.7.3 Cement Grout: Portland cement (ANSI/ASTM C 150, Type I or Type III) and clean uniformly graded, natural sand (ANSI/ASTM C 404, Size No. 2). Mix at a ratio of 1.0 part cement to 3.0 parts sand, by volume, with minimum amount of water required for placement and hydration.
 - 2.7.4 Heavy-Duty Steel Trapezes: Fabricate from steel shapes or continuous channel struts selected for loads required; weld steel in accordance with AWS standards.

3 EXECUTION

3.1 Preparation

- 3.1.1 Proceed with installation of hangers, supports and anchors only after required building structural work has been completed in areas where the work is to be installed. Correct inadequacies including (but not limited to) proper placement of inserts, anchors and other building structural attachments.
- 3.1.2 Prior to installation of hangers, supports, anchors and associated work, Installer shall meet at project site with Contractor, installer of each component of associated work, and installers of other work requiring coordination with work of this section for purpose of reviewing material selections and procedures to be followed in performing the work in compliance with requirements specified.

3.2 Installation of Building Attachments:

- 3.2.1 Install building attachments at required locations within concrete or on structural steel for proper piping support. Space attachments within maximum piping span length indicated in MSS SP-69. Install additional building attachments where support is required for additional concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten insert securely to forms. Where concrete with compressive strength less than 2500 psi is indicated, install reinforcing bars through openings at top of inserts.
- 3.2.2 In areas of work requiring attachments to existing concrete, use self drilling rod inserts, Phillips Drill Co., "Red-Head" or equal.

3.3 Installation of Hangers and Supports:

- 3.3.1 General: Install hangers, supports, clamps and attachments to support piping properly from building structure; comply with MSS SP-69. Arrange for grouping of parallel runs of horizontal piping to be supported together on trapeze type hangers where possible. Install supports with maximum spacings complying with MSS SP-69 or as listed herein, whichever is most limiting. Where piping of various sizes is to be supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe. Do not use wire or perforated metal to support piping, and do not support piping from other piping.
 - 3.3.1.1 Horizontal steel pipe and copper tube 1-1/4" diameter and smaller: support on 6 foot centers.
 - 3.3.1.2 Horizontal steel pipe and copper tube 1-1/2" diameter and larger: support on 10 foot centers.
 - 3.3.1.3 Vertical steel pipe and copper tube: support at each floor.
 - 3.3.1.4 Plastic pipe: support in accordance with manufacturer's recommendations.
 - 3.3.1.5 Horizontal cast iron pipe inside building: support each length of pipe (at the joint).
 - 3.3.1.6 Vertical cast iron pipe: support at each floor and at the base.
 - 3.3.1.7 Fire protection piping: support in accordance with NFPA 13.
- 3.3.2 Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers and other accessories.
- 3.3.3 Paint all black steel hangers with black enamel. Galvanized steel and copper clad hangers do not require paint.
- 3.3.4 Prevent electrolysis in support of copper tubing by use of hangers and supports which are copper plated, or by other recognized industry methods.
- 3.3.5 Provision for Movement:
 - 3.3.5.1 Install hangers and supports to allow controlled movement of piping systems and to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.
 - 3.3.5.2 Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.
 - 3.3.5.3 Pipe Slopes: Install hangers and supports to provide indicated pipe slopes, and so that maximum pipe deflections allowed by ANSI B31 are not exceeded.
- 3.3.6 Insulated Piping: Comply with the following installation requirements.

- 3.3.6.1 Shields: Where low-compressive-strength insulation or vapor barriers are indicated, install coated protective shields.
- 3.3.6.2 Clamps: Attach clamps, including spacers (if any), to piping with clamps projecting through insulation; do not exceed pipe stresses allowed by ANSI B31.
- 3.4 Installation of Anchors:
 - 3.4.1 Install anchors at proper locations to prevent stresses from exceeding those permitted by ANSI B31, and to prevent transfer of loading and stresses to connected equipment.
 - 3.4.2 Fabricate and install anchors by welding steel shapes, plates and bars to piping and to structure. Comply with ANSI B31 and with AWS standards.
 - 3.4.3 Anchor Spacings: Where not otherwise indicated, install anchors at ends of principal pipe-runs, at intermediate points in pipe-runs between expansion loops and elbows. Make provisions for preset of anchors as required to accommodate both expansion and contraction of piping.
 - 3.4.4 Where expansion compensators are indicated, install anchors in accordance with expansion unit manufacturer's written instructions to limit movement of piping and forces to maximums recommended by manufacturer for each unit.
- 3.5 Equipment Bases:
 - 3.5.1 Provide concrete housekeeping bases for all floor mounted equipment furnished as part of the work of Division 22. Size bases to extend minimum of 4" beyond equipment base in any direction; and 4" above finished floor elevation. Construct of reinforced concrete, roughen floor slab beneath base for bond, and provide steel rod anchors between floor and base. Locate anchor bolts using equipment manufacturer's templates. Chamfer top and edge corners.
 - 3.5.2 Provide structural steel stands to support equipment not floor mounted or hung from structure. Construct of structural steel members or steel pipe and fittings. Provide factory-fabricated tank saddles for tanks mounted on steel stands. Prime and paint with black enamel.

END OF SECTION

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SECTION 20I

MECHANICAL IDENTIFICATION

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-20 Basic Mechanical Materials and Methods section, and is part of each Division-20, 21, & 22 section making reference to or requiring identification devices specified herein.
- 1.3 Extent of mechanical identification work required by this section is indicated on drawings and/or specified in other Division-20, 21, & 22 sections.
- 1.4 Refer to Division-26 sections for identification requirements of electrical work; not work of this section.
- 1.5 Refer to other Division-21 sections for identification requirements for controls; not work of this section.
- 1.6 Codes and Standards: Comply with ANSI A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.

2 PRODUCTS

- 2.1 General: Provide manufacturer's standard products of categories and types required for each application as referenced in other Division-20, 21, & 22 sections. Where more than single type is specified for application, selection is Installer's option, but provide single selection for each product category.
- 2.2 Painted Identification Materials
 - 2.2.1 Stencils: Standard fiberboard stencils, prepared for required applications with letter sizes generally complying with recommendations of ANSI A13.1 for piping and similar applications, but not less than 1-1/4" high letters for ductwork and not less than 3/4" high letters for access door signs and similar operational instructions.
 - 2.2.2 Stencil Paint: Standard exterior type stenciling enamel; black, except as otherwise indicated; either brushing grade or pressurized spray-can form and grade.
 - 2.2.3 Identification Paint: Standard identification enamel.
- 2.3 Plastic Pipe Markers
 - 2.3.1 Pressure-Sensitive Type: Provide manufacturer's standard pre-printed, permanent adhesive, color-coded, pressure-sensitive vinyl pipe markers.
 - 2.3.1.1 Lettering: Manufacturer's standard pre-printed nomenclature which best describes piping system in each instance, as selected by Architect/Engineer in cases of variance with name as shown or specified.

2.3.1.2 Arrows: Print each pipe marker with arrows indicating direction of flow, either integrally with piping system service lettering (to accommodate both directions), or as separate unit of plastic.

2.4 Valve Tags:

2.4.1 Brass Valve Tags: Provide 19-gage polished brass valve tags with stamp-engraved piping system abbreviation in 1/4" high letters and sequenced valve numbers 1/2" high, and with 5/32" hole for fastener. Provide 1-1/2" diameter tags, except as otherwise indicated.

2.4.2 Plastic Laminate Valve Tags: Provide manufacturer's standard 3/32" thick engraved plastic laminate valve tags, with piping system abbreviation in 1/4" high letters and sequenced valve numbers 1/2" high, and with 5/32" hole for fastener. Provide 1-1/2" square black tags with white lettering, except as otherwise indicated.

2.5 Engraved Plastic-Laminate Signs:

2.5.1 General: Provide engraving stock melamine plastic laminate, in the sizes and thicknesses indicated, engraved with engraver's standard letter style a minimum of 3/4" tall and wording indicated, punched for mechanical fastening except where adhesive mounting is necessary because of substrate.

2.5.2 Thickness: 1/16" for units up to 20 sq. in. or 8" length; 1/8" for larger units.

2.5.3 Fasteners: Self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate the substrate.

2.6 Stamped Nameplates: Provide equipment manufacturer's standard stamped nameplates for motors, AHUs, pumps, etc.

3 EXECUTION

3.1 Coordination: Where identification is to be applied to surfaces which require insulation, painting or other covering or finish, including valve tags in finished mechanical spaces, install identification after completion of covering and painting. Install identification prior to installation of acoustical ceilings and similar removable concealment.

3.2 Ductwork Identification:

3.2.1 General: Identify air supply, return, exhaust, intake and relief ductwork with stenciled signs and arrows, showing ductwork service and direction of flow, in black or white.

3.2.2 Location: In each space where ductwork is exposed, or concealed only by removable ceiling system, locate signs near points where ductwork originates or continues into concealed enclosures, and at 50' spacings along exposed runs.

3.2.3 Access Doors: Provide stenciled signs on each access door in ductwork and housings, indicating purpose of access (to what equipment) and other maintenance and operating instructions, and appropriate and procedural information.

3.3 Piping System Identification:

- 3.3.1 General: Install pipe markers of one of the following types on each system indicated to receive identification, and include arrows to show normal direction of flow:
 - 3.3.1.1 Plastic pipe markers.
 - 3.3.1.2 Stenciled markers, black or white for best contrast.
- 3.3.2 Locate pipe markers as follows wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces and exterior non-concealed locations.
 - 3.3.2.1 Near each valve and control device.
 - 3.3.2.2 Near each branch, excluding short take-offs for fixtures and terminal units; mark each pipe at branch, where there could be question of flow pattern.
 - 3.3.2.3 Near locations where pipes pass through walls, floors, ceilings, or enter non-accessible enclosures.
 - 3.3.2.4 At access doors, manholes and similar access points which permit view of concealed piping.
 - 3.3.2.5 Near major equipment items and other points of origination and termination.
 - 3.3.2.6 Spaced intermediately at maximum spacing of 50' along each piping run, except reduce spacing to 25' in congested areas of piping and equipment.
 - 3.3.2.7 On piping above removable acoustical ceilings, except omit intermediately spaced markers.
- 3.3.3 The following piping shall be color-coded where exposed in mechanical and electrical rooms by completely painting the piping with the indicated color. Use standard colors where exposed in finished spaces. Use standard identification methods in concealed areas.

Gas Piping-Yellow

- 3.4 Valve Identification: Provide coded valve tag on every valve, cock and control device in each piping system; exclude check valves, valves within factory-fabricated equipment units, plumbing fixture faucets, convenience and lawn-watering hose bibs, and shut-off valves at plumbing fixtures, HVAC terminal devices and similar rough-in connections of end-use fixtures and units. Coordinate code with operating instructions.
- 3.5 Valve Charts: Provide framed, glass covered valve charts in each mechanical room. Identify coded valve number, valve function, and valve location for each valve.
- 3.6 Mechanical Equipment Identification: Install engraved plastic laminate sign on a vertical surface on or near each major item of mechanical equipment and each operational device. Label shall indicate type of system and area served. Provide signs for the following general categories of equipment and operational devices:

- 3.6.1 Main control and operating valves, including safety devices.
- 3.6.2 Meters, gauges, thermometers and similar units.
- 3.6.3 Heat exchangers, coils, evaporators, cooling towers, heat recovery units and similar equipment.
- 3.6.4 Fans, blowers, primary balancing dampers and VAV boxes.
- 3.6.5 HVAC air handlers and fan coil units.
- 3.6.6 Air conditioning indoor and outdoor units.
- 3.7 Stamped Nameplates: Equipment manufacturers to provide standard stamped nameplates on all major equipment items such as motors, pumps, AHUs, etc. Where motors are hidden from view (within equipment casing, or otherwise not easily accessible, etc.), the equipment supplier shall furnish a duplicate motor data nameplate to be affixed to the equipment casing in an easily visible location, unless data is already included on the equipment nameplate.]
- 3.8 Adjusting and Cleaning:
 - 3.8.1 Adjusting: Relocate any mechanical identification device which has become visually blocked by work of this division or other divisions.
 - 3.8.2 Cleaning: Clean face of identification devices, and glass frames of valve charts.

END OF SECTION

SECTION 20J

ACCESS DOORS

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-20 Basic Mechanical Materials and Methods section, and is part of each Division-20, 21, & 22 section making reference to or requiring access panels specified herein.
- 1.3 Approval Submittals:
- 1.3.1 Product Data: When required by other Division-20, 21, & 22 sections, submit product data for access doors. Submit with Division-20, 21, & 22 section using access doors, not as a separate submittal. Include rating data.
- 1.4 O&M Data Submittals: Submit a copy of approval submittal. Include this data in O&M Manuals.

2 PRODUCTS

- 2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide access doors by Acudor, Milcor, Jay R. Smith, Zurn, BOICO, Elmdor, or approved equal.
- 2.2 General: Where floors, walls and ceilings must be penetrated for access to mechanical work, provide types of access doors indicated. Furnish sizes indicated or, where not otherwise indicated, furnish adequate size for intended and necessary access. Furnish manufacturer's complete units, of type recommended for application in indicated substrate construction, in each case, complete with anchorages and hardware.
- 2.3 Access Door Construction: Except as otherwise indicated, fabricate wall/ceiling door units of welded steel construction with welds ground smooth; 16-gauge frames and 14-gauge flush panel doors; 175° swing with concealed spring hinges; flush screw-driver-operated cam locks; factory-applied rust-inhibitive prime-coat paint finish.
- 2.4 Locks: Where indicated, provide flat pass key type unless otherwise indicated, 2 keys.
- 2.5 Fire Rated Access Doors: Where required furnish with 20-gauge insulated sandwich panel, automatic closing mechanism, cylinder type lock (self-latching with inside release mechanism), and continuous concealed steel hinge pin. Access doors shall carry the UL 1-½ hour "B" label.
- 2.6 Insulated Access Doors: Provide 1.0" double wall insulated, hinged access doors. Provide 20 gauge satin coat steel door panels with 0.060" extruded aluminum door panel frames and 0.080" extruded aluminum flanged frame. Provide 0.75 PCF fiberglass insulation sandwiched between inner and outer panel. Provide extruded EDPM or closed cell neoprene draft seal gasket, zinc plated steel continuous hinge. Provide dual acting compression lever type handles, operable from either side of the

door. Provide 2 handles for doors 48" tall or less. Provide 3 handles for doors over 48" tall.

3 EXECUTION

- 3.1 Access doors shall be installed to operate and service all mechanical equipment including valves, dampers, duct access panels, and other items requiring maintenance that are concealed above or behind finished construction. Access doors shall be installed in walls, chase and floors as necessary, but are not required in accessible suspended ceiling systems. Access doors shall have factory applied protective phosphate coating and baked enamel primer suitable for field painting.
- 3.2 Access doors shall be installed by the Division installing the substrate construction. However, responsibility for furnishing and determining location of access doors is part of this Division's work. The style of access door shall be suitable for construction into which installed.
- 3.3 Access doors shall be sized and located as required to provide proper maintenance and service access in accordance with the manufacturer's recommendations and code authority requirements for all devices and equipment.

END OF SECTION

SECTION 20K

TESTING, CLEANING, AND STERILIZATION OF PIPING SYSTEMS

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-20 Basic Mechanical Materials and Methods section, and is part of each Division-20, 21, & 22 section making reference to or requiring the testing and other procedures specified herein.
- 1.3 Notify the Architect/Engineer when system tests are ready to be witnessed at least 24 hours prior to the test.
- 1.4 All materials, test equipment, and devices required for cleaning, testing, sterilizing or purging shall be provided by the Contractor.

2 PRESSURE TESTS

- 2.1 General: Provide temporary equipment for testing, including pump and gauges. Test piping systems before insulation is installed wherever feasible, and remove control devices before testing. Test each natural section of each piping system independently but do not use piping system valves to isolate sections where test pressure exceeds valve pressure rating. Fill each section with indicated medium and pressurize for indicated pressure and time.
- 2.2 Required test period is four hours.
- 2.3 No piping, fixtures, or equipment shall be concealed or covered until they have been tested. The contractor shall apply each test and ensure that it is satisfactory for the period specified before calling the Architect/Engineer to observe the test. Test shall be repeated upon request to the satisfaction of those making the inspection.
- 2.4 Observe each test section for leakage at the end of the test period. Test fails if leakage is observed or if pressure drop exceeds 5% of the test pressure.
- 2.5 Check of systems during application of test pressures should include visual check for water leakage and soap bubble or similar check for air and nitrogen leakage.
- 2.6 During heating and cooling cycles, linear expansion shall be checked at all elbows and expansion joints for proper clearance.
- 2.7 Repair piping systems sections which fail required piping test. Disassemble and re-install using new materials to extent required to overcome leakage. Do not use chemicals, stop-leak compounds, mastics, or other temporary repair methods.
- 2.8 Pressure Test Requirements:
 - 2.8.1 Soil, Waste, and Vent Test all piping within the building with a 10 foot head of water. Test piping in sections so that all joints are tested. Provide test tees as required.

2.8.2 Domestic Water: Perform hydrostatic test on all piping within the building at twice the normal static pressure at service point, but not less than 100 psig. Once tested, flush out piping and leave under pressure of the supply main or 40 psig for the balance of the construction period.

2.8.3 Gas: Test with air or nitrogen at 150% of normal working pressure, but not less than 25 psig. The test and check for leaks shall be in accordance with NFPA-54.

3 CLEANING AND STERILIZATION

3.1 General: Clean exterior surfaces of installed piping systems of superfluous materials, and prepare for application of specified coatings (if any). Flush out piping systems with clean water or blowdown with air before proceeding with required tests. Inspect each run of each system for completion of joints, supports and accessory items.

3.2 Flush and drain all water systems at least three times. Reverse flush systems from smallest piping to largest piping. Replace startup strainers with operating strainers.

3.3 Blowdown all gas systems with air or nitrogen (at a rate of flow exceeding design) at least three times or until no residue shows at each outlet. Reverse blowdown systems from smallest piping to largest piping.

3.4 Sterilization of Domestic Water Systems:

3.4.1 Prerequisites: All new hot and cold water piping installed (complete), all fixtures connected, system flushed out, and system filled with water.

3.4.2 The shut off valve at the point of connection shall be closed, all fixture outlets opened slightly, and a sterilizing solution shall be introduced at a manifold connection installed by the Contractor at the point of connection.

3.4.3 The solution shall contain 50 parts per million of available chlorine. The chlorinating material shall be either liquid chlorine or calcium hypochlorite. The solution shall be allowed to stand in the system for at least eight hours after which the entire system shall be flushed.

3.4.4 After final flushing, all aerators shall be removed, cleaned, and reinstalled. After final flush the residual chlorine shall not exceed 0.2 parts per million.

3.4.5 The Architect/Engineer shall be notified 24 hours prior to the procedure so that it can be witnessed.

3.4.6 Provide sampling and certified report by an independent testing lab. Provide written Health Department approval of disinfection samples.

3.5 Fuel Gas: Purge all fuel gas systems in accordance with NFPA 54.

END OF SECTION

SECTION 20L

EXCAVATION & BACKFILL

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-20 Basic Mechanical Materials and Methods section, and is part of each Division-20, 21, & 22 section making reference to or requiring excavation and backfill specified herein.
- 1.3 Existing Utilities: Underground utilities shown were taken from old drawings. The exact location of these utilities and irrigation branches and abandoned services are not known. Use extreme caution when excavating.
- 1.4 Refer to other Division-20, 21, & 22 sections and/or drawings for specific requirements of the particular piping system being installed. Where another Division-20, 21, & 22 section or the drawings conflict with requirements of this section, the other Division-20, 21, & 22 section or the drawings shall take precedence over the general requirements herein.
- 1.5 OSHA: Contractor employee worker protection for all trenching and excavation operations shall comply with 29 CFR 1926.650 Subpart P and all current OSHA requirements.
- 1.6 Trench Safety Act: Contractor shall comply with all requirements of Florida Statutes Chapter 553, including the requirement to provide a separate line item to identify the cost to comply on a per lineal foot of trench and per square foot of shoring.

2 PRODUCTS

- 2.1 Sand: Clean, hard, uncoated grains free from organic matter or other deleterious substances. Sand for backfill shall be of a grade equal to mortar sand.
- 2.2 Gravel: Clean, well graded hard stone or gravel, free from organic material. Size range to be from No. 4 screen retentions to 1".
- 2.3 Earth: Fill free of clay, muck, stones, wood, roots or rubbish.
- 2.4 Identification Tape: Polyethylene 6 inches wide, 0.004 inches thick, continuously printed with "CAUTION" in large letters and type of pipe below.
- 2.5 Copper Identification Wire: 14-gauge.

3 EXECUTION

- 3.1 Ditching and Excavation: Shall be performed by hand wherever there is a possibility of encountering obstacles or any existing utility lines of any nature whatsoever. Where clear and unobstructed areas are to be excavated, appropriate machine excavation methods may be employed. Avoid use of machine excavators within the limits of the building lines.

- 3.2 Bedding: Excavate to bottom grade of pipe to be installed, and shape bed of undisturbed earth to contour of pipe for a width of at least 50% of pipe diameter. If earth conditions necessitate excavation below grade of the pipe, such as due to the presence of clay, muck, or roots, subcut and bring bed up to proper elevation with clean, new sand (as described in paragraph 2.1), deposited in 6" layers and tamped. Notify Architect/Engineer if subcut exceeds 12", or if bed is of an unstable nature. In this case a 6" minimum layer of gravel will be required before sand bedding begins. Submit cost proposal if the earth conditions require subcut in excess of 12" or if gravel is required to achieve proper bedding.
- 3.3 Placing: Pipe shall be carefully handled into place. Avoid knocking loose soil from the banks of the trench into the pipe bed. Rig heavier sections with nylon slings in lieu of wire rope to avoid crushing or chipping. Pipe which is handled with insulation in place, coated pipe, and jacketed pipe shall have special handling slings as required to prevent damage to the material.
- 3.4 Backfilling: Deposit clean new sand (as described in paragraph 2.1) to 6" above the pipe and tamp. Then deposit sand or earth carefully in 6" layers, maintaining adequate side support, especially on nonferrous piping materials. Compact fill in 6" layers, using mechanical means, up to the top elevation of the pipe, and in 12" layers to rough or finish grade as required. Fine grade and restore surface to original condition.
- 3.5 Special: Excavations shall be installed and maintained in satisfactory condition during the progress of the work. Subsurface structures are to be constructed in adequately sized excavations. De-watering equipment shall be installed and properly maintained where required. Shoring shall be employed in the event of unstable soil condition, and in all cases where required by OSHA regulations and necessary to protect materials and personnel from injury.
- 3.6 Identification: Install identification tape directly above all underground piping, one tape for each pipe where multiple pipes are installed. Depth of tape shall be at least 6 inches below finished grade and 24" above buried pipe. Install copper wire above non-metallic pipes.
- 3.7 Depth of Cover: Minimum cover for underground piping is two feet unless indicated otherwise.

END OF SECTION

SECTION 21C

REFRIGERANT PIPING

PART 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.
- 1.2 Division 21 Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of refrigerant piping work is indicated on drawings and schedules, and by requirements of this section.
- 1.4 Refer to other Division 21 sections for insulation of refrigerant piping; not work of this section.
- 1.5 Codes and Standards:
- 1.5.1 ANSI Compliance: Fabricate and install refrigerant piping in accordance with ANSI B31.5 "Refrigerant Piping". Extend applicable lower pressure limits to pressure below 15 psig.
- 1.5.2 ASHRAE Compliance: Fabricate and install refrigerant piping in accordance with ASHRAE 15 "Safety Code for Mechanical Refrigeration".
- 1.6 Approved Submittals:
- 1.6.1 Product Data: Submit manufacturer's technical product data for:
- Valves
 - Solenoid Valves
 - Strainers
 - Moisture-Liquid Indicators
 - Filter-Driers
 - Evaporator Pressure Regulators
 - Discharge Line Mufflers
 - Expansion Valves
- 1.7 Test Reports and Verification Submittals:
- 1.7.1 Submit brazing certificates.
- 1.8 O&M Data Submittals: Submit a copy of approval data. Submit maintenance data and parts lists for solenoid valves, evaporator pressure regulators, and expansion valves. Include all data in O&M manual.

PART 2 PRODUCTS

- 2.1 General: Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, temperature ratings, and capacities as indicated. Where not indicated, provide proper requirements. Provide materials and products complying

with ANSI B31.5 Code for Refrigeration Piping where applicable, base pressure rating on refrigerant piping system maximum design pressures. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in refrigerant piping systems. Where more than one type of materials or products are indicated, selection is Installer's option.

- 2.2 Basic Identification: Plastic pipe markers.
- 2.3 Basic Pipes and Pipe Fittings: Provide pipes and pipe fittings complying with Division 15 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings", in accordance with the following listing:
 - 2.3.1 Tube Size 4" and Smaller: Copper tube; Type ACR, hard-drawn temper; wrought-copper, solder-joint fittings; soldered joints.
 - 2.3.2 Tube Size 4" and Smaller: Copper tube; Type ACR, hard-drawn temper; wrought-copper, solder-joint fittings; brazed joints.
 - 2.3.6 Soldered Joints: Solder joints using silver-lead solder, ASTM B 32, Grade 96 TS.
 - 2.3.7 Brazed Joints: Braze joints using American Welding Society (AWS) classification BCuP-4 for brazing filler metal.
- 2.4 Basic Piping Specialties: Provide piping specialties complying Basic Mechanical Materials and Methods section "Piping Specialties".
- 2.5 Basic Support and Anchors: Provide supports and anchors complying with Division 15 Basic Materials and Methods section "Supports and Anchors".
- 2.6 Refrigerant Valve: Provide valves required for refrigeration piping systems of the following types:
 - 2.6.1 Globe Shutoff Valves: Provide forged brass, packed, back seating, winged seal cap, 300 degrees F temperature rating, 500 psi working pressure.
 - 2.6.2 Check Valves: Provide forged brass, accessible internal parts, soft synthetic seat, fully guided brass piston and stainless steel spring, 250°F temperature rating, 500 psi working pressure.
 - 2.6.3 Solenoid Valves: Provide two-way, forged brass solenoid valves, designed to conform to ARI 760, with normally closed teflon valve seat, NEMA 1 solenoid enclosure rated at 24 volt, 60 Hz. Valves shall be UL-listed with ½" conduit adapter, 250 degrees F temperature rating, and 400 psi working pressure. Provide manual operator to open valve.
 - 2.6.4 Acceptable Manufacturers: Subject to compliance with requirements, provide valves of one of the following:

Alco Controls Div.
Automatic Switch Co.
Henry Valve Co.
Parker-Hannifin Corp.
Sporlan Valve Co.

- 2.7 Refrigerant Accessories:
- 2.7.1 Refrigerant Strainers: Provide brass shell and end connections, brazed joints, monel screen, 100 mesh, UL-listed, 350 psi working pressure.
- 2.7.2 Moisture-Liquid Indicators: Provide forged brass, single port, removable cap, polished optical glass, solder connections, UL-listed, 200°F temperature rating, 500 psi working pressure.
- 2.7.3 Refrigerant Filter-Driers: Provide corrosion-resistant steel shell, steel flange ring and spring, wrought copper fittings, ductile iron cover plate with steel cap screws, built-in relief, replaceable filter-drier core, 500 psi working pressure.
- 2.7.4 Evaporator Pressure Regulators: Provide corrosion-resistant, spring loaded, stainless steel springs, pressure operated, evaporator pressure regulator, in size and working pressure indicated, with copper connections.
- 2.7.5 Refrigerant Discharge Line Mufflers: Provide discharge line mufflers as recommended by equipment manufacturer for use in service indicates, UL-listed.
- 2.7.6 Expansion Valves: Provide thermostatic expansion valves with external equalizer.
- 2.7.7 Acceptable Manufacturers: Subject to compliance with requirements, provide refrigeration accessories of one of the following:
- Alco Controls Div.
Henry Valve Co.
Parker-Hannifin Co.
Sporlan Valve Co.

PART 3 EXECUTION

- 3.1 General: Examine areas and conditions under which refrigerant piping systems materials and products are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.
- 3.2 Installation of Basic Identification: Install mechanical identification in accordance with Division 20 Basic Mechanical Materials and Methods section "Mechanical Identification".
- 3.3 Installation of Refrigerant Piping: Install refrigerant piping in accordance with Division 20 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings", and in compliance with equipment manufacturer's recommendations.
- 3.3.1 Install refrigerant piping with ¼" per foot (1%) downward slope in direction of oil return to compressor. Provide oil traps and double risers where indicated, and where required to provide oil return.
- 3.3.2 Clean refrigerant piping by swabbing with dry lint less (linen) cloth, followed by refrigerant oil soaked swab. Remove excess oil by swabbing with cloth soaked in high flash point petroleum solvent, squeezed dry.

- 3.3.3 Bleed dry nitrogen through refrigerant piping during brazing operations.
- 3.4 Installation of Piping Specialties: Install piping specialties in accordance with requirement of Division 15 Basic Mechanical Materials and Methods section “Piping Specialties”.
- 3.5 Installation of Supports and Anchors: Install supports and anchors in accordance with requirements of Division 20 Basic Mechanical Materials and Methods section “Supports and Anchors”.
- 3.6 Installation of Refrigerant Valves: Install refrigerant valves where indicated, and in accordance with manufacturer’s instructions. Remove accessible internal parts before soldering or brazing, replace after joints are completed.
 - 3.6.1 Solenoid Valves: Install in refrigerant piping as indicated with stem pointing upwards.
 - 3.6.2 Wiring of solenoid valves must be coordinated with unit control sequence. Comply with manufacturer’s recommendations.
- 3.7 Installation of Refrigerant Accessories:
 - 3.7.1 Refrigerant Strainers: Install in refrigerant piping as indicated and in accessible locations for service.
 - 3.7.2 Moisture-Liquid Indicators: Install as indicated on refrigerant liquid lines, in accessible location.
 - 3.7.3 Refrigerant Filter-Dryers: Install in refrigerant lines as indicates, and in accessible location for service. Size in accordance with manufacturer’s recommendations.
 - 3.7.4 Evaporator Pressure Regulators: Install in refrigerant suction lines or evaporator outlets as indicated. Adjust as required for proper evaporator pressure.
 - 3.7.5 Refrigerant Discharge Line Mufflers: Install as indicated, in horizontal or downflow portion of hot-gas lines, immediately after leaving compressor; not in riser.
- 3.8 Equipment Connections: Connect refrigerant piping to mechanical equipment as indicated, and comply with equipment manufacturer’s instructions where not otherwise indicated. Install flexible connections where indicated.
- 3.9 Locate and coordinate installation of access doors for all valves and devices in accordance with Division 20 Basic Mechanical Materials and Methods section “Access Doors”.
- 3.10 Refrigerant Piping Leak Test: Prior to initial operation, clean and test refrigerant piping in accordance with ANSI B31.5, “Refrigeration Piping”. Perform initial test with dry nitrogen, using soap solution to test all joints. Perform final test with 27” vacuum, and then 150 psi using a suitable tracer refrigerant and dry nitrogen, or a suitable refrigerant. Perform final leak tests with an electronic halide leak detector having a sensitivity of at least ½ ounce R-12 per year. The system shall be entirely leak-free.

- 3.11 Repair or replace refrigerant piping as required to eliminate leaks, and retest as specified to demonstrate compliance.
- 3.12 Evacuation: After completing the successful pressure test, multiple-evacuate the system. For charged condensing units, leave the compressor isolation valves shut and connect the vacuum pump to both the high and low sides. Evacuate the system to an absolute pressure of 1,500 microns. Then break vacuum to 2 psig with dry nitrogen. Repeat this process. Install the proper drier in the liquid line and evacuate the system to 500 microns. Leave vacuum pump running for at least two hours without interruption. Apply heat to pockets, elbows, and low spots in piping. Maintain system vacuum for at least 5 hours after closing the vacuum pump valve. Break vacuum with the refrigerant to be used and raise pressure to 2 psig. Do not operate compressors during the evacuation procedure.
- 3.13 Charging: After completing the successful evacuation procedure, charge refrigerant directly to the system from the original containers through a filter drier. Charge to the manufacturer's stated conditions of pressure for required temperature. Weigh the refrigerant added and record on the startup report.

END OF SECTION

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SECTION 21B

AIR-COOLED REFRIGERATION EQUIPMENT

PART 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-20 Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Approval Submittals:
 - 1.3.1 Product Data: Submit manufacturer's technical product data for condensers, including dimensions, weight, capacities, materials of construction, and installation instructions.
 - 1.3.2 Assembly Drawings: Submit manufacturer's assembly drawings showing all piping and electrical connections and all mounting requirements. Show methods of fastening and assembly of components.
- 1.4 O&M Data Submittals:
 - 1.4.1 Wiring Diagrams: Submit manufacturer's electrical requirements for power supply wiring to units. Submit manufacturer's ladder-type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory-installed and portions to be field-installed.
 - 1.4.2 Maintenance Data: Submit a copy of approved submittals. Submit maintenance data and parts list for each unit, control, and accessory; including "trouble-shooting" maintenance guide. Include all data in O&M manual.

PART 2 PRODUCTS

- 2.1 General: Provide factory-fabricated air-cooled condensers and warehouse evaporators recommended by the manufacturer for use in service indicated. Provide units of capacities indicated with features indicated. Provide units with electrical characteristics indicated.
 - 2.1.1 Standard Warranty: The manufacturer shall warranty all parts of the equipment for a period of one year from date of startup plus extended warranties as described in the following sections.
- 2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following: Bohn or approved equal.
- 2.3 Condensing Unit Features:
 - 1. Provide R-448A/R-449A air cooled scroll condensing units designed and certified for use in walk-in cooler applications above 32°F room temperature.
 - 2. Painted steel cabinet with heavy duty steel raised base with 1-1/2" legs.

3. Provide microchannel coils.
4. Provide suction service valves and receiver with fusible plug, liquid shutoff valve, charging port, and sight glass.
5. Provide scroll compressors.
6. Leak test units while being bump tested and allowed to cycle off on the high and low pressure control.
7. Factory test all electrical circuits
8. Provide encapsulated auto-reset, high and low pressure controls.
9. Provide matched fan, motor, and coil.
10. Phase loss protection for 3 phase units.

2.4.1 Refrigerant Circuit: An Electric Expansion Valve must be factory mounted on each evaporator. The Expansion valve is to be a stepper motor type with 255 steps from fully closed to fully open and operate on 24 volts from a microprocessor based controller mounted on the evaporator. The system shall be able to initiate a pump-down cycle without the need for a separate liquid line solenoid valve.

Provide factory mounted suction pressure transducer to be used in determining system suction pressures and system operating superheat.

2.5 Electrical Characteristics: Condensers and evaporators shall have electrical characteristics as listed on the drawings. Units shall contain all required starters, contactors, relays, transformers, and fuses required for proper operation.

2.6 Coils: Aluminum microchannel coils for condensing units and copper tubes with aluminum fins for evaporators.

2.6.1 Coil Warranty: Two years from date of startup.

2.7 Microprocessor Control: System is to be controlled by microprocessor based unit controller (factory mounted on the evaporator) along with temperature sensors factory mounted on the evaporator(s) and condensing unit. All the operating functions of the evaporator(s) and the condensing unit must be controlled by the Controller except for compressor pressure safety controls. All system controls must be factory mounted, factory tested and factory preset to most popular defaults.

Control circuit voltage is to be supplied from 24 volt transformer which is factory mounted on each evaporator. The compressor contactor must have proper voltage controlling coils. Any evaporator fan motor or defrost heater relays/contactors must be factory mounted on the evaporator. The evaporator(s), the microprocessor based controller and the condensing unit must all be UL approved.

Electrical wiring between the evaporator(s) and the condensing unit must be 24 Volt 18 gauge thermostat wire type requiring only 5 leads. Power wiring for the evaporator(s) and condensing unit can be independent of each other.

The microprocessor based controller must allow the monitoring and/or adjusting of the following:

- Defrost Type - (air or electric)
- Refrigerant Type - (R-448A/R-449A)

- Box Temperature
 - by the onboard temperature control (-30°F to +70°F)
- System Superheat - selectable from 4°F to 20°F
- Number of Defrosts per day - Elapsed time
 - selectable from 1,2,3,4,5,6,8,10 or 12 per day
- Defrost Fail-Safe time - selectable from 10 to 200 minutes
- Defrost Termination Temperature - selectable from 40°F to 100°F
- Defrost Delayed Start timer - (1/2 to 23 1/2 hours)
- High Alarm Temperature (-40°F to +90°F)
- Low Alarm Temperature (-40°F to +90°F)
- Alarm Time Duration (2 to 120 minutes)
- Set °F/°C Display

Defaults must be included in the non-volatile program coding of the controller for all of the setpoints listed above.

Each evaporator controller must have a LED display by which normal operational modes and values along with any faults/errors will be indicated using 3 alpha-numeric output characters.

A set of dry contacts must be provided, on the controller, for use in connecting an alarm device (visual, audible or sensible), which will close when there is a fault.

The system must not require the use of an electro-mechanical time clock, separate room thermostat, separate liquid line solenoid valve for system pumpdown, or separate defrost termination/fan delay controls. An outdoor ambient temperature sensor must be included and factory mounted on the condensing unit.

In the event of a power failure the expansion should close and all programmed settings must be retained. When power is returned the system should start and operate normally, including the initiation of defrost at the scheduled times.

The ability to connect multiple evaporators to a single condensing unit must be standard with each evaporator having the ability to be the 'master' system controller. Control wiring connection between the multiple evaporators must be via 24 Volt 18 gauge thermostat wiring.

Provide one microprocessor controller for each cooler or freezer system.

- 2.7.1 Accessory: Input terminals and display capabilities to be provided for use of spare sensor to monitor user defined temperatures (such as product temperature.)

Provide remote controller/terminal option to allow for programming and monitoring of the refrigeration system, remotely for up to 1000 ft away using 24 volt (18 ga.) wiring. Coordinate final location with owner and engineer. It must also have the ability to indicate

operational modes, faults and alarms.

2.7.2 Warranty: The Microprocessor based Controller, Remote Controller, the Electric Expansion Valve and the Temperature Sensors shall have three (3) year part warranty against any manufacturing or workmanship defects. This covers 36 months from the date of installation or 42 months from the date of shipment from the manufacturer according to whichever occurs first.

2.8 ECM Fan Motor Warranty: The manufacture shall warranty ECm

PART 3 EXECUTION

3.1 Install the condensers on concrete housekeeping pads in accordance with the manufacturer's printed instructions and project details. Verify required clearances for air flow and maintenance are available.

3.2 Connect to refrigerant piping, test, evacuate, and charge in accordance with Division-20 section "Refrigerant Piping".

3.3 Startup and test under the supervision of a trained manufacturer's representative.

END OF SECTION

SECTION 21C

SPLIT SYSTEM AIR CONDITIONING UNITS

1 GENERAL

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

1.2 Division-20 Basic Mechanical Materials and Methods sections apply to work of this section.

1.3 Refer to other Division-21 sections for testing, adjusting, and balancing of air conditioning units (AHUs).

1.4 Approval Submittals:

1.4.1 Product Data: Submit manufacturer's technical product data, including dimensions, ratings, electrical characteristics, weight, capacities, materials of construction, and installation instructions.

Split system units
Vibration Isolation

1.5 O&M Data Submittals: Submit manufacturer's maintenance data including parts lists. Include these data, a copy of approval submittals, product data, and wiring diagrams in O&M manual.

2 PRODUCTS

2.1 Quality Assurance:

2.1.1 Provide units tested by UL, ARL or ETL.

2.1.2 Construct refrigeration system in accordance with ASHRAE 15 (ANSI B 9.1) "Safety Code for Mechanical Refrigeration".

2.1.3 Test and rate AHUs in accordance with the applicable ARI standards and provide certified rating seal. Sound test and rate units in accordance with ARI 270.

2.1.4 Provide units with an EER or SEER that meets the Florida Energy Efficiency Code and the schedules on the drawings.

2.1.5 Acceptable Manufacturers: Subject to compliance with requirements provide units by: Carrier, Trane, Lennox, or approved equal.

2.2 General:

2.2.1 Units shall be factory-assembled, wired and tested. All controls shall be factory-adjusted and preset to the design conditions.

2.2.2 Casings: Construct of heavy gauge steel (or aluminum) formed panels rigidly reinforced and braced. Each unit shall be provided with removable panels to permit

the unit (including fans and compressors) to be properly maintained and serviced. Entire casing shall be painted with factory-applied finish. Casing for outdoor units shall be provided with weatherproof construction with all seams bolted. Provide stainless steel hardware.

2.2.3 Heat Pump Condensing Unit Supports: Provide individual concrete pad 4" larger than the unit on all sides.

2.3 Condensing Unit:

2.3.1 Condenser Fans and Drives: Fan shall of rustproof construction: hot-dipped galvanized steel, stainless steel or aluminum. Unit shall have a variable speed motor suitable for the duty indicated. Provide a close fretwork galvanized steel or non-ferrous fan and guard. Motors shall be the permanently lubricated type, resiliently mounted.

2.3.2 Condenser Coil: Construct of copper nonferrous tubes and nonferrous fins. Provide inlet guard to protect condenser fins.

2.3.3 Compressor: Shall be scroll, hermetic, or semi-hermetic reciprocating design for R410a refrigerant with vibration isolation. Each compressor shall have separate refrigerant circuit. Motors shall be ball bearing, high starting torque, low starting current type for compressor service. Compressors shall not produce objectionable noise or vibration inside the building. Compressors shall have five (5) year warranty. Provide dual compressor machines if scheduled.

2.3.4 Service Valves: Provide for high and low pressure readings.

2.4 Evaporator Unit:

2.4.1 Interior of unit shall be thermally and acoustically insulated with minimum R=4.2 insulation. Provide removable panels to permit the unit to be properly serviced and maintained.

2.4.2 The evaporator shall include centrifugal fan, fan motor, direct drive ECM fan motors and lubricated bearings. Motors shall be high efficiency type. Provide cooling coils constructed of copper nonferrous tubes and aluminum fins. Filters and coils shall be selected for a maximum face velocity of 500 fpm. Provide thermal expansion valve, sight glass, refrigerant drier, strainer, controls and other necessary devices for a completely automatic unit.

2.4.3 Each unit shall be equipped with sloped IAQ drain pans under the entire evaporator coil to prevent condensate carry-over.

2.5 Electric Heater Section:

2.5.1 Provide electric heating coils controlled by one or more magnetic contactors. Three phase coils shall be wired for balanced current in each wire, if possible. Furnish and install necessary overheating and air flow controls to meet the requirements of the National Electric Code. Provide built-in air flow switch and heater interlock relay.

2.5.2 Heaters shall be factory mounted and wired with all required fuses and contactors to provide single point connection.

2.6 Unit Controls:

2.6.1 All safety and operational controls shall be factory wired.

2.6.2 Safety and Operational Control Features:

Internal compressor overtemperature protection.

Crankcase heaters.

Individual motor overcurrent protection.

High pressure cutout.

Low pressure cutout.

Anti-recycle timer (5 minute)

Timer-type defrost control.

Liquid line solenoid.

2.7 Refrigerant Piping:

2.7.1 Copper tubing ¾" and smaller: Type ACR, hard-drawn temper tubing; wrought-copper, solder-joint fitting; brazed joints.

2.7.2 Copper tubing 7/8" – 4-1/8": Type ACR, hard-drawn temper tubing; wrought-copper, solder-joint fitting; brazed joints.

2.7.3 Silver solder material: Silver solder bearing at least 15% silver; Sil Fos.

2.8 Basic Vibration Isolation: Provide vibration isolation products complying with Division-20 section "Vibration Isolation" and the following list:

2.8.1 Equipment Mounting: Type EM5

3 EXECUTION

3.1 Installation: Install in accordance with producer's printed instructions. Brush out fins on all coils.

3.2 Support: Mount units on concrete housekeeping pads with manufacturer's recommended service and operating clearance.

3.3 Mount units on vibration isolation for units 5 tons and under; mount on concrete housekeeping pads and vibration isolation for units over 5 tons.

3.4 Brush out fins on all coils.

3.5 Refrigerant Piping: Comply with ANSI B31.5, "Refrigerant Piping," (except lower pressure limits below 15 psig), and ASHRAE 15 (ANSI B9.1). Make all joints carefully and neatly. Clean pipe and fittings before fluxing. Remove burrs. Braze by the sweat method using Sil Fos. Install field installed refrigerant devices and valves as required.

3.6 Testing: After job erection, or modification of factory installed piping, pressure test for leaks at 150 psig using a nominal amount of a suitable tracer refrigerant and dry nitrogen or a suitable refrigerant. Perform leak tests with an electronic halide leak

detector having a sensitivity of at least ½ ounce R-12 per year. Refrigeration piping will not be accepted unless it is gas tight.

- 3.7 Evacuation: After completing the successful pressure test, multiple-evacuate the system. Leave the compressor isolation valves shut and connect the vacuum pump to both the high and low sides. Evacuate the system to an absolute pressure of 1,500 microns. Then break vacuum to 2 psig with dry nitrogen. Repeat this process. Install the proper biflow drier in the liquid line and evacuate the system to 500 microns. Leave vacuum pump running for at least two hours without interruption. Break vacuum with the refrigerant to be used and raise pressure to 2 psig. Do not operate compressors during the evacuation procedure.
- 3.8 Charging: After completing the successful evacuation procedure, charge refrigerant directly to the system from the original containers through a filter drier. Charge to the manufacturer's stated conditions of pressure for required temperature. Weigh the refrigerant added and record on the startup report.
- 3.9 Construction Filters: Provide 2" thick 30% filters in all units during construction. After construction (but prior to the test and balance being performed) install clean final filters.
- 3.10 Cleaning: Clean tar and all other soil from housing exterior. Leave ready for Division 7, Caulking Work. Caulk around pipe sleeves.
- 3.11 Condensate Drain: Pipe trapped copper condensate drain (full size of unit outlet) to nearest floor drain or as shown on the drawings. Refer to Division-20 section "Insulation" for pipe insulation.
- 3.12 Startup: Check entire assembly for correctness of installation, alignment, and control sequencing. Start all component parts in proper sequence. Make all adjustments required to insure proper smooth quiet operation.

END OF SECTION

SECTION 21D

DUCTLESS SPLIT SYSTEM AIR CONDITIONING UNITS

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-20 Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Refer to other Division-20 sections for testing, adjusting, and balancing of units; not work of this section.
- 1.4 Approval Submittals:
 - 1.4.1 Product Data: Submit manufacturer's technical product data, including dimensions, ratings, electrical characteristics, weight, capacities, materials of construction, and installation instructions. Submit assembly-type drawings showing all piping and electrical connections and all mounting requirements. Show methods of fastening and assembly of components. Provide wiring diagrams.
- 1.5 O&M Data Submittals: Submit manufacturer's maintenance data including parts lists. Include these data, product data, and a copy of approval submittals in O&M manual.

2 PRODUCTS

- 2.1 Quality Assurance:
 - 2.1.1 Test and rate split system air conditioning units in accordance with ARI Standard 210, 240 or 360 as applicable, and provide certified rating seal.
 - 2.1.2 Construct refrigeration system of split system air conditioning units in accordance with ASHRAE 15 (ANSI B 9.1) "Safety Code for Mechanical Refrigeration".
 - 2.1.3 Provide split system air conditioning units with an SEER that meets the Florida Energy Efficiency Code and the schedule on the drawings.
 - 2.1.4 Provide split system air conditioning units that are designed, manufactured, and tested in accordance with UL or ETL requirements.
 - 2.1.5 Acceptable Manufacturers: Submit to compliance with requirements, provide units by Friedrich, Daikin, Carrier, Sanyo, Toshiba, Mitsubishi, or approved equal.
- 2.2 General:
 - 2.2.1 Casings: Construct of painted mill galvanized steel (or aluminum) formed panels rigidly reinforced and braced. Each unit shall be provided with removable panels to permit the unit (including fans and compressors) to be properly maintained and serviced.
- 2.3 Condensing Unit:

- 2.3.1 Condenser Fans and Drives: Fan shall be of rustproof construction, hot dipped galvanized steel, stainless steel or aluminum. Unit shall have weather protected totally enclosed motor. Provide a close fretwork galvanized steel or non-ferrous fan guard. Motors shall be the permanently lubricated type, resiliently mounted.
- 2.3.2 Condenser Coil: Construct of non-ferrous tubes and aluminum fins. Provide inlet guard to protect condenser fins.
- 2.3.3 Compressor: Shall be scroll or hermetic design with vibration isolation. Compressor shall not produce objectionable noise or vibration inside the building. Compressors shall have five (5) year warranty.
- 2.3.4 Service Valves: Provide for high and low pressure readings.
- 2.4 Evaporator Unit:
 - 2.4.1 Interior of unit shall be thermally and acoustically insulated with 1 inch fiberglass duct liner insulation. Provide removable panels to permit the unit to be properly serviced and maintained.
 - 2.4.2 The evaporator section shall include centrifugal fan, two-speed fan motor, and direct drive. Provide cooling coil, snap out washable filters, refrigerant drier, controls and other necessary devices for a completely automatic unit. Coils shall have copper tubes and aluminum fins. Provide automatic oscillating louver action to facilitate air distribution.
- 2.5 Controls:
 - 2.5.1 All safety and operational controls shall be factory wired.
 - 2.5.2 Provide remote microprocessor-based controls with room thermostat, timer and fan speed switch.
- 2.6 Refrigerant Piping:
 - 2.6.1 Copper tubing 3/4" and smaller: Type ACR, hard drawn temper; cast copper-alloy fittings for flared copper tubes; flared joints.
 - 2.6.2 Brazing material: Silver solder bearing at least 15% silver; Sil Fos.
- 3 EXECUTION
 - 3.1 Installation: Install in accordance with producer's printed instructions.
 - 3.2 Refrigerant Piping: Comply with ANSI B31.5, "Refrigerant Piping," (extend lower pressure limits below 15 psig), and ASHRAE 15 (ANSI B9.1). Make all joints carefully and neatly. Clean pipe and fittings before fluxing. Remove burrs. Braze by the sweat method using Sil Fos.
 - 3.3 Testing: After job erection, pressure test for leaks at 150 psig using a nominal amount of a suitable tracer refrigerant and dry nitrogen or a suitable refrigerant. Perform leak tests with an electronic halide leak detector having a sensitivity of at least 1/2 ounce

R-12 per year. Refrigeration piping will not be accepted unless it is gas tight.

- 3.4 Evacuation: After completing the successful pressure test, multiple-evacuate the system. Leave the compressor isolation valves shut and connect the vacuum pump to both the high and low sides. Evacuate the system to an absolute pressure of 1,500 microns. Then break vacuum to 2 psig with dry nitrogen. Repeat this process. Install the proper biflow drier in the liquid line and evacuate the system to 500 microns. Leave vacuum pump running for at least two hours without interruption. Break vacuum with the refrigerant to be used and raise pressure to 2 psig. Do not operate compressors during the evacuation procedure.
- 3.5 Charging: After completing the successful evacuation procedure, charge refrigerant directly to the system from the original containers through a filter drier. Charge to the manufacturer's stated conditions of pressure for required temperature. Weigh the refrigerant added and record on the startup report.
- 3.6 Cleaning: Clean tar and all other soil from housing exterior. Leave ready for Division 7, Caulking Work. Caulk around pipe sleeves.
- 3.7 Condensate Drain: Pipe trapped copper condensate drain to outside the building or to a point of disposal as shown on the drawings. Pipe shall be full size of unit outlet. Refer to Division-20 section "Insulation" for pipe insulation.
- 3.8 Startup: Check entire assembly for correctness of installation, alignment, and control sequencing. Start all component parts in proper sequence. Make all adjustments required to insure proper smooth quiet operation.

END OF SECTION

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SECTION 21E

FANS

1 **GENERAL**

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-20 Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of fan work required by this section as indicated on drawings and schedules, and by requirements of this section.
- 1.4 Coordination:
- 1.4.1 Refer to Division-7 sections for installation of prefabricated roof curbs; not work of this section. Furnishing prefabricated roof curbs is part of this section's work.
- 1.4.2 Refer to Division-21 section "Testing, Adjusting, and Balancing" for balancing of fans.
- 1.4.3 Refer to Division-21 HVAC control systems sections for control work required in conjunction with fans.
- 1.4.4 Refer to Division-26 sections for power supply wiring from power source to power connection on fans. Division-26 work will include starters, disconnects, and required electrical devices, except where specified as furnished, or factory-installed, by manufacturer.
- 1.5 Codes and Standards:
- 1.5.1 AMCA Compliance: Provide fans which have been tested and rated in accordance with AMCA standards, and bear AMCA Certified Ratings Seal.
- 1.5.2 UL Compliance: Provide fans which are listed by UL and have UL label affixed.
- 1.6 Approval Submittals:
- 1.6.1 Product Data: Submit manufacturer's technical data for fans, including specifications, capacity ratings, dimensions, weights, materials, accessories furnished, and installation instructions. Submit assembly-type drawings showing unit dimensions, construction details, methods of assembly of components, and field connection details.
- Fans
Vibration Control
- 1.7 O&M Data Submittals: Submit maintenance data and parts list for each type of fan, accessory, and control. Include these data, a copy of approved submittals, and wiring diagrams in O&M Manual.

2 **PRODUCTS**

- 2.1 General: Except as otherwise indicated, provide standard prefabricated fans of type and size indicated, modified as necessary to comply with requirements, and as required for complete installation. Provide accessories as listed in the schedule on the drawings and as described herein. Motors shall be high efficiency per Division-21 section "Motors".
- 2.2 Acceptable Manufacturers: Subject to compliance with requirements provide fans manufactured by Acme, Greenheck, Loren Cook, Penn, Carnes, or approved equal unless otherwise noted herein.
- 2.3 Centrifugal Ceiling Exhausters:
- 2.3.1 Fan Assembly: Provide steel housing, aluminum grille, backdraft damper, statically and dynamically balanced fan wheel, permanently lubricated motor with internal thermal overloads, vibration isolation and all required mounting hardware and brackets. Provide acoustically treated housing for all fans larger than 60 cfm. Mounting type shall be as indicated on the drawings or on the schedule.
- 2.3.2 Connectors: Provide adaptors, connectors, and eave elbows as required to connect fan discharges to outlets.
- 2.3.3 Outlets: Provide where shown on the drawings (or required by the installation) wall caps, vent caps, or roof jacks, each with birdscreen, to match fans and surrounding construction.
- 2.4 Vibration Isolation: Mount fans on vibration isolators in accordance with the requirements of Division-20 section "Vibration Isolation" and the following list.
- 2.4.1 Equipment Mountings: Type EM4.
- 2.4.2 Hangers: Type HA3
- 3 EXECUTION
- 3.1 General: Except as otherwise indicated or specified, install fans in accordance with manufacturer's installation instructions and recognized industry practices to insure that fans serve their intended function.
- 3.2 Coordinate fan work with work of walls, and ceilings as necessary for proper interfacing. Framing of openings, caulking, and curb installation is not work of this section.
- 3.3 Ductwork: Refer to Division-21 section "Ductwork". Connect ducts to fans in accordance with manufacturer's installation instructions. Provide flexible connections in ductwork at fans.
- 3.4 Install fans on vibration isolation equipment as required. Set level and plumb.
- 3.5 Electrical Wiring: Install electrical devices furnished by manufacturer but not specified to be factory-mounted. Furnish copy of manufacturer's wiring diagram submittal to electrical Installer. Verify that electrical wiring installation is in accordance with

manufacturer's submittal and installation requirements of Division-26 sections. Verify proper rotation direction of fan wheels. Do not proceed with equipment start-up until wiring installation is acceptable to equipment installer.

- 3.6 Remove shipping bolts and temporary supports within fans. Adjust dampers for free operation.
- 3.7 Testing: After installation of fans has been completed, test each fan to demonstrate proper operation of units at performance requirements specified. When possible, field correct malfunctioning units, then retest to demonstrate compliance. Replace units which cannot be satisfactorily corrected.
- 3.8 Cleaning: Clean factory-finished surfaces. Remove all tar and soil. Repair any marred or scratched surfaces with manufacturer's touch-up paint.

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SECTION 21F

COOKING HOOD PACKAGED SYSTEM

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-20 Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of cooking hood work required by this section is indicated on drawings and schedules, and by requirements of this section.
- 1.4 Coordination:
 - 1.4.1 Refer to Division-21 section "Testing, Adjusting, and Balancing" for balancing of fans.
 - 1.4.2 Refer to Division-26 sections for power supply wiring from power source to power connection on hoods and fans. Division-26 work will include starters, disconnects, and required electrical devices, except where specified as furnished, or factory-installed, by manufacturer. Division-26 work includes all fire alarm tie-in work.
- 1.5 Codes and Standards:
 - 1.5.1 Comply with NFPA 96 "Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment" requirements.
 - 1.5.2 Comply with NFPA 70, National Electric Code.
 - 1.5.3 UL Compliance: Provide hoods, fans, and fire extinguishing systems which are listed by UL and have UL label affixed.
 - 1.5.4 NSF Approval: Provide hoods with NSF Seal of Approval.
 - 1.5.5 Comply with NFPA 17 "Standard for Dry Chemical Extinguishing Systems" or NFPA 17A "Standard on Wet Chemical Extinguishing Systems" requirements.
 - 1.5.6 AMCA Compliance: Provide fans which have been tested and rated in accordance with AMCA standards, and bear AMCA Certified Ratings Seal.
- 1.6 Approval Submittals:
 - 1.6.1 Project Data: Submit manufacturer's technical and product data, including specifications, capacity ratings, dimensions, weights, materials, accessories furnished, and installation instructions. Show size, length, and arrangement of all piping and a description and location of all nozzles. Submit assembly-type shop drawings for fans and hoods showing unit dimensions, construction details, methods of assembly of components, and field connection details.
 - 1.6.1.1 Hoods

- 1.6.1.2 Fans
- 1.6.1.3 Fire suppression equipment
- 1.7 O&M Data Submittals:
 - 1.7.1 Wiring Diagrams: Submit manufacturer's electrical requirements for power supply wiring to hood, fans, and extinguishing systems. Submit manufacturer's ladder-type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory-installed and portions to be field-installed.
 - 1.7.2 Maintenance Data: Submit maintenance data and parts list for fans and extinguishing system, each accessory, and control. Include this data, product data, drawings, wiring diagrams and a copy of approval submittals in O&M Manual.

2 PRODUCTS

- 2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide equipment by one of the following: Greenheck, Accurex, Loren Cook, Greasemaster, Captive Aire, Duo Aire, or approved equal unless otherwise noted herein.
- 2.2 Cooking Hoods:
 - 2.2.1 General: Except as otherwise indicated, provide packaged factory-built cooking hoods of type and size indicated, modified as necessary to comply with requirements, and as required for complete installation.
 - 2.2.2 Sheetmetal: Fabricate hoods of 18-gauge sheet steel. Sheet metal shall be Type 430 stainless steel with No. 4 finish. All seams and joints shall have a liquid tight continuous external weld. All welds on stainless steel shall be ground and polished. Provide matching closure panel from top of hood to ceiling].
 - 2.2.3 Grease Filters: Provide grease filters and frames constructed of stainless steel. Grease filters shall be 2" thick with stainless steel media, frame and reinforcing, and shall be listed for use with commercial cooking equipment. Filters shall be mounted at least 18" from any heat source and be protected by baffles if required. Filters shall be tight fitting and firmly held in place, but shall be easily accessible and removable for cleaning. Mount filters at 45° angle from horizontal.
 - 2.2.4 Grease Filter Racks: Provide 20-gauge stainless steel construction with drip trays, braces, fasteners, container and all necessary fittings.
 - 2.2.5 Controls: Provide kitchen fan control center with switches for supply and exhaust fans and temperature interlock switches for all hoods. Location shall be as shown on floorplan drawings.
 - 2.2.6 Supply Plenum: Provide external air curtain supply plenum with each hood. Provide balancing dampers with locking quadrant to set supply air flow. Provide supply air registers of the type and size indicated.
 - 2.2.7 Fire Dampers: Refer to Division-21 section "Ductwork Accessories".

- 2.2.8 Lighting: Provide UL listed LED vapor proof light fixtures with nickel plated sockets and heat resistant globes.
- 2.3 Piping: Schedule 40 steel with steel, malleable, or ductile iron threaded fittings. All visible piping and fittings shall be chrome plated or stainless steel. No galvanized pipe or fittings shall be used.
- 2.4 Fire Extinguisher System:
- 2.4.1 General: Provide a UL-listed, pre-engineered, cartridge type, liquid agent or dry chemical fire suppression system designed for use with commercial cooking equipment. The system shall be from a single manufacturer and shall be complete and fully operational. Provide wall mounted tank cabinet. Hook up and testing shall be done by a factory authorized representative.
- 2.4.2 Actuation: The system shall provide automatic detection and actuation with local or remote manual actuation. Actuation shall be accomplished by a cylinder release mechanism controlled by: automatic fusible link, remote manual by mechanical pull station, or local manual by push button in the space. The system shall be capable of being tested without actual chemical discharge.
- 2.4.3 Nozzles: Nozzles shall be tested and listed for the specific applications. The number of nozzles, nozzle placement, and nozzle orifice size shall be determined by the Installer for the specific application. The system shall protect the hood, exhaust ducts, plenums, filters, and all cooking equipment under the hood.
- 2.4.4 Accessories:
- 2.4.4.1 Remote Manual Pull Station: Provide break glass type, stainless steel cable actuated pull station.
- 2.4.4.2 Electric Power Shutoff: A UL-listed, pneumatically operated switch shall be provided to shut off electrical power to all appliances under the hood on actuation of the system.
- 2.4.4.3 Fire Alarm Initiation: Provide a UL-listed pneumatic-electric switch to send a signal to the fire alarm system on actuation of the system. Provide a local audible and visual alarm that shows the system has actuated.
- 2.4.4.4 Fan Shut Down: Provide a UL-listed, semi-automatic hand reset pneumatic-electric switch to stop hood supply fan on system actuation. Exhaust fan shall only stop if required by listing of other system component.
- 2.5 Fan Package:
- 2.5.1 General: Except as otherwise indicated, provide packaged, factory-built, roof-mounted, fan package assemblies of type and size indicated, modified as necessary to comply with requirements, and as required for complete installation. The entire unit shall be accessible from the roof through hinged access doors for steam cleaning all ducts and fans from the roof. The unit shall include the following components.

- 2.5.2 Exhaust Fan: Provide heavy gauge aluminum upblast centrifugal exhaust fan with integral grease drain trough and drain fitting. Provide aluminum fan wheel, statically and dynamically balanced. Motor and drive shall be isolated from the air stream and shall be cooled by clean, outside air only. Provide high efficiency motors per Division-20 section "Motors". Provide direct drive fan mounted on vibration isolation equipment. Provide thermal barrier. Provide hinged access. The fan shall be AMCA approved and UL-listed for grease removal. Fan shall have Florida Product Approval.
- 2.5.3 Supply Fan: Provide rooftop, centrifugal, horizontal supply fan with painted, weatherproof finish. Provide aluminum fan wheel statically and dynamically balanced. Motor and drive shall be mounted on vibration isolation equipment. Provide high efficiency motors per Division-20 section "Motors". Provide direct drive fan with disconnect. Provide 18-gauge painted galvanized steel housing and angle iron support legs. Provide service access to all components. Fan shall have Florida Product Approval.
- 2.5.4 Intake: Provide supply fan intake with birdscreen and 1-inch washable aluminum filters. Maximum face velocity shall be 500 fpm. Provide motorized backdraft damper that opens and closes with supply fan operation. Intake shall be at least 10' from exhaust fan.
- 2.5.5 Curb: Furnish 12" high, roofed-over type, prefabricated, aluminum curb with integral pressure treated wood nailer and 1-inch thick rigid insulation. Provide curb extensions and sections as required to meet NFPA requirements for exhaust discharge height and supply-exhaust fan separation.
- 2.5.6 Controls: Provide prewired control center complete with: remote control station at hood, master fused disconnect switch, magnetic motor starters with thermal overloads and manual reset, fused 24 volt control transformer, relays, and wiring. The system shall be UL-listed and require single point connection for fan power. The system shall provide fully automatic operation.

3 EXECUTION

- 3.1 Install cooking hoods and fan packages as shown on the drawings, in accordance with referenced standards, and the manufacturer's written instructions.
- 3.2 Refer to Division-21 section "Metal Ductwork" for connection to supply and exhaust systems. Refer to other Division-21 sections for Ductwork Accessories and connections to preheaters.
- 3.3 Hoods shall be of sizes shown on the drawings. The depth of the canopy shall be at least 24" from the lower to upper edge. Mount cooking hoods 6'-8" above the finished floor.
- 3.4 Supports: Provide channels and rods to support hoods as shown on the drawings.
- 3.5 Piping: Seal all pipe penetration through the hood or ducts with a listed device. All fire suppression piping and nozzles shall be pre-engineered and installed in the hood as a packaged system.

- 3.6 Fire Extinguishing System: Install fire extinguishing systems in accordance with the manufacturer's printed instructions, the referenced standards (NFPA 17 or NFPA 17A), and the requirements of the authority having jurisdiction.
- 3.6.1 Piping: Install piping with a minimum of restrictions and provide for agent discharge forces, thermal expansion and contraction, and required spray patterns. Support piping securely. Test piping to ensure system is leak-free.
- 3.6.2 Accessories: Install remote manual pull station where shown on the drawings at 48" above finished floor. Coordinate with electrical installer for automatic electric power shut down, fan shut down, and fire alarm work. Shunt trip for electric power shut down, fan starters, and fire alarm work are provided by Division-26.
- 3.6.3 A manufacturer's representative shall check and test the installed system and provide a written certification that the system is fully operational and conforms to referenced standards.
- 3.7 Coordinate fan work with work of roofing, walls, and ceilings, as necessary for proper interfacing. Framing of openings, caulking, and curb installation is not work of this section.
- 3.8 Ductwork: Refer to Division-21 section "Ductwork". Connect ducts to fans in accordance with manufacturer's installation instruction.
- 3.9 Roof Curbs: Furnish roof curbs to roofing Installer for installation.
- 3.10 Electrical Wiring: Install electrical devices furnished by manufacturer but not specified to be factory-mounted. Furnish copy of manufacturer's wiring diagram submittal to electrical Installer. Verify that electrical wiring installation is in accordance with manufacturer's submittal and installation requirements of Division-26 sections. Verify proper rotation direction of fan wheels. Do not proceed with equipment start-up until wiring installation is acceptable to equipment installer.
- 3.11 Remove shipping bolts and temporary supports within fans. Adjust dampers for free operation.
- 3.12 Testing: After installation of hoods and fans has been completed, test each fan to demonstrate proper operation of units at performance requirements specified. When possible, field correct malfunctioning units, then retest to demonstrate compliance. Replace units which cannot be satisfactorily corrected.
- 3.13 Cleaning: Clean factory-finished surfaces. Remove all tar and soil. Repair any marred or scratched surfaces with manufacturer's touch-up paint.

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SECTION 21G

HVAC METAL DUCTWORK

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-20 Basic Mechanical Materials and Methods Sections apply to work of this section.
- 1.3 Extent of HVAC metal ductwork is indicated on drawings and in schedules, and by requirements of this section.
- 1.4 Refer to other Division-21 sections for exterior insulation of metal ductwork.
- 1.5 Refer to other Division-21 sections for ductwork accessories.
- 1.6 Codes and Standards:
- 1.6.1 SMACNA Standards: Comply with SMACNA's "HVAC Duct Construction Standards, Metal and Flexible" 1985 Edition for fabrication and installation of metal ductwork, unless otherwise noted.
- 1.6.2 NFPA 90A Compliance: Comply with NFPA 90A "Standard for the Installation of Air Conditioning and Ventilating Systems".
- 1.7 Approval Submittals:
- 1.7.1 Product Data: Submit manufacturer's technical product data and installation instructions for the following.
- Factory-fabricated ductwork
Sealants
Flexible duct
Spin-in fittings
Side take-off fittings
- 1.7.2 Shop Drawings: Submit scaled layout drawings of HVAC metal ductwork and fittings including, but not limited to, duct sizes, locations, elevations, and slopes of horizontal runs, wall and floor penetrations, and connections. Show interface and spatial relationship between ductwork and proximate equipment. Show modifications of indicated requirements, made to conform to local shop practice, and how those modifications ensure that free area, materials, and rigidity are not reduced.

2 PRODUCTS

2.1 Ductwork Materials:

- 2.1.1 Exposed Ductwork Materials: Where ductwork is indicated to be exposed to view in occupied spaces, provide materials which are free from visual imperfections including pitting, seam marks, roller marks, stains and discolorations, and other imperfections,

including those which would impair painting.

- 2.1.2 Galvanized Sheet Metal: Except as otherwise indicated, fabricate ductwork from galvanized sheet steel complying with ASTM A 527, lockforming quality; with G 90 zinc coating in accordance with ASTM A 525; and mill phosphatized for exposed locations. Stamp gauge and manufacturer's identification on each sheet. Break sheets so that identification is exposed.
- 2.2 Miscellaneous Ductwork Materials:
 - 2.2.1 General: Provide miscellaneous materials and products of types and sizes indicated and, where not otherwise indicated, provide type and size required to comply with ductwork system requirements including proper connection of ductwork and equipment.
 - 2.2.2 Duct Sealant: Provide non-hardening, non-migrating mastic or liquid elastic sealant, type applicable for fabrication/installation detail, as compounded and recommended by manufacturer specifically for sealing joints and seams in ductwork.
 - 2.2.3 Ductwork Support Materials: Except as otherwise indicated, provide hot-dipped galvanized steel fasteners, anchors, rods, straps, trim and angles for support of ductwork.
 - 2.2.4 Flexible Ducts: Provide flexible ductwork with an R-value of R-6. The use of flexible ductwork for connection of supply air and return air devices is acceptable only where shown on the drawings.
 - 2.2.4.1 Construction: Provide reinforced metalized polyester jacket that is tear and puncture resistant, air tight inner core with no fiberglass erosion in the air stream and an encapsulated wire helix. Flexible ductwork shall have a recommended operating pressure of 6" w.g. for sizes 4" through 12" diameter and 4" w.g. for sizes 14" through 20" diameter. All diameters shall be suitable for a negative operating pressure of 0.75" w.g. Flexible ductwork shall meet the requirements of UL-181, the Florida Energy Code, FBC, NFPA 90A and NFPA 90B.
 - 2.2.4.2 Acceptable Manufacturers: Subject to compliance with requirements, provide R-6 flexible ductwork by: Atco 36, Flexmaster 8M-R6 or Thermaflex M-KE R6.
 - 2.2.5 Spin-in and Side Take-off Fittings: Provide round branch run-outs as follows.
 - 2.2.5.1 Supply and Return air grille connections shall be straight sided with damper and one inch high insulation standoff equal to Crown 724-D5 or Flexmaster FLD-BO.
 - 2.2.5.2 Exhaust air grille connections shall be straight sided with damper equal to Crown 724 or Flexmaster FLD.
 - 2.2.5.3 Where duct height does not permit the use of conical spin-in fittings, use low profile side take-off fittings equal to Crown 3300-DS or Flexmaster STOD-BO.
 - 2.2.6 Fittings: Provide smooth radius type fittings. Unless specifically detailed otherwise, use 45° laterals and 45° elbows for branch takeoff connections. Where 90° branches are indicated, provide conical type tees.

- 2.3 Fabrication:
- 2.3.1 Shop fabricate ductwork in 4, 8, 10 or 12-ft lengths, unless otherwise indicated or required to complete runs. Preassemble work in shop to greatest extent possible, so as to minimize field assembly of systems. Disassemble systems only to extent necessary for shipping and handling. Match-mark sections for reassembly and coordinated installation.
- 2.3.2 Shop fabricate ductwork of gauges and reinforcement complying with SMACNA "HVAC Duct Construction Standards", except provide sealant at all joints. All supply duct from air conditioning units and all return and exhaust duct shall be minimum 2" pressure class unless otherwise noted.
- 2.3.3 Fabricate duct fittings to match adjoining ducts, and to comply with duct requirements as applicable to fittings. Except as otherwise indicated, fabricate elbows with center-line radius equal to 1½ times associated duct width; and fabricate to include turning vanes in elbows where shorter radius is necessary. Limit angular tapers to 30° for contracting tapers and 20° for expanding tapers.
- 2.3.4 Fabricate ductwork with accessories installed during fabrication to the greatest extent possible. Refer to Division-21 section "Ductwork Accessories" for accessory requirements.
- 2.4 Factory-Fabricated Low Pressure Ductwork (Maximum 2" W.G.):
- 2.4.1 Material: Galvanized sheet steel complying with ASTM A 527, lockforming quality, with ASTM A 525, G90 zinc coating, mill phosphatized.
- 2.4.2 Gauge: 28-gauge minimum for round ducts and fittings, 4" through 8" diameter. 26-gauge minimum 9" through 14", 24-gauge minimum 15" through 26".
- 2.4.3 Elbows: One piece construction for 90° and 45° elbows 14" and smaller. Provide multiple gore construction for larger diameters with standing seam circumferential joint.
- 2.4.4 Divided Flow Fittings: 90° tees, constructed with saddle tap spot welded and bonded to duct fitting body.
- 2.4.5 Acceptable Manufacturers: Subject to compliance with requirements, provide factory-fabricated ductwork by Semco Mfg., Inc., Eastern Sheetmetal, United Sheet Metal Div., United McGill Corp, or approved equal.
- 3 EXECUTION
- 3.1 General: Examine areas and conditions under which HVAC metal ductwork is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.
- 3.2 Installation Of Metal Ductwork:
- 3.2.1 General: Assemble and install ductwork in accordance with recognized industry practices which will achieve air-tight (5% leakage for systems rated 3" and under; 1% for systems rated over 3") and noiseless (no objectionable noise) systems, capable of

performing each indicated service. Install each run with minimum number of joints. Align ductwork accurately at connections, within 1/8" misalignment tolerance and with internal surfaces smooth. Support ducts rigidly with suitable ties, braces, hangers and anchors of type which will hold ducts true-to-shape and to prevent buckling. Support vertical ducts at every floor.

- 3.2.2 Supports: Install concrete inserts for support of ductwork in coordination with formwork, as required to avoid delays in work. Install self-drilling screw anchors in prestressed concrete or existing work.
- 3.2.3 Field Fabrication: Complete fabrication of work at project as necessary to match shop-fabricated work and accommodate installation requirements. Seal joints in round or oval ductwork with hard cast or shrink bands, and sheet metal screws, or by welding.
- 3.2.4 Routing: Locate ductwork runs, except as otherwise indicated, vertically and horizontally. Avoid diagonal runs wherever possible. Locate runs as indicated by diagrams, details and notations or, if not otherwise indicated, run ductwork in shortest route which does not obstruct useable space or block access for servicing building and its equipment. Hold ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building. Limit clearance to 1/2" where furring is shown for enclosure or concealment of ducts, but allow for insulation thickness, if any. Where possible, locate insulated ductwork for 1" clearance outside of insulation. In finished and occupied spaces, conceal ductwork from view by locating in mechanical shafts, hollow wall construction or above suspended ceilings, unless specifically noted as "Exposed". Do not encase horizontal runs in solid partitions, except as specifically shown. Coordinate layout with suspended ceiling and lighting layouts and similar finished work.
- 3.2.5 Electrical Equipment Spaces: Do not route ductwork through transformer vaults or other electrical equipment spaces and enclosures.
- 3.2.6 Penetrations: Where ducts pass through interior partitions and exterior walls, and are exposed to view, conceal space between construction opening and duct or duct insulation with sheet metal flanges of same gauge as duct. Overlap opening on 4 sides by at least 1 1/2". Fasten to duct and substrate. Where ducts pass through fire-rated floors, walls, or partitions, provide firestopping between duct and substrate.
- 3.2.7 Coordination: Coordinate duct installations with installation of accessories, dampers, coil frames, equipment, controls and other associated work of ductwork system.
- 3.2.8 Installation: Install metal ductwork in accordance with SMACNA HVAC Duct Construction Standards. Fan discharge outlet ducts shall be installed correctly with regard to "system effect" per AMCA Publication 201.
- 3.3 Installation of Flexible Ducts:
- 3.3.1 Maximum Length: For any duct run using flexible ductwork, do not exceed 5'-0" extended length. Flexible duct shall only be allowed as detailed on the drawings.
- 3.3.2 Installation: Install in accordance with Section III of SMACNA's "HVAC Duct Construction Standards, Metal and Flexible". Support flexible ducts to eliminate pinching and kinking which would restrict flow.

- 3.3.3 Low Pressure Ductwork: Peel back insulation and slide the inner core over the spin-in or diffuser neck, seal with duct sealant and install Panduit strap tightly. Slide insulation back over the inner core and install another Panduit strap over the insulation outer jacket. Tape is not acceptable.
- 3.3.4 Seal all exposed edges of fiberglass insulation with glassfab and mastic.
- 3.4 Leakage Tests: After each duct system is completed, test for duct leakage in accordance with Sections 3 and 5 of the SMACNA HVAC Air Duct Leakage Test Manual. Test pressure shall be equal to pressure class of duct, less 0.5" static pressure. Repair leaks and repeat tests until total leakage is less than 5% of system design air flow for low pressure systems and less than 1% for systems rated over 3".
- 3.5 Equipment Connections: Connect metal ductwork to equipment as indicated, provide flexible connection for each ductwork connection to equipment mounted on vibration isolators, and/or equipment containing rotating machinery. Provide access doors as indicated.
- 3.6 Clean ductwork internally free of dust and debris. Clean external surfaces of foreign substances which might cause corrosive deterioration of metal or, where ductwork is to be painted, might interfere with painting or cause paint deterioration. Keep ducts closed with poly during construction to prevent contamination by construction dust and debris.
- 3.7 Balancing: Refer to Division-21 section "Testing, Adjusting, and Balancing" for air distribution balancing of metal ductwork; not work of this section. Seal any leaks in ductwork that become apparent in balancing process.
- 3.8 System Adjustment: Adjust the system to provide functional operation to the extent possible, and leave ready for Testing and Balancing work. It is not the intent of this section to provide final testing and balancing, but to leave the system operational with a minimum of noise.

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SECTION 21H

FACTORY FABRICATED GREASE DUCT

- 1 GENERAL
- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-20 Basic Mechanical Materials and Methods Sections apply to work of this section.
- 1.3 Extent of Factory fabricated grease duct is indicated on drawings and in schedules, and by requirements of this section. All kitchen hood exhaust shall be factory fabricated grease duct.
- 1.4 Codes and Standards:
 - A. ETL listed and complies with safety standards UL1978, UL2221, CAN/ULC-S144 and testing has been extended to recognize ASTM E2336 and AC101 due to similar testing criteria.
 - B. When installed in accordance with these instructions and National Fire Protection Association "NFPA 96"; Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.
 - C. UL 2221: Standard for Fire Resistive Grease Duct Enclosure Assemblies. Chapter 7 of this standard references a test labeled Internal Fire Test. Section 7.1.1 references two installation conditions, Condition A and Condition B. Condition A represents all installation condition except for installation within non-ventilated combustible enclosures. Condition B represents installation within a non-ventilated combustible enclosure.
 - D. Duct shall be classified under UL2221 (Test of Fire Resistive Duct Enclosure Assemblies) as an alternate to 2-Hr. fire resistive shaft enclosures with a minimum zero clearance to combustibles (sizes 5" to 36" diameter). Duct shall be listed in accordance with the requirements for duct enclosure Condition A and B.
- 1.5 WARRANTY
 - A. All units shall be provided with the following standard warranties:
 - 1. Grease duct systems are warranted to be free from defects in material and workmanship, under normal use and service, for a period of 20-years from the date of shipment.
- 1.6 SUBMITTALS
 - A. Product Data: Submit manufacturer's technical product data and installation instructions for the following:
 - 1. Factory Fabricated Grease Duct
 - 2. Fittings
 - B. Shop Drawings: Submit scaled layout drawings of factory fabricated grease duct and fittings, including, but not limited to, duct sizes, locations, elevations, and

slopes of horizontal runs, wall and floor penetrations, cleanouts, and connections. Show interface and spatial relationship between ductwork and proximate equipment.

2 PRODUCTS

2.1 GENERAL

- A. Intended for use with Type I kitchen hoods, which conform to the requirements of NFPA-96.

2.2 CONSTRUCTION

- A. Inner duct section wall shall be constructed of .036" thick, 430 type stainless steel and be available in diameters 5" through 36".
- B. Outer Duct section wall shall be constructed of 430 stainless steel at a minimum of .024" thickness.
- C. Duct shall include 2 layers of Super Wool 607 Plus or Insulfrax Elite Blanket between the inner and outer wall insulation between the inner and outer wall.
- D. Duct sections shall be held together by the means of a formed V clamp. V clamps shall be of the hex-head type with flanged stops and tapered "lead in" threads.
- E. Duct joints shall be sealed with 3M Fire Barrier 2000+.
- F. Duct wall assembly shall be tested and listed at zero inch clearance, according to classifications.
- G. Duct access doors shall have a clear sight window.

2.3 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with requirements, provide factory fabricated, zero clearance ductwork and fittings manufactured by Captive Aire, Jeremias, Accurex, or approved equal.

3 EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. If unsatisfactory conditions exist, correct conditions prior to installation.

3.2 APPLICATION

- A. Suitable for use in commercial cooking installations for the removal of smoke and grease-laden vapors.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions, drawings, written specifications, manufacturer's installation manual, and all applicable building codes.
- B. Provide cleanouts in duct at each floor and as required by Florida Building Code. Provide sight window in all duct cleanouts.

3.4 CONNECTIONS

- A. Piping installation requirements are specified in other Division 20 and 221 Sections. Drawings indicate the general arrangement of piping, fittings, and specialties. Install the duct system to allow service and maintenance.
- B. Duct installation requirements are specified in other Division 20 and 21 Sections. Drawings indicate the general arrangement of ducts.

3.5 LEAK TESTING:

- A. All duct shall be leak tested prior to concealment in accordance with section 506.3.2.5 of 2023 Florida Building Code-Mechanical. Provide engineer with 24 hour notice to witness test. Ductwork shall be tested by passing a minimum 100 watt light through the entire duct section to be tested. The lamp shall be open so as to emit light equally in all directions. Only joints in factory ductwork are required to be tested. Contractor shall correct any deficiencies found during testing.

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SECTION 21I

DUCTWORK ACCESSORIES

1 GENERAL

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

1.2 Division-20 Basic Mechanical Materials and Methods sections apply to work of this section.

1.3 Extent of ductwork accessories work is indicated on drawings and in schedules, and by requirements of this section.

1.4 Refer to other Division-21 sections for testing, adjusting, and balancing of ductwork accessories; not work of this section.

1.5 Codes and Standards:

1.5.1 SMACNA Compliance: Comply with applicable portions of both SMACNA "HVAC Duct Construction Standards, Metal and Flexible" and "Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems".

1.5.2 UL Compliance: Construct, test, and label fire dampers in accordance with UL Standard 555 "Fire Dampers and Ceiling Dampers". Construct, test and label smoke dampers in accordance with UL Standard 555S "Leakage Rated Dampers for use in Smoke Control Systems" .

1.5.3 NFPA Compliance: Comply with applicable provisions of NFPA 90A "Air Conditioning and Ventilating Systems" pertaining to installation of ductwork accessories.

1.6 Approval Submittals:

1.6.1 Product Data: Submit manufacturer's technical product data for each type of ductwork accessory, including dimensions, capacities, and materials of construction; and installation instructions as follows:

Low pressure manual dampers
Control dampers
Fire dampers
Duct access doors
Flexible connections

1.6.2 O&M Data Submittals: Submit manufacturer's maintenance data including parts lists for fire dampers, smoke dampers. Include this data, product data, and a copy of approval submittals in O&M manual.

2 PRODUCTS

2.1 Dampers:

- 2.1.1 Low Pressure Manual Dampers: Provide 16 gauge dampers of single-blade type (12" maximum blade width) or multiblade type. Damper blades to be gang-operated from a single shaft with nylon or ball bearings on each end. Provide indexed locking quadrant. Parallel or opposed blade style is acceptable. Provide 2" standoff on locking quadrant for externally insulated duct.
- 2.1.2 Control Dampers: Provide dampers with parallel blades for 2-position control or opposed blades for modulating control. Construct blades of 16-ga. steel. Provide heavy-duty molded self-lubricating nylon bearings and 1/2" diameter steel axles spaced on 9" centers. Provide sponge rubber or felt blade edges. Construct frame of 2" x 1/2" x 1/8" steel channel for face areas 25 sq. ft. and under; 4" x 1-1/4" x 16-ga. channel for face areas over 25 sq. ft. Provide galvanized steel finish with aluminum touch-up. Actuators (motors) are provided by control contractor.
- 2.1.3 Acceptable Manufacturers: Subject to compliance with requirements, provide dampers by Air Balance, American Warming & Ventilating, Arrow Louver and Damper, Penn Ventilator Co., or Ruskin Mfg. Co.
- 2.2 Fire Dampers:
- 2.2.1 Fire Dampers: Provide curtain type fire dampers, UL classified and labeled per UL 555, of types and sizes indicated. Construct casings and blades of galvanized steel. Damper shall not restrict duct free area when open. Dampers shall be rated for dynamic closure under flow and pressure. Provide sleeves and mounting angles. Provide fusible link rated at 160 to 165° F unless otherwise indicated. Provide damper with positive lock in closed position. All dampers shall be spring activated. Basis of design:
- 1-1/2 HR: Ruskin IBD2 - Style B for rectangular, Style CR for round, Style CO for oval.
- 1-1/2 HR: Ruskin IBDT for transfer grilles in narrow partitions.
- 3 HR: Ruskin IBD23 - Style B for rectangular, Style CR for round, Style CO for oval.
- 2.2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide fire and smoke dampers by Air Balance, Inc., American Warning & Ventilating, Arrow Louver and Damper, Penn Ventilator Co., Greenheck, or Ruskin Mfg. Co.
- 2.3 Turning Vanes: Provide manufactured or fabricated single wall turning vanes and vane runners, constructed in accordance with SMACNA "HVAC Duct Construction Standards".
- 2.4 Duct Access Doors:
- 2.4.1 General: Provide duct access doors of size indicated, or as required for duty indicated.
- 2.4.2 Construction: Construct of same or greater gauge as ductwork served. Provide insulated doors for insulated ductwork. Provide flush frames for uninsulated ductwork, extended frames for externally insulated duct. Provide one side hinged, other side

with one handle-type latch for doors 12" high and smaller, 2 handle-type latches for larger doors.

2.4.3 Acceptable Manufacturers: Subject to compliance with requirements, provide access doors by Air Balance, Inc., Duro Dyne Corp., Ruskin Mfg. Co., or Ventfabrics, Inc.

2.5 Flexible Connections:

2.5.1 General: Provide flexible duct connections wherever ductwork connects to vibration isolated equipment. Construct flexible connections of neoprene-coated flameproof fabric crimped into duct flanges for attachment to duct and equipment. Make airtight joint. Provide adequate joint flexibility to allow for thermal, axial, transverse, and torsional movement, and also capable of absorbing vibrations of connected equipment.

2.5.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products by one of the following: Duro Dyne Corp., Flexaust (The) Co., or Ventfabrics, Inc.

3 EXECUTION

3.1 Examine areas and conditions under which ductwork accessories will be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 Installation of Ductwork Accessories:

3.2.1 Install ductwork accessories in accordance with manufacturer's installation instructions, with applicable portions of details of construction as shown in SMACNA standards, and in accordance with recognized industry practices to ensure that products serve intended function.

3.2.2 Install balancing dampers at all main ducts adjacent to units in return air, outside air and where indicated.

3.2.3 Install control dampers as shown. Damper operator provided by control contractor.

3.2.4 Install turning vanes in square or rectangular 90° elbows in supply, return, and exhaust air systems, and elsewhere as indicated.

3.2.5 Install access doors to open against system air pressure, with latches operable from either side, except outside only where duct is too small for person to enter. Install on entering air side of reheat coils and motorized dampers. Install at fire dampers. Opening size shall be per NFPA 90A for servicing fire dampers. Provide label with 1-1/2" letters to indicate location of fire protection devices.

3.2.6 Install flexible connections in ductwork such that the clear length of the connector is approximately two inches. Provide thrust restraints as required. Flexible material shall not be so slack as to take a definite concave or convex shape during fan operation.

3.2.7 Coordinate with other work, including ductwork, as necessary to interface installation of ductwork accessories properly with other work.

- 3.2.8 Install fire dampers within fire walls and floors at locations shown on the mechanical drawings. Install in strict accordance with the manufacturer's printed instructions, NFPA 90A, and UL 555. Basis of design installation is detailed on the drawings.
- 3.3 Fire Dampers: Notify Engineer at least 24 hours in advance of ceiling installation or chase closure so that complete fire damper installation can be observed. A copy of the manufacturer's printed installation instructions shall be available at the site.
- 3.4 Operate installed ductwork accessories to demonstrate compliance with requirements. Test for air leakage while system is operating. Repair or replace faulty accessories as required to obtain proper operation and leakproof performance.
- 3.5 Adjusting And Cleaning:
- 3.5.1 Adjusting: Adjust ductwork accessories for proper settings. Install fusible links in fire dampers and adjust for proper action.
- 3.5.2 Final positioning of manual dampers is specified in Division-21 section "Testing, Adjusting, and Balancing". However, the system shall be left functional with all dampers open or throttled.
- 3.5.3 Cleaning: Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint.
- 3.5.4 Furnish extra fusible links to Owner, one link for every 10 installed of each temperature range; obtain receipt.

END OF SECTION

SECTION 21J

GRILLES, REGISTERS AND CEILING DIFFUSERS

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-20 Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of air outlets and inlets work is indicated by drawings and schedules, and by requirements of this section.
- 1.4 Refer to other Division-21 sections for ductwork and duct accessories required in conjunction with air outlets and inlets and for balancing of air outlets and inlets; not work of this section.
- 1.5 Codes and Standards:
 - 1.5.1 ADC Compliance: Test and rate air outlets and inlets in certified laboratories under requirements of ADC 1062 "Certification, Rating and Test Manual". Provide air outlets and inlets bearing ADC Certified Rating Seal.
 - 1.5.2 NFPA Compliance: Install air outlets and inlets in accordance with NFPA 90A "Standard for the Installation of Air Conditioning and Ventilating Systems".
- 1.6 Approval Submittals:
 - 1.6.1 Product Data: Submit manufacturer's technical product data for air outlets and inlets indicating construction, finish, and mounting details.
 - 1.6.2 Performance Data: For each type of air outlet and inlet furnished, provide aspiration ability, temperature and velocity traverses, throw and drop, and noise criteria ratings. Indicate selections and data as required.
- 1.7 O&M Data Submittals: Submit cleaning instructions for finishes and spare parts lists. Include this data and a copy of approval submittals in O&M manual.

2 PRODUCTS

- 2.1 General:
 - 2.1.1 Except as otherwise indicated, provide manufacturer's standard grilles, registers, and ceiling diffusers where shown; of size, shape, capacity and type indicated; constructed of materials and components as indicated, and as required for complete installation.
 - 2.1.2 Manufacturers not listed in the following specification will not be considered for approval unless accepted by addendum prior to bid.
 - 2.1.3 Performance: Provide grilles, registers and ceiling diffusers that have, as minimum, temperature and velocity traverses, throw and drop, and noise criteria ratings for each

size device equal to the basis of design.

- 2.1.4 Ceiling and Wall Compatibility: Provide grilles, registers and diffusers with border styles that are compatible with adjacent wall and ceiling systems, and that are specifically manufactured to fit into ceiling module or wall with accurate fit and adequate support. Refer to general construction drawings and specifications for types of ceiling systems and walls which will contain each type of ceiling diffuser, grille, or register.
- 2.1.5 Appearance: All grilles and registers shall be aluminum construction and all diffusers shall be aluminum construction, unless otherwise noted, with uniform matching appearance for each type of outlet. Ceiling mounted grilles and registers shall be set to be sight tight from the predominant exposure.
- 2.1.6 Finish: All ceiling mounted grilles, registers, and diffusers shall be finished with baked white enamel. Wall and door mounted grilles and registers shall be finished with clear anodized finish baked white enamel.
- 2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products by Titus, Price, Nailor, or Metal Aire.
- 2.3 Rectangular Ceiling Diffusers: Provide rectangular face, adjustable diffuser with removable inner core, no corner joints. If square or rectangular neck is provided, provide square to round adaptor as required. Provide lay-in panel as required. Provide beveled trim ring for diffusers in hard ceilings.
- 2.4 Return, Exhaust, and Transfer Grilles and Registers: Provide grilles or registers with one set of 45 degree fixed louvers, parallel to the long dimension. Provide opposed blade damper, screwdriver operated from the face for registers. Provide mounting frame for all wall and plaster ceiling installations.

3 EXECUTION

- 3.1 Coordinate installation with ceiling and light fixture installation. Locate ceiling outlets as indicated on architectural Reflected Ceiling Plans. Unless otherwise indicated, locate ceiling outlets in the center of acoustical ceiling modules with sides parallel to the grid.
- 3.2 Install air outlets and inlets in accordance with manufacturer's written instructions and in accordance with recognized industry practices to insure that products serve intended functions.
- 3.3 Coordinate with other work, including ductwork and duct accessories, as necessary to interface installation of air outlets and inlets with other work.
- 3.4 Set air volumes to values shown on the drawings so that the system is functional. Leave ready for test and balance contractor.
- 3.5 Furnish to Owner three operating keys for each type of outlet and inlet that require them; obtain receipt.

END OF SECTION

SECTION 21K

WALL LOUVERS

1 GENERAL

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

1.2 Division-20 Basic Mechanical Materials and Methods sections apply to work of this section.

1.3 Extent of wall louver work is indicated by drawings and schedules, and by the requirements of this section.

1.4 Refer to other Division-21 sections for ductwork, duct accessories and controls work.

1.5 AMCA Compliance: Test and rate louvers in accordance with AMCA Standard 500. Provide AMCA certified rating seal. Ratings based on tests and procedures performed in accordance with AMCA 500-L and complying with the AMCA 511 Certified Ratings Program. AMCA Certified Ratings Seal applies to air performance, water penetration and wind driven rain ratings.

1.6 Product Qualifications:

1. Miami-Dade County, Florida Notice of Acceptance (NOA).
2. Florida Building Code Approval.
3. Louver shall be certified to Florida Building Code Testing Application Standards TAS 100(A) (Wind Driven Rain Resistance), TAS 201 (Large Missile Impact), TAS 202 (Uniform Static Air Pressure) and TAS 203 (Cyclic Wind Loading).
4. AMCA Listed for compliance to AMCA 540 Level D and AMCA 550 standards.

1.7 Approval Submittals:

1.7.1 Product data: Submit manufacturer's technical product data for louvers including: model number, accessories furnished, construction, finish, mounting details, performance data.

1.8 O&M Data Submittals: Submit maintenance data, including cleaning of finishes and a copy of approval submittals. Include in O&M manual.

2 PRODUCTS

2.1 Acceptable Manufacturers: Subject to compliance with requirements, submit products by Ruskin, Greenheck, Arrow, American Warming and Ventilating, or AMCA labeled approved equal.

2.2 General: Except as otherwise indicated, provide manufacturer's standard louvers where shown; of size, shape, capacity and type indicated; constructed of materials and components as indicated, and as required for complete installation. Provide Kynar 500 coated, corrosion resistant finish and 5 year warranty; color to be selected by the Owner.

- 2.3 Substrate Compatibility: Provide louvers with 3 inch frame, flange and sill extension piece that are compatible with adjacent substrate, and that are specifically manufactured to fit into construction openings with accurate fit and adequate support, for weatherproof installation. Refer to general construction drawings and specifications for types of substrate which will contain each type of louver.
- 2.4 Materials: Construct of aluminum extrusions, Alloy 6063-T6 0.062" thick for frame and 0.040" thick for blades. Weld units or use stainless steel fasteners.
- 2.5 Sill Flashing: Formed aluminum, 0.080" thick, upturned sides to prevent water leakage.
- 2.6 Installation Angles: Material: 1.375 x 2.25 inch x 0.125 inch thick continuous aluminum angles around louver perimeter for installation in concrete, deep CMU, steel and wood substrate wall systems.
- 2.7 Installation Plates: Material: 0.250 inch (6.4 mm) thick continuous aluminum flat or zee plates for installation in thin CMU substrate wall systems.
- 2.8 Louver Screens: On inside face of exterior louvers, provide 1/2" square mesh anodized aluminum wire bird screens mounted in removable extruded aluminum frames.
- 2.9 Stationary Louvers: Hurricane and impact rated louvers, basis of design is Ruskin EME3625DFL.
- 2.10 Performance Data:
1. Performance Ratings: AMCA licensed.
 - a. Based on testing 48 inch by 48 inch (1219 mm by 1219 mm) size unit in accordance with AMCA 500.
 2. Free Area: 45 percent, nominal.
 3. Free Area Size: 7.29 sf (.68 sm).
 4. Maximum Recommended Air Flow through Free Area: 2024 feet per minute (7.2 m/s).
 5. Air Flow: 14755 cubic feet per minute (418 cu. m/min).
 6. Maximum Pressure Drop: .42 inches w.g. (.05 kPa).
 7. Based on testing 39 inches x 39 inches (1 m x 1 m) core area, 41 inches x 44 inches (1.04 m x 1.12 m) nominal size unit in accordance with AMCA 500-L.
 8. Wind Velocity: 29 mph (47 kph).
 - a. Rainfall Rate: 3 inches/hour (76 mm/hour).
 - b. Free Area Velocity: 2010 feet per minute (10.0 m/sec).
 - c. Water Resistance Effectiveness: 100% (AMCA Class A).
 9. Wind Velocity: 50 mph (80 kph).
 - a. Rainfall Rate: 8 inches/hour (203 mm/hour).
 - b. Free Area Velocity: 2024 feet per minute (10.1 m/sec).
 - c. Water Resistance Effectiveness: 100% (AMCA Class A).

3 EXECUTION

- 3.1 Install where shown on the drawings in accordance with the manufacturer's printed instruction and Florida Product Approval. Exercise care to prevent scratches.

- 3.2 Isolate dissimilar metals per the manufacturer's recommendations.
- 3.3 Verify size of louvers shown on drawings prior to fabrication. Coordinate with wall openings. Sizes may be altered subject to approval by Engineer provided free area remains approximately the same as indicated.

END OF SECTION

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SECTION 21L

START-UP REQUIREMENTS FOR HEATING, VENTILATING, & AIR CONDITIONING (HVAC) SYSTEMS

1 GENERAL

1.1 Intent: It is the intent of this section to require that the startup requirements and report noted herein be performed prior to starting TAB work on each system. Work can be phased with permission of the Engineer.

1.2 Coordination:

1.2.1 The Contractor shall furnish to the TAB Contractor a complete set of plans, specifications, addenda, shop drawings, equipment performance data sheets, change orders, etc. as requested by the TAB Contractor.

1.2.2 The Contractor shall participate in a TAB coordination meeting to discuss interface requirements with the TAB Contractor and to establish a schedule for TAB work prior to start of TAB work.

1.3 Test Reports and Verification Submittals:

1.3.1 Submit Startup Report as described herein for each system. Attach Factory Startup Report for equipment as required by other Division-21 sections.

2 PRODUCTS: None

3 EXECUTION:

3.1 The TAB work shall not commence until the Engineer has received written notice from the Contractor that HVAC systems are 100% complete and are fully operational. Submit Startup Report as described herein.

3.2 The Contractor shall place all HVAC systems and equipment into complete operation during each working day of TAB work.

3.3 The Contractor shall provide access to HVAC systems and equipment by supplying ladders and/or scaffolding, and opening access panels and equipment room doors.

3.4 The TAB Contractor will provide to the Contractor TAB punch lists of non-complying HVAC work as they are discovered. The Contractor shall replace or repair non-complying work as soon as possible in order not to delay completion of TAB work.

3.5 Airside Systems: The Contractor shall provide the following information to the Engineer to substantiate proper start-up and preliminary adjustments of air handler units, belt driven fans, and duct systems.

3.5.1 Verify that air grilles (supply, return, exhaust, transfer, outdoor, etc.) are installed and connected to the duct system.

3.5.2 Verify that duct systems are clean of debris.

- 3.5.3 Verify that ducts attached with flexible connectors are aligned within ½" and have a uniform gap between ducts of 1"-1.5". Flexible connectors shall not leak and shall be insulated.
- 3.5.4 Verify that filters are clean and filter spacers are installed.
- 3.5.5 Verify that balancing dampers at grilles and branch ducts are operational and are fully opened.
- 3.5.6 Verify that fire and smoke dampers are correctly installed and are fully opened.
- 3.5.7 Verify that fan discharges are appropriate for the outlet ductwork with regards to the "system effect" per AMCA Publication 201. Inappropriate fan discharges will not be accepted.
- 3.5.8 Verify proper fan rotation.
- 3.5.9 Verify fan motor overload elements are correctly sized.
- 3.5.10 Adjust fan sheave until CFM is at or above design CFM. Provide additional sheaves and belts as required. Verify that motor is not overloaded.
- 3.5.11 Verify that HVAC control systems are fully operational.
- 3.6 Startup Report: The Contractor shall submit the startup information required by this section to the Engineer in a typed report organized as outlined herein. The Startup Report is required to meet the written notice described herein prior to starting TAB work. TAB work will not start until the Startup Report has been submitted and approved.

END OF SECTION

SECTION 21M

TESTING AND BALANCING OF MECHANICAL SYSTEMS

1 GENERAL

1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section. Division-20 Basic Mechanical Materials Sections apply to work of this section.

1.2 Description of Work:

1.2.1 Extent of testing, adjusting, and balancing work (TAB) is indicated by requirements of this section, and also by drawings and schedules, and is defined to include, but is not necessarily limited to, air distribution systems, hydronic distribution systems and associated equipment and apparatus of mechanical work. The work consists of setting speed and volume (flow) adjusting facilities provided for systems, recording data, conducting tests, preparing and submitting reports, and recommending modifications to work as required.

1.2.2 Coordination: Coordinate with the General Contractor and Mechanical Contractor responsible for the HVAC system installation as required to complete the TAB work.

1.3 The intent of this specification is to balance HVAC systems within the tolerances listed, maintaining the pressure relationships indicated, with a minimum of noise.

1.3.1 Airflow Tolerances:

1.3.1.1 Air Handling: The supply air, return air and outdoor air quantities shall be balanced within $\pm 5\%$ of design values.

1.3.1.2 Exhaust Fans: The exhaust fan quantities shall be set as required to maintain the design exhaust terminal flows within $\pm 5\%$ of design values. If no exhaust terminals exist, exhaust fan air quantities shall be balanced within $\pm 10\%$ of design values.

1.3.1.3 Ceiling Diffusers, Supply Registers, Return and Exhaust Inlets: Balance to an air quantity within $\pm 10\%$ of the design values.

1.3.2 Temperature Tolerances:

1.3.2.1 Air Handling Temperatures: The controlled temperatures at AHUs shall be verified to be under control within $\pm 1^{\circ}\text{F}$ of design values.

1.3.2.2 Room Temperatures: Balance systems and controls within $\pm 2^{\circ}\text{F}$ of indicated settings.

1.4 Quality Assurance: The TAB Contractor shall be certified as one of the following:

1.4.1 Tester: A firm certified by National Environmental Balancing Bureau (NEBB) in those testing and balancing disciplines required for this project, who is not the Installer of the systems to be tested and is otherwise independent of the project. Comply with NEBB's "Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems" as applicable to this work.

- 1.4.2 Tester: A firm certified by Associated Air Balance Council (AABC) in those testing and balancing disciplines required for this project. AABC-certified firms are independent by definition. Comply with AABC's Manual MN-1 "AABC National Standards", as applicable to this work.
- 1.4.3 Industry Standards: Comply with American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) recommendations pertaining to measurements, instruments and testing, adjusting and balancing, except as otherwise indicated.
- 1.5 Job Conditions:
- 1.5.1 Do not proceed with testing, adjusting, and balancing work until HVAC work (including Controls) has been completed and is operable. Ensure that there is no residual work still to be completed.
- 1.5.2 Do not proceed until work scheduled for testing, adjusting, and balancing is clean and free from debris, dirt and discarded building materials.
- 1.5.3 Do not proceed until architectural work that would affect balancing (walls, ceiling, windows, doors) have been installed.
- 1.5.4 Testing may proceed system by system, but each HVAC system must be complete as described herein.
- 1.5.5 The mechanical contractor shall make any changes in pulleys, belts, and dampers, and/or add dampers as required for correct balancing.
- 1.6 Approval Submittals
- 1.6.1 Submit the name of the proposed test and balance company for the Engineer's approval within thirty (30) days after awarding of contract.
- 1.7 Test Reports and Verification Submittals:
- 1.7.1 Submit four (4) copies of the dated test and balance report upon completion of TAB work. The report shall include a list of instruments used for the work. The report shall be signed by the supervisor who performed the TAB work.

2 PRODUCTS

- 2.1 Patching Materials: Except as otherwise indicated, use same products as used by original Installer for patching holes in insulation, ductwork and housings which have been cut or drilled for test purposes, including access for test instruments, attaching jigs, and similar purposes.
- 2.2 Test Instruments: Utilize test instruments and equipment of the type, precision, and capacity as recommended in the referenced standard. All instruments shall be in good condition and shall have been calibrated within the previous six (6) months (or more recently if required by standard).

3 EXECUTION

- 3.1 General:
- 3.1.1 Examine installed work and conditions under which testing is to be done to ensure that work has been completed, cleaned and is operable. Do not proceed with TAB work until unsatisfactory conditions have been corrected in manner acceptable to Tester.
- 3.1.2 Test, adjust and balance environmental systems and components, as indicated, in accordance with procedures outlined in applicable standards, and as modified or detailed herein.
- 3.1.3 Test, adjust and balance systems during summer season for air conditioning systems and during winter season for heating systems, including at least a period of operation at outside conditions within 5°F wet bulb temperature of maximum summer design condition, and within 10°F dry bulb temperature of minimum winter design condition. When seasonal operation does not permit measuring final temperatures, then take final temperature readings when seasonal operation does permit. The Contractor shall return for a change of seasons test at no additional cost to the Owner and submit the revised TAB report.
- 3.1.4 Punch List: Prepare a deficiency (punch)list for the Contractor with a copy of the Engineer that lists all items that are incorrectly installed or are functioning improperly. Provide a retest after all items are corrected.
- 3.1.5 Prepare TAB report of test results, including instrumentation calibration reports, in format recommended by applicable standards, modified as required to include all data listed herein.
- 3.1.6 Patch holes in insulation, ductwork and housings, which have been cut or drilled for test purposes, in manner recommended by original Installer.
- 3.1.7 Mark equipment settings, including damper control positions, valve indicators, fan speed control levers, and similar controls and devices, to show final settings at completion of TAB work. Provide markings with paint or other suitable permanent identification materials.
- 3.1.8 Include in the TAB report recommendations for correcting unsatisfactory mechanical performances when system cannot be successfully balanced.
- 3.1.9 Include an extended warranty of ninety (90) days after completion of test and balance work, during which time the Engineer, at his discretion, may request a recheck, or resetting of any component as listed in test report. The TAB company shall provide technicians and instruments and make any tests required by the Engineer during this time period.
- 3.2 Controls
- 3.2.1 Check all HVAC controls for proper location, calibration and sequence of operation.
- 3.2.2 Check operation of all controllers and controlled devices to verify proper action and direction. Check the operation of all interlocks.
- 3.3 Air Balancing

- 3.3.1 Leakage tests on ductwork must have been completed before air balancing.
- 3.3.2 Set dampers, volume controls and fan speeds to obtain specified air delivery with minimum noise level. Rebalance as required to accomplish this. Simulate fully loaded filters during test.
- 3.3.3 Set grille deflections as noted on plans. Modify deflections if required to eliminate drafts or objectionable air movement.
- 3.3.4 Record air terminal velocity after completion of balance work.
- 3.3.5 Record final grille and register deflection settings if different from that specified on contract drawings.
- 3.3.6 Record all fan speeds.
- 3.4 Data Collection:
- 3.4.1 In addition to the data required for any specified performance tests, measure and record the temperatures, pressures, flow rates, and nameplate data for all components listed herein.
- 3.4.2 It is the intent of this section to record data on balanced systems, under normal operating or design conditions.
- 3.4.3 Temperatures:
1. Outside dry and wet bulb temperatures.
 2. Dry bulb temperature in each room and at least one wet bulb temperature in each zone.
 3. Refrigerant liquid and suction temperatures.
 4. Inlet and outlet temperature of each heat exchange device - both fluids.
- 3.4.4 Pressures:
1. Suction and discharge static pressure of each fan.
- 3.4.5 Flow rates:
1. Flow rate through each fan.
 2. Flow rate through each coil or heat exchange device.
- 3.4.6 Nameplate Data:
1. Complete nameplate data for all equipment.
 2. Motor data to include horsepower, phase, voltage, RPM, full load nameplate current, fuse rating in disconnect switch, number or manufacturer's size

designation, and ampere rating of overcurrent and low voltage protection devices in starters.

3.5 All test openings in ductwork shall be resealed in an approved manner.

END OF SECTION

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SECTION 21N

INSULATION FOR HVAC PIPING

1 GENERAL

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

1.2 Division-20 Basic Mechanical Materials and Methods Sections apply to work of this section.

1.3 Approval Submittals:

1.3.1 Product Data: Submit producer's data sheets and installation instructions on each insulation system including insulation, coverings, adhesives, sealers, protective finishes, and other material recommended by the manufacturer for applications indicated. Submit for:

Flexible unicellular piping insulation

1.4 O&M Data Submittals: Submit a copy of all approval submittals. Include in O&M Manual.

2 PRODUCTS

2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide insulation products by Armstrong, Johns Manville, Knauf, Owens Corning, Pittsburgh Corning, U.S. Rubber, or approved equal. All products shall be asbestos-free.

2.2 Flame/Smoke Ratings: Provide composite mechanical insulation (insulation, jackets, coverings, sealers, mastics, and adhesive) with a flame-spread rating of 25 or less, and a smoke-developed rating of 50 or less, as tested by ANSI/ASTM E84.

2.3 Pipe Insulation Materials:

2.3.1 Flexible Unicellular Pipe Insulation: ASTM C534, Type I. (Tubular, suitable for use to 200°F.)

2.3.2 Staples, Bands, Wires, and Cement: As recommended by the insulation manufacturer for applications indicated.

2.3.3 Adhesives, Sealers, Protective Finishes: Products recommended by the insulation manufacturer for the application indicated.

3 EXECUTION

3.1 General:

3.1.1 Install thermal insulation products in accordance with manufacturer's written instructions, and in compliance with recognized industry practices to ensure that insulation serves intended purpose.

- 3.1.2 Install insulation materials with smooth and even surfaces and on clean and dry surfaces. Redo poorly fitted joints. Do not use mastic or joint sealer as filler for gapping joints and excessive voids resulting from poor workmanship.
- 3.1.3 Maintain integrity of vapor-barrier on insulation and protect it to prevent puncture and other damage. Label all insulation "ASBESTOS FREE".
- 3.1.4 Do not apply insulation to surfaces while they are hot or wet.
- 3.1.5 Do not install insulation until systems have been checked and found free of leaks. Surfaces shall be clean and dry before attempting to apply insulation. A professional insulator with adequate experience and ability shall install insulation.
- 3.1.6 Do not install insulation on pipe systems until acceptance tests have been completed except for flexible unicellular insulation. Do not install insulation until the building is "dried-in".
- 3.2 Flexible Unicellular Pipe Insulation:
- 3.2.1 Insulate the following piping systems:
 - 3.2.1.1 Condensate drains from air conditioning units - 1/2" thick.
 - 3.2.1.2 Refrigerant piping - 3/4" thick.
- 3.2.2 Apply insulation in accordance with the manufacturer's recommendations and instructions. Mitre cut insulation to fit pipe fittings. Use approved cement to seal all joints and ends in the insulation.
- 3.2.3 Insulation outside the building shall be protected by a smooth 0.016" thickness aluminum jacket secured with aluminum bands on 12" centers.

END OF SECTION

SECTION 210

EXTERIOR INSULATION FOR DUCTWORK

1 GENERAL

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

1.2 Division-20 Basic Mechanical Materials and Methods sections apply to work of this section.

1.3 Approval Submittals:

1.3.1 Product Data: Submit producer's data sheets and installation instructions on each insulation system including insulation, coverings, adhesives, sealers, protective finishes, and other material recommended by the manufacturer for applications indicated. Submit for:

Flexible duct insulation

1.4 O&M Data Submittals: Submit a copy of all approval submittals. Include in O&M Manual.

2 PRODUCTS

2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide insulation products by Knauf, Owens-Corning, Johns Manville, Certainteed.

2.2 Flame/Smoke Ratings: Provide composite mechanical insulation (insulation, coverings, sealers, mastic, and adhesive) with a flame spread rating of 25 or less, and a smoke-developed rating of 50 or less as tested by ANSI/ASTM 84.

2.3 Flexible Fiberglass Insulation: ASTM C553, Type I, Class B-3 (temperature less than 350°F). Duct wrap shall be 1 pcf density with UL rated aluminum foil vapor barrier (FSK).

2.4 General Purpose Mastic: Benjamin Foster 35-00 Series, Insulcoustic VIAC Mastic, Childers CP-10, or approved equal. The final selection of this product for the specific application indicated is the responsibility of the insulation supplier. The insulation system must meet the specified application.

2.5 Vapor Barrier Sealant: Benjamin Foster 30-35, Insulcoustic IC-501, 3M EC-1378, Childers CP-30, or approved equal. Provide "Low Odor" type. The final selection of this product for the specific application indicated is the responsibility of the insulation supplier. The insulation system must meet the specified application.

2.6 Adhesive: Benjamin Foster 85-20, Insulcoustic IC-205, 3M EC-35, Childers CP-82, Childers CP-89, or approved equal. The final selection of this product for the specific application indicated is the responsibility of the insulation supplier. The insulation system must meet the specified application.

2.7 Fiber-Glas Mesh: 10x10 Mesh. Foster Mastafab or equal.

3 EXECUTION

- 3.1 Installation of Flexible Insulation: Insulate all supply, return and outdoor air ductwork and the backs of all ceiling supply outlets with 2" thick fiberglass blanket insulation with vapor barrier.
 - 3.1.1 Insulate round elbows and fittings with wrap such that thickness is equal to adjoining duct covering. Clean and dry ductwork prior to insulating.
 - 3.1.2 Adhere insulation to duct with 50 percent coverage using approved insulation adhesive applied in 6-inch wide swaths with 6-inch spaces between swaths. Additionally secure insulation with perforated pins and Tuff-Bond or by self-sticking pins with a 3/8" self-tapping screw. Space on 12-inch centers and 3 inches from all edges. Ducts up through 24" wide only require one row of pins. Ducts over 24" wide shall have pins spaced as described herein.
 - 3.1.3 Lap all joints 2 inches and seal joints with 4-inch wide strips of open mesh glass fabric embedded in two coats of general purpose mastic.
 - 3.1.4 Seal all punctures and breaks in aluminum vapor barrier with open mesh glass fabric and vapor barrier sealant.

SECTION 22A

INSULATION FOR PLUMBING EQUIPMENT AND PIPING

1 GENERAL

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

1.2 Division-20 Basic Mechanical Materials and Methods Sections apply to work of this section.

1.3 Approval Submittals:

1.3.1 Product Data: Submit a producer's data sheets and installation instructions on each insulation system including insulation, coverings, adhesives, sealers, protective finishes, and other material recommended by the manufacturer for applications indicated. Submit for:

Fiberglass pipe insulation

1.4 O&M Data Submittals: Submit a copy of all approval submittals. Include in O&M Manual.

2 PRODUCTS

2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide insulation products by Armstrong, Johns Manville, Knauf, Owens Corning, Pittsburgh Corning, U.S. Rubber, or approved equal. All products shall be asbestos-free.

2.2 Flame/Smoke Ratings: Provide composite mechanical insulation (insulation, jackets, coverings, sealers, mastics, and adhesive) with a flame-spread rating of 25 or less, and a smoke-developed rating of 50 or less, as tested by ANSI/ASTM E84.

2.3 Pipe Insulation Materials:

2.3.1 Fiberglass Pipe Insulation: ASTM C547, Class 1 unless otherwise indicated. (Preformed sleeving with white all-service jacket, suitable for temperatures up to 450°F)

2.3.2 Staples, Bands, Wires, and Cement: As recommended by the insulation manufacturer for applications indicated.

2.3.3 Adhesives, Sealers, Protective Finishes: Products recommended by the insulation manufacturer for the application indicated.

2.3.4 Jackets: ASTM C921, Type I (vapor barrier) for piping below ambient temperature, Type II (vapor permeable) for piping above ambient temperature. Type I may be used for all piping at Installer's option.

3 EXECUTION

3.1 General:

- 3.1.1 Install thermal insulation products in accordance with manufacturer's written instructions, and in compliance with recognized industry practices to ensure that insulation serves intended purpose.
- 3.1.2 Install insulation materials with smooth and even surfaces and on clean and dry surfaces. Redo poorly fitted joints. Do not use mastic or joint sealer as filler for gapping joints and excessive voids resulting from poor workmanship.
- 3.1.3 Maintain integrity of vapor-barrier on insulation and protect it to prevent puncture and other damage. Label all insulation "ASBESTOS FREE".
- 3.1.4 Do not apply insulation to surfaces while they are hot or wet.
- 3.1.5 Do not install insulation until systems have been checked and found free of leaks. Surfaces shall be clean and dry before attempting to apply insulation. A professional insulator with adequate experience and ability shall install insulation.
- 3.1.6 Do not install insulation on pipe systems until acceptance tests have been completed except for flexible unicellular insulation. Do not install insulation until the building is "dried-in".

3.2 Fiberglass Pipe Insulation:

- 3.2.1 Insulate the following piping systems (indoor locations):
 - 3.2.1.1 Domestic hot water, 141^o-180^o F: up to 1-1/4" pipe - 1½" thick, over 1-1/4" pipe 2" thick.
 - 3.2.1.2 Domestic hot water, 105^o-140^o F: up to 3" pipe - 1½" thick, over 3" pipe - 2" thick.
- 3.2.2 Apply insulation to pipe with all side and end joints butted tightly. Seal longitudinal lap by pressurizing with plastic sealing tool. Apply 3 inch wide self sealing butt strips to joints between insulation sections. Insulate all fittings, flanges, valves and strainers with premolded insulation. Apply coat of insulating cement to fittings and wrap with glass cloth overlapping each wrap 1" and adjacent pipe 2". Finish with heavy coat of general purpose mastic. Premolded PVC covers may also be used, but no flexible inserts are allowed.
- 3.2.3 Provide hanger or pipe support shields of 16 gauge (minimum) galvanized steel over the insulation which extends halfway up the pipe insulation cover and at least 6" on each side of the hanger.
- 3.2.4 Omit insulation on exposed plumbing fixture runouts from faces of wall or floor to fixture; on unions, flanges, strainer blowoffs, flexible connections and expansion joints.

END OF SECTION

SECTION 22B

POTABLE WATER SYSTEM

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-20 Basic Mechanical Requirements and Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of potable water systems work, is indicated on drawings and schedules, and by requirements of this section.
- 1.4 Refer to other Division-22 sections for site water distribution system; not work of this section unless noted.
- 1.5 Refer to appropriate Division-2 sections for exterior potable water system; not work of this section unless noted.
- 1.6 Insulation for potable water piping is specified in other Division-22 sections, and is included as work of this section. Insulation requirements include:
 - 1.6.1 Domestic hot water piping
- 1.7 Excavation and backfill required in conjunction with water piping is specified in other Division-20 sections, and is included as work of this section.
- 1.8 Code Compliance: Comply with applicable portions of Standard Plumbing Code pertaining to selection and installation of plumbing materials and products. Comply with local utility requirements.
- 1.9 Approval Submittals:
 - 1.9.1 Product Data: Submit manufacturer's technical product data and installation instructions for:
 - Valves
 - Hose bibbs
 - Wall hydrants
 - Water hammer arresters
 - Relief valves
 - Trap primers
 - Access doors
- 1.10 Test Reports and Verification Submittals:
 - 1.10.1 Disinfection: Submit report by Health Department.
- 1.11 O&M Data Submittals: Submit a copy of all approval submittals. Submit maintenance

data and parts lists for valves, trap primers. Include these data in O&M manual.

2 PRODUCTS

- 2.1 General: Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, temperature ratings, and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide materials and products complying with Standard Plumbing Code where applicable. Provide sizes and types matching pipe materials used in potable water systems. Where more than one type of materials or products is indicated, selection is Installer's option.
- 2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following listed for each item.
- 2.3 Identification: Provide identification complying with Division-20 Basic Mechanical Materials and Methods section "Mechanical Identification". Provide manufacturer's standard permanent, bright-colored, continuous-printed plastic tape, intended for direct burial service; not less than 6" wide x 4 mils thick. Provide blue tape with black printing reading "CAUTION WATER LINE BURIED BELOW".
- 2.4 Pipes and Fittings: Provide pipes and pipe fittings complying with Division-20 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings", in accordance with the following listing:
- 2.4.1 Interior Water Piping:
- 2.4.1.1 Above Grade: Copper tube; Type L, hard-drawn temper; wrought-copper fittings, solder-joints.
- 2.4.1.2 Below Grade: Copper tube; Type L, soft-annealed temper; no joints below floor.
- 2.4.2 Exterior Water Piping:
- 2.4.2.1 Copper tube; Type L, hard-drawn temper; wrought-copper fittings, solder-joints.
- 2.4.3 Solder joints shall be made with 95-5 solder.
- 2.5 Piping Specialties: Provide piping specialties complying with Division-20 Basic Mechanical Materials and Methods section "Piping Specialties".
- 2.6 Supports and Anchors: Provide supports and anchors complying with Division-20 Basic Mechanical Materials and Methods section "Supports and Anchors".
- 2.7 Interior Valves: Provide valves complying with Division-20 Basic Mechanical Materials and Methods section "Valves", in accordance with the following listing:
- 2.7.1 Sectional and Shutoff Valves: GA1, GA2, GA3, BA1, BA2.
- 2.7.2 Drain Valves: GA1, GA2, BA1, BA2.
- 2.7.3 Throttling Valves: BA1, BA2.

- 2.7.4 Check Valves: CK1, CK2, CK3.
- 2.8 Hose Bibbs: Provide rough nickel plated hose bibbs with lock shield compression stop and removable handle, solid flange, female connection with ¾" male threaded hose end, and straight line type non-removable vacuum breaker with ¾" male threaded hose end. Acorn 8121 RCP or equal model by Woodford.
- 2.9 Wall Hydrants: Provide complete bronze body hose bibbs inside stainless steel box with hinged access door with cylinder lock and "WATER" stamped on cover. Provide key operated control valve with all bronze interior parts, replaceable seat washer, screwdriver operated stop valve in supply, and ¾" male threaded hose connection. Zurn Z1350 or equal by Acorn or Woodford.
- 2.10 Water Hammer Arresters: Provide bellows type water hammer arresters, stainless steel casing and bellows, pressure rated for 250 psi, tested and certified in accordance with PDI Standard WH-201. Precision Plumbing Products, Josam, Zurn, Amtrol, Wade, Jay R. Smith, or approved equal.
- 2.11 Combined Pressure-Temperature Relief Valves: Provide relief valves as indicated, of size and capacity as selected by Installer for proper relieving capacity, in accordance with ASME Boiler and Pressure Vessel Code. Provide bronze body, test lever and thermostat complying with ANSI Z21.22 listing requirements for temperature discharge capacity. Provide temperature relief at 210°F, and pressure relief at 150 psi. Watts, Cash, Zurn, or approved equal.
- 2.12 Mechanical Trap Primers: Provide brass trap primers and distribution units to seal floor drains indicated on drawings. Trap primer valves shall be automatic, self contained type with no springs or diaphragms and shall not require adjustment. Trap primer valves shall be the type that can be installed anywhere on cold water piping. Distribution units shall supply 1-4 floor drains. Trap primer valves shall comply with ASSE 1018. Precision Plumbing Products PR-500, or approved equal. Where P-trap primers are indicated use "Prime-Eze" by Jay R. Smith, or approved equal.
- 2.13 Access Doors: Provide access doors to service all valves and other devices as required in accordance with Division-20 Basic Materials and Methods Section "Access Doors".

3 EXECUTION

- 3.1 General: Examine areas and conditions under which potable water systems are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.
- 3.2 Install mechanical identification in accordance with Division-20 Basic Mechanical Materials and Methods section "Mechanical Identification". Install underground plastic pipe markers during backfill, 6"-8" below grade.
- 3.3 Install water distribution piping in accordance with Division-20 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings".
- 3.3.1 Install piping with 1/32" per foot (¼%) downward slope towards drain point.

- 3.3.2 Locate groups of pipes parallel to each other, spaced to permit applying full insulation and servicing of valves.
- 3.4 Install exterior water piping in compliance with local governing regulations. Water piping shall be installed with a minimum of 30 inches of cover unless otherwise indicated.
- 3.5 Install piping specialties in accordance with Division-20 Basic Mechanical Materials and Methods section "Piping Specialties".
- 3.6 Install supports and anchors in accordance with Division-20 Basic Mechanical Materials and Methods section "Supports and Anchors".
- 3.7 Install valves in accordance with Division-20 Basic Mechanical Materials and Methods section "Valves".
 - 3.7.1 Sectional Valves: Install on each branch and riser, close to main, where branch or riser serves two or more plumbing fixtures or equipment connections, and elsewhere as indicated.
 - 3.7.2 Shutoff Valves: Install on inlet of each plumbing equipment item, and on inlet of each plumbing fixture, and elsewhere as indicated.
 - 3.7.3 Drain Valves: Install on each plumbing equipment item located to completely drain equipment for service or repair. Install at base of each riser, at base of each rise or drop in piping system, and elsewhere where indicated or required to completely drain potable water system.
 - 3.7.4 Check Valves: Install where indicated.
- 3.8 Hose Bibbs and Wall Hydrants: Install on concealed piping where indicated with vacuum breaker. Mount 18 inches above grade or finished floor.
- 3.9 Install relief valves on each water heater, and where indicated in accordance with the manufacturer's instructions. Pipe full size outside or to floor drain. Cut the end of the pipe at a 45° angle and terminate 6 inches above the floor or grade.
- 3.10 Piping Runouts to Fixtures: Provide hot and cold water piping runouts to fixtures of sizes indicated, but in no case smaller than required by Standard Plumbing Code.
- 3.11 Mechanical Equipment Connections: Connect hot and cold water piping system to mechanical equipment as indicated, and comply with equipment manufacturer's installation instructions. Provide shutoff valve and union for each connection, provide drain valve on drain connection.
- 3.12 Install water hammer arresters in upright position, in locations and of sizes indicated in accordance with PDI Standard WH-201.
- 3.13 Install trap primers as indicated, and in accordance with manufacturer's installation instructions. Provide access panels to all trap primers unless accessible through a lay-in ceiling.

- 3.14 Locate and coordinate installation of access doors for all valves and devices in accordance with Division-20 Basic Mechanical Materials and Methods section "Access Doors".
- 3.15 Piping Tests: Test, clean, and sterilize potable water piping in accordance with testing requirements of Division-20 Basic Mechanical Materials and Methods section "Testing, Cleaning, and Sterilization of Piping Systems".

END OF SECTION

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SECTION 22C

SOIL, WASTE AND VENT SYSTEM

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-20 Basic Mechanical Requirements and Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of soil waste and vent systems work is indicated on drawings and schedules, and by requirements of this section.
- 1.4 Refer to appropriate Division-2 sections for exterior sanitary sewer system required in conjunction with soil and waste systems; not work of this section.
- 1.5 Excavation and backfill required in conjunction with soil, waste and vent piping is specified in other Division-20 sections and is included as work of this section.
- 1.6 Refer to Division-7 section "Flashing and Sheet Metal" for flashings required in conjunction with soil and waste systems; not work of this section.
- 1.7 Code Compliance: Comply with applicable portions of Florida Building Code-Plumbing pertaining to plumbing materials, construction and installation of products. Comply with local utility requirements.
- 1.8 Approval Submittals:
 - 1.8.1 Product Data: Submit manufacturer's technical product data for:

Cleanouts
Floor drains
Grease Interceptors
- 1.9 O&M Data Submittals: Submit a copy of all approval submittals. Include these data in O&M manual.

2 PRODUCTS

- 2.1 General: Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in soil and waste systems. Where more than one type of materials or products is indicated, selection is Installer's option.

Underground-Type Plastic Line Marker: Manufacturer's standard permanent, bright-colored, continuous-printed plastic tape, intended for direct-burial service; not less than 6" wide x 4 mils thick. Provide green tape with black printing reading "CAUTION SEWER LINE BURIED BELOW".

- 2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following listed for each item.
- 2.3 Pipes and Fittings: Provide pipes and pipe fittings complying with Division-20 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings", in accordance with the following listing:
 - 2.3.1 Above Ground Soil, Waste, and Vent Piping:
 - 2.3.1.1 Polyvinyl chloride plastic pipe (PVC); Type DWV; PVC plastic type DWV socket-type fitting, solvent cement joints. Do not use in fire-rated assemblies or return air plenums.
 - 2.3.2 Underground Building Drain Piping (within 5 feet of the building):
 - 2.3.2.1 Pipe Size 6" and Smaller: Polyvinyl chloride sewer pipe (PVC); Type DWV; PVC plastic type DWV socket-type.
- 2.4 Pipe Specialties: Provide piping specialties complying with Division-20 Basic Materials and Methods section "Piping Specialties".
- 2.5 Supports and Anchors: Provide supports and anchors complying with Division-20 Basic Mechanical Materials and Methods section "Supports and Anchors".
- 2.6 Cleanouts: Provide factory-fabricated drainage piping products of size and type indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements and governing regulations. Josam, Jay R. Smith, Wade, Zurn.
 - 2.6.1 Cleanout Plugs: Cast-bronze or brass, threads complying with ANSI B2.1 countersunk head.
 - 2.6.2 Cleanout for PVC Systems:
 - 2.6.2.1 Floor Cleanouts: Cast-iron body with adjustable head, brass plug, and scoriated nick-brass cover. Furnish with carpet flange for carpeted floors. Furnish with recessed cover for tile floors. Furnish with clamping ring for floors with membrane. Wade W-6030 hub outlet for push-on.
 - 2.6.2.2 Cleanouts in Piping: PVC cleanout adaptor with threaded PVC plug.
 - 2.6.2.3 Wall Cleanouts: PVC cleanout adaptor with tapped, countersunk, threaded brass plug. Square 8.75"x8.75" hinged wall access cover, with scoriated nickel bronze finish.
 - 2.6.2.4 Grade Cleanouts: PVC cleanout adaptor with countersunk, threaded brass plug. Wade W-8590-D plug. In sidewalks and other finished concrete, provide access cover frames with a non-tilting tractor cover. Wade W-7035-Z or equal.
 - 2.6.2.5 Cleanouts in Paved Areas: Cast iron body, adjustable housing, ferrule with plug and round loose scoriated tractor cover. Wade W-8300-MF. Coordinate concrete depth at site with adjustable flange.
- 2.7 Floor Drains: Provide floor drains of size as indicated on drawings; and type, including features, as specified herein. Josam, Jay R. Smith, Wade, Zurn.

- 2.7.1 Floor Drains: Provide inside caulk bottom outlet or TY-Seal hub outlet with adaptor for cast iron trap installation and a 4" deep trap seal. Provide clamping rings for floors with membrane.
- 2.7.2 Strainer: Provide 5" satin-nickel bronze strainer.
- 2.7.3 Trap Primer Connection: Provide ½" trap primer tapping.
- 2.7.4 Funnel: Provide funnel where shown on the drawings.
- 2.7.5 Basis of Design: Zurn Z415B-P.
- 2.8 Grease Interceptors: Provide rotationally molded polyethylene hydromechanical grease interceptor. Provide the following features:
 - 2.8.1 Flow control cartridge shall be PVC with 75 GPM flow rate.
 - 2.8.2 Interceptor shall be furnished for above or below grade installation.
 - 2.8.3 Interceptor shall be certified to ASME A112.14.3 (Type C) and CSA B481.1, with adjustable cover adapters, Safety Star® access restrictor built into each cover adapter, built-in flow control and three outlet options.
 - 2.8.4 Interceptor grease capacity shall be 287 lbs @ 75 GPM.
 - 2.8.5 Cover shall provide water/ gas-tight seal and have minimum 16,000 lbs. load capacity.
 - 2.8.6 Interceptor shall be furnished with field cut riser model # FCR2 to enable access for below grade installation.
 - 2.8.7 Made in USA
 - 2.8.8 Provide lifetime guarantee.
 - 2.8.9 Basis of Design: Schier Great Basin GB-50.

3 EXECUTION

- 3.1 Examine substrates and conditions under which soil and waste systems are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.
- 3.2 Piping Installation:
 - 3.2.1 Install above grade soil and waste piping in accordance with Division-20 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings", and with Florida Building Code-Plumbing.
 - 3.2.2 Install underground soil and waste pipes as indicated and in accordance with Florida Building Code-Plumbing. Lay underground piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install required gaskets in accordance with manufacturer's recommendations for use of lubricants, cements, and other special

installation requirements. Clean interior of piping of dirt and other superfluous material as work progresses. Maintain swab or drag in line and pull past each joint as it is completed. Place plugs in ends of uncompleted piping at end of day or whenever work stops.

- 3.2.3 Install building soil and vent piping pitched to drain at minimum slope of ¼" per foot (2%) for piping smaller than 3", and 1/8" per foot (1%) for piping 3" and larger.
- 3.3 Install piping specialties in accordance with Division-20 Basic Mechanical Materials and Methods section "Piping Specialties".
- 3.4 Install supports and anchors in accordance with Division-20 Basic Mechanical Materials and Methods section "Supports and Anchors".
- 3.5 Installation of Cleanouts: Install in above ground piping and building drain piping as indicated, as required by Florida Building Code-Plumbing; and at each change in direction of piping greater than 45°; at minimum intervals of 50' for piping 4" and smaller and 100' for larger piping; and at base of each vertical soil or waste stack. Install floor and wall cleanout covers for concealed piping, select type to match adjacent building finish.
 - 3.5.1 Size: Cleanouts shall be full size up to 4". Piping over 4" shall have a reducing fitting to accommodate a 4" cleanout unless indicated otherwise on drawings.
 - 3.5.2 Install cleanouts to allow adequate clearance for rodding.
 - 3.5.3 Protect all finished surfaces of cleanouts with a suitable adhesive covering until construction is completed.
 - 3.5.4 Cleanouts to Grade: Provide an 18" x 18" x 8" thick concrete pad around the cleanout. Set the cleanout ferrule, adapter, or access cover frame in the concrete as required. The cleanout shall be extended to the finished grade. The concrete pad shall slope away from the cleanout in all directions approximately one inch. Cover pad with fill to finished grade.
 - 3.5.5 Cleanouts in Paved Areas: Provide concrete pad similar to cleanout to grade and coordinate concrete depth at site with adjustable flange. Access cover frames are required.
- 3.6 Flashing Flanges: Install flashing flange and clamping device with each stack and cleanout passing through waterproof membranes.
- 3.7 Vent Flashing Sleeves: Install on stack passing through roof, secure to stack flashing in accordance with manufacturer's instructions. For metal roofs, sleeves and flashing are by Division-7.
- 3.8 Installation of Floor Drains: Install floor drains in accordance with manufacturer's written instructions and in locations indicated.
 - 3.8.1 Coordinate flashing work with work of waterproofing and adjoining substrate work.
 - 3.8.2 Install floor drains at low points of surface areas to be drained, or as indicated. Set tops of drains flush with finished floor.

- 3.8.3 Install drain flashing collar or flange so that no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes, where penetrated.
- 3.8.4 Position drains so that they are accessible and easy to maintain.
- 3.9 Connection of Trap Primers: Connect trap primers as indicated, and in accordance with manufacturer's installation instructions. Pitch piping towards drain trap, minimum of 1/8" per foot (1%). Adjust trap primer for proper flow.
- 3.10 Piping Runouts to Fixtures: Provide soil and waste piping runouts to plumbing fixtures and drains, with approved trap, of sizes indicated, but in no case smaller than required by Florida Building Code-Plumbing.
- 3.11 Install grease interceptor in accordance with manufacturer's printed instructions. Handle tank with care placing.
- 3.12 Test, clean, flush, and inspect soil and waste piping in accordance with requirements of Division-20 Basic Mechanical Materials and Methods section "Testing, Cleaning and Sterilization of Piping Systems".

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SECTION 22D

PLUMBING FIXTURES, EQUIPMENT, TRIM & SCHEDULE

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-20 Basic Mechanical Requirements and Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of plumbing fixtures work required by this section is indicated on drawings and schedules, and by requirements of this section.
- 1.4 Refer to Division-26 sections for field-installed electrical wiring required for plumbing fixtures; not work of this section.
- 1.5 Codes and Standards:
 - 1.5.1 Plumbing Fixture Standards: Comply with applicable portions of Florida Building Code-Plumbing pertaining to materials and installation of plumbing fixtures.
 - 1.5.2 ANSI Standards: Comply with applicable ANSI standards pertaining to plumbing fixtures and systems.
 - 1.5.3 PDI Compliance: Comply with standards established by PDI pertaining to plumbing fixture supports.
 - 1.5.4 UL Listing: Construct plumbing fixtures requiring electrical power in accordance with UL standards and provide UL-listing and label.
 - 1.5.5 ARI Compliance: Construct and install water coolers in accordance with ARI Standard 1010 "Drinking-Fountains and Self-Contained Mechanically-Refrigerated Drinking-Water Coolers", and provide Certification Symbol.
 - 1.5.6 ANSI Compliance: Construct and install barrier-free plumbing fixtures in accordance with ANSI Standard A117.1 "Specifications for Making Buildings and Facilities Accessible To and Usable By Physically Handicapped People".
- 1.6 Approval Submittals:
 - 1.6.1 Product Data: Submit manufacturer's technical product data, including rated capacities of selected model clearly indicated, furnished specialties and accessories; and installation instructions. Submit manufacturer's assembly-type drawings indicating dimensions, roughing-in requirements, required clearances, and methods of assembly of components and anchorages. The submittal shall be organized by "fixture number" and each fixture package shall be so identified. Each fixture package shall include all of the required fitting and trim, even if such devices are used for more than one fixture.
- 1.7 O&M Data Submittals: Submit a copy of approval submittals. Submit maintenance data and parts lists for each type of plumbing fixture and accessory; including "trouble-shooting" maintenance guide. Include these data in O&M manual.

1.8 Handle plumbing fixtures carefully to prevent breakage, chipping and scoring fixture finish. Do not install damaged plumbing fixtures; replace and return damaged units to equipment manufacturer.

2 PRODUCTS

2.1 General: Provide factory-fabricated fixtures of type, style and material indicated. For each type fixture, provide trim, carrier, seats, and valves as specified. Where not specified, provide products as recommended by manufacturer, and as required for complete installation. Where more than one type is indicated, selection is Installer's option; but, all fixtures of same type must be furnished by single manufacturer. Where type is not otherwise indicated, provide fixtures complying with governing regulations.

2.2 Model Numbers: Basis of design model numbers of a particular manufacturer are listed in the fixture schedule as an aid to contractors. Where conflicts between the model number and the written description occur, the written description shall govern. Where acceptable manufacturers are listed, products are subject to compliance with requirements.

2.3 Refer to plumbing construction drawings for fixture specifications.

2.4 Materials:

2.4.1 Provide materials which have been selected for their surface flatness and smoothness. Exposed surfaces which exhibit pitting seam marks, roller marks, foundry sand holes, stains, discoloration, or other surface imperfections on finished units are not acceptable.

2.4.2 All fixtures shall be white vitreous china unless otherwise specifically noted. Where enameled iron fixtures are specified, they shall be furnished with acid resisting enamel.

2.4.3 Where fittings, trim and accessories are exposed or semi-exposed provide bright chrome-plated or polished stainless steel units. Provide copper or brass where not exposed.

2.4.4 Stainless Steel Sheets: ASTM A 167, Type 302/304, hardest workable temper. Finish shall be No. 4, bright, directional polish on exposed surfaces.

2.4.5 Vitreous China: High quality, free from fire cracks, spots, blisters, pinholes and specks; glaze exposed surfaces, and test for crazing resistance in accordance with ASTM C 554.

2.4.6 Synthetic Stone: High quality, free from defects, glaze on exposed surfaces, stain resistant.

2.5 Plumbing Fittings, Trim and Accessories:

2.5.1 Faucets: At locations where water is supplied (by manual, automatic or remote control), provide commercial quality chrome-plated, cast-brass faucets, valves, or other dispensing devices, of type and size indicated, and as required to operate as indicated.

- 2.5.1.1 Aerators: Provide aerators of types approved by Health Department having jurisdiction.
- 2.5.1.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. American Standard, Chicago Faucet Co., Kohler Co., Speakman Co., T & S Brass and Bronze Works, Water Saver Faucet Co.
- 2.5.2 Stops: Provide chrome-plated brass, angle type, manual shutoff valves and 3/8" chrome-plated flexible supply pipes to permit fixture servicing without shutdown of water supply piping systems for all fixtures. Coordinate with fixture requirements.
- Provide loose key stops.
- 2.5.2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Zurn or approved equal.
- 2.5.3 Waste Outlets: Provide removable P-traps, drains, waste arms, tailpieces and wastes-to-wall where drains are indicated for direct connection to drainage system for all fixtures unless otherwise noted. Provide drains, tailpieces and waste arms where indirect drains are indicated. Waste outlets shall be full size of fixture drain connection.
- 2.5.3.1 Provide chrome-plated cast-brass P-traps and drains with cleanout.
- 2.5.3.2 P-traps, wastes and drains of all types shall be 17-gauge.
- 2.5.3.3 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Zurn, or approved equal.
- 2.5.4 Flush Valves: Provide quiet-flush, chrome-plated, cast-brass flush valves with vacuum breaker and screwdriver stop. Where handicap service is indicated, provide ADA compliant handles with the handle on the wide side of the stall.
- 2.5.4.1 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Sloan Valve Co. or Zurn.
- 2.5.5 Carriers: Provide cast-iron supports for fixtures of either graphitic gray iron, ductile iron, or malleable iron or steel as indicated. Coordinate with specific fixture requirements and conditions of the project.
- 2.5.5.1 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Josam, Wade, Zurn, J.R. Smith.
- 2.5.6 Fixture Bolt Caps: Provide manufacturer's standard exposed fixture bolt caps finished to match fixture finish.
- 2.5.7 Escutcheons: Where fixture supplies and drains penetrate walls in exposed locations, provide chrome-plated brass sheet steel escutcheons with friction clips.
- 2.5.8 Comply with additional fixture requirements listed for each fixture and as required for a complete and functional system.

2.6 Water Closets:

- 2.6.1 General: Provide white china siphon jet type unless otherwise noted.
- 2.6.1.1 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. American Standard, Crane, Kohler, or Zurn.
- 2.6.2 Fixture Seats: Provide white, heavy molded plastic fixture seats with stainless steel self-sustaining check hinges.
- 2.6.2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Bemis Mfg. Co., Beneke Corp., Zurn, Church or Comfort Seats.
- 2.7 Urinals:
1. General: Provide white china siphon jet wall hung type with ¾" top spud and 2" outlet unless otherwise noted. Provide short foot carrier with top and bottom hanger plates.
 2. Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. American Standard, Crane, Kohler, or Zurn.
- 2.8 Lavatories:
- 2.8.1 General: Provide white china lavatories.
- 2.8.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. American Standard, Crane, Kohler, or Zurn.
- 2.9 Stainless Steel Sinks:
- 2.9.1 General: Provide Type 304, 18 gauge self-rimming stainless steel back ledge with No. 4 finish . Provide sound deadening material on the sides and bottom of the sink. Provide grid drain or strainer with removable crumb cup and stopper as indicated.
- 2.9.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Elkay, Just
- 2.10 Water Heaters:
- 2.10.1 Electric Water Heaters:
- 2.10.2 Accessories: VB, relief, pan, stand, etc.
- 2.10.3 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Ruud, Rheem, Mor-Flo, State, A.O. Smith.

2.11 Thermostatic Mixing Valves:

2.11.1 General:

2.11.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item: Zurn, Watts, or approved equal.

2.12 Miscellaneous Fixtures:

2.12.1 General: Provide miscellaneous fixtures as described in the schedule below.

2.12.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products as listed or equal.

3 EXECUTION

3.1 Examine roughing-in work of potable water and waste piping systems to verify actual locations of piping connections prior to installing fixtures. Also examine floors and substrates, and conditions under which fixture work is to be accomplished. Correct any incorrect locations of piping, and other unsatisfactory conditions for installation of plumbing fixtures. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 Install plumbing fixtures of types indicated where shown and at indicated heights. Install in accordance with fixture manufacturer's written instructions, roughing-in drawings, and with recognized industry practices. Install in accordance with ADA and applicable handicap code requirements. Ensure that plumbing fixtures comply with requirements and serve intended purposes. Comply with applicable requirements of Florida Building Code-Plumbing pertaining to installation of plumbing fixtures. Furnish templates for cut-outs in countertops. Coordinate exact fixture locations with countertop shop drawings.

3.3 Fasten plumbing fixtures securely to indicated supports or building structure; and ensure that fixtures are level and plumb. Secure plumbing supplies behind or within wall construction so as to be rigid, and not subject to pull or push movement. Mount at heights shown on the drawings. Fixture heights are floor-to-rim distance. Fitting heights are to centerline.

3.4 Install stop valve in water supply to each fixture.

3.5 After fixtures are set, the crack between the fixture and wall shall be caulked with DAP silicone-based caulking, or approved equal.

3.6 Protect installed fixtures from damage during remainder of construction period.

3.7 Upon completion of installation of plumbing fixtures and after units are water pressurized, test fixtures to demonstrate capability and compliance with requirements. When possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with retesting.

3.8 Inspect each installed unit for damage to finish. If feasible, restore and match finish to original at site; otherwise, remove fixture and replace with new unit. Feasibility and match to be judged by Architect/Engineer. Remove cracked or dented units and replace with new units.

- 3.9 Clean plumbing fixtures, trim, aerators, and strainers of dirt and debris upon completion of installation.
- 3.10 Adjust water pressure at faucets and flush valves to provide proper flow stream and specified gpm.
- 3.11 Adjust or replace washers to prevent leaks at faucets and stops.

END OF SECTION

SECTION 22E

GAS SYSTEM

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specifications sections, apply to work of this section.
- 1.2 Division-20 Basic Mechanical Requirements and Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of gas systems work, is indicated on drawings and schedules, and by requirements of this section.
- 1.4 Excavation and backfill required in conjunction with gas service piping is specified in Division-20 sections, and is included as work of this section.
- 1.5 Codes and Standards
- 1.5.1 NFPA Compliance: Fabricate and install gas systems in accordance with NFPA 54 "National Fuel Gas Code".
- 1.5.2 Utility Compliance: Fabricate and install gas systems in accordance with local gas utility company requirements and standards.
- 1.6 Approval Submittals:
- 1.6.1 Product Data: Submit manufacturer's technical product data and installation instructions as follows:
- Gas cocks and/or ball valves
Access doors
- 1.7 O&M Data Submittals: Submit a copy of approval submittals. Submit maintenance data and parts lists for gas cocks, ball valves. Include these data in O&M manual.

2 PRODUCTS

- 2.1 General: Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide materials and products complying with NFPA 54 where applicable. Base pressure rating on gas piping system maximum design pressures. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in gas systems. Where more than one type of materials or products are indicated, selection is Installer's option.
- 2.2 Identification: Provide identification complying with Division-20 Basic Mechanical Materials and Methods section "Mechanical Identification".
- 2.3 Pipes and Fittings: Provide pipes and pipe fittings complying with Division-20 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings", in accordance

with the following listing:

2.3.1 Building Distribution Piping:

2.3.1.1 Pipe Size 2" and Smaller: Black steel pipe; Schedule 40; malleable-iron threaded fittings.

2.3.1.2 Pipe Sizes 2" and Smaller: Gas piping within each laboratory shall be Type L hard drawn copper with silver solder brazed joints.

2.4 Piping Specialties: Provide piping specialties complying with Division-20 Basic Mechanical Materials and Methods section "Piping Specialties".

2.5 Sealants: Provide UL-listed or AGA approved sealants for gas piping.

2.6 Supports and Anchors: Provide supports and anchors complying with Division-20 Basic Mechanical Materials and Methods section "Supports and Anchors".

2.7 Valves: Provide valves complying with Division-20 Basic Mechanical Materials and Methods section "Valves" and in accordance with the following listing.

2.7.1 Gas Cocks 2" and Smaller: UL-listed, AGA approved, 150 psi non-shock WOG, full port, bronze straightway cock, flat or square head, threaded ends.

2.7.2 Wrenches: Provide operating wrenches for all gas cocks serving boilers.

2.7.3 Acceptable Manufacturers for gas cocks: Subject to compliance with requirements, provide products of one of the following: Resun R1430 and R1431, Milliken 200M and 201M or approved equal.

2.8 Gas Meter and Regulator: Provided by local utility company.

2.9 Access Doors: Provide access doors to service all valves and other devices as required in accordance with Division-20 Basic Materials and Methods Section "Access Doors".

3 EXECUTION

3.1 Examine areas and conditions under which gas systems materials and products are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer. Coordinate with gas supplier prior to starting work.

3.2 Install mechanical identification in accordance with Division-20 Basic Mechanical Materials and Methods section "Mechanical Identification".

3.3 Install gas piping in accordance with Division-20 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings".

3.3.1 Use sealants on metal gas piping threads which are chemically resistant to gas. Use sealants sparingly, and apply to only male threads of metal joints.

3.3.2 Remove cutting and threading burrs before assembling piping.

- 3.3.3 Do not install defective piping or fittings. Do not use pipe with threads which are chipped, stripped or damaged. Do not use bushings in the gas system.
- 3.3.4 Plug each gas outlet, including valves, with threaded plug or cap immediately after installation and retain until continuing piping, or equipment connections are completed.
- 3.3.5 Ground gas piping electrically and continuously within project, and bond tightly to grounding connection.
- 3.3.6 Install drip-legs in gas piping where indicated, and where required by code or gas company requirements.
- 3.3.7 Install "Tee" fitting with bottom outlet plugged or capped, at bottom of pipe risers.
- 3.3.8 Use dielectric unions where dissimilar metals are joined together.
- 3.3.9 Install piping with 1/64" per foot (1/8%) downward slope in direction of flow.
- 3.3.10 Install piping parallel to other piping, but maintain minimum of 12" clearance between gas piping and steam or hydronic piping above 200°F.
- 3.4 Install piping specialties in accordance with Division-20 Basic Mechanical Materials and Methods section "Piping Specialties".
- 3.5 Install supports and anchors in accordance with Division-20 Basic Mechanical Materials and Methods section "Supports and Anchors".
- 3.6 Installation of Valves:
- 3.6.1 Gas Cocks: Provide at connection to gas train for each gas-fired equipment item; and on risers and branches where indicated.
- 3.6.2 Locate gas cocks where easily accessible, and where they will be protected from possible injury.
- 3.7 Equipment Connections: Connect gas piping to each gas-fired equipment item, with drip leg and shutoff gas cock. Comply with equipment manufacturer's instructions.
- 3.8 Locate and coordinate installation of access doors for all valves and devices in accordance with Division-20 Basic Mechanical Materials and Methods section "Access Doors".
- 3.9 Piping Tests: Inspect, test, and purge gas systems in accordance with NFPA 54, local utility requirements, and Division-20 Basic Mechanical Materials and Methods section "Testing, Cleaning and Sterilization of Piping Systems".

END OF SECTION

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SECTION 260000

ELECTRICAL GENERAL REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES:

- A. Electrical General Requirements specifically applicable to Division 26 Sections, in addition to Division 1 - General Requirements.

1.2 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 Engineer before proceeding.
- C. Before submitting a proposal for the work contemplated in these specifications and accompanying Drawings, each bidder shall examine the site and familiarize himself with all the existing conditions and limitations. No additional compensation will be allowed because of the Contractor's misunderstandings as to the amount of work involved or his lack of knowledge of any condition in connection with the work.

1.3 REGULATORY REQUIREMENTS:

- A. Permits and Inspections: This Contractor shall secure and pay for all permits, and inspections required on work performed under this section of the Specifications. He shall assume full responsibility for all assessments and taxes necessary for the completion and acceptance of the work.
- B. Applicable Standards and Codes: All materials and workmanship shall comply with all applicable codes, specifications, local ordinances, industry standards and utility company regulations. In case of difference between building codes, specifications, federal and state laws, local ordinances, industry standards and utility company regulations and the Contract Documents, the most stringent requirements shall govern. The Contractor shall promptly notify the Engineer in writing of such differences. Should the Contractor perform any work that does not comply with the requirements of the applicable building codes, federal and state laws, local ordinances, industry standards and utility company regulations, he shall bear all costs arising in correcting the deficiencies. Applicable codes and standards shall include all State laws, State Board of Health and State Rating Bureau, local ordinances, utility company regulations and the applicable requirements of the following:
 - 1. Standard Building Code
 - 2. National Fire Protection Association - NFPA
 - 3. National Electrical Manufacturers Association - NEMA
 - 4. National Bureau of Standards
 - 5. American National Standards Institute - ANSI
 - 6. Underwriters' Laboratories - UL 1.04

- A. Cooperate with others in laying out the electrical work so that this phase of the work will properly fit the building and other contractors' requirements.

1.5 PRODUCTS FURNISHED BY OTHERS:

- A. Products are furnished by the Owner or under other Divisions of these Specifications that require electrical connection. This Contractor shall provide all necessary materials and labor to connect to the electrical
- B.

system all equipment and fixtures having electrical power connection requirements. Refer to other Divisions of these Specifications for additional or specific requirements. Actual rough-in dimensions shall be obtained from Shop Drawings or measurements of the equipment or fixture.

- C. The unpacking, assembling and setting of equipment furnished by the Owner or under other Divisions of these Specifications will be performed by others, unless stated otherwise.
- D. Because the manufacturer of the equipment actually purchased or supplied may vary slightly from that specified, as hereinbefore stated, some rearranging of the requirements may be necessary. This Contractor shall make connections as required by the actual equipment furnished.

1.6 SEQUENCING AND SCHEDULING:

- A. Construct work in sequence under provisions of applicable sections of these specifications.
- B. Power outages shall be scheduled with the Owner and other Contractors. Outages shall be at the convenience of the Owner.

1.7 APPROVAL OF MATERIALS AND EQUIPMENT:

- A. Whenever a material, article, or piece of equipment is identified on the Drawings or in these Specifications by reference to manufacturer's or vendor's name, trade name, catalog number or the like, it is so identified for the purpose of establishing a standard of quality and shall not be construed as limiting competition. Any material, article, or piece of equipment of other manufacturers or vendors, which will perform adequately the intent of the design, will be considered equally acceptable provided written approval has been granted by the Engineer. Materials submitted for approval shall comply with all applicable Sections of these Specifications prior to acceptance. Submit proposed substitutions to the Architect for approval at least ten

(10) days prior to the bid so that an addendum can be issued to all contractors. Engineer's opinion shall be final on the equality of substituted items.

- B. After the Contract has been awarded, catalog cuts on the following items shall be submitted to the Architect/Engineer for final approval before purchase of the equipment whether substitutions are being made or not:

1. Light Fixtures
2. Panelboards and Switchboards
3. Distribution Equipment
4. Wiring Devices
5. Fabricated Equipment
6. Automatic Transfer Switches

1.08 OBSERVATION, TESTING AND

BALANCING:

- A. Observation: The complete job will be, during and/or after construction, subject to the administration of the Engineer. Site visit(s) shall be conducted by the Architect/Engineer or his designated representative as necessary to maintain compliance with the Contract requirements.
- B. Balancing: All branch circuits and feeders shall be tested under typical load conditions (under maximum load conditions if so desired/requested by general contractor or engineer), and loads shall be balanced on the phases of the electrical system.

1.09 WORKMANSHIP:

- A. All work shall be executed in a neat and substantial manner by skilled workman, well qualified, and regularly engaged in the type of work required. Substandard work shall be removed and replaced by the Contractor at no cost to the Owner.

1.10 OPERATING AND MAINTENANCE INSTRUCTIONS/AS BUILT DRAWINGS:

- A. Four (4) complete sets of instructions containing the manufacturer's operating and maintenance instructions for each piece of equipment shall be furnished to the Owner. Each set shall be permanently bound and shall have a hard cover. One complete set shall be furnished at the time that the test procedure is submitted, and remaining sets shall be furnished before the Contract is completed. Flysheets shall be placed before instructions covering each subject. The instruction sheets shall be approximately 8-1/2" by 11" with large sheets of Drawings folded in. The instructions shall include information for major pieces of equipment and systems.
- B. Upon completion of the work and at the time designated, the services of one project engineer shall be provided by the Contractor to instruct the representative of the Owner in the operation and maintenance of the systems.
- C. This Contractor shall provide as-built Drawings at the completion of the job. Drawings shall show all significant changes in equipment, wiring, routing, location, etc.

1.11 GUARANTEE:

- A. This Contractor shall guarantee to the Owner, all work performed under this contract to be free from defects in workmanship and material for a period of one year from date of final acceptance by Owner and Architect. Any defects arising during this period will be promptly remedied by the Contractor without cost to the Owner. Lamps and fuses burned out during normal operation after acceptance are exempt from guarantee. This Contractor shall furnish the Owner with an estimated time, from notification of a problem to presence on the site, for all service calls on warranty items.

1.12 COMPLIANCE:

- A. In the event of a conflict between Specifications, Drawings, Codes, Requirements, etc., the most stringent requirements shall govern.
- B. The interpretation of conflicts and resolution thereof shall remain the right of the Architect/Engineer or his designated representative.

PART 2 - PRODUCTS: Not

Used PART 3 - EXECUTION:

Not Used

SECTION 260519

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS, CABLES, AND DEVICES

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

- A. Section 260000 - Electrical General Requirements, apply to the work specified in this Section, with additions and modifications specified herein.

1.2 SECTION INCLUDES:

- A. Wire and Cable
- B. Wiring Devices

PART 2 PRODUCTS

2.01 WIRE AND CABLE

A. Building Wire:

1. Feeder and Branch Circuits 10 AWG and Smaller: Copper, solid conductor, 600 volt insulation, rated 75 degrees C, THHN/THWN.
2. Feeder and Branch Circuits 8 AWG and 6 AWG: Copper, stranded conductor, 600 volt insulation, rated 75 degrees C, THHN/THWN.
3. Feeder and Branch Circuits Larger Than 6 AWG: Copper, stranded conductor, 600 volt insulation, rated 75 degrees C, THW.
4. Control Circuits: Copper, stranded conductor, 600 volt insulation, THHN/THWN.

NOTE: The use of Romex cable is not allowed on this project. MC (metal clad) cable may be used where applicable and approved by local AHJ **and ARCHITECT/OWNER**. Aluminum wire may be used for feeder conductors provided the local AHJ **and OWNER** approve and the minimal allowable ampacity (as specified) is met.

B. Remote Control Signal Cable (where applicable):

- 1. Control Cable for Class 1 Remote Control and Signal Circuits: Copper conductor, 600 volt insulation, rated 60 degree C, individual conductors twisted together, shielded, and covered with PVC jacket.
- 2. Control Cable for Class 2 or Class 3 Remote Control and Signal Circuits: Copper conductor, 300 volt insulation, rated 60 degree C, individual conductors twisted together, shielded, and covered with PVC jacket; UL listed.

- C. Cords: Oil-resistant thermoset-insulated multi-conductor flexible cord with identified equipment grounding conductor, suitable for extra hard usage in damp locations, type SO.

2.2 WIRING DEVICES AND WALL PLATES:

- A. Manufacturers:
 - 1. Hubbell
 - 2. Leviton
 - 3. Arrow Hart

- B. Wall Switches: AC general use, quiet-operating snap switch rated 20 amperes and 120/277 volts AC, with plastic toggle handle, ivory color unless noted otherwise on architectural drawings. Confirm with COSCo.
 - 1. Single Pole Switch: Hubbell 1221-I (or equal)
 - 2. Three Way Switch: Hubbell 1223-I (or equal)

- C. Receptacle:
 - 1. Convenience Receptacle Configuration: Type 5-20R, plastic face, ivory color. Model 5262-I manufactured by Hubbell (or equal).
 - 2. Specific Purpose Receptacle: Configuration indicated on Drawings with black plastic face.
 - 3. Provide straight-blade receptacles to NEMA WD 1.
 - 4. Provide straight-blade receptacles to NEMA WD 5.
 - 5. GFCI Receptacles: Duplex convenience receptacle with integral ground fault current interrupter. Model GFR-5352IA manufactured by Hubbell (or equal). Device shall be compliant to the requirements of UL 943.

- D. Wall Dimmer: Rotary dial or slide type, ivory color. (Confirm with COSCo) Model C-2000 manufactured by Lutron.(or equal) Rating of 2000 watts at 120 volts, AC.

- E. Decorative Cover Plate: Smooth Stainless steel, ivory color, ANSI 302.

- F. Weatherproof Cover Plate: Gasketed cast metal with hinged gasketed device covers rated raintight while in use in accordance with Article 410-57 of the National Electrical Code.

- G. Attachment Plug Cap: Match receptacle configuration provided for equipment connection.

- H. Cord Reels: Provide cord reels as indicated on the drawings. Cords shall be sized per loads served and shall be 50' in length.

PART 3 EXECUTION

3.01 EXAMINATION AND PREPARATION:

- A. Verify that interior of building has been physically protected from weather.
- B. Verify that mechanical work which is likely to injure conductors has been completed.
- C. Completely and thoroughly swab raceway system before installing conductors.

3.02 INSTALLATION:

- A. Wiring Methods:
 - 1. Concealed Interior Locations: Building wire in raceway.
 - 2. Exposed Interior Locations: Building wire in raceway.
 - 3. Above Accessible Ceilings: Building wire in raceway.
 - 4. Wet or Damp Interior Locations: Building wire in raceway.
 - 5. Exterior Locations: Building wire in raceway.
 - 6. Underground Locations: Building wire in raceway.
 - 7. Hazardous Locations: Building wire in raceway conforming to applicable NEC Articles as identified on the Drawings.
- B. Use no wire smaller than 12 AWG for power and lighting circuits, and no smaller than 14 AWG for control wiring. Conductors shall be sized to compensate for voltage drop.
- C. Neatly train and secure wiring inside boxes, equipment and panelboards.
- D. Use UL listed wire pulling lubricant for pulling conductors in raceways.
- E. Make splices, taps, and terminations to carry full ampacity of conductors without perceptible temperature rise.
- F. Devices shall mount flush or as indicated on the Drawings.
- G. Install wiring devices in accordance with manufacturer's instructions.
 - 1. Install wall switches 48 inches above floor, "OFF" position down.
 - 2. Install wall dimmers 48 inches above floor. De-rate ganged dimmers as instructed by manufacturer. Do not use a common neutral, provide a separate neutral for each dimmed circuit.
 - 3. Unless noted otherwise, install convenience receptacles 18 inches above floor, 6 inches above counters or splashbacks, with grounding pole on bottom.
 - 4. Install GFCI receptacles at all outdoor locations and all indoor locations as required by NFPA70, and as indicated.
 - 5. Install specific purpose receptacles at heights shown on Drawings.
 - 6. Install cord and attachment plug caps on equipment where acceptable and approved by all local AHJ's... and deemed necessary. Size cord for connected load and rating of branch circuit over-current protection.
- K. Install wall plates flush and level.
 - 1. Install decorative plates on switch, receptacle, and blank outlets in finished areas.
 - 2. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.

3. Install weatherproof coverplates on all devices/boxes in wet or outdoor locations.

3.3 FIELD QUALITY CONTROL:

- A. Perform field inspection and testing of circuits under provisions of Section 16000.
 1. Inspect wire and cables for physical damage and proper connection.
 2. Torque test conductor connections and terminations to manufacturer's recommended values.
 3. Perform continuity test on all power and equipment branch circuit conductors. Verify proper phasing connections.

END OF SECTION 260519

SECTION 260530

RACEWAY SYSTEMS

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

- A. Section 260000 - Electrical General Requirements, apply to the work specified in this section, with additions and modifications specified herein.

1.2 SECTION INCLUDES:

- A. Conduit and Conduit Fittings
- B. Electrical Boxes and Fittings
- C. Cable Tray

PART 2 PRODUCTS

2.1 CONDUIT AND FITTINGS:

A. Conduit:

1. Metal Rigid Conduit: Galvanized steel.
2. Metal Tubing: Galvanized steel.
3. Flexible Conduit: Steel.
4. Liquid-Tight Flexible Conduit: Flexible conduit with PVC Jacket.
5. Plastic Conduit and Tubing: NEMA TC 2; PVC. Use Schedule 40 conduit.

B. Conduit and Fittings:

1. Conduit Fittings and Conduit Bodies: NEMA FB 1. Conduit fittings to be steel, threaded type. Split couplings are not acceptable.
2. Tubing Fittings: NEMA FB 1. Tubing fittings to be steel compression type for conduit up to 2" in diameter and set screw type for conduit 2-1/2" and larger.
3. Flexible Conduit Fittings: NEMA FB 1. Flexible conduit fittings to be steel set screw or screw in type.
4. Liquid-Type Flexible Conduit Fittings: NEMA FB 1. Liquid-tight flexible conduit fittings to be steel compression type.
5. Plastic Fittings and Conduit Bodies: NEMA TC 3.

2.2 ELECTRICAL BOXES:

A. Boxes:

1. Sheet Metal: NEMA OS 1; galvanized steel, 4" or 4-11/16" square. Provide galvanized plaster/tile ring for recessed outlet boxes.
 2. Cast Metal: Aluminum or cast ferrous alloy, deep type, gasketed cover, threaded hubs.
 3. Nonmetallic: NEMA OS 2.
- B. Large Enclosures: NEMA 250; Type 4, steel enclosures with manufacturer's standard enamel finish and cover, held closed screws.

2.03.1 CABLE TRAY (where applicable):

A. Manufacturers:

1. B-line
 2. Mono-Systems
- B. Ladder type, constructed of aluminum with 9" rung spacing, 6" siderails and 18" wide
- C. Fittings: Horizontal 90° elbows, horizontal tees, and horizontal crosses with all metal accessories to connect to straight sections.
- D. Support: Supports shall be fabricated channel, and threaded rods.
- E. Grounding: Provide grounding straps as each junction, splice, fitting, etc.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION:

- A. Examine supporting surfaces to determine that surfaces are ready to receive work.
- B. Electrical boxes shown on Contract Drawings are approximate locations unless dimensioned.

3.2 INSTALLATION:

- A. Use conduit and tubing for raceways in the following locations:
 1. Underground Installations: Rigid steel conduit, painted with two coats of epoxy asphaltum paint, or PVC conduit.
 2. Installations In Concrete: Rigid steel conduit, or PVC conduit.
 3. In Slab Above Grade: Rigid steel conduit, or PVC conduit.
 4. Exposed Outdoor Locations: Rigid steel conduit where damage from an external source is likely. Otherwise, schedule 80 PVC may be used.

5. Wet Interior Locations: Rigid steel conduit or electrical metallic tubing. Use threaded or raintight fittings for conduit.
 6. Concealed Dry Interior Locations: Rigid steel conduit or electrical metallic tubing. Raceway to be installed concealed inside walls unless otherwise noted on plans. **Where the electrical contractor foresees that installation inside a wall may be difficult or conflict with another system or construction, EC to verify with GC/Architect prior to surface-mounting.**
 7. Exposed Dry Interior Locations: Rigid steel conduit or electrical metallic tubing.
 8. Feeders: Galvanized rigid steel conduit on all feeders.
- B. Size raceways for conductor type installed.
1. Minimum Size Conduit: 1/2 inch.
- C. Arrange conduit and tubing to maintain headroom and to present a neat mechanical appearance.
1. Route exposed raceway parallel and perpendicular to walls and adjacent piping.
 2. Maintain minimum 6 inch clearance to piping and 12 inch clearance to heat surfaces such as flues, piping, and heating appliances.
 3. Maintain required fire, acoustic, and vapor barrier rating when penetrating walls, floors, and ceilings.
 4. Route conduit through roof openings for piping and ductwork where possible; otherwise, route through roof jack with pitch pocket.
 5. Group in parallel runs where practical. Use rack constructed of steel channel. Maintain spacing between raceways or de-rate circuit ampacities to NFPA 70 requirements.
 6. Use approved manufactured conduit hangers and clamps; do not fasten with wire or perforated pipe straps. Utilize conduit hangers for conduits located below floor slabs.
 7. Use conduit bodies to make sharp changes in direction.
 8. Terminate all conduits with insulated bushings.
 9. Use suitable caps to protect installed raceway against entrance of moisture and dirt.
 10. Provide a pull string in all empty raceways.
 11. Install expansion joints fittings where raceway crosses building expansion joints.
 12. Install plastic conduit and tubing in strict accordance with the manufacturer's recommendations. When plastic conduit is installed, use galvanized rigid elbows for 90E bends.
- D. Install electrical boxes as shown on the Drawings, and as required for splices, taps, wire pulling,

equipment connections and regulatory requirements.

1. Use cast outlet box in exterior locations, wet locations, and exposed interior locations.
 2. Use large enclosure for interior pull and junction boxes larger than 12 inches in any dimension.
 3. Locate and install electrical boxes to allow access. Provide access panels if required.
 4. Locate and install electrical boxes to maintain headroom and to present a neat mechanical appearance.
 5. Install pull boxes and junction boxes above accessible ceilings or in unfinished areas.
 6. Provide knockout closure for unused openings.
 7. Align wall-mounted outlet boxes plumb and level for switches, and similar devices.
 8. Coordinate mounting heights and locations of outlets above counters and backsplashes.
 9. Install lighting outlets to locate luminaires as shown on the Drawings.
- E. Use recessed outlet boxes in finished areas where indicated.
1. Secure boxes to interior wall and partition studs, accurately positioning to allow for surface finish thickness, and plaster/tile ring installation.
 2. Use stamped steel stud bridges for flush outlets in hollow stud wall, and adjustable steel channel fasteners for flush ceiling outlet boxes.
 3. Locate boxes in masonry walls to require cutting corner only. Coordinate masonry cutting to achieve neat openings for boxes.
 4. Do not install boxes back-to-back in walls; provide 6 inch separation, minimum. In acoustic-rated walls provide 24 inch separation minimum.
 5. Do not damage insulation.

END OF SECTION 260530

SECTION 262713

SERVICE AND DISTRIBUTION

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

- A. Section 260000 - Electrical General Requirements, apply to the work specified in this Section, with additions and modifications specified herein.

1.02 SECTION INCLUDES:

- A. System Description
- B. Utility Requirements
- C. Grounding
- D. Switchboards
- E. Panelboards
- F. Enclosed Switches
- G. Fuses
- H. Transformers
- I. Enclosed Circuit Breakers
- J. Plug-in Duct

1.03 SYSTEM DESCRIPTION:

- A. The existing overhead 120/240V, 3-phase, 4W to be reconnected to new weatherhead. Utility to determine if new overhead service required to be replaced if load merits so. Refer to 'Power Riser Diagram' for details. The EC shall field-coordinate with the utility company prior to construction to confirm method of new service and all requirements.

1.04 PROJECT CONDITIONS:

- A. Verify field measurements for the equipment to ensure proper fit with in the space proposed.

1.05 UTILITY REQUIREMENTS:

- A. The serving utility is FP&L. New 120/240V, 3-phase, 4-wire overhead service to be installed from existing utility overhead transformer bank to service-entrance equipment. Refer to 'Power Riser Diagram'.
- B. If required, metering shall be provided by the utility company and installed by electrical contractor.

1. Coordinate with the utility for exact metering requirements.
2. Install metering devices provided by the utility company.

PART 2 PRODUCTS

2.01 SWITCHBOARD:

A. Manufacturers:

1. Square D Company
2. ITE-Siemens
3. General Electric Company
4. Cutler Hammer

B. Switchboard: NEMA PB2.

1. Line and Load Terminations: Accessible from front only of switchboard, suitable for conductor materials used.
2. Main Sections Devices: Individually mounted.

C. Ratings: As shown on Drawings.

D. Bussing:

1. Bus Material: Copper or Aluminum with tin plating sized in accordance with NEMA PB2.
2. Bus Connections: Accessible from front for maintenance.
3. Ground Bus: Copper

E. Enclosure: Type 1 General purpose as shown on the Drawings.

1. Align sections at front and rear.
2. Height: 90 inches
3. Finish: Manufacturer's standard light gray enamel over external surfaces.

F. Future Provisions:

1. Fully equip spaces for future devices with bussing and bus connection provisions; continuous current rating as indicated on the Drawings.
2. Do not taper main bus rating.

G. Switching and Over-Current Protection Devices:

1. Molded Case Circuit Breakers: NEMA AB 1.

2. Solid State Molded Case Circuit Breakers: NEMA AB 1; with electronic sensing, timing and tripping circuits for adjustable current settings; ground fault trip; instantaneous trip and adjustable short time trip.

H. Switchboard Instruments:

1. Ground Fault Sensors: Zero sequence type.
2. Ground Fault Relay: Adjustable ground fault sensitivity from 200 to 1200 amperes, time delay adjustable from 0 to 1 second.
3. Square D Power Logic metering.

2.02 PANELBOARDS:

A. Manufacturers:

1. Square D Company
2. ITE-Siemens
3. General Electric Company
4. Cutler Hammer

B. Distribution Panelboards: NEMA PB 1; circuit breaker type.

1. Enclosures: Type 1 or 3R as shown on Drawings.
2. Mounting: Surface or flush mount as shown on Drawings.
3. Bus: Copper.
4. Ground Bus: Copper
5. Voltage and phase: As shown on Drawings.
6. Minimum Integrated Equipment: As shown on Drawings.
7. Hinged door with lock.
8. Circuit Breakers: Bolt-on, ratings as shown on Drawings.

C. Light and Power Panelboards: NEMA PB 1; circuit breaker type.

1. Enclosures: Type 1 or 3R as shown on Drawings.
2. Surface or flush mount as shown on Drawings.
3. Bus: Copper.
4. Ground Bus: Copper.

5. Voltage and phase as shown on Drawings.
 6. Minimum Integrated Equipment: As shown on Drawings.
 7. Hinged door with lock.
 8. Circuit Breakers: Bolt-on, ratings as shown on Drawings.
- D. Accessories: Provide panel and branch device accessories as shown on Drawings.
- E. Future Provisions: Where space provisions are indicated on the Drawings provide bussing, bus extensions, etc. require to mount future circuit breakers. Where spare provisions are indicated on the Drawings provide circuit breakers complete and ready for connection.

2.3 ENCLOSED SWITCHES:

- A. Manufacturers:
1. Square D Company
 2. ITE-Siemens
 3. General Electric Company
 4. Cutler Hammer
- B. Enclosed Switch Assemblies: NEMA KS 1; Type HD.
1. Fuse Clips: Designed to accommodate Class `R' or `J' fuses as shown on Drawings.
- C. Enclosures: NEMA KS 1; Type 1 or 3R as required.
- D. Ground: Provide grounding lug.
- E. Ratings: 600 or 250 volts to match system service requirements, poles and ampere ratings as indicated on the Drawings.

2.04 FUSES:

- A. Manufacturers:
1. Bussman
 2. Shawmut
 3. Little Fuse
- B. Service Entrance/Feeder Circuits-601 Amp and Larger
1. Current Limiting
 2. UL Class L
 3. 200,000 Ampere RMS Interrupting Rating

4. Voltage Rating: As required for system compatibility.
- C. Service Entrance/Feeder Circuits-600 Amp and Smaller
1. Current Limiting
 2. UL Class RK1
 3. 200,000 Ampere RMS Interrupting Rating
 4. Voltage Rating: As required for system compatibility
- D. Motor, Motor Controller, Transformer and Inductive Circuits
1. Current Limiting
 2. UL Class RK1, Time Delay
 3. 200,000 Ampere RMS Interrupting Rating
 4. Voltage Rating: As required for system compatibility.

2.05 TRANSFORMERS:

- A. Manufacturers:
1. Square D Company
 2. ITE-Siemens
 3. General Electric Company
 4. Cutler Hammer
- B. Description: Enclosed air-cooled dry type transformer.
- C. Ratings:
1. Primary Voltage: As shown on Drawings.
 2. Secondary Voltage: As shown on Drawings.
 3. Capacity: KVA ratings as shown on Drawings.
 4. Basic Impulse Level: 10 BIL.
 5. Insulation Class/Temperature Rise: Class 220/115 degrees C.
- D. Configuration: Two winding, delta-wye.
- E. Winding Taps: Four full capacity primary taps, each at 2.5 percent below rated voltage; and two full capacity primary taps, each at 2.5 percent above rated voltage.

- F. Mounting: Wall, floor, or trapeze as shown on Drawings.
- G. Enclosures: Code gauge steel, NEMA 1 or 3R as required.

2.06 ENCLOSED CIRCUIT BREAKERS:

- A. Manufacturers:
 - 1. Square D Company
 - 2. ITE-Siemens
 - 3. General Electric Company
 - 4. Cutler Hammer
- B. Circuit Breaker: NEMA AB 1.
 - 1. Voltage: As shown on Drawings.
 - 2. Enclosure: NEMA AB 1; Type 1 or 3R as required.
 - 3. Accessories: As indicated on Drawings.

2.07.1 PLUG-IN DUCT

- A. Manufacturers:
 - 1. Square D Company
 - 2. ITE-Siemens
 - 3. General Electric
 - 4. Cutler Hammer
- B. Plug-in Duct
 - 1. Bus Material: Copper
 - 2. Enclosure: NEMA 1
 - 3. Mounting: Suspended from structure
 - 4. Rating: 225 amperes, 600 volt, 3 phase, 4 wire
- C. Plug-in Units
 - 1. Fusible switches

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION:

- A. Make arrangements with utility company to obtain permanent electrical service to the facility.

- B. Provide concrete pad for utility transformer. Pad details on the Drawings are for estimating purposes. Coordinate exact pad requirements with the utility prior to installation.

3.02 INSTALLATION:

- A. Install utility services in accordance with utility company standards and requirements.
 - 1. Underground Service: Install service entrance conduits and conductors from the utility padmounted transformer to the service equipment as shown on the Drawings. (Verify with utility prior to bid/construction.) In addition, coordinate with utility company for required provisions for utility- owned underground primary cabling.
 - 2. If applicable...provide lugs on utility transformer spaces sized to accommodate service entrance conductors.
- B. Install equipment in accordance with manufacturer's instructions.
- C. Install switchboard to NEMA PB 2.1.
- D. Install panelboards to NEMA PB 1.1.
- E. Ground the electrical service in accordance with NFPA 70, National Electrical Code, Article 250.
- F. Provide labels for all switchboards, panelboards, and distribution equipment.
- G. Provide typewritten directory inside panel door for all panelboards.

END OF SECTION 262713

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SECTION 264313

SURGE PROTECTION FOR LOW-VOLTAGE ELECTRICAL POWER CIRCUITS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. The Contractor shall furnish and install the Transient Voltage Surge Suppression (TVSS) equipment having the electrical characteristics, ratings and modifications as specified herein and as shown on the contract drawings. Refer to related sections for surge requirements in:

1.2 SUMMARY

- a) Section 16300 -- Panelboards

1.3 DEFINITIONS

The TVSS units and all components shall be designed, manufactured and tested in accordance with the latest applicable UL Listed standards (UL 1449, 2nd Edition), UL 1283 and CSA certified per CSA 22.2

1.4 SUBMITTALS

- A. The following information shall be submitted to the Engineer:
 - 1. Provide verification that the TVSS device complies with the required UL 1449 2nd Edition and CSA approvals.
 - 2. Provide actual let through voltage test data in the form of oscillograph results for the ANSI/IEEE C62.41 Category C3 & C1 (combination wave) and B3 (ringwave) tested in accordance with ANSI/IEEE C62.45.
 - 3. Provide spectrum analysis of each unit based on MIL-STD-220A test procedures between 50 kHz and 200 kHz verifying the device's noise attenuation exceeds 41 dB at 100 kHz.
 - 4. Provide test report from a recognized independent testing laboratory verifying the suppressor components can survive published surge current rating on both a per mode and per phase basis using the IEEE C62.41, 8 x 20 microsecond current wave. Note that test data on individual module is not accepted.
- B. Submit five (5) copies of the above information.

1.05 SUBMITTALS – FOR INFORMATION:

When requested by the Engineer the following product information shall be submitted to the engineer:

- a) UL 1449 Listing classifications, and clamping voltage rating for each mode of protection.

- b) ANSI/IEEE C62.41 AND C62.45 Category C3 clamping voltage.
- c) Sequential surge survivability per ANSI/IEEE C62.45.
- d) Dimensions and weight
- e) Recommended connection wiring diagram

1.06 QUALIFICATIONS

- A. Manufacturer must have a minimum of five years (in U.S.) experience in producing TVSS systems.
- B. TVSS devices and accessories shall be obtained through one manufacturer.
- C. Other manufacturers not listed in this document may be considered by the engineer/architect at least 14 days prior to bid. The specifications of the product listed in 1.05 "SUBMITTALS-FOR INFORMATION" shall be highlighted.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Equipment shall be handled and stored in accordance with manufacturer's instructions. One (1) copy of these Shall be included with the equipment at time of shipment.

1.08 OPERATION AND MAINTENANCE MANUALS

- A. Five (5) copies of the equipment operation and maintenance manuals shall be provided.
- B. Operation and maintenance manuals shall include the following information:
 - 1. Instruction books and/or leaflets
 - 2. Recommended renewal parts list

1.10 EXTRA MATERIALS:

- A. Furnish replaceable protection modules for service entrance unit with labeled protective covering for storage.

II. PRODUCTS

2.01 MANUFACTURERS

- A. Cutler-Hammer, Square D, Advanced Protection Technologies (APT), Surge Suppression Inc.

2.02 VOLTAGE SURGE SUPPRESSION – GENERAL

A. Electrical Requirements

- 1. Unit Operating Voltage -- Refer to drawings for operating voltage and unit configuration.
- 2. Maximum Continuous Operating Voltage (MCOV) -- The MCOV shall be greater than 115% of the nominal system operating voltage.
- 3. Protection Modes -- For a wye configured system, the device must have directly connected suppression elements between line-neutral (L-N), line-ground (L-G), and neutral-ground (N-G). For a delta configured system, the device must have suppression elements between line to line (L-L) and line to ground (L-G).

4. UL 1449 2nd Edition SVR -- The maximum UL 1449 2nd Edition SVR for the device must not exceed the following:

Modes	208Y/120	480Y/277	600Y/347
L-N; L-G; N-G	500 V	900 V	1000 V
L-L	900 V	1500 V	1800 V

5. ANSI/IEEE Cat C3 Let Through Voltage -- The let through voltage based on IEEE C62.41 and C62.45 recommended procedures for Category C3 surges (20 kV, 10 kA) shall be less than:

Modes	208Y/120	480Y/277	600Y/347
L-N	910 V	1070 V	1300 V

6. ANSI/IEEE Cat. B3 Let Through Voltage -- Let through voltage based on IEEE C62.41 and C62.45 recommended procedures for the ANSI/IEEE Cat. B3 ringwave (6 kV, 5000 amps) shall be less than:

Modes	208Y/120	480Y/277	600Y/347
L-N	375 V	510 V	300 V

B. TVSS Design

- Balanced Suppression Platform -- The surge current shall be equally distributed to all MOV components to ensure equal stressing and maximum performance. The surge suppression platform must provide equal impedance paths to each matched MOV. Designs incorporating TVSS modules shall not be acceptable.
- Electrical Noise Filter -- Each unit shall include a high-performance EMI/RFI noise rejection filter. Noise attenuation for electric line noise shall be 41 dB at 100 kHz using the MIL-STD-220A insertion loss test method. The unit shall be complimentary listed to UL 1283. Products not able to demonstrate noise attenuation of 41 dB @ 100 kHz shall be rejected.
- Internal Connections -- No plug-in component modules shall be used as surge current conductors. All internal components shall be hardwired with connections utilizing low impedance conductors and compression fittings.
- Safety and Diagnostic Monitoring -- Each unit shall be equipped with 200 kAIC internal fuses. Each unit shall provide the following three levels of monitoring:
 - Continuous monitoring of fusing system

- b) Thermal detection circuit shall monitor for overheating in all modes due to thermal runaway.
 - c) A green/red solid state indicator light shall be provided on each phase. The absence of a green light and the presence of a red light, shall indicate which phase(s) have been damaged. Fault detection will activate a flashing trouble light. Units which can not detect open-circuit damage, thermal conditions and over current will not be accepted.
5. Warranty -- The manufacturer shall provide a full ten (10) year warranty from the date of shipment against any TVSS part failure when installed in compliance with manufacturer's written instructions and any applicable national or local electric code.

2.03 SYSTEM APPLICATION

- A. The TVSS applications covered under this section include distribution and branch panel locations, bus plugs, motor control centers (MCC), switchgear, and switchboard assemblies.
- B. Surge Current Capacity -- The minimum total surge current 8 x 20 microsecond waveform that the device is capable of withstanding shall be as shown in the following table:

<u>Application</u>	<u>Min. Surge Current (per mode)</u>
Service Entrance (Switchboards Switchgear, MCC Main Entrance)	120 kA
Distribution Panelboards	80 kA
High Exposure Roof Top Locations	80 kA
Branch Locations (Panelboards, MCC's, Busway)	40 kA

2.04 Accessories

- A. Push to test feature to verify operational integrity.
- B. Form C dry contacts one NO, one NC for remote status monitoring.

2.05 Enclosures

- A. All enclosed equipment shall have NEMA 1 general purpose enclosures, unless otherwise noted. Provide enclosures suitable for locations as indicated on the drawings and as described below:
 1. NEMA 1 surface or flush-mounted general purpose enclosures primarily intended for indoor use
 2. NEMA 12 dust-tight enclosures intended for indoor use primarily to provide protection against circulating dust, falling dirt and dripping non-corrosive liquids (Panelboards Only)
 3. NEMA 3R rainproof enclosures intended for outdoor use primarily to provide protection against rain, sleet and damage from external ice formation
 4. NEMA 4 watertight stainless steel intended for indoor or outdoor use primarily to provide protection against windblown dust and rain, splashing rain, hose-directed water, and damage from external ice formation. (Side Mounted Units Only)

III. EXECUTION

3.01 Examination

3.02 Factory testing

- A. Standard factory tests shall be performed on the equipment under this section. All tests shall be in accordance with the latest version of NEMA and UL standards.

3.03 Installation

- A. The Contractors shall install all equipment per the manufacturer's recommendations and the contract drawings.
- B. Surge protection devices shall be installed and connected before the service entrance is connected or energized.
- C. Existing utilities shall not be interrupted without written permission from project's architect.

END OF SECTION 264313

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SECTION 265000

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

- A. Section 260000 - Electrical General Requirements, apply to the work specified in this Section, with additions and modifications specified herein.

1.2 SECTION INCLUDES:

- A. Grounding and Bonding
- B. Supports
- C. Identification
- D. Connection of Equipment
- E. Excavation, Trenching, and Backfilling
- F. Cleaning and Painting
- G. Cutting and Patching

1.3 PROJECT CONDITIONS:

- A. Existing project conditions indicated on Drawings are based on casual field observation and existing record documents.
- B. Verify field measurements and circuiting arrangements as shown on the Drawings.
- C. Report discrepancies to Engineer before disturbing existing installation.

PART 2 PRODUCTS

2.1 GROUNDING MATERIALS:

- A. Ground Rod: Copper clad steel, 3/4 inch in diameter x 10 feet in length.
- B. Mechanical Connectors: Cast bronze construction with matching bolt, nuts, and washers.
- C. Exothermic Welds: Materials shall be from the same source. Materials shall be Cadweld or approved equal.
- D. Conductors: Insulated type complying with applicable Sections of these Specifications or bare soft drawn copper as indicated.

2.2 SUPPORTS:

- A. Fabrication Steel: Galvanized or painted steel of standard shapes and sizes.
- B. Manufactured Channel: Hot dipped galvanized with all hardware required for mounting as manufactured by

Unistrut, Kindorf, or Powerstrut.
- C. Miscellaneous Hardware: Standard sizes treated for corrosion resistance.

2.3 IDENTIFICATION:

- A. Nameplates: Engraved three-layer laminated plastic, black letters on white background.
- B. Panel Directories: Typewritten under plastic cover.
- C. Wire and Cable Markers: Cloth type, split sleeve type, or tubing type.

PART 3 EXECUTION

3.1 INSTALLATION:

- A. Install Products in accordance with manufacturer's instructions.
- B. Except where specifically indicated otherwise, all exposed non-current-carrying metallic parts of electrical equipment, metallic raceway systems, and service neutral of the electrical system shall be grounded.
 - 1. Equipment grounding shall be accomplished by installing a separate grounding conductor in each raceway of the system. The Conductor shall be provided with a distinctive green insulation or marker and shall be sized in accordance with Table 250-122 of the National Electrical Code for circuit ampacity ratings.
 - 2. The electrical system grounding electrode shall be made at the main service equipment and shall be extended to the point of entrance of the metallic cold water service. Ground to be sized in accordance with Table 250-66 of the National Electrical Code. Connection to the water pipe shall be made by a suitable ground clamp. If flanged pipes are encountered, connection shall be made on the street side of the flange connection. If the metallic water service is coated with an insulating material or there is no metallic water service to the building, ground connection shall be made to ground rods at the exterior of the building driven full length into the earth. The maximum resistance of the driven ground shall not exceed 25 ohms under normally dry conditions. If this resistance cannot be obtained with a single rod, additional rods shall be installed not less than 6 feet on centers, or if sectional type rods are used, additional sections may be coupled together and driven with the first rod. The resultant resistance shall not exceed 25 ohms measured not less than 48 hours after rainfall.
 - 3. Ground all building steel including reinforcing bars in concrete and all piping entering the building from outside. Where applicable, see Section 16900 for additional requirements.

- C. Make electrical connections to equipment in accordance with equipment manufacturer's instructions.
 - 1. Verify that wiring and outlet rough-in work is complete and that equipment is ready for electrical connection, wiring, and energization.
 - 2. Make wiring connections in control panel or in wiring compartment of pre-wired equipment. Provide interconnecting wiring as required by equipment manufacturer.
 - 3. Install and connect disconnect switches, controllers, control stations, and control devices as required by equipment manufacturer.
 - 4. Make conduit connections to equipment using flexible conduit. Use liquid-tight flexible conduit in damp or wet locations.
 - 5. Install pre-fabricated cord set where connections with attachment plug is indicated or specified, or use attachment plug with suitable strain-relief clamps.
 - 6. Provide suitable strain-relief clamps for cord connections to outlet boxes and equipment connection boxes.

- D. Install support systems sized and fastened to accommodate weight of equipment and conduit, including wiring, which they carry.
 - 1. Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structure using precast insert system, expansion anchors, preset inserts, beam clamps, or spring steel clips.
 - 2. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion and anchors on concrete surfaces; sheet metal screws in sheet metal studs; and wood screws in wood construction.
 - 3. Do not fasten supports to piping, ceiling support systems, ductwork, mechanical equipment, conduit, etc.
 - 4. Do not use powder-actuated anchors.
 - 5. Do not drill structural steel members.
 - 6. Fabricate supports from structural steel or steel channel.
 - 7. Install surface mounted cabinets and panelboards with minimum of four anchors.
 - 8. Provide steel channel supports to stand cabinets one inch off wall in wet locations.
 - 9. Bridge studs top and bottom with channels to support flush mounted cabinets and panelboards in stud walls.
 - 10. Install free-standing electrical equipment on 4 inch high concrete pads.

- E. Identify electrical distribution and control equipment, and loads served, to meet regulatory requirements and as specified herein.

1. Degrease and clean surface to receive nameplates.
 2. Secure nameplates to equipment fronts using screws or rivets with edges parallel to equipment lines.
 3. Use nameplates with 1/4 inch lettering to identify Switchboard, Panelboards, Safety Switches, Motor Starters and Branch Devices of Switchboards.
 4. Panel directories shall accurately indicate load served and location of load.
 5. Engrave plates as indicated by Schedules on the Drawings.
- F. Install wire markers on each conductor in panelboard gutters, boxes, and at load connections.
1. Use distribution panel and branch circuit or feeder number to identify power and lighting circuits.
 2. Use control wire number as indicated on schematic and interconnection diagrams or equipment manufacturer's shop drawings to identify control wiring.
- G. Excavating, trenching, and backfilling shall be accomplished as indicated on the Drawings or where required to install systems and/or equipment.
1. Trenches for all underground conduits or equipment shall be excavated to the required depths. Where soft, wet, or unstable soil is encountered, the bottom of the trench shall be filled with 6 inches of compacted gravel and sand fill. All trench bottoms shall be tamped hard. Trenches shall be shored as required to meet OSHA requirements and general safe working conditions.
 2. After conduits or equipment have been inspected and approved by the Architect and prior to backfilling, all forms shall be removed and the excavation shall be cleaned of all trash and debris. Material for backfilling shall consist of the excavation, or borrow of sand, gravel, or other materials approved by the Architect and shall be free of trash, lumber, or other debris. Backfill shall be placed in horizontal layers, not exceeding 9 inches in depth and properly moistened to approximate optimum requirements. Each layer shall be compacted by hand or machine tamped to a density equivalent to surrounding soil.
- H. Cleaning and Painting: The respective Contractors for the various phases of work shall clear away all debris, surplus materials, etc., resulting from their work or operations, leaving the job and equipment furnished in the clean first class condition.
1. All fixtures and equipment shall be thoroughly cleaned of plaster, stickers, rust, stains and other foreign matter or discoloration, leaving every part in an acceptable condition ready for use.
 2. The Contractor shall refinish and restore to the original condition and appearance, all electrical equipment which has sustained damage to manufacturer's prime and finish coats or enamel or paint. Materials and workmanship shall be equal to the requirements described for other painting.

- I. Cutting and Patching: This Contractor shall provide all cutting, digging, etc., incident to his work and shall make all required repairs thereafter to the satisfaction to the Engineer, but in no case shall the Contractor cut into any major structural element, beam, or column without written approval of the Engineer.
1. Pavements, sidewalks, roads, curbs, walls, ceilings, floors, and roofs shall be cut, patched, repaired and/or replaced as required to permit the installation of the electrical work.
 2. The Contractor shall bear the expense of all cutting, patching, painting, repairing, or replacing of the work of other trades required because of his fault, error, or tardiness or because of any damage done by him.

END OF SECTION 265000

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SECTION 265100

LIGHTING

PART 1 – GENERAL

Luminaire Schedule: Product requirements for each luminaire are specified in luminaire schedule on Drawings. **EQUALS MUST BE SUBMITTED TO ARCHITECT/ENGINEER FOR APPROVAL 10 DAYS PRIOR TO SUBMITTING BID.**

1.1 SUMMARY

A. Section includes the following types of LED luminaires:

1. Cylinder.
2. Downlight.
3. Lowbay.
4. Recessed linear.
5. Strip light.
6. Surface mount, linear.
7. Surface mount, nonlinear.
8. Suspended, linear.
9. Suspended, nonlinear.
10. Materials.
11. Finishes.
12. Luminaire support.

2.1 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color Rendering Index.
- C. Fixture: See "Luminaire."
- D. IP: International Protection or Ingress Protection Rating.
- E. LED: Light-emitting diode.
- F. Lumen: Measured output of lamp and luminaire, or both.
- G. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

3.1 ACTION SUBMITTALS

- A. Product Data: For each type of product, arranged by designation.

- B. Shop Drawings: For nonstandard or custom luminaires.
 - 1. Include plans, elevations, sections, and mounting and attachment details.
 - 2. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 3. Include diagrams for power, signal, and control wiring.
- C. Product Schedule: For luminaires and lamps, **Use same designations indicated on Drawings.**

4.1 INFORMATIONAL SUBMITTALS

- A. Seismic Qualification Certificates: For luminaires, accessories, and components, from manufacturer.
- B. Product Certificates: For each type of luminaire.
- C. Sample warranty.

5.1 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

6.1 WARRANTY

- A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
- B. Warranty Period: **Five** year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

1.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Luminaires shall withstand the effects of earthquake motions determined according to ASCE 7.

2.1 LUMINAIRE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Standards:
 - 1. ENERGY STAR certified.
 - 2. California Title 24 compliant.
 - 3. NRTL Compliance (where applicable): Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by an NRTL.
 - 4. FM Global Compliance (where applicable): Luminaires for hazardous locations shall be

listed and labeled for indicated class and division of hazard by FM Global.

5. UL Listing: Listed for damp location.
 6. Recessed luminaires shall comply with NEMA LE 4.
- C. CRI of minimum 80. CCT of minimum 2700 K (interior fixtures) and minimum 4000 K (exterior fixtures unless noted otherwise on drawings).
 - D. Rated lamp life of 50,000 hours to L70.
 - E. Lamps dimmable from 100 percent to 0 percent of maximum light output.
 - F. Internal driver.
 - G. Nominal Operating Voltage: 120-277 V ac (unless specified otherwise on drawings).
 1. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.
 - H. Housings:
 1. Extruded-aluminum housing and heat sink.
 2. Fixture dependent; refer to 'LIGHTING FIXTURE SCHEDULE' on drawings.
- 3.1 CYLINDER wall-mounted luminaires, used for direct or indirect lighting.
- A. **If 'Other Than Specified' fixtures are to be considered as equal for bidding, equal fixture shall be submitted to Architect/Engineer a minimum of 10 days prior to submitting bid.**
 - B. Minimum 1000 lumens. Minimum allowable efficacy of 80 lumens per watt.
 - C. With integral mounting provisions.
- 4.1 DOWNLIGHT
- A. Minimum 1,000 lumens. Minimum allowable efficacy of **80** lumens per watt.
 - B. Universal mounting bracket.
 - C. Integral junction box with conduit fittings.
 - D. Optics:
 1. Refer to drawings to determine if fixtures are to have Fixed or Adjustable lens.
 2. Refer to drawings to determine Spot/[Medium]/[Wide light distribution.
- 5.1 LOWBAY
- A. Minimum 5,000 lumens. Minimum allowable efficacy of 80 lumens per watt.
 - B. Universal mounting bracket.

6.1 RECESSED LINEAR

- A. Minimum 1,500 lumens. Minimum allowable efficacy of 85 lumens per watt.
- B. Integral junction box with conduit fittings.

7.1 STRIP LIGHT

- A. Minimum 750 lumens. Minimum allowable efficacy of 80 lumens per watt.
- B. Integral junction box with conduit fittings.

8.1 SURFACE MOUNT, LINEAR

- A. Minimum 750 lumens. Minimum allowable efficacy of 80 lumens per watt.
- B. Integral junction box with conduit fittings.

9.1 SURFACE MOUNT, NONLINEAR

- A. Minimum 750 lumens. Minimum allowable efficacy of 80 lumens per watt.
- B. Integral junction box with conduit fittings.

10.01 SUSPENDED, LINEAR

- A. Minimum 1,500 lumens. Minimum allowable efficacy of 85 lumens per watt.

11.01 SUSPENDED, NONLINEAR

- A. Minimum 1,500 lumens. Minimum allowable efficacy of 85 lumens per watt.
- B. Integral junction box with conduit fittings.

12.01 MATERIALS

- A. Metal Parts:
 - 1. Free of burrs and sharp corners and edges.
 - 2. Sheet metal components shall be steel unless otherwise indicated.
 - 3. Form and support to prevent warping and sagging
- B. 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.
- C. Diffusers, and Globes:

1. Acrylic: One hundred percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
2. Glass: Annealed crystal glass unless otherwise indicated.
3. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.

D. Housings:

1. Extruded-aluminum housing and heat sink.
2. Refer to drawings for type of finish.

13.01 METAL FINISHES

- A. Variations in finishes are unacceptable in the same piece. Variations in finishes of adjoining components are acceptable if they are within the range of approved Samples and if they can be and are assembled or installed to minimize contrast.

14.01 LUMINAIRE SUPPORT

- A. Comply with requirements in Section 16400 "Basic Electrical Materials & Methods" 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 luminaire.
- C. Wires: ASTM A 641/A 641 M, Class 3, soft temper, zinc-coated steel, 12 gage.
- D. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.
- E. Hook Hangers: Integrated assembly matched to luminaire, line voltage, and equipment with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

1.1 INSTALLATION

- A. Comply with NECA 1.
- B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.
- C. Install lamps in each luminaire.
- D. Supports: Sized and rated for luminaire weight.
- E. Flush-Mounted Luminaire Support: Secured to outlet box.
- F. Wall-Mounted Luminaire Support:
1. Attached to structural members in walls, to a minimum 20 gauge backing plate attached to wall structural members, or using through bolts and backing plates on either side of wall.

2. Do not attach luminaires directly to gypsum board.

G. Ceiling-Mounted Luminaire Support:

1. Ceiling mount with minimum one (1) 5/32-inch diameter aircraft cable supports 120 inches in length.
2. Ceiling mount with pendant mount with 5/32-inch diameter aircraft cable supports adjustable to [120 inches in length.
3. Ceiling mount with hook mount.

H. Suspended Luminaire Support:

1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
2. Stem-Mounted, Single-Unit Luminaires: Suspend with twin-stem hangers. Support with approved outlet box and accessories that hold stem and provide damping of luminaire oscillations. Support outlet box vertically to building structure using approved devices.
3. Continuous Rows of Luminaires: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of luminaire chassis, including one at each end.
4. Do not use ceiling grid as support for pendant luminaires. Connect support wires or rods to building structure.

I. Ceiling-Grid-Mounted Luminaires:

1. Secure to any required outlet box.
2. Secure luminaire using approved fasteners in a minimum of four locations, spaced near corners of luminaire.

J. Comply with requirements in Section 16100 "Low-Voltage Electrical Power Conductors and Cables" for wiring connections.

2.1 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
2. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.

B. Luminaire will be considered defective if it does not pass operation tests and inspections.

C. Prepare test and inspection reports.

END OF SECTION 265100