GALVESTON COUNTY

NORTH COUNTY ANNEX

174 CALDER DR.

LEAGUE CITY, TX

AHU 1 & 2 REPLACEMENT

March 15, 2012

Prepared by:

Ibis Engineering

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North County Annex
AHU 1 & 2 Replacement

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SECTION 00100 - REQUEST FOR COMPETITIVE SEALED PROPOSALS

GALVESTON COUNTY, TEXAS

Galveston County requests sealed proposals for the project identified below in accordance with Proposal Documents and such Addenda as may be issued prior to date of proposal from qualified Proposers who can furnish the specified insurance and security requirements

Plans and specifications may be obtained from the office of the Galveston County Purchasing Agent.

This project is to be constructed under a multi-contract arrangement utilizing multiple trade contracts. This proposal package represents a portion of the overall scope of work. The Proposer shall review the contract documents for the entire project to familiarize himself with the overall scope of the project and how this package relates to it.

The scope of work for this proposal is the replacement of Air Handling Units 1 and 2 at the North County Annex at 174 Calder Road; League City; Texas; 77573 for Galveston County.

Sealed proposals in **sets of nine (9), one (1) original and eight (8) copies** will be received in the office of the County Purchasing Agent, until 2:00pm (local) on Tuesday April 10, 2012 and publically opened as soon as practical after proposal time in that office in the presence of the County Auditor and the Purchasing Agent. **Proposers are specifically advised that any Proposal delivered after this time will be returned unopened.**

A non-mandatory pre-proposal conference will be held on Monday, March 26, 2012 ***at*** 10:00am (local) ***at the Galveston County North County Annex located at 174 Calder Dr.; League City, Texas 77573.***

Proposer must seal all proposals in an opaque envelope with the following information on the face of the envelope and deliver to:

To:
Galveston County Purchasing Agent
722 Moody (21st Street) - 5th Floor
Galveston, Texas 77550

From:
Name of Proposer
Mid County Annex
Proposal Package Number (*insert package number, name, and RFP number)*

Each proposal must be accompanied by a Certified or Cashier's Check or acceptable Proposer (Bid) Bond in the amount of 5% of Proposal as a guarantee that, if awarded the contract the Proposer will enter into a contract and execute required Performance and Payment Bonds.

No proposal shall be withdrawn within sixty (60) days after proposal date without the specific consent of Galveston County.

Design Professional: **Ibis Engineering**
ATTN: Norm Hoffman, PE
PO Box 55171
Galveston, TX; 77555
409.539.5548

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The Galveston County Commissioners' Court may consider informal any proposal not prepared and submitted in accordance with the provisions hereof and may waive any and all informalities, reject any and all proposals and accept any proposal deemed in its best interest or otherwise advantageous to it.

Upon satisfaction of contractual terms (e.g., goods delivered in promised condition, services rendered as agreed, etc.), vendor is to be paid via Galveston County's normal accounts payable process after certification by the Construction Manager agent, Architect, and OC Unbehagen, Galveston County Construction Manager.

Rufus Crowder, CPPB
Purchasing Agent
Galveston County

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SECTION 00101 - PROPOSAL DOCUMENTS

Proposer may obtain an electronic copy of the plans and specifications in pdf format at the Galveston County Purchasing Agent's office.

Proposal Documents will be available prior to proposal date and may be obtained at the following address:

Proposals Documents available at:

The Office of the County Purchasing Agent
722 Moody (21st Street) - 5th Floor
Galveston, Texas 77550

Office Hours are 8:00 AM to 5:00 PM, Monday – Friday. The Purchasing Department is closed from 12:00 p.m. – 1:00 p.m.

PAYMENT BOND AND PERFORMANCE BOND: A Payment Bond and Performance Bond, each in an amount equal to or greater than 100% of the Contract Sum conditioned upon the faithful performance of the Contract will be required. Please note that all bonding companies presented must be acceptable to Galveston County.

NON MANDATORY PRE-PROPOSAL MEETING : All Proposers are encouraged to attend a non-mandatory pre-proposal meeting at the Galveston County North County Annex; 174 Calder Dr.; League City, Texas; 77575 on Monday, March 26, 2012 at 10:00am (local). While this meeting is not mandatory there may be information available at the meeting that is important to the Proposer.

QUALIFICATION: Proposer is required to comply with certain procedures as enumerated in the Instructions to Proposer regarding qualification of Proposer.

COMPLETE SET OF DOCUMENTS : Trade Contractors and Suppliers intending to submit proposals to Galveston County are required to prepare their proposal based on a complete set of documents. If after reviewing the complete set of documents, Trade Contractors and Suppliers desire to purchase individual drawings and specification sections for their convenience, they may do so by ordering the specific drawings and specifications directly from a reproduction company. Each proposer purchasing a partial set of documents is responsible for determining exactly which documents he requires and is responsible for all costs associated with printing and delivery. Trade Contractors and Suppliers exercising this option must agree to do so on the basis that documents shall not be used on other construction projects. Successful Trade Contractors and Suppliers may retain their Documents until completion of the construction.

Any proposer submitting a proposal is required to visit the site.

END OF SECTION 00101

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SECTION 00102 – INSTRUCTIONS TO PROPOSERS

SECTION **CONTENTS**

1. Proposal (Bid) Bond
2. Qualification Statement
3. Preparation of Proposal
4. Proposal Procedures
5. Restrictive or ambiguous specifications
6. Proposer's presentation
7. Exception to Proposal
8. Rejection of proposals
9. Proposal documents
10. Competitiveness and Integrity
11. Pre-proposal modifications (addenda)
12. Substitutions of materials and equipment
13. Pre-proposal MEETING
14. Tax Exemption
15. Proposer Investigation
16. No Commitment by County
17. Proposal Opening
18. Determination of the Recommended Proposal
19. Single Proposal Response
20. Award of contract
21. Protest
22. Conflict of Interest Disclosure Reporting
23. Non-Collusion Affidavit
24. Procurement Ethics
25. Open Records

1. PROPOSAL (BID) BOND

All proposals must include a Proposal Bond in compliance with State of Texas statute, a Certified Check, or a Cashier's Check, for not less than five percent (5%) of the greatest amount proposed (considering alternates, if any). No proposal will be considered unless it is accompanied by proposal bond. The bond issuing company must be approved to do business in the State of Texas.

The Proposal Bond shall insure the execution of the contract and the furnishing of an acceptable Performance Bond and Payment Bond by the successful proposer after notification of award to such proposer and that this proposal will not be withdrawn within sixty (60) days after date of opening of proposals without the consent of Galveston County.

Proposal Bond is forfeited if proposal is withdrawn after the proposal opening, or Contract Documents are not executed in accordance with the above.

2. QUALIFICATION STATEMENT

The Qualification Statement included in the Proposal Evaluation Waiver must be completed and submitted along with the Proposal Form.

3. PREPARATION OF PROPOSAL

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One (1) original and nine (9) copies of each proposal must be submitted on the Proposal Form bound herein, or as furnished by the Galveston County Purchasing Agent. All blank spaces for proposal prices must be filled in, in ink or typewritten, in both words and figures, the signature in longhand and the completed form shall be without alterations or erasures. Where Proposer is a corporation, include the name of the state of incorporation and the legal signatures of two (2) officers authorized to bind the corporation to a contract.

If forwarded by mail, the sealed envelope containing the proposal must be enclosed in another envelope addressed as specified in the Proposal Form and must be sent via registered mail.

Oral, telegraphic, or telephonic proposals or modifications will not be considered. The envelopes containing the proposals must be sealed and addressed on the outside of an envelope as follows:

To:
Galveston County Purchasing Agent
722 Moody (21st Street) - 5th Floor
Galveston, Texas 77550

From:
Name of Proposer
Mid County Annex
Proposal Package Number (*insert package number, name, and RFP number)*

4. PROPOSAL PROCEDURES

A. A proposal is invalid if it has not been received at the designated location prior to the time and date for receipt of proposals indicated in the Request for Competitive Sealed Proposals, or prior to any extension thereof issued to the proposers by Addenda. All proposals must be delivered sealed to the Office of the Galveston County Purchasing Agent 722 Moody (21st Street) 5th floor Galveston, Texas 77550 at or before the time and date set. Proposals will be received at no other place. If Proposal is sent by U.S. Mail, it must be sent Registered Mail.

B. Proposals received prior to the submission deadline will be maintained unopened until the specified time for opening. If the Proposer fails to identify the Proposal Number on the outside of the envelope as required, the Purchasing Agent will open the envelope for the sole purpose of identifying the proposal Number for which the submission was made. The envelope will then be resealed. No liability will attach to a County Officer or employee for the premature opening of a Proposal.

C. All requested Alternates shall be proposed. If no change in amount or time to the Base Proposal is required as a result of the Alternate, enter "No Change".

D. Prior to the receipt of Proposals, Addenda will be mailed, faxed, e-mailed, or delivered to each person or firm recorded by the Purchasing Agent as having received the proposal documents and will be available for inspection wherever the proposal documents are kept available for that purpose. If the Purchasing Agent has no record of a potential Proposer's interest then they will be unable to notify that Proposer of Addenda. Therefore it is incumbent upon potential proposers to register their interest with the Purchasing Agent.

E. Galveston County reserves the right to reject any Proposal if the evidence submitted by, or investigation of, such Proposer fails to satisfy Galveston County that such Proposer is properly qualified to carry out the obligations of the contract and to complete the work therein.

F. Conditional proposals will not be accepted.

G. The Proposer or his duly authorized representative may withdraw a proposal by request, provided such request is received by Galveston County at the place designated for receipt of proposals and prior to the time fixed for the opening of proposals. The Proposal Bond will be returned with the proposals if withdrawn in accordance with the above. The withdrawal of a proposal does not prejudice the right of the proposer to file a new proposal at the time and place stated.

H. A Proposer may modify a Proposal by letter at any time prior to the submission deadline for receipt of Proposals. Modification requests must be received prior to the submission deadline. Modifications made before opening time must be initialed by Proposer guaranteeing authenticity. Proposals may not be amended or altered after the official opening with the single exception that any product literature and/or supporting data required by the actual specifications, if any, will be accepted at any time prior to the Commissioners' Court consideration of same.

5. RESTRICTIVE OR AMBIGUOUS SPECIFICATIONS

It is the responsibility of the prospective Proposer to review the entire Request for Competitive Sealed Proposal and to notify the Purchasing Department if the specifications are formulated in a manner that would restrict competition or appear ambiguous. Any such protest or question(s) regarding the specifications or Proposal procedures must be received in the Purchasing Department not less than five (5) days prior to the time set for Proposal opening. Vendors are to Propose, as specified herein or request a substitution as per Section 01300 of the Project Manual.

6. PROPOSERS PRESENTATION - By making his proposal each Proposer presents the following:

A. He has read and understands the Proposal Documents and his Proposal is made in accordance therewith.

B. He has visited the site, has familiarized himself with the local conditions under which the work is to be performed and has correlated his observations with the requirements of the proposed Contract Documents.

C. He agrees to comply with the requirements of the following paragraph. These requirements are absolute, and any Trade Contractor who subsequently does not agree to comply with these requirements will automatically disqualify himself from proposing or receiving award of the contract.

D. He agrees that:

01 Work on the project will begin immediately upon receipt of signed Contract or Notice to Proceed.

02 Contractor will participate as a team member in cooperation with Galveston County Architect, and Construction Manager Agent.

03 The Trade Contractor will assign a competent full-time superintendent, to the project, and that superintendent shall be maintained on the project for the duration of the Trade Contractor's scope of work on the project, subject only to their continuous employment.

04 If awarded, the Contractor shall furnish and pay for a Performance Bond and a Payment Bond each in the full contract amount.

05 Each Proposer by making his Proposal represents that his Proposal includes only material and equipment specified in the Proposal Documents and supplemented, if necessary, for a complete and operating system.

7. EXCEPTION TO PROPOSAL

The Proposer will list on a separate sheet of paper any exceptions to the conditions of the Proposal. This sheet will be labeled, "Exceptions to Proposal Conditions", and will be attached to the Proposal. If no exceptions are stated, it will be understood that all general and specific conditions will be complied with,

without exception. Proposer is cautioned that exceptions to the proposal conditions may result in the rejection of the proposal.

8. REJECTION OF PROPOSALS

A. Galveston County has the right to reject any or all proposals and to reject a proposal not accompanied by any required Proposal Security, or by other data required by the Proposal Documents, or to reject a proposal which is in any way incomplete or irregular.

B. Galveston County reserves the right to (1) reject any and all proposals and waive any informality in the proposals received, or (2) disregard the proposal of any Proposer determined not to be responsive.

C. Galveston County reserves the right to reject any or all Proposals in whole or in part received by reason of this Proposal package and may discontinue its efforts for any reason under this Proposal package at any time prior to actual execution of the Contract by the County. Proposers may be disqualified and rejection of Proposals may be recommended to the Commissioners' Court for any of (but not limited to) the following causes:

1. Failure to use the Proposal form furnished by the County
2. Lack of signature by an authorized representative on the Proposal form
3. Failure to properly complete and sign the Proposal Form
4. Proposals that do not meet the mandatory requirements
5. Evidence of collusion among Proposers

9. PROPOSAL DOCUMENTS

The Request for Competitive Sealed Proposals, General Terms and Conditions, Drawings, Project Manual, any addenda issued prior to receipt of proposals, and the Proposal Form are all considered part of the Proposal package. Proposals must be submitted in triplicate on the forms provided by the County, including the Proposal Form completed in its entirety and signed by an authorized representative by original signature. Any individual signing on behalf of the Proposer expressly affirms that he or she is duly authorized to tender this Proposal and to sign the Proposal Form/contract under the terms and conditions in this Proposal. Each Proposer is required to thoroughly review this entire Proposal packet to familiarize themselves with the Proposal procedures, the plans and specifications for the requested work as well as the terms, and conditions of the contract the successful Proposer will execute with the County.

In addition to documents issued to Proposers, Proposal documents will be available at the following locations.

F. W. Dodge Corp.
3131 Eastside, #300
Houston, Texas 77098
(713) 529-4895

A.G.C.
3825 Dacoma
Houston, Texas 77092-8717
(713) 843-3700

ABC Plan Room
3910 Kirby, Suite 131
Houston, Texas 77098-4151
(713) 523-6222

Construction Market Data
10900 North West Freeway, Suite 124
Houston, Texas 77092
(888) 956-7650

10. COMPETITIVENESS AND INTEGRITY

To prevent biased evaluations and to preserve the competitiveness and integrity of such acquisition efforts, Proposers are to direct all communications regarding this Proposal to the Galveston County Purchasing Agent, unless otherwise specifically noted.

Do not contact the requesting department. Attempts by offering firms to circumvent this requirement will be viewed negatively and may result in rejection of the offer of the firm found to be in non-compliance.
All questions regarding this Request for Proposal must be submitted in writing to:

Rufus Crowder, CPPB
Galveston County Purchasing Agent
722 Moody (21st Street)
Fifth (5TH) Floor
Galveston, Texas 77550
Fax: (409) 621-7997
E-mail: rufus.crowder@co.galveston.tx.us

11. PRE-PROPOSAL MODIFICATIONS (ADDENDA)

A. Proposers and Suppliers requiring clarification or interpretation of the Proposal Documents shall make a written request which shall reach the Purchasing Agent at least five (5) days prior to the date for receipt of proposals

B. If a Proposer finds discrepancies, ambiguities, omissions or errors of any type that affect his proposal, he is required to seek immediate clarification or correction. All discrepancies, ambiguities, omissions or errors of any type brought to the attention of the Purchasing Agent will be answered by Addenda.

C. Any interpretation, correction or change of the Proposal Documents will be made by Addenda. Interpretations, corrections or changes of the Proposal Documents made in any other manner will not be binding.

D. Changes to the proposal documents may be made during the proposal period by Addenda. Any modification to any portion of this proposal packet will be in writing in the form of addenda and attempts will be made to deliver them to all recorded holders of plans and specifications at least three (3) working days prior to the date of the opening of the proposals.

E. Proposals shall include addenda issued prior to proposal time. Mark the numbers of the addenda received in the appropriate place on the proposal form. Proposer should inquire whether addenda have been issued inasmuch as Proposers shall be bound by such addenda whether or not received.

F. Failure of any Proposer to receive any such addendum or interpretation shall not relieve such Proposer from any obligation under his proposal as submitted. All addenda so issued shall become part of the Contract Documents.

G. If it becomes necessary to revise any part of this Proposal, a written notice of such revision will be provided to all Proposers in the form of addenda. The County is not bound by any oral representations, clarifications, or changes made in the written specifications by the County's employees, unless such clarification or change is provided to Proposers in a written addendum from the Purchasing Agent.

12. SUBSTITUTIONS OF MATERIALS AND EQUIPMENT

A. Refer to Section 01630 of the Project Manual for procedures and the process of requesting substitution.

B. No substitutions will be considered after the Contract award.

13. NON-MANDATORY PRE-PROPOSAL MEETING

A non-mandatory pre-proposal meeting will be held on Monday, March 26, 2012 at 10:00am (local) in the Galveston County North County Annex: 174 Calder Dr.; League City, Texas; 77573.

Representatives of Galveston County and the Engineer will be present at this meeting. All proposers are encouraged to attend.

Questions as a result of discussions of the pre-proposal conference will be answered in writing and delivered by mail, e-mail, fax or delivery to all in attendance providing an address at least five (5) days prior to the time stated in the Request for Competitive Sealed Proposal for opening the proposals.

14. TAX EXEMPTION

Pursuant to Section 151.309 of the Texas Tax Code, Galveston County qualifies for exemption from sales, excise and use taxes imposed under the Limited Sales, Excise, and Use Tax Act, which is codified at Chapter 151 of the Texas Tax Code. In accordance with Section 151.309, a taxable item sold, leased, or rented to, or stored, used, or consumed by the County is exempt from the taxes imposed under Chapter 151. Section 151.311 of the Texas Tax Code lists its requirements for tax exemptions on taxable items incorporated into or used for the improvement of realty of an exempt entity. Section 151.3111 lists its requirements for tax exemptions on certain services. Contractor is cautioned that this RFP provision simply highlights some statutory qualifying exemptions from the sale and use taxes imposed under Chapter 151. If Contractor believes all or a portion of its costs are exempt from taxes imposed under Chapter 151 of the Texas Tax Code, it may request a certificate of tax exemption by submitting a written request for such to the County Purchasing Agent. Additionally, information regarding eligibility for exemption from taxes imposed under Chapter 151 may be obtained through the Office of the State of Texas Comptroller of Public Accounts, whose website is http://www.window.state.tx.us/.

15. PROPOSER INVESTIGATION

Before submitting a Proposal, each proposer shall make all investigations and examinations necessary to ascertain all site conditions and requirements affecting the full performance of the contract and to verify any representations made by the County upon which the Proposer will rely. If the Proposer receives an award as a result of its Proposal submission, failure to have made such investigations and examinations will in no way relieve the contractor from its obligation to comply in every detail with all provisions and requirements of the contract, nor will a plea of ignorance of such conditions and requirements be accepted as a basis for any claim whatsoever by the contractor for additional compensation.

16. NO COMMITMENT BY COUNTY OF GALVESTON

This Request for Sealed Proposal does not commit the County of Galveston to award any costs or pay any costs, or to award any contract, or to pay any costs associated with or incurred in the preparation of a Proposal to this request, or to procure or contract for services or supplies.

17. PROPOSAL OPENING

Only the names of Proposers will be read at the opening.

The names of those who submitted Proposals will not be made public information until after an award is made by Commissioners' Court. No price or staffing information will be released. Proposers are requested to withhold all inquiries regarding their Proposal or other submissions until after an award is made. No communication is to be had with any County employee, other than the Purchasing Agent, regarding whether a Proposal was received. Violations of this provision may result in the rejection of a Proposal.

18. DETERMINATION OF THE RECOMMENDED PROPOSAL

A. In determining the best responsible Proposal, Galveston County will evaluate the information derived from the Contractor's Qualification Statement required and included with the Proposal Form herein and the information submitted on the Proposal Form.

1. The amount of the Base Proposal and each Alternate Proposal
2. The length of construction time proposed (time is of the essence).
3. References from **all** previous contracts comparable to this contract size and scope during the last five years.
4. References from **all** previous contracts with Galveston County and other political subdivisions located within Galveston County.
5. The quality and availability of the Proposer's personnel and services.
6. Listing of proposed subcontractors, suppliers, and other team members.
7. Based upon references listed above the probability of satisfactory post construction maintenance, repair, and service for emergency warranty work.
8. Based upon references listed above the probability of satisfactory timely completion of the work.
9. The Proposer's safety record including the current EMR (experience modifier rate).
10. The Proposer's history of claims, mediation, litigation or arbitration with any Owner in the past 5 years.
11. The Proposer's historic compliance with laws and codes governing construction activities.

B. The criteria utilized for determining the most desirable Proposal includes but is not limited to the following:

1. Proposer's experience, skill, ability, business judgment, financial capacity, integrity, honesty, possession of the necessary facilities or equipment, previous performance, reputation, and promptness.
2. The probability that the Proposer can perform in accordance with the Proposal Documents.
3. The likelihood that the Proposer will perform without delay or interference.
4. The responsibility and reputation of the Proposer.
5. The quality of the Proposer's performance on previous contracts.
6. The Proposer's previous compliance with laws affecting the project
7. The Proposer's previous noncompliance regarding time of completion or submission.
8. The sufficiency of the Proposer's financial resources.
9. In determining and evaluating the best Proposal, the pricing may not necessarily be controlling, but quality, equality, efficiency, utility, general terms, delivery, suitability of the service offered, and the reputation of the service in general use will also be considered with any other relevant items. The Commissioners' Court shall be the sole judge in the determination of these matters.

19. SINGLE PROPOSAL RESPONSE

If only one Proposal is received in response to the Invitation to Proposal, a detailed cost Proposal may be requested of the single Proposer. A cost/price analysis and evaluation and/or audit may be performed of the cost Proposal in order to determine if the price is fair and reasonable.

20. AWARD OF CONTRACT

The award will be made to the Proposer who is determined to submit the best Proposal demonstrating ability to fulfill the requirements of the Project. The prices proposed will be considered firm and cannot be altered after the submission deadline.

The Proposer shall commence work only after the transmittal of a fully executed contract and after receiving written notification to proceed from Galveston County. The contractor will perform all services indicated in the Proposal in compliance with this contract.

Neither department heads nor elected officials are authorized to sign any binding contracts or agreements prior to being properly placed on the Commissioners' Court Agenda and approved in open court. Department heads and other elected officials are not authorized to enter into any type of agreement or contract on behalf of Galveston County. Only the Commissioners' Court, acting as a body, may enter

into a contract on behalf of the County. Additionally, department heads and other elected officials are not authorized to agree to any type of supplemental agreements or contracts for goods or services. Supplemental agreements are subject to review by the County Legal Department prior to being signed by the County's authorized representative.

The County of Galveston reserves the right to accept Proposals on individual items listed, or group items, or on the Proposal as a whole; to reject any and all Proposals; to waive any informality in the Proposals; and to accept the Proposal that appears to be in the best interest of the County.

Notice of Contract Award will be made within sixty (60) days of opening of Proposals to the lowest responsive and responsible Contractor, whose Proposal complies with all the requirements in the Request for Competitive Sealed Proposal.

21. PROTEST

Any actual or prospective Proposer who is allegedly aggrieved in connection with the solicitation or award of Proposal may protest. The protest will be submitted in writing to the Purchasing Agent within seven (7) days after such aggrieved person knows of, or should have known of the facts giving rise thereto. If the protest is not resolved by mutual agreement, the Purchasing Agent will promptly issue a decision in writing to the protestant. If the protestant wishes to appeal the decision rendered by the Purchasing Agent, such appeal must be made to the Commissioners' Court through the Purchasing Agent. The decision of the Court will be final. The Court need not consider protests unless the procedure is followed.

22. CONFLICT OF INTEREST DISCLOSURE REPORTING

Proposer may be required under Chapter 176 of the Texas Local Government Code to complete and file a conflict of interest questionnaire (CIQ Form). If so, the completed CIQ Form must be filed with the County Clerk of Galveston County, Texas.

If Proposer has an employment or other business relationship with an officer of Galveston County or with a family member of an officer of Galveston County that results in the officer or family member of the officer receiving taxable income that exceeds $2,500.00 during the preceding 12-month period, then Proposer **MUST** complete a CIQ Form and file the original of the CIQ Form with the County Clerk of Galveston County.

If Proposer has given an officer of Galveston County or a family member of an officer of Galveston County one or more gifts with an aggregate value of more than $250.00 during the preceding 12-months, then Proposer **MUST** complete a CIQ Form and file the original of the CIQ Form with the County Clerk of Galveston County.

The Galveston County Clerk has offices at the following locations:

Galveston County Clerk
Galveston County Justice Center, Suite 2001
600 59th Street
Galveston, Texas 77551

Galveston County Clerk
North County Annex, 1st Floor
174 Calder Road
League City, Texas 77573

Again: If Proposer is required to file a CIQ Form, the original completed form is filed with the Galveston County Clerk (not the Purchasing Agent).

For Proposer's convenience, a blank CIQ Form is enclosed with this proposal. Blank CIQ Forms may also be obtained by visiting the Galveston County Clerk's website and/or the Purchasing Agent's website – both of these web sites are linked to the Galveston County homepage, at http://www.co.galveston.tx.us.

As well, blank CIQ Forms may be obtained by visiting the Texas Ethics Commission website, specifically at http://www.ethics.state.tx.us/whatsnew/conflict_forms.htm.

Chapter 176 specifies deadlines for the filing of CIQ Forms (both initial filings and updated filings).

It is Proposer's sole responsibility to file a true and complete CIQ Form with the Galveston County Clerk if Proposer is required to file by the requirements of Chapter 176. Proposer is advised that it is an offense to fail to comply with the disclosure reporting requirements dictated under Chapter 176 of the Texas Local Government Code.

If you have questions about compliance with Chapter 176, please consult your own legal counsel. Compliance is the individual responsibility of each person, business, and agent who is subject to Chapter 176 of the Texas Local Government Code.

23. NON-COLLUSION AFFIDAVIT

The Proposer declares, by signing and submitting a Proposal, that the Proposal is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the Proposal is genuine and not collusive or sham; that the Proposer has not directly or indirectly induced or solicited another contractor to put in a false or sham Proposal, and has not directly or indirectly colluded, conspired, connived, or agreed with any contractor or anyone else to put in a sham Proposal, of that anyone shall refrain from Proposal; that the Proposer has not in any manner, directly or indirectly, sought by agreement, communications, or conference with anyone to fix the Proposal price of the Proposer of any other Proposer, or to fix any overhead, profit or cost element of the Proposal price, or of that of any other Proposer, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the Proposal are true; and further, that the Proposer has not, directly or indirectly, submitted his or her Proposal price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any cooperation, partnership, company association, organization, Proposal depository, or to any member or agent thereof to effectuate a collusive or sham Proposal.

No negotiations, decisions, or actions shall be initiated by any company as a result of any result of any verbal discussion with any County employee prior to the opening of responses to this Invitation to Proposal.

No officer or employee of the County of Galveston, and no other public or elected official, or employee, who may exercise any function or responsibilities in the review or approval of this undertaking shall have any personal or financial interest, direct or indirect, in any contract or negotiation process thereof. The above compliance request will be part of all County of Galveston contracts for this service.

24. PROCUREMENT ETHICS

Galveston County is committed to the highest ethical standards. Therefore, it is a serious breach of the public trust to subvert the public purchasing process by directing purchases to certain favored vendors, or to tamper with the competitive Proposal process, whether it's done for kickbacks, friendship or any other reason. Since misuse of the purchasing power of a local government carries criminal penalties, and many such misuses are from a lack of clear guidelines about what constitutes an abuse of office, the Code of Ethics outlined below must be strictly followed.

Galveston County also requires ethical conduct from those who do business with the county.

CODE OF ETHICS – Statement of Purchasing Policy

"Public employment is a public trust. It is the policy of Galveston County to promote and balance the objective of protecting the County's integrity and the objective of facilitating the recruitment and retention of personnel needed by Galveston County. Such policy is implemented by prescribing essential standards of ethical conduct without creating unnecessary obstacles to entering public office."

Public employees must discharge their duties impartially so as to assure fair competitive access to governmental procurement by responsible contractors. Moreover, they should conduct themselves in such a manner as to foster public confidence in the integrity of the Galveston County procurement organization.

To achieve the purpose of the Article, it is essential that those doing business with Galveston County also observe the ethical standards prescribed here.

General Ethical Standards
It shall be a breach of ethics to attempt to realize personal gain through public employment with Galveston County by any conduct inconsistent with the proper discharge of the employee's duties.

It shall be a breach of ethics to attempt to influence any public employee of Galveston County to breach the standards of ethical conduct set forth in this code.

It shall be a breach of ethics for any employee of Galveston County to participate directly or indirectly in a procurement when the employee knows that:

- The employee or any member of the employee's immediate family, has a financial interest pertaining to the procurement

- A business or organization in which the employee, or any member of the employee's immediate family, has a financial interest pertaining to the procurement

- Any other person, business or organization with which the employee or any member of the employee's immediate family is negotiating or has an arrangement concerning prospective employment is involved in the procurement.

Gratuities
It shall be a breach of ethics to offer, give or agree to give any employee of Galveston County, or for any employee or former employee of Galveston County to solicit, demand, accept or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, preparation of any part of a program requirement or purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any program requirement or a contract or subcontract, or to any solicitation or Proposal therefore pending before this government.

Kickbacks
It shall be a breach of ethics for any payment, gratuity or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime contractor or higher tier subcontractor for any contract for Galveston County, or any person associated therewith, as an inducement for the award of a subcontract or order.

Confidential Information
It shall be a breach of ethics for any employee or former employee of Galveston County to knowingly use confidential information for actual or anticipated personal gain, or for the actual or anticipated gain of any person.

25. RECORDS

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Galveston County is required to adhere to the provisions of the Texas Public Information Act. All information, documentation and other material submitted by the vendor in response to any solicitations or under any resulting contract thereof may be subject to public disclosure under the Texas Public Information Act (TX Govt Code, Chapter 552). Vendors are hereby notified that Galveston County strictly adheres to this statute and the interpretations thereof rendered by the Courts and/or Texas Attorney General's office. Vendor shall be deemed to have knowledge of this law and how to protect their interest under it. Exceptions to disclosure of information as provided by this statute are intended to protect legitimate interests of the County or vendor, are not intended to serve as a means to withhold or delay disclosure of information not covered by these exceptions.

If vendor considers any submitted information to be proprietary in nature, protected by trade secrets, or otherwise confidential, said material should be clearly marked and conspicuously notated as such. Failure to do so shall not place any burden on the County of Galveston for the release of any material not abiding by this provision.

END OF SECTION 00102

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SECTION 00102 FORMS – VENDOR QUALIFICATION PACKET

County of Galveston
Purchasing Department
Building Construction - Vendor Qualification Packet

(rev. 1.2, May 23, 2011)

All interested parties seeking consideration for qualified vendor status with the County of Galveston **should complete and return only the following attached forms to:**

Galveston County Purchasing Department
722 Moody Avenue, (21st Street), 5th Floor
Galveston, Texas 77550
(409) 770-5371 ***office***
(409) 621-7987 ***fax***

Form PEID: Person /Entity Information Data
Form W-9: Request for Taxpayer Identification Number and Certification
(please note that the included form may not be the latest revised form issued by the Internal Revenue Service. Please check the IRS website at http://www.irs.gov/pub/irs-pdf/fw9.pdf for the latest revision of this form.)
Form CIQ: Conflict of Interest Questionnaire
(please note that the included form may not be the latest revised form issued by the State of Texas Ethics Commission. Please check the Texas Ethics Commission website at for the latest revision of this form. Please note that Galveston County Purchasing Agent is not responsible for the filing of this form with the Galveston County Clerk per instructions of the State of Texas Ethics Commission).

Certificate(s) of Insurance: **If the person or entity seeking qualified vendor status with the County will be performing work at or on any County owned facility and/or property, Certificate(s) of Insurance are required to be submitted prior to performing any work.**

Insurance requirements are as follows:

Public Liability and Property Damage Insurance:

Please refer to Article 26 of the General Conditions of the Contract.

Procurement Policy - Special Note:

Understand that it is, according to Texas Local Government Code, Section 262.011, Purchasing Agents, subsections (d), (e), and (f), the sole responsibility of the Purchasing Agent to supervise all procurement transactions.

Therefore, be advised that all procurement transactions require proper authorization in the form of a Galveston County purchase order from the Purchasing Agent's office prior to commitment to deliver supplies, materials, equipment, including contracts for repair, service, and maintenance agreements. Any commitments made without proper authorization from the Purchasing Agent's office, pending

1

Commissioners' Court approval, may become the sole responsibility of the individual making the commitment including the obligation of payment.

Code of Ethics - Statement of Purchasing Policy:

Public employment is a public trust. It is the policy of Galveston County to promote and balance the objective of protecting the County's integrity and the objective of facilitating the recruitment and retention of personnel needed by Galveston County. Such policy is implemented by prescribing essential standards of ethical conduct without creating unnecessary obstacles to entering public office.

Public employees must discharge their duties impartially so as to assure fair competitive access to governmental procurement by responsible contractors. Moreover, they should conduct themselves in such a manner as to foster public confidence in the integrity of the Galveston County procurement organization.

To achieve the purpose of these instructions, it is essential that those doing business with Galveston County also observe the ethical standards prescribed here.

General Ethical Standards: It shall be a breach of ethics to attempt to realize personal gain through public employment with Galveston County by any conduct inconsistent with the proper discharge of the employee's duties.

It shall be a breach of ethics to attempt to influence any public employee of Galveston County to breach the standards of ethical conduct set forth in this code.

It shall be a breach of ethics for any employee of Galveston County to participate directly or indirectly in procurement when the employee knows that:

- The employee or any member of the employee's immediate family has a financial interest pertaining to the procurement.
- A business or organization in which the employee, or any member of the employee's immediate family, has a financial interest pertaining to the procurement.
- Any other person, business or organization with which the employee or any member of the employee's immediate family is negotiating or has an arrangement concerning prospective employment is involved in the procurement.

Gratuities: It shall be a breach of ethics to offer, give or agree to give any employee of Galveston County, or for any employee or former employee of Galveston County to solicit, demand, accept or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, preparation of any part of a program requirement or purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any program requirement or a contract or subcontract, or to any solicitation or proposal therefore pending before this government.

Kickbacks: It shall be a breach of ethics for any payment, gratuity or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime contractor or higher tier subcontractor for any contract for Galveston County, or any person associated therewith, as an inducement for the award of a subcontract or order.

Contract Clause: The prohibition against gratuities and kickbacks prescribed above shall be conspicuously set forth in every contract and solicitation by Galveston County.

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Confidential Information: It shall be a breach of ethics for any employee or former employee of Galveston County to knowingly use confidential information for actual or anticipated personal gain, or for the actual or anticipated gain of any person.

Questions/Concerns:
If you have any questions or concerns regarding the information or instructions contained within this packet, please contact any member of the Purchasing Department staff at **(409) 770-5371**.

CONFLICT OF INTEREST DISCLOSURE REPORTING

Proposer may be required under Chapter 176 of the Texas Local Government Code to complete and file a conflict of interest questionnaire (CIQ Form). If so, the completed CIQ Form must be filed with the County Clerk of Galveston County, Texas.

If Proposer has an employment or other business relationship with an officer of Galveston County or with a family member of an officer of Galveston County that results in the officer or family member of the officer receiving taxable income that exceeds $2,500.00 during the preceding 12-month period, then Proposer **MUST** complete a CIQ Form and file the original of the CIQ Form with the County Clerk of Galveston County.

If Proposer has given an officer of Galveston County or a family member of an officer of Galveston County one or more gifts with an aggregate value of more than $250.00 during the preceding 12-months, then Proposer **MUST** complete a CIQ Form and file the original of the CIQ Form with the County Clerk of Galveston County.

The Galveston County Clerk has offices at the following locations:

Galveston County Clerk
Galveston County Justice Center, Suite 2001
600 59th Street
Galveston, Texas 77551

Galveston County Clerk
North County Annex, 1st Floor
174 Calder Road
League City, Texas 77573

Again, if Proposer is required to file a CIQ Form, the original completed form is filed with the Galveston County Clerk (not the Purchasing Agent).

For Proposer's convenience, a blank CIQ Form is enclosed with this proposal. Blank CIQ Forms may also be obtained by visiting the Galveston County Clerk's website and/or the Purchasing Agent's website – both of these web sites are linked to the Galveston County homepage, at http://www.co.galveston.tx.us.

As well, blank CIQ Forms may be obtained by visiting the Texas Ethics Commission website, specifically at http://www.ethics.state.tx.us/whatsnew/conflict_forms.htm.

Chapter 176 specifies deadlines for the filing of CIQ Forms (both initial filings and updated filings).

It is Proposer's sole responsibility to file a true and complete CIQ Form with the Galveston County Clerk if Proposer is required to file by the requirements of Chapter 176. Proposer is advised that it is an offense to fail to comply with the disclosure reporting requirements dictated under Chapter 176 of the Texas Local Government Code.

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If you have questions about compliance with Chapter 176, please consult your own legal counsel. Compliance is the individual responsibility of each person, business, and agent who is subject to Chapter 176 of the Texas Local Government Code.

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COUNTY of GALVESTON
Purchasing Department

rev. 1.3, March 29, 2010

FORM PEID:	Request for Person-Entity Identification Data

Instructions: Please type or print clearly when completing sections 1 thru 4 and return completed form to:

Galveston County Purchasing Agent
722 Moody Avenue (21st. Street), 5th Floor
Galveston, Texas 77550
(409) 770-5371 *office*
(409) 621-7987 *fax*

1.

Business Name:	
Attention Line:	

2.

Physical Address:			
City:		State:	Zip+4:

3.

Billing / Remit Address:			
City:		State:	Zip+4

4.

Main Contact Person:	
Main Phone Number:	
Fax Number:	
E-mail Address:	

Areas below are for County use only.

Requested By:	Phone / Ext. #
Department:	Date:

Action Requested - Check One:	IFAS PEID Vendor Number:	
( ) Add New	( ) Change Data	( ) Re-activate
( ) Inactivate	( ) Employee	( ) Attorney
( ) Landlord	( ) Foster Parent	( ) Refund
( ) One Time	( ) Foster Child	

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Form **W-9**
(Rev. October 2007)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give form to the requester. Do not send to the IRS.

Print or type See Specific Instructions on page 2.

Name (as shown on your income tax return)

Business name, if different from above

Check appropriate box: ☐ Individual/Sole proprietor ☐ Corporation ☐ Partnership
☐ Limited liability company. Enter the tax classification (D=disregarded entity, C=corporation, P=partnership) ► .....
☐ Other (see instructions) ►

☐ Exempt payee

Address (number, street, and apt. or suite no.)

Requester's name and address (optional)

City, state, and ZIP code

List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on Line 1 to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Social security number

or

Employer identification number

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
3. I am a U.S. citizen or other U.S. person (defined below).

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the Certification, but you must provide your correct TIN. See the instructions on page 4.

Sign Here Signature of U.S. person ► Date ►

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Purpose of Form

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.

Note. If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,
- An estate (other than a foreign estate), or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business. Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.

The person who gives Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States is in the following cases:

- The U.S. owner of a disregarded entity and not the entity,

Cat. No. 10231X Form **W-9** (Rev. 10-2007)

- The U.S. grantor or other owner of a grantor trust and not the trust, and
- The U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

Foreign person. If you are a foreign person, do not use Form W-9. Instead, use the appropriate Form W-8 (see Publication 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items:

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.

2. The treaty article addressing the income.

3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.

4. The type and amount of income that qualifies for the exemption from tax.

5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity not subject to backup withholding, give the requester the appropriate completed Form W-8.

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 28% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,

2. You do not certify your TIN when required (see the Part II instructions on page 3 for details),

3. The IRS tells the requester that you furnished an incorrect TIN,

4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or

5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See the instructions below and the separate Instructions for the Requester of Form W-9.

Also see *Special rules for partnerships* on page 1.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of $50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a $500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Name

If you are an individual, you must generally enter the name shown on your income tax return. However, if you have changed your last name, for instance, due to marriage without informing the Social Security Administration of the name change, enter your first name, the last name shown on your social security card, and your new last name.

If the account is in joint names, list first, and then circle, the name of the person or entity whose number you entered in Part I of the form.

Sole proprietor. Enter your individual name as shown on your income tax return on the "Name" line. You may enter your business, trade, or "doing business as (DBA)" name on the "Business name" line.

Limited liability company (LLC). Check the "Limited liability company" box only and enter the appropriate code for the tax classification ("D" for disregarded entity, "C" for corporation, "P" for partnership) in the space provided.

For a single-member LLC (including a foreign LLC with a domestic owner) that is disregarded as an entity separate from its owner under Regulations section 301.7701-3, enter the owner's name on the "Name" line. Enter the LLC's name on the "Business name" line.

For an LLC classified as a partnership or a corporation, enter the LLC's name on the "Name" line and any business, trade, or DBA name on the "Business name" line.

Other entities. Enter your business name as shown on required federal tax documents on the "Name" line. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on the "Business name" line.

Note. You are requested to check the appropriate box for your status (individual/sole proprietor, corporation, etc.).

Exempt Payee

If you are exempt from backup withholding, enter your name as described above and check the appropriate box for your status, then check the "Exempt payee" box in the line following the business name, sign and date the form.

Generally, individuals (including sole proprietors) are not exempt from backup withholding. Corporations are exempt from backup withholding for certain payments, such as interest and dividends.

Note. If you are exempt from backup withholding, you should still complete this form to avoid possible erroneous backup withholding.

The following payees are exempt from backup withholding:

1. An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2),

2. The United States or any of its agencies or instrumentalities,

3. A state, the District of Columbia, a possession of the United States, or any of their political subdivisions or instrumentalities,

4. A foreign government or any of its political subdivisions, agencies, or instrumentalities, or

5. An international organization or any of its agencies or instrumentalities.

Other payees that may be exempt from backup withholding include:

6. A corporation,

7. A foreign central bank of issue,

8. A dealer in securities or commodities required to register in the United States, the District of Columbia, or a possession of the United States,

9. A futures commission merchant registered with the Commodity Futures Trading Commission,

10. A real estate investment trust,

11. An entity registered at all times during the tax year under the Investment Company Act of 1940,

12. A common trust fund operated by a bank under section 584(a),

13. A financial institution,

14. A middleman known in the investment community as a nominee or custodian, or

15. A trust exempt from tax under section 664 or described in section 4947.

The chart below shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 15.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 9
Broker transactions	Exempt payees 1 through 13. Also, a person registered under the Investment Advisers Act of 1940 who regularly acts as a broker
Barter exchange transactions and patronage dividends	Exempt payees 1 through 5
Payments over $600 required to be reported and direct sales over $5,000[1]	Generally, exempt payees 1 through 7[2]

[1] See Form 1099-MISC, Miscellaneous Income, and its instructions.
[2] However, the following payments made to a corporation (including gross proceeds paid to an attorney under section 6045(f), even if the attorney is a corporation) and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, and payments for services paid by a federal executive agency.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are a single-member LLC that is disregarded as an entity separate from its owner (see *Limited liability company (LLC)* on page 2), enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note. See the chart on page 4 for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local Social Security Administration office or get this form online at *www.ssa.gov*. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at *www.irs.gov/businesses* and clicking on Employer Identification Number (EIN) under Starting a Business. You can get Forms W-7 and SS-4 from the IRS by visiting *www.irs.gov* or by calling 1-800-TAX-FORM (1-800-829-3676).

If you are asked to complete Form W-9 but do not have a TIN, write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note. Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

Caution: *A disregarded domestic entity that has a foreign owner must use the appropriate Form W-8.*

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if items 1, 4, and 5 below indicate otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). Exempt payees, see *Exempt Payee* on page 2.

Signature requirements. Complete the certification as indicated in 1 through 5 below.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account)	The actual owner of the account or, if combined funds, the first individual on the account [1]
3. Custodian account of a minor (Uniform Gift to Minors Act)	The minor [2]
4. a. The usual revocable savings trust (grantor is also trustee)	The grantor-trustee [1]
b. So-called trust account that is not a legal or valid trust under state law	The actual owner [1]
5. Sole proprietorship or disregarded entity owned by an individual	The owner [3]
For this type of account:	**Give name and EIN of:**
6. Disregarded entity not owned by an individual	The owner
7. A valid trust, estate, or pension trust	Legal entity [4]
8. Corporate or LLC electing corporate status on Form 8832	The corporation
9. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
10. Partnership or multi-member LLC	The partnership
11. A broker or registered nominee	The broker or nominee
12. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity

[1] List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

[2] Circle the minor's name and furnish the minor's SSN.

[3] You must show your individual name and you may also enter your business or "DBA" name on the second name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

[4] List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships* on page 1.

Note. If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Secure Your Tax Records from Identity Theft

Identity theft occurs when someone uses your personal information such as your name, social security number (SSN), or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

Call the IRS at 1-800-829-1040 if you think your identity has been used inappropriately for tax purposes.

Victims of identity theft who are experiencing economic harm or a system problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

Protect yourself from suspicious emails or phishing schemes. Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to *phishing@irs.gov*. You may also report misuse of the IRS name, logo, or other IRS personal property to the Treasury Inspector General for Tax Administration at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at: *spam@uce.gov* or contact them at *www.consumer.gov/idtheft* or 1-877-IDTHEFT(438-4338).

Visit the IRS website at *www.irs.gov* to learn more about identity theft and how to reduce your risk.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons who must file information returns with the IRS to report interest, dividends, and certain other income paid to you, mortgage interest you paid, the acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA, or Archer MSA or HSA. The IRS uses the numbers for identification purposes and to help verify the accuracy of your tax return. The IRS may also provide this information to the Department of Justice for civil and criminal litigation, and to cities, states, the District of Columbia, and U.S. possessions to carry out their tax laws. We may also disclose this information to other countries under a tax treaty, to federal and state agencies to enforce federal nontax criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism.

You must provide your TIN whether or not you are required to file a tax return. Payers must generally withhold 28% of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to a payer. Certain penalties may also apply.

North County Annex
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CONFLICT OF INTEREST QUESTIONNAIRE — FORM CIQ

For vendor or other person doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 1491, 80th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code by a person who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the person meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the person becomes aware of facts that require the statement to be filed. *See* Section 176.006, Local Government Code.

A person commits an offense if the person knowingly violates Section 176.006, Local Government Code. An offense under this section is a Class C misdemeanor.

OFFICE USE ONLY

Date Received

1 **Name of person who has a business relationship with local governmental entity.**

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.**

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date the originally filed questionnaire becomes incomplete or inaccurate.)

3 **Name of local government officer with whom filer has employment or business relationship.**

_____
Name of Officer

This section (item 3 including subparts A, B, C & D) must be completed for each officer with whom the filer has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the filer of the questionnaire?

☐ Yes ☐ No

B. Is the filer of the questionnaire receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership of 10 percent or more?

☐ Yes ☐ No

D. Describe each employment or business relationship with the local government officer named in this section.

4

_____ _____
Signature of person doing business with the governmental entity Date

Adopted 06/29/2007

END OF SECTION 00102 FORMS

North County Annex
AHU 1 & 2 Replacement

SECTION 00103 – PROPOSAL FORM

1. OWNER: Galveston County
2. PROJECT: Galveston County North County Annex Air Handler Replacement
3. Engineer Ibis Engineering

4. SUBMITTED BY:

_____
Proposer Name
_____

_____

_____

_____
Proposer Address

_____
Proposer Phone Number
_____
Proposer e-mail or website

5. PROPOSAL:

A. Having examined the Instructions to Proposers, Contract Documents, and Conditions of the Contract of the Project listed above, dated March 15, 2012 including Addenda and having visited and fully inspected the site and examined all conditions affecting the Project, the undersigned, proposes to perform the complete Work of the Project required by the said Documents for the sum or sums set forth below.

B. In submitting this proposal, the undersigned, agrees to the following:
   01. Hold the proposal open for acceptance for 60 days from the submission of Proposal.
   02. Accept the right of the Owner to reject any or all proposals, to waive formalities, and to accept the proposal which the Owner considers most advantageous to him.
   03. Accept the right of the Owner to reject any Subcontractor. A new Subcontractor may be contracted with the difference in proposal amount added to, or subtracted from, the Contract.
   04. Enter into and execute a Contract if awarded, on the basis of the Base Proposal and selected Alternate Proposals, if any.
   05. Complete the Work in accordance with the Contract Documents within the stipulated Contract Time.

C. Furnish specified insurance.
   01. Furnish specified insurance, performance, and payment bonds as per the Agreement between Galveston County and Trade Contractor.

D. The undersigned acknowledges that being notified that he has the best responsible Proposal does not convey upon him any property right to an award of the Contract or anything of value. The undersigned also acknowledges that no rights rest under the Proposal or tentative award and that any rights the Proposer may obtain will arise only upon execution of the Contract.

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6. **Addenda:** The undersigned acknowledges receipt of:

   Addenda #.....dated....._ _ /_ _/2010

7. **Base Proposal:** The undersigned agrees to perform the complete Work of this Project, for the lump sum price of (The Base Proposal includes all allowances listed in the Section 01020 except for the Contingency Allowance):

   _____ Dollars and no/100 $_____
   (Amount written in words governs) (Amount in figures)

8. **Contract Time:** Undersigned agrees to commence work upon receipt of Notice to Proceed and be substantially complete within _____calendar days

9. **ALTERNATES**: If the Owner elects to accept any or all of the Alternates, the undersigned agrees to modify the Base Proposal as stipulated

   Alternate NO. 1 – Hot and Cold Water Recirculating Pumps Replacement

   Add/Deduct_____ Dollars and no/100 $_____
   (Amount written in words governs) (Amount in figures)

10. **Contingency Allowance:** The undersigned agrees to include a Contingency Allowance equal to 5% of the Base Proposal lump sum (item 7) to be utilized by Galveston County for unforeseen items of work as per Section 01020 of the Project manual:

    _____ Dollars and no/100 $_____
    (Amount written in words governs) (Amount in figures)

11. **Total:** The sum of items 7, 9, and 10 above:

    _____Dollars and no/100 $_____
    (Amount written in words governs) (Amount in figures)

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Proposer's Printed Name: .....

Proposers Address: .....

.....

.....

Proposers Phone Number.....

Signatory's Printed Name: .....

Signatory's Position/Title:.....

Seal:

Signature:.....date.....

Note that Section 00104 - Proposal Evaluation Waiver and other documents must accompany this form.

STATE OF TEXAS TAX STATEMENT OF MATERIALS and other charges:

The cost of in-place materials to be
incorporated into the project.....$_____

The cost of labor, profit, materials
not in-place and all other charges.....$_____

TOTAL: (Must agree with Proposal total above).....$_____

A copy of Section 00104 Proposal Evaluation Waiver must be included with Proposer's Proposal.

END OF SECTION 00103

North County Annex
AHU 1 & 2 Replacement

SECTION 00104 – PROPOSAL EVALUATION WAIVER & QUALIFICATION STATEMENT

By submitting a proposal, the Proposer indicated below agrees to waive any claim it has or may have against the Owner, Architect, Engineers, Consultants, or Construction Manager and their respective employees, arising out of or in connection with the administration, evaluation, or recommendation of any proposal. The Proposer further agrees the Owner reserves the right to waive any requirements under the proposal documents or the Contract Documents, acceptance or rejection of any proposals, and recommendation or award of the contract.

In order to evaluate proposals the following items **must** be turned in along with the proposal form to allow Galveston County to determine the best overall proposal.

The information below shall be provided on the Proposer's letterhead. Failure to provide the information may result in no points awarded for that item in the evaluation process. Each item below will be researched for each Trade Contractor and assigned a relative value more fully described on the Proposal Tabulation Form attached for information only in Section 00300.

a) References from **all or the most recent 20** previous contracts comparable to this contract size and scope during the last five years. (including complete Owner name, individual Owner contact, current phone numbers, project size, etc.). This item accounts for **5%** of the evaluation scoring.

b) References from **all or the most recent 20** previous contracts with Galveston County and other political subdivisions located within Galveston County. (include Entity name, individual Entity contact, current phone numbers, project size, etc.). This item accounts for **5%** of the evaluation scoring.

c) Single page resume of superintendent, Project Manager, and Project Executive for this project. The quality of personnel accounts for **5%** of the evaluation scoring.

d) Listing of proposed subcontractors, suppliers, and other team members. The quality of subcontractors, suppliers, and other team members (if none then the quality of personnel above will be duplicated here) accounts for **5%** of the evaluation scoring.

e) Based upon references listed above the probability of satisfactory post construction maintenance, repair, and service for emergency warranty work. The probability of satisfactory response to warranty work accounts for **5%** of the evaluation scoring.

f) Based upon references listed above the probability of satisfactory timely completion of the work. The probability of satisfactory timely completion of the work accounts for **5%** of the evaluation scoring.

g) The Proposer's safety record including the current EMR (experience modifier rate). The EMR relative to 1 accounts for **5%** of the evaluation scoring.

h) The Proposer's history of claims, mediation, litigation or arbitration with any Owner in the past 5 years. This item accounts for **5%** of the evaluation scoring.

i) The Proposer's historic compliance with laws and codes governing construction activities. This item accounts for **5%** of the evaluation scoring.

j) The Proposer's attendance at the Pre-proposal meeting and walkthrough. This item accounts for **5%** of the evaluation scoring.

NOTE: The Statement of Affirmation Must Be Notarized.

STATEMENT OF AFFIRMATION

North County Annex
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"The undersigned affirms that he/she is duly authorized to execute this waiver by the person(s) or business entity making the proposal.

Proposer's Name:.....

Proposers Address: .....

.....

.....

Signatory's Name:.....

Signatory's Position/Title:.....

Signature:.....date.....

Subscribed and sworn to me on this _____ day of _____

_____
Notary Public

My Commission expires _____

NOTE: THIS FORM MUST BE EXECUTED AND SUBMITTED WITH PROPOSAL.

END OF SECTION 00104

North County Annex
AHU 1 & 2 Replacement

SECTION 00104 Form - Proposal Tabulation and Evaluation Form

Galveston County Mid County Annex

RFP # B111044 - North County Annex AHU 1&2 Replacement
Evaluation Team Member

Grading		50	5	5	5	5	5	5	5	5	5	5	100
Budget	$1.00	Base Proposal and alternate	References from previous contracts comparable in size and scope	Quality of performance with County (or other political subdivisions in County) on previous contracts	Quality of Proposed personnel	Quality of Proposed subcontractor, supplier, or team members personnel	Probability of satisfactory future maintenance, repair, & service, including time for emergency repair/ work	Compliance with laws on previous contracts	Proposer performance record of timely completion on previous projects similar in size and scope	Proposer safety record including current EMR	Proposer history of claims, litigation, or arbitration with any Owner in the last 5 years	Proposer attendance at Pre-Proposal Conference Walkthrough May 31, 2011	Total Score
	Proposal Bond												
	Addenda												
	Addenda												
	Addenda												
Lowest Base proposal and/or alternates		$1											
Proposer													
	Cost												
	Grading Score												
	Rating												
	Grading Score												
	Cost												
	Grading Score												
	Rating												
	Grading Score												
	Cost												
	Grading Score												
	Rating												
	Grading Score												

The Base Proposal Cost rating is from lowest dollar to highest dollar. The scoring for the Base Proposal Costs is accomplished by dividing the lowest proposed cost by the individual proposer cost to obtain the grading and multiplying that fraction by the 50 points possible. Therefore the proposal cost proposal will receive 50 points.
The Safety record will be scored based upon all EMR below 1 being awarded 5 points, an EMR of 1 awarded 4 points, an EMR of 1.1 awarded 3 points, an EMR of 1.2 awarded 2 points, an EMR of 1.3 awarded 1 point.

No item is perfect	100	Perfect
What we want	90	Quality Work and willingly contributes to the team effort
If above not available	80	Quality work and causes the rest of the tea m extra effort to deal with them
Acceptable	70	Good work and willingly advances the team effort
Mediocre	60	Good work and causes the rest of the team extra effort to deal with them
Only if we have to	50	Marginally acceptable work and willingly contributes to the team effort
Prefer not	40	Marginally acceptable work and causes the rest of the team extra effort to deal with them
No	30	Poor work and attempts to contribute to the team effort
This will just waste time	20	Poor work and causes the rest of the team extra effort to deal with them
please dont submit	0	

W:\Architecture\0 PROJECTS\10-003 North County Annex HVAC\Proposal Tabulation and evaluation

North County Annex
AHU 1 & 2 Replacement

SECTION 00105 – TRADE CONTRACTOR AGREEMENT

Agreement between Galveston County and Trade Contractor

Agreement for: Project Name

This contract is entered into between Galveston County and the Trade Contractor named below pursuant to Sub chapter B, Chapter 271, Texas Local Government Code, and the referenced Request for Competitive sealed Proposal.

Contract No: _____

Proposal No: _____

Contractor: _____

Article I.

The Work

Section 1.01 The Trade Contractor and Galveston County agree that the materials and equipment to be furnished and the work to be done by the Trade Contractor are as follows:

The scope of work for this proposal is the replacement of Air Handling Units 1 and 2 at the North County Annex at 174 Calder Road; League City; Texas; 77573 for Galveston County.

Section 1.02 The Trade Contractor shall be held accountable for the following Project related responsibilities: furnish all labor and supervision; furnish, supply and install all equipment, material, supplies, tools, scaffolding, hoisting, transportation, unloading and handling; do all things required to complete the work described above on the Project all in accordance with the drawings and Project Manual prepared by the Architect; and furnish all necessary information, shop drawings, details, samples, brochures, etc. For Owner/Architect approval, as may be required.

Article II.

Time of Commencement and Completion

Section 2.01 The Trade Contractor shall start the work upon notice to proceed and shall execute the work with diligence and dispatch so as to maintain such schedules and milestones as established by the Construction Manager. The Trade Contractor agrees to complete portions and the whole of the work by the following anticipated dates:

Contractor to provide a schedule that is acceptable to the CMa.

Section 2.02 The Trade Contractor is cautioned that schedules and milestones are subject to review and revision, and in such event, such revisions will be made available for the Trade Contractor's information at the jobsite office of the Construction Manager. It is the sole responsibility of the Trade Contractor to attend job meetings, keep itself informed of any revisions, and conform to any such revisions.

Section 2.03 In the event the Trade Contractor should fail to maintain the Construction Manager's progress schedule or the schedule as established above, Galveston County reserves the right, after 48 hours formal notice, either by letter or telegram to the Trade Contractor, to procure the materials, equipment, and labor necessary to proceed with, or to complete the work, or any portion thereof from other sources and charge the cost thereof to the Trade Contractor.

Section 2.04 Time is of the essence in this Agreement.

Article III.

The Contract Sum

Section 3.01 Galveston County agrees to pay the Trade Contractor for the satisfactory performance of his work the total sum of: _____Dollars and No/100 ($), payments to be made as described herein in current funds subject to additions and deductions for changes, as may be agreed upon in writing, and to make payments on account thereof as follows:

Section 3.02 On the established day of each month, the Trade Contractor shall deliver to the Construction Manager, and Galveston County, a detailed, quadruplicate statement acceptable to the Construction Manager, and if required, supported by receipts, vouchers, etc. showing values of all materials delivered and work completed up to the established billing date for which payment is requested. Monthly and final payments will be made to the Trade Contractor from Galveston County. It is specifically understood and agreed that prior to submission of the first statement, the Trade Contractor will deliver to the Construction Manager, for review and approval, a detailed breakdown of this contract sum showing a schedule of values for the various parts of the work Once accepted by the Construction Manager, this schedule of values will be used as a basis for checking the Trade Contractor's monthly statement.

Section 3.03 The Trade Contractor shall, with the second and each succeeding monthly request for payment, submit receipts and/or an affidavit and waiver of bond claim, provided by the Construction Manager, showing all payments made for labor and materials and on account for all work covered in the previous months request for payment. Affidavit and waiver of bond claims may be required to be submitted from Trade Contractors, suppliers, and/or Sub-Trade Contractors (all tier). The Trade Contractor shall be required to execute a general release, provided by the Construction Manager and satisfactory to Owner, prior to receiving final payment.

Section 3.04 Five percent (5%) of each payment shall be retained, unless specific provisions to the contrary are indicated in the contract documents.

Section 3.05 No payment made under this Agreement, including the final payment, shall be conclusive evidence of the performance of the work, either wholly or in part, and no payment shall be construed as an acceptance of defective work or improper materials.

Section 3.06 The Trade Contractor shall save and keep the Construction Manager, Galveston County and Galveston County's property free from all claims, including bond claims, legal or equitable, arising out of the Trade Contractor's work hereunder. I n the e vent any such b and claim is filed by anyone claiming by, through, or under the Trade Contractor, the Trade Contractor shall remove and discharge same, by bonding or otherwise, within five (5) days of the filing thereof.

Article IV.

The Contract Documents

Section 4.01 The contract documents consist of this Agreement and any exhibits attached hereto; Proposal Documents, Proposal Form, General Terms and Conditions, the Project Manual, the Drawings, and all addenda issued prior to and all modifications issued after execution of the Agreement between Galveston County and Construction Manager and agreed upon by the parties.

Section 4.02 The Trade Contractor agrees to perform the work under the general direction of the Construction Manager and subject to the final approval of the Architect or other specified representative of Galveston County, in accordance with the contract documents.

Section 4.03 The Trade Contractor agrees to be bound to and assume toward the Construction Manager all of the obligations and responsibilities that the Construction Manager, by those documents, assumes toward Galveston County. Contract documents are available, at reasonable times, at the office of the Construction Manager for examination by the Trade Contractor.

Section 4.04 No extra work shall be performed under this Agreement, except upon receipt of a written order from the Construction Manager or Galveston County.

The Specifications and Drawings are enumerated as follows:

Project Manual .....-..... Dated 03/15/2012

Drawings.....-..... Dated 05/16/2011

Addenda.....-.....TBD

Article V.

Insurance and Indemnity

Section 5.01 The Trade Contractor agrees to, at the time of execution of this Agreement, furnish the Construction Manager with certificates of insurance from an insurance company (or other source) acceptable to Galveston County. These certificates should certify that the Trade Contractor is

protected on the work with worker's compensation and employer's liability, public liability and bodily injury, property damage insurance, and any other insurance as required by the contract documents and in accordance with the attachment to this Agreement. The Trade Contractor will not be permitted to start work at the site until these certificates are filed with Galveston County. Compliance by the Trade Contractor with the foregoing requirements, as to carrying insurance and furnishing certificates, shall not relieve the Trade Contractor of its liabilities and obligations.

Section 5.02 For ten ($10.00) dollars and other good and valuable consideration, the receipt whereof is hereby acknowledged, and to the fullest extent permitted by law, the Trade Contractor agrees to indemnify and hold harmless Galveston County, the Construction Manager, the Architect, and all of their agents and employees from and against claims, damages, losses and expenses, including but not limited to attorneys' fees arising out of or resulting from the performance or failure in performance of the Trade Contractor's work under this Agreement provided that any such claim, damage, loss, or expense (1) is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom, (2) is caused, in whole or in part, by any negligent act or omission of the Trade Contractor or anyone directly or indirectly employed by the Trade Contractor, or anyone for whose acts the Trade Contractor may be liable, regardless of whether caused in part by a party indemnified hereunder. Such obligations shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this paragraph. In any and all claims against the Construction Manager, or any of its agents or employees, by any employee of the Trade Contractor, or anyone directly or indirectly employed by the Trade Contractor, or anyone for whose acts he may be liable, the indemnification obligation under this paragraph 5.02 shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the Trade Contractor under worker's compensation acts, disability benefit acts, or other employee benefit acts.

Section 5.03 The obligations of the Trade Contractor, under paragraph 5.02, shall not extend to the liability of the Architect, his agents, or employees, arising out of the preparation or approval of maps, drawings, opinions, reports surveys, change orders, designs, or Project Manual and/or the giving of or failure to give directions or instructions by the Architect, his agents or employees, providing such giving or failure to give is the primary cause of the injury or damage

Section 5.04 The Trade Contractor agrees to obtain, maintain, and pay for such contractual liability insurance coverage and endorsements as will insure the indemnification obligation of the Trade Contractor pursuant to paragraph 5.02 above.

Article VI.

Performance Bond and Labor and Material Payment Bond

Section 6.01 The Trade Contractor agrees to furnish and pay for a 100% Performance Bond and a 100% Labor and Material Payment Bond on the bond forms issued with this Agreement naming the Galveston County as Obligee. Bonds must be issued by a company acceptable to Galveston County and must be accompanied by a Power of Attorney. The bonds are to be delivered with this executed Agreement.

Article VII.

Warranty

Section 7.01 The Trade Contractor agrees to promptly make good, without cost to Galveston County, any and all defects, due to faulty workmanship and/or materials, which may appear within the guarantee or warranty period so established in the contract documents. If no such period is stipulated in the contract documents, then such guarantee shall be for a period of one (1) year from date of substantial completion and acceptance of the work by Galveston County. The Trade Contractor further agrees to provide any and all guarantees as required by the terms of the contract documents, as a condition precedent to final payment.

Article VIII.

Changes in the Work

Section 8.01 The Trade Contractor may be ordered in writing by Galveston County, without invalidating this Agreement, to make changes in the work within the general scope of this Agreement. These changes may consist of additions, deletions, or other revisions, the contract sum and the contract time being adjusted accordingly. The Trade Contractor, prior to the commencement of such changed or revised work, shall submit promptly to the Construction Manager written copies of any claim for adjustment to the contract sum and contract time for such revised work in a manner consistent with the contract documents

Section 8.02 Where changes in the work involve both additions and deletions, percentages for overhead and profit shall be applied to the net increase of such values for labor and materials.

Section 8.03 The amount to be paid by Galveston County for changes in the work, as outlined in paragraph 8.01 above, shall be made on the basis of one of the following methods:

a) by mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation and agreed upon by the Construction Manager and the Trade Contractor, or
b) by unit prices stated in the contract documents, or
c) if no such unit prices are set forth and if the parties cannot agree upon a lump sum, then the actual net cost in money to the Trade Contractor of materials and labor (including insurance and applicable taxes) required, plus rental of plant equipment (other than small tools and small equipment) plus compensation for overhead and for profit as noted in Article 12. (Field overhead will not be considered as part of actual net cost), or
d) by the method provided in subparagraph 8.04.

Section 8.04 If none of the above methods set forth in clauses 8.03 (a), 8.03 (b), 8.03 (c) is agreed upon, the Trade Contractor, provided he receives a written order signed by Galveston County shall promptly proceed with the work involved. The cost of such work shall be determined by the Construction Manager on the basis of reasonable expenditures and savings of those performing the work attributable to the change, including, in the case of an increase in the contract sum, a reasonable allowance for overhead and profit. In such case, and also under clauses 8.03 (c) and 8.03 (d) above, the Trade Contractor shall keep and present, in such form as the Construction Manager may prescribe,

an itemized accounting together with appropriate supporting data for inclusion in a change order. Unless otherwise provided in the contract documents, cost shall be limited to the following: cost of materials including cost of delivery, cost of labor including social security, old age and unemployment insurance and fringe benefits required by Agreement or custom; workers or workmen's compensation insurance; bond premiums; rental value of equipment and machinery; and the additional costs of supervision and field office personnel directly attributable to the change. Pending final determination of cost, payments, on account shall be made as determined by Galveston County. The amount of credit to be allowed by the Trade Contractor for any deletion or change which results in a net decrease in the contract sum will be the amount of the actual net cost as confirmed by Galveston County. When both additions and credits covering related work or substitutions are involved in any one change, the allowance for overhead and profit shall be figured on the basis of the net increase, if any with respect to that change.

Section 8.05 Owner's Audit - Owner's duly authorized representative shall have access, at all reasonable times, to all Trade Contractor's personnel, books, records, correspondence, instructions, plans, drawings, receipts, vouchers and memoranda of every description pertaining to any change(s) for the purpose of auditing and verifying Trade Contractor's net cost of change or for any other reasonable purpose. Owner's representative shall have the right to reproduce any of the aforesaid documents. Trade Contractor shall preserve, and shall cause its Trade Contractors to preserve all the aforesaid documents for a period of two years after the completion and acceptance or termination of work.

Section 8.06 For work performed by a Sub-Trade Contractor, the Trade Contractor will be allowed to add 5% only and said Sub-Trade Contractor mark-up shall not exceed the agreed upon percentages noted in Article 12 for overhead and profit.

Article IX.

Trade Contractor Responsibilities

Section 9.01 The Trade Contractor shall provide sufficient, safe, and proper facilities at all times for the inspection of the work by Galveston County and the Construction Manager , or their authorized representatives. The Trade Contractor shall, within a 24-hour notice from the Construction Manager, proceed to take down all portions of the work and remove from the grounds or buildings, all materials, whether worked or un-worked, which the Construction Manager, Galveston County, or their authorized representatives shall condemn as unsound or improper, or as in any way failing to conform to the contract documents. The Trade Contractor shall make good at its own expense, all work damaged or destroyed thereby

Section 9.02 The Trade Contractor agrees, in the performance of this Agreement, to comply with all federal, state, municipal, and local laws, ordinances, codes and governing regulations, to pay all costs and expenses required thereby; to pay all fees, charges, assessments, and taxes, and to pay all fringe and other benefits required by Agreement or law.

Section 9.03 The Trade Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save Galveston County, Construction Manager, and Architect harmless from loss on account thereof, except that Galveston County shall be

responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified, but if the Trade Contractor has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to Galveston County.

Section 9.04 Should the Trade Contractor become insolvent, or at any time, refuse or neglect to supply a sufficiency of properly skilled workers, or equipment and materials of the proper quality, or fail in any respect to prosecute the work with promptness and diligence, or fail in the performance of any of the Agreements herein contained, Galveston County shall be at liberty, after 48 hours written notice to the Trade Contractor, to provide any such labor, equipment,, and materials and deduct the cost thereof, from any money then due or thereafter to become due to the Trade Contractor, under this Agreement. In the event of such refusal, neglect, or failure Galveston County shall also be at liberty to terminate the employment of the Trade Contractor. Consequently, Galveston County may enter upon the premises to take possession, for the purpose of completing the work included under this Agreement, of all materials, tools, and appliances thereon, and to employ any other person or persons to finish the work and provide the materials therefore. In case of such discontinuance of the employment, the Trade Contractor shall not be entitled to receive any further payment under this Agreement until the said work shall be wholly finished. If the unpaid balance of the amount to be paid under this Agreement shall exceed the expense incurred by Galveston County in finishing the work, such excess shall be paid by Galveston County to the Trade Contractor. If such expense shall exceed such unpaid balance, the Trade Contractor shall pay the difference to Galveston County. The expense incurred by Galveston County, as herein provided, either for furnishing materials, or finishing the work, and any damage incurred through such default, shall be chargeable to the Trade Contractor

Section 9.05 Notwithstanding the above paragraph, Galveston County reserves the right to terminate this Agreement for its convenience upon written notice to the Trade Contractor. In such instance the Trade Contractor will be paid its share of the contract amount proportionate to the percentage of its work completed and other reasonable cancellation costs incurred as a result of said termination. No payments shall be made for anticipated overhead and profit. Prior to making any payments under this clause, the Owner shall have the right to audit the records of the Trade Contractor

Section 9.06 The Trade Contractor agrees to adhere to the federal Occupational Safety & Health Act, state and local safety regulations and the Construction Manager's safety and health program so as to avoid injury or damage to persons or property, and to be directly responsible for damage to persons and property resulting from failure to do so.

Section 9.07 In the event the Trade Contractor after a 24-hour written notice from Galveston County, the Construction Manager, or duly authorized representative, fails to take corrective action to insure compliance with said safety regulations or removal of rubbish and debris resulting from his work, Galveston County shall undertake these obligations and charge the cost of same to the Trade Contractor's account without further notice to the Trade Contractor.

Section 9.08 The Trade Contractor agrees to notify the Construction Manager's representative on the jobsite of all accidents which may occur to persons or property and shall provide the Construction Manager's representative with a copy of all accident reports on appropriate forms.

All reports shall be signed by the Trade Contractor or his authorized representative and submitted within five (5) days of occurrence

Section 9.09 The Trade Contractor shall procure its materials from such sources, and employ such labor subject to contract terms and conditions in order to ensure harmonious labor relations on the site and prevent strikes or labor disputes by its employees or other trade employees. The Trade Contractor, in the event of a labor dispute including strikes, shall take whatever action is required in order to prevent the disruption of work on the Project site.

Section 9.10 The Trade Contractor will not assign this Agreement, nor any moneys due or to become due under this Agreement, nor sublet the whole or any part of the work to be performed hereunder, without the written consent of the Owner and Construction Manager. In the event of such a consent, a Sub-Trade Contractor must comply with all the requirements of this Agreement.

Section 9.11 The Trade Contractor agrees that all disputes concerning the jurisdiction of trades shall be adjusted in accordance with any plan for the settlement of jurisdictional disputes which may be in effect either nationally or in the locality in which the work is being done. The Trade Contractor shall be bound by, and shall abide by, all such adjustments and settlements of jurisdictional disputes, whether or not the Trade Contractor is signature bound by the Agreement establishing the impartial jurisdictional disputes board and/or its successors. The Trade Contractor agrees not to cause a work stoppage, due to the jurisdictional assignment of work

Section 9.12 The Trade Contractor shall submit to the Construction Manager upon request, copies of orders placed for the various materials required for the Project or authentic stock lists if such material is normally a stock item. Order copies need not reflect prices but should indicate type of material, quantity, vendor name, and address, etc. The Trade Contractor shall be required to submit to the Construction Manager a monthly material status report, or more often if required by the Construction Manager, as a prerequisite for the monthly progress payment. The Trade Contractor shall notify the Construction Manager immediately upon learning of a change of status of any material, equipment, or supplies

Section 9.13 The Trade Contractor shall continuously and adequately protect all his work and will immediately replace all damaged and defective work

Section 9.14 The Trade Contractor agrees to maintain an adequate force of experienced workers and the necessary materials, supplies, and equipment to meet the requirements of the Construction Manager and other trades in order to maintain construction progress schedules, as established by the Construction Manager. In the event that his force is, in the judgment of the Construction Manager, inadequate to meet the established schedules during the regular working hours, the Trade Contractor agrees to work sufficient overtime hours or increase his work force to meet such schedules at no extra cost to Galveston County. If for reasons not already stated, the Construction Manager requires and directs the Trade Contractor to work overtime, including Saturdays, Sundays or Holidays, the Trade Contractor will be reimbursed the net premium rate only. The net premium rate is understood to mean the actual premium labor cost, including applicable taxes and wage additives required by trade Agreement or by law, but without additives for overhead, labor efficiency, or profit.

Section 9.15 The Trade Contractor agrees to employ competent administrative, supervisory, and field personnel to accomplish the work, including layout and engineering and preparation and checking of shop drawings. If required, the Trade Contractor shall substantiate this employment of competent personnel to the Construction Manager's satisfaction before initiating any work

Section 9.16 The Trade Contractor shall insure that all construction tools, equipment, temporary facilities, and other items used in accomplishing the work, whether purchased, rented, or otherwise provided by the Trade Contractor or provided by others, are in a safe, sound, and good condition, must be capable of performing the functions for which they are intended and must be maintained in conformance with applicable laws and regulations

Section 9.17 If the Trade Contractor is delayed at any time in the progress of the work by any act or neglect of the Owner, Construction Manager, or the Architect, or by any employee of either, or by any separate contractor employed by the Owner, or by changes ordered in the work, or by labor disputes, fire, unusual delay in transportation, adverse weather conditions not reasonably anticipatable, unavoidable casualties or any causes beyond the Trade Contractor's control, or by delay authorized by the Owner or Construction Manager, or by any other cause which the Construction Manager determines may justify the delay, then the contract time shall be extended by amendment for such reasonable time as the Construction Manager and Owner may determine.

Section 9.18 Right-To-Know each Trade Contractor is required to implement the provisions of the right-to-know law, if any, as enacted by the state in which the work is being performed. Before using on site any material listed in the right-to-know substance list, each Trade Contractor will furnish the Construction Manager a copy of the material safety data sheet for that substance

Section 9.19 In the event the Trade Contractor employs independent contractors, as well as payroll labor, to discharge its obligations hereunder, the Trade Contractor acknowledges and understands that it does so at its own risk and that federal, state and/or local agencies may dispute the independent contractor status and assess penalties, fines, and costs should there be a determination to reclassify such workers. In that event, the Trade Contractor agrees that it will defend, indemnify and hold Galveston County harmless from any fines, costs, damages, penalties, attorneys fees, and causes of action, including without limitation, personal injury or property damage, arising out of or relating in any way to such a determination.

Article X.

Construction Manager Responsibilities

Section 10.01 The Construction Manager will be the Owner's representative and will administer the trade contract as described in the trade contract documents. The Construction Manager will advise and consult with the Owner. The Construction Manager will have authority to act on behalf of the Owner to the extent provided in the trade contract documents, as they may be modified by change order in accordance with other provisions of the trade contract

Section 10.02 The Trade Contractor agrees to perform the work under the general direction and coordination of the Construction Manager in accordance with the contract documents. Any directive given by the Construction Manager shall be binding on the Trade Contractor.

Section 10.03 The Construction Manager, acting for the Owner and subject to the Owner's delegation of such authority, may perform all tasks necessary or appropriate to administer and manage the trade contract, and undertake any action with respect to the Trade Contractor, that the Owner is entitled to undertake.

Section 10.04 The Construction Manager shall not give instructions or orders directly to employees or workers of the Trade Contractor, except to persons designated as authorized representatives of the Trade Contractor.

Article XI.

Equal Opportunity

Section 11.01 During the performance of this Agreement, the Trade Contractor agrees not to discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Trade Contractor will take affirmative action to insure that applicants are employed without regard to their race, color, religion, sex, or national origin. The Trade Contractor will comply with all provisions of Executive Order No. 11246, Section 503 of the Rehabilitation Act of 1973, as Amended, the Vietnam Era Veterans' Readjustment Assistance Act of 1974, as Amended, (38 U.S.C. 4212) and their implementing regulations at 41 CFR Chapter 60.

Article XII.

Alterations

Section 12.01 The overhead and profit allowable under Article 8.03. A, 8.03 B, 8.03 C is: 10% Cost for Administering Changes, 5% Profit

Article XIII.

Complete Agreement

Section 13.01 This Agreement, together with all documents, Project Manual, drawings, incorporated herein by reference, constitute the entire Agreement between Galveston County and Trade Contractor. There are no terms, conditions, or provisions, either oral or written, between the parties hereto, other than those contained herein. This Agreement supersedes any and all written representations, inducements, or understandings of any kind or nature between the parties hereto, relating to the particular Project involved herein

Section 13.02 The said parties for themselves, their heirs, successors, executors, administrators and assigns, do hereby agree to the full performance of the covenants herein contained.

North County Annex
AHU 1 & 2 Replacement

This Contract is issued pursuant to award made by Commissioners' Court on _____, 20__.

EXECUTED this ____ day of _____, 20__.

COUNTY OF GALVESTON, TEXAS

BY: _____
Mark Henry, County Judge

ATTEST:

_____
Dwight Sullivan, County Clerk

CONTRACTOR

_____

BY: _____
Signature - Title

_____
Printed Name

END OF SECTION 00105

North County Annex
AHU 1 & 2 Replacement

SECTION 00106 – GENERAL CONDITIONS TO THE CONTRACT

GENERAL TERMS AND CONDITIONS OF THE CONTRACT

Article

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North County Annex
AHU 1 & 2 Replacement

General Terms and Conditions of the Contract

1. Contract Documents

A. The Work - For the purpose of this document, the term "Work" is the work defined in Article 1 of the Trade Contract

B. The Project is the total construction to be performed under the Agreement between the Owner and Construction Manager of which the Work is a part.

C. Proposal Package

1. The project is to be constructed under a multi-contract arrangement utilizing multiple trade contracts. The Scope of Work (description of the portion of work) for each "Proposal Package" including an index of respective Drawings and Project Manual Sections shall be specified in the "Competitive Sealed Proposal Form" which form is a part of each "Proposal Package".
2. The work to be performed by each separate Trade Contractor shall be as more fully described in the Proposal Form for each separate Trade Contract (Proposal Package under “Scope of Work") and subsequently inserted in Article 1 of the Agreement. Note: The Scope of Work of a Trade Contract (Proposal Package) may:
   a. Require work to be performed which is covered under more than one (1) section of the Project Manual; and/or
   b. Require the performance of one or more items of work which are only a part of the work covered by a section of the Project Manual
3. Where the Scope of Work of any separate Trade Contract (Proposal Package) requires the performance of an item of work, said item of work shall be performed in full accordance with the requirements of the applicable Sections of the Project Manual, or the applicable part thereof.

D. Abbreviations

1. The language of the Project Manual and elsewhere in the Contract Documents is of the abbreviated type in certain instances, and implies words and meanings which will be appropriately interpreted.
2. Actual word abbreviations of a self-explanatory nature have been included in the Project Manual and Drawings. These are generally defined in the Project Manual Sections at the first instance of use of each term so abbreviated.
3. Singular words will be interpreted as plural and plural words will be interpreted as singular wherever applicable and the full context of the requirements so indicates.

E. General Definitions

1. The word "County" in this contract refers to the County of Galveston.
2. The word "Contractor" refers to the person or entity agreeing to perform the work in this contract and is also referred to as the "Trade Contractor"
3. "Program Administrator" refers to the person designated by County to act on its behalf in administering this contract.
4. "Provide", or "perform": To supply, install and connect up complete and ready for safe and regular operation of particular work referred to unless specifically noted otherwise.

5. "Furnish" to supply, deliver to site and transfer to others for installation.
6. "Install": To receive, unload, distribute, construct, erect, mount, and connect complete with related accessories.
7. "Supply": To purchase, procure, acquire and deliver complete with related accessories.
8. "Product": The term "product" shall include materials, equipment and systems.
9. "As approved": Where used in conjunction with the Construction Manager's or the Architect's response to submittals, requests, applications, inquiries, reports and claims by the Trade Contractor, the meaning of the term "approved" shall not exceed the limitations of the Construction Manager's or the Architect's responsibilities and duties as established in the contract documents.
    a. In no case shall "approval" by the Construction Manager or the Architect be interpreted as a release of the Trade Contractor from responsibilities to fulfill the requirements of the Contract Documents.
    b. "Approval", where required for an item, shall be obtained from the Architect through the Construction Manager in writing.
10. The term "Indicated" is a cross reference to details, notes, or schedules on the drawings, other paragraphs or schedules in the Project Manual, and similar means of recording requirements in the Contract Documents.
    a. Where terms such as "shown", "noted", "scheduled", and "specified" are used instead of "indicated, it is for purpose of helping the reader accomplish the cross reference, and no limitation of location is intended except as specifically noted.
11. "Directed", "Requested", Etc.: Where not otherwise explained, terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted", and "permitted" mean "directed by the Architect, Construction Manager or Owner's Representative", requested by the Architect, Construction Manager or Owner's Representative", etc. However, no such implied meaning will be interpreted to extend the Architect's or Construction Manager's responsibility in the Trade Contractor's area of construction supervision.
12. "Installer": The person or entity engaged by the Trade Contractor or his or Sub-trade contractor for the performance of a particular unit of work at the project site, including installation, erection, application and similar required operations. It is a general requirement that installers be recognized experts in the work they are engaged to perform.
13. "Suitable", "reasonable", "proper", "correct" and "necessary": Such terms shall mean as suitable, reasonable, proper, correct, or necessary for the purpose intended as required by the contract documents, subject to the judgment of the Architect or the Construction Manager.
14. "Including", "Such as": The terms "including" and "such as" shall always be taken in most inclusive sense, namely, "including, but not limited to", and "such as, but not limited to"
15. "Option": The term "option" shall mean a choice from the specified products or procedures which shall be made by the Trade Contractor. The choice is not "whether" the work is to be performed, but "which" product or "which" procedure is to be used. The product or procedure chosen by the Trade Contractor shall be provided at no increase in the cost to the Owner and with no lessening of the Trade Contractor's responsibility for its performance.
16. "Exposed": The term "exposed" shall mean any item or surface, exterior or interior,

which can be seen by a person outside the building, or seen by a person inside any usable space within the building during normal activity.

a. Mechanical and electrical rooms, air handling rooms, storage rooms and penthouses shall be considered to have exposed surfaces, as shall the mechanical and electrical construction within them.

b. The interiors of closets and alcoves shall be considered exposed surfaces, and shall be finished to match the finish of the adjoining room or space, unless another finish is shown.

c. The interiors of cabinets shall be considered exposed, but a finish different from that of the exterior may be permitted or required.

d. Spaces which are not normally occupied or used by occupants or building staff, such as, shafts, hoist ways, tunnels, ceiling plenums, attics, and crew spaces shall be considered "concealed" spaces, unless finishes are shown or specified for their surfaces

17. "At no additional cost": The term "at no additional cost" shall mean at no additional cost to the Owner, the Architect, or the Construction Manager.

18. "Testing Laboratory": An independent entity engaged to perform specific inspections or tests of the Work, either at the project site or elsewhere; and to report and interpret the results of those inspections or tests.

19. Where the word "similar" appears on the drawings, it shall be interpreted in its general sense and not as meaning identical and all details shall be worked out in relation to their location and connection with other parts of the Work.

a. Where on any drawings a portion of the Work is drawn out and the remainder is indicated in outline, the parts drawn out shall also apply to parts outlined.

2. Executions, Correlation, and Intent

A. By executing his Agreement, each Trade Contractor represents that he has visited the site, familiarized himself with the local conditions under which the Work is to be performed and correlated his observances with the requirements of the Contract Documents. Claims, as a result of failure to do so, will not be considered.

B. The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work. The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all. Work not covered in the Contract Documents will not be required unless it is consistent therewith and is reasonably inferable therefrom as being necessary to produce the intended results. Words and abbreviations in the Contract Documents which have well known technical or trade meanings are used in accordance with such recognized meanings

C. The organization of the Project Manual into divisions, sections and articles, and the arrangements of Drawings shall not control the Construction Manager in dividing the Work among Trade Contractors or in establishing the extent of Work to be performed by any trade

D. Written interpretations necessary for the proper execution or progress of the Work, in the form of drawings or otherwise, will be issued with reasonable promptness by the Architect through the Construction Manager and in accordance with any schedule agreed upon. The Trade Contractor shall make written request through the Construction Manager to the Architect for such interpretations. Such interpretations shall be consistent with and reasonably inferable from the Contract Documents. The Trade Contractor shall execute and complete the Work in accordance

with such interpretations.

3. Ownership and Use of Documents

A. Unless otherwise provided in the Contract Documents, the Trade Contractor will be furnished, free of charge, three (3) sets of Working Drawings and Project Manual reasonably necessary for the execution of the Work.

B. All Drawings, Project Manual and copies thereof furnished by the Architect are and shall remain his property. They are to be used only with respect to this Project and are not to be used on any other project. With the exception of one contract set for each party, such documents are to be returned or suitably accounted for to the Architect on request at the completion of the Work. Submission or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's common law copyright or other reserved rights.

4. Owner

A. The Owner for this project is:

Galveston County
722 Moody, Suite 200
Galveston, Texas 77550

The Owner is the person or entity identified as such in the Agreement between the Owner and Construction Manager and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term "Owner" means the Owner or his authorized representative.

B. Information and Services furnished by the Owner.

1. The Owner will furnish all surveys describing the physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site.
2. Except as provided in Article 9.2 of the Trade Contract the Owner will secure and pay for necessary approvals, easements, assessments and charges required for the construction, use, or occupancy of permanent structures or for permanent changes in existing facilities.
3. Information or services under the Owner's control will be furnished by the Owner with reasonable promptness to avoid delay in the orderly progress of the Work.
4. The Owner shall forward all instructions to the Trade Contractors through the Construction Manager.
5. The Owner or Construction Manager may elect to utilize a formal Partnering Program on the project. If the Owner or Construction Manager utilizes a Partnering Program, the Trade Contractor shall be required to participate and require all sub-tier contractors to participate.

5. Engineer

A. Definition

1. The Engineer for this project is:

Ibis Engineering; PO Box 55171; Galveston, TX; 77555; 409.539.5548

2. The Engineer is the person lawfully licensed to practice engineering or an entity lawfully

practicing engineering identified as such in the Agreement between the Owner and Construction Manager and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Engineer means the Engineer or his authorized representative.

3. Nothing contained in the Contract Documents shall create any contractual relationship between the Architect and any Trade Contractor.

B. Engineer Duties during Construction

1. The Engineer will be the interpreter of the requirements of the Drawings and Project Manual. The Engineer will, within a reasonable time, render such interpretations as are necessary for the proper execution of the progress of the work.
2. The Engineer shall interpret the requirements of Changes In The Work, and he shall decide all other questions of design intent in connection with the work.
3. The Engineer will recommend suspension of the Work whenever such suspension may be necessary to ensure proper execution of the Work.
4. All interpretations of the Engineer shall be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. All requests for interpretations shall be directed through the Construction Manager.
5. It shall be the responsibility of the Engineer to make interpretations and render opinions in regard to all claims of the Owner or Construction Manager involving questions of interpretation of the intent of the drawings and Project Manual.
6. Neither the Trade Contractor, the Construction Manager nor the Owner shall be bound by any determination, interpretation or opinion of the Engineer if it is later determined that such is not in accord with the true intent of the contract documents. The party taking issue with the determination, interpretation or decision of the Engineer shall give the other party or parties, as the case may be, written notice of such fact within ten (10) days after the determination, interpretation or opinion is rendered by the Engineer. However, it is the intent of this paragraph that in the actual performance of the Work, the Trade Contractor and/or the Construction Manager shall, in the first instance, proceed in accordance with the instruction given by the Engineer unless the Owner and the Construction Manager mutually agree that the Trade Contractor and/or the Construction Manager shall proceed otherwise.
7. The Engineer’s decision in matters relating to artistic effect will be final if consistent with the Contract Documents.
8. The Engineer will have authority to reject Work which does not conform to the Contract Documents. Whenever, in his opinion, he considers it necessary or advisable for the implementation of the Contract Documents, he will have authority to require special inspection or testing of the Work in accordance with Subparagraph 19.B whether or not such Work be then fabricated, installed or completed. However, neither the Engineer's authority to act under this Subparagraph nor any decision made by him in good faith either to exercise or not to exercise such authority, shall give rise to any duty or responsibility of the Engineer to the Trade Contractor, any Sub-trade contractor, any of their agents or employees, or any other person performing any of the Work.
9. The Engineer will be the judge of the performance of the Work and will use his powers under the contract to enforce its faithful performance. The Architect will determine the amount, quality, acceptability and fitness of all parts of the work.

10. The Engineer will review or take other appropriate action upon Trade Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for conformance with the design concept of the Work and with the information given in the Contract Documents. Such action shall be taken with reasonable promptness so as to cause no delay. The Engineer's review of a specific item shall not indicate approval of an assembly of which the item is a component.
11. The Engineer along with the Construction Manager will conduct site visits to determine the dates of Substantial Completion and final completion, will receive written warranties and related documents required by the Contract and assembled by the Trade Contractor.
12. The Engineer will communicate with the Trade Contractor through the Construction Manager.

6. Construction Manager Agent

A. Definition

1. The Construction Manager Agent is also referred to as Construction Manager in this agreement.
2. The Construction Manager for this project is: O.C. Unbehagen
3. The Construction Manager is the person or entity who has entered into an agreement with the Owner to serve as Construction Manager and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Construction Manager means the Construction Manager acting through his authorized representative.
4. It is the intent of these General Conditions to allow the Construction Manager to direct and schedule the performance of all Work and the Trade Contractors are expected to follow all such directions and schedules.

B. Administration of the Contract

1. The Construction Manager will provide, as the Owner's authorized representative, the general administration of the Project as described herein and in Article 10 of the Trade Contract.
2. The Construction Manager will be the Owner's Construction Representative during construction until final payment and shall have the responsibility to manage the work of all Trade Contractors.
3. The Construction Manager will provide leadership to the Project Team on all matters relating to construction.
4. The Construction Manager shall have the authority to reject Work, which does not conform to the Contract Documents, and to require any Special Inspection and Testing in accordance with Subparagraph 19.B.
5. The Construction Manager will prepare and issue Amendments (Changes In The Work) to the Trade Contractors in accordance with Article 26.
6. The Construction Manager, along with the Architect, will conduct site visits to determine the dates of Substantial Completion and Final Completion, and will receive and review written warranties and related documents required by the Contract and assembled by the Trade Contractor.
7. The Construction Manager may call for meetings of the Trade Contractors, Sub-trade contractors, and material suppliers, as he deems necessary for the proper coordination of the work. Such meetings shall be held at the jobsite on regular working days during regular working hours. Unless otherwise directed by the Construction Manager,

attendance shall be mandatory for all parties notified.

7. Trade Contractor

A. Definition

1. Trade Contractor is the person or entity identified as such, and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Trade Contractor means the Trade Contractor or his authorized representative.
2. In the Project Manual, the word "contractor" shall mean and shall be interpreted as being the "Trade Contractor" whose "scope of work" and Project Manual index includes that portion of the work. In these General Conditions the word "contractor" and/or "Trade Contractor" shall mean and shall be interpreted as being "individually, each and every Trade Contractor".
3. The Trade Contractor shall at all times be considered to be an independent contractor, and will not hold itself or its employees out to be employees or agents of the County of Galveston.
4. The Trade Contractor will retain full control over this contract and will not assign said contract without the prior written consent of the County.

B. Review of Contract Documents

1. The Trade Contractor shall carefully study and compare the Contract Documents and shall at once report to the Construction Manager any error, inconsistency or omission he may discover. If the Trade Contractor performs any work without reporting any such error, inconsistency, or omission to the Construction Manager or contrary to any laws, ordinances, rules, or regulations, and without such notice to the Construction Manager, he shall assume full responsibility therefore and shall bear all costs attributable thereto.

C. Supervision and Construction Procedures

1. All work shall be performed and completed in a thorough, workmanlike manner and in accordance with the latest proven practices of the trade by thoroughly skilled and experienced workers.
2. The Trade Contractor shall supervise and direct the Work, using his best skill and attention. He shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract subject to the overall coordination of the Construction Manager.
3. The Construction Manager may reject any means, methods, techniques, sequences or procedures proposed by the Trade Contractor, which might constitute or create a hazard to the Work, or to persons or property, or which will not provide Work in accordance with the Contract Documents
4. The Trade Contractor shall be responsible to the Owner for the acts and omissions of his employees and all his Sub-trade contractors and their agents and employees and other persons performing any of the Work under a contract with the Trade Contractor.
5. Neither observations nor site visits, tests or approvals by persons other than the Trade Contractor shall relieve the Trade Contractor from his obligations to perform the Work in accordance with the Contract Documents. The Trade Contractor shall do and be responsible for the correct laying out of the Work as per drawings and written instruction of the Construction Manager including all necessary leveling and checking. The Trade Contractors shall check the established grades and bench marks, and shall lay out all partition lines and other significant reference lines or points which will enable them to

accurately place their boxes, openings, sleeves, conduits, pipe duct, controls, hangers, inserts and other devices. Trade subcontractors shall be responsible for laying out their Work from these reference points.

D. Labor and Materials

1. The Trade Contractor is encouraged to use local labor, but not at the expense of poor workmanship and higher cost.
2. The Trade Contractor and all Sub-trade contractors shall not discriminate against any employee or applicant for employment because of race, color, sex, or national origin.
3. The Trade Contractor shall post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.
4. In the event of Trade Contractor's non-compliance with the non-compliance clause of this Contract, the Contract entered into may be canceled in whole or part.
5. The Trade Contractor shall at all times enforce strict discipline and good order among his employees and shall not employ on the Work any unfit person or anyone not skilled in the task assigned to him. Obnoxious behavior, possession, or consumption of alcoholic beverages or drugs on the premises is strictly prohibited. Violators shall be promptly discharged from the site.
6. The Trade Contractor shall accept delivery, unload, store, protect, provide security, distribute and install any materials, systems and equipment furnished by others which are a part of the Work. The Trade Contractor shall document receipt of such materials, systems and equipment on forms acceptable to the Construction Manager.
7. Whenever the Trade Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of the work of this contract, the Trade Contractor shall immediately give notice thereof to the Construction Manager. The Trade Contractor shall then confirm the notice, in writing, within 24 hours of the giving thereof and shall include all relevant information with respect thereto. No claims will be accepted for costs incurred as a result of jurisdictional or labor practices disputes.
8. The County is committed to maintaining an alcohol and drug free workplace. Possession, use or being under the influence of alcohol or controlled substances by the Contractor's employees while in the performance of this Contract is prohibited. Violation of this requirement shall constitute grounds for immediate termination of the Contract.

8. Warranty

A. The Trade Contractor warrants to the Owner that all materials and equipment furnished under this Contract will be new unless otherwise specified, and that all Work will be of good quality, free from faults and defects and in conformance with the Contract Documents. All Work not so conforming to these requirements, including substitutions not properly reviewed and authorized, may be considered defective. If required by the Construction Manager, the Trade Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. This warranty is not limited by the provisions of Paragraph 28.B

B. The warranty of materials, equipment and workmanship defined in 8.A is separate from, independent of, and in addition to any other guarantees in this contract or any other warranties required by the Contract Documents.

C. The Trade Contractor, prior to or at the time of substantial completion for the Work and during administrative closeout of the project, shall submit one copy of all specified warranties and guarantees to the Construction Manager for review, approval and subsequent transmittal to the Architect and Owner.

D. Warranties and guarantees, including those specified in excess of the general one year guarantee shall be complete for all specific materials, systems, sub-systems, equipment, appliances and products specified and required by the Contract Documents.

E. Warranties and guarantees shall clearly define what is to be guaranteed; the extent, terms, conditions, time and effective dates.

F. Copies of the same warranties and guarantees shall be included in the "Owner's Maintenance Manual" as specified herein.

G. Owner's Maintenance Manual: The Trade Contractor, during the course of the work, shall maintain, coordinate and collect copies of warranties, guarantees, certificates, test results, installation drawings, manufacturer's maintenance and operations manuals, parts lists, and keying schedules and at the acceptance of the project, shall assemble this material into a manual and forward to the Construction Manager for incorporation in the Operations and Maintenance Manual for the project..

H. Warranties shall not commence to run until the Owner:

1. Accepts the work for beneficial occupancy, and
    a. is in possession of all the specified guarantee/ warranty documentation, and
    b. has received the specified training for the operation and maintenance of the system/equipment.
    c. a Substantial Completion Certificate has been issued by the Architect.

I. If prior to the acceptance of the Work the Owner occupies or uses any separate unit of the Work, the guarantee period shall, as to the unit so occupied or used, commence on the date of such occupancy or use, with the further provision that the Owner shall have first agreed in writing that the separate unit is complete to such a degree as to permit its use or occupancy and subject to subparagraph 8.H as applicable. No such separate unit shall be occupied or used by the Owner until such certificate has been given. Equipment and facilities, which have seasonal limitations on their operation, shall be guaranteed for one full year from the date of test and acceptance in writing by the Owner.

J. If within any guarantee period, repairs or changes are required in connection with the guaranteed Work, as the result of the use of materials, equipment or workmanship, which are defective, or inferior, or not in accordance with the terms of the Contract, the Trade Contractor shall, promptly, within 48 hours after receipt of notice from the Construction Manager or Owner and without expense to the Owner or Construction Manager, commence and continue to effect such repairs or changes and:

1. Place in satisfactory condition, in every particular, all of such guaranteed work and correct all defects therein.
2. Make good all changes to the structure, site, equipment, or contents thereof, which, in the opinion of the Architect, and Construction Manager is the result of the use of materials, equipment or workmanship, which are inferior, defective, or not in accordance with the terms of the Contract.

K. Notifications by Owner or Construction Manager of defects shall stop the warranty time period. The guarantee or warranty period for that replaced or restored work shall be reinstated for the remaining time period, starting on the date of acceptance of the replaced or restored work.

L. In any case, where in fulfilling the requirements of the Contract or of any guarantee embraced in or required thereby, the Trade Contractor disturbs any work guaranteed under another contract, he shall restore such work to a condition satisfactory to the Architect, and Construction Manager and guarantee such restored work to the same extent as it was guaranteed under such other contract.

M. If the Trade Contractor after notice fails to proceed within 48 hours to commence and continue to comply with the terms of the guarantee, the Owner or Construction Manager may have the defect corrected in which case the Trade Contractor and his surety shall be liable for all expenses incurred.

N. All special guarantees or warranties applicable to definite parts of the Work that may be stipulated in the Project Manual or other papers forming a part of the Contract shall be subject to the terms of this Article during the first year of the life of such special guarantee.

O. Nothing contained in this Article shall be construed to establish a period of limitation with respect to any other obligation which the Trade Contractor might have under the Contract Documents.

P. In the event the Work of the Trade Contractor is to be modified by another Trade Contractor, either before or after inspection, the first Trade Contractor shall remain responsible in all respects under the warranty given in Article 8 and under any other warranties provided in the Company Documents or by law. However, the first Trade Contractor shall not be responsible for any defects in material or workmanship introduced by the Trade Contractor modifying its work. Both the first Trade Contractor and the Trade Contractor making the modifications shall each be responsible solely for the work done by each. The Trade Contractor modifying the earlier work shall be responsible for any damage to or defect introduced into the Work which it is modifying.

9. Taxes

A. Any taxes which are the responsibility of the Trade Contractor, but are not paid by the Trade Contractor, and which are subsequently assessed against and paid by the Owner shall be deducted by the Owner as an offset from the unpaid Contract Sum and any other amounts due to the Trade Contractor. If the amount of such unpaid taxes exceeds the total of the unpaid Contract Sum and other amounts due to the Trade Contractor, the Trade Contractor agrees to pay the amount of such excess to the Owner.

10. Superintendent and key Personnel

A. The Trade Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during the progress of the Work. The superintendent shall be satisfactory to the Construction Manager, and shall not be changed except with the consent of the Construction Manager, unless the superintendent proves to be unsatisfactory to the Trade Contractor or ceases to be in his employ. The superintendent shall represent the Trade Contractor and all communications given to the superintendent shall be as binding as if given to the Trade Contractor. Important communications shall be confirmed in writing. Other communications shall be so confirmed on written request in each case.

B. A duly authorized representative of the Trade Contractor shall be available for emergency telephone communication from the Owner or Construction Manager on a 24-hour basis, seven days a week during the performance of the work.

C. The Trade Contractor shall identify the key personnel he intends to assign to the project, to the Construction Manager. The Owner, acting through the Construction Manager, reserves the right to approve the Trade Contractor's proposed personnel, and anyone not so approved shall be immediately replaced by someone acceptable. If, in the course of construction, the Construction Manager feels that it would be in his best interest to request a change in the Trade Contractor's personnel, he may do so; and the Trade Contractor shall immediately assign an acceptable replacement at no additional cost.

11. Drawings and Project manual at the site

A. The Trade Contractor shall maintain at the site for the Construction Manager and Architect one copy of all Drawings, Project Manual, Addenda, Bulletins, Amendments, and other Modifications, in good order and marked currently to record all changes made during construction. Including any changes in locations, sizing and arrangement of the various components of the Work or any other variations from the Drawings or Shop Drawings. The Trade Contractor shall mark each drawing as the Work shown thereon is completed in the field, revising any or adding lines, dimensions, elevations, depths, notes or any other information required to accurately record "As-Built" conditions. These drawings, marked to record all changes during construction, and approved Shop Drawings, Product Data and Samples shall be delivered to the Construction Manager, for the Owner, upon completion of the Work.

B. In addition to maintaining and delivering to the Construction Manager those record Drawings required by Subparagraph 11.A the Trade Contractor shall also prepare and submit to the Construction Manager, upon completion of the Work "As-Built" Reproducible Drawings.

12. Use of Site

A. The owner does not assume any responsibility for any materials, tools, or equipment stored on or about the site.

B. The Trade Contractor shall confine operations at the site to areas designated by the Construction Manager, permitted by law, ordinances, permits and by the Contract Documents, and shall not unreasonably encumber the site with any materials or equipment. The Trade Contractor shall not use any of the existing Owner's facilities, such as, toilets, cafeteria, parking areas, power hookup, etc., except with the Construction Manager's written approval. The Trade Contractor shall not, at any time, block or restrict access to the site.

C. The Trade Contractor shall coordinate all of his operations with the Construction Manager and obtain his approval before using any portion of the project site and the Trade Contractor shall comply with the Construction Manager's Site Utilization Plan.

D. The roads, sidings and other transportation facilities at the site, where work under the Contract is being performed, are for the general use and convenience of the Owner. If Trade Contractors are permitted to use them, they must conform to the regulations of the local authorities. If the work of a Trade Contractor requires that such facilities be temporarily discontinued, after obtaining Construction Manager's approval, the work must be done expeditiously and he shall provide and maintain proper warnings and detour signs at all pedestrian and vehicular closures, intersections, and along detours, directing traffic around closed portions of roadways. He shall, at his own expense, wherever necessary or required, provide and maintain fences, temporary roadways, temporary cross signs, watchmen, warning lights and take such other precautions as may be necessary to protect life any way by his act or neglect. All barricades and obstructions shall be illuminated at night, and all lights shall be kept on from one half hour before sunset, until one-half-hour after sunrise.

E. On-site storage space for Trade Contractor's field office trailer, sheds, materials, tools, equipment, and supplies must be coordinated with and approved by the Construction Manager in advance. Trade Contractor's materials, equipment, tools and supplies shall be moved at no cost if their location obstructs or impedes the work of others.

F. The Construction Manager will provide site survey, selected baselines and benchmarks.

G. The Trade Contractor shall not disturb existing monuments and markers at the site. Should monuments, markers, or both be disturbed by the Trade Contractor, he shall bear the cost of a

licensed surveyor engaged by the Construction Manager for the purpose of relocating such monuments or markers.

H. Each Trade Contractor shall lay out his work and shall be responsible for the accuracy of all lines, elevations and measurements, grading, utilities, and other work executed by him under his Trade Contract. He must exercise proper precaution to verify figures shown on drawings before laying out work and will be held responsible for any error resulting from his failure to exercise such precaution.

13. Communications

A. The Trade Contractor shall forward all communications to the Owner and Architect through the Construction Manager.

B. The Trade Contractor shall promptly return telephone calls or respond to any other form of communication initiated by the Construction Manager. Failure to promptly do so shall be considered lack of performance on the part of the Trade Contractor.

C. All written correspondence to the Construction Manager shall be dated, and signed by the Trade Contractor or his authorized representative.

D. Written notice shall be deemed to have been duly served if delivered in person to the individual or member of the firm or entity or to an officer of the corporation for whom it was intended, or if delivered at or sent by registered or certified mail to the last business address known to him who gives the notice.

14. Sub-Trade Contractors

A. Definition

1. A Sub-trade contractor is a person or entity who has a direct or indirect contract with a trade Contractor to perform any of the Work at the site. The term Sub- Trade contractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Sub-trade contractor or his authorized representative.
2. Nothing in the contract documents shall create any contractual relationship between the Owner, the Architect or the Construction Manager and any Sub-trade contractor of the Trade Contractor.

B. Award of Sub-trade Contracts and other Contract for Portions of the Work

1. Unless otherwise required by the Contract Documents the Trade Contractor shall furnish to the Construction Manager in writing, for acceptance by the Owner and the Construction Manager in writing, the names of the persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each of the principal portions of the Work. The Trade Contractor is encouraged to use Local vendors wherever possible. The Construction Manager will promptly reply to the Trade Contractor in writing if either the Owner or the Construction Manager, after due investigation, has reasonable objection to any such proposed person or entity. Failure of the Owner or Construction Manager to reply shall constitute notice of no reasonable objection.
2. The Trade Contractor shall not contract with any such proposed person or entity to whom the Owner or the Construction Manager has made reasonable objection under the provision of Subparagraph 14.B.1. The Trade Contractor shall not be required to contract with anyone to whom he has a reasonable objection.
3. If the Owner or Construction Manager refuses to accept any person or entity on a list

submitted by the Trade Contractor in response to the requirements of the Contract Documents, the Trade Contractor shall submit an acceptable substitute; however, no increase in the Contract Sum shall be allowed for any such substitution.

4. The Trade Contractor shall make no substitution for any Sub-trade contractor, person or entity previously selected if the Owner or Construction Manager makes reasonable objection to such substitution.

C. Sub-trade Contractual Relations

1. By an appropriate written agreement, the Trade Contractor shall require each Sub-trade contractor to the extent of the work to be performed by the Sub-trade contractor, to be bound to the Trade Contractor by the terms of the Contract Documents, and to assume toward the Trade Contractor all the obligations and responsibilities which the Trade Contractor, by these documents, assumes toward the Owner, the Construction Manager, or the Architect. Said agreement shall preserve and protect the rights of the Owner, the Construction Manager and the Architect under the Contract Documents with respect to the work to be performed by the Sub-trade contractor so that the subcontracting thereof will not prejudice such rights, and shall allow to the Sub-trade contractor, unless specifically provided otherwise in the Trade Contractor agreement, the benefit of all rights, remedies and redress against the Trade Contractor that the Trade Contractor, by these Documents, has against the Owner.
2. Where appropriate, the Trade Contractor shall require each Sub- trade contractor to enter into similar agreements with his Sub-trade contractors. The Trade Contractor shall make available to each proposed Sub-trade contractor, prior to the execution of the Sub-trade contract, copies of the Contract Documents to which the Sub- trade contractor will be bound by this Paragraph 14.C.1 and shall identify to the Sub-trade contractor any terms and conditions of the proposed Sub-trade contract which may be at a variance with the Contract Documents. Each Sub-trade contractor shall similarly make copies of such Documents available to his Sub-trade contractors.

15. Separate Trade Contractors

A. The Trade Contractor shall afford the Construction Manager and other Trade Contractors reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work, and shall connect and coordinate his Work with others under the general direction of the Construction Manager.

B. If any part of the Trade Contractor's Work depends, for proper execution or results, upon the work of the Construction Manager or any separate Trade Contractor, the Trade Contractor shall, prior to proceeding with the Work, promptly report to the Construction Manager any apparent discrepancies of defects in such work that render it unsuitable for such proper execution and results. Failure of the Trade Contractor so to report shall constitute an acceptance of the other trade contractor's or Construction Manager's work as fit and proper to receive his Work, except as to latent defects which may subsequently become apparent in such work by others.

C. Copies of Drawings and Project Manual relating to these separate contracts will be available to the Trade Contractor, upon request, for his information in carrying out the above provisions. The Trade Contractor shall be held responsible for any damage or misfit resulting from his neglect to comply with the foregoing.

D. All Trade Contractors on the project shall have equal rights on the premises for the performance of

their work, but shall follow the sequence established by the progress schedule and/or instruction issued by the Construction Manager.

E. If the Trade Contractor notifies the Construction Manager, in writing, that another contractor on this project is failing to coordinate his work with the Work of this contract, as directed, the Construction Manager will promptly investigate the charge. If he finds it to be true, he will promptly issue such directions to the other contractor with respect thereto as the situation may require. The Construction Manager or Owner shall not, however, be liable for any damages suffered by this Trade Contractor by reason of the other contractor's failure to promptly comply with the directions so issued by the Construction Manager or by reason of another contractor's default in performance; it being understood that the Construction Manager does not guarantee the responsibility or continued efficiency of any contractor. Any costs caused by defective or ill-timed work shall be borne by the party responsible therefore.

F. Should the Trade Contractor wrongfully cause damage to the work or property of the Owner, any separate Trade Contractor or other Contractor, the Trade Contractor shall, upon due notice, promptly attempt to settle with the Owner, the separate Trade Contractor or other Contractor by agreement, or otherwise resolve the dispute. If such separate Trade Contractor or other Contractor sues the Owner on account of any damage alleged to have been caused by the Trade Contractor, the Owner shall notify the Trade Contractor who shall defend such proceedings at the Trade Contractor's expense, and if any judgment or award against the Owner arises therefrom, the Trade Contractor. shall pay or satisfy it and shall reimburse the Owner for all attorney's fees and court costs which the Owner has incurred.

G. Should the Trade Contractor sustain any damage through any act or omission of any other contractor having a contract with the Owner for the performance of work upon the site or of work which may be necessary to be performed for the proper prosecution of the work to be performed hereunder, or through any act of omission of a subcontractor of such contractor, the Trade Contractor shall have no claim against the Owner, Architect, Construction Manager or the Owner's consultants for such damage, but shall have a right to recover such damage from the other contractor under the provision similar to the following provisions that have been or will be inserted in the contracts with such other contractors.

H. Should any other contractor having or who shall hereafter have a contract with the Owner for the performance of work upon the site sustain any damage through any act or omission of a Sub-trade contractor of the Trade Contractor, the Trade Contractor agrees to reimburse such other contractor for all such damages and to indemnify and hold the Owner, Architect and Construction Manager harmless from all claims.

I. The Trade Contractor shall indemnify and hold the Owner, Architect and Construction Manager harmless from any and all claims or judgments for damages and from costs and expenses to which the Owner and/or Construction Manager may be subjected or which either may suffer or incur by reason of the Trade Contractor's failure to comply with the Construction Manager's directions promptly. If the Trade Contractor installs any work prior to proper coordination, or in such manner as to cause interference with work of others, he shall arrange for removal of or arrange for necessary modifications to the work. Any such action is subject to the approval of the Construction Manager and shall be at no additional cost.

J. The Trade Contractor shall cooperate with the Owner, Architect and Construction Manager and other Trade Contractors working on this project in order to avoid interference, inconvenience or damage. To aid in avoiding conflicts, the Trade Contractor, without additional charge, shall make all reasonable modifications in the work as may be directed by the Construction Manager. In the

event of the Trade Contractor's operations causes any damage, interference, or inconvenience to work being carried out under any other Trade Contract, the Trade Contractor shall restore, replace, rectify, or otherwise make good any damage to the satisfaction of the Construction Manager or to the other Trade Contractors. Should the responsible Trade Contractor fail to comply with this provision, the work will be done by others at the expense of the responsible Trade Contractor.

K. Trade Contractor agrees that he has become familiar with the site, has reviewed the plans and Project Manual covering the work of his and other trades and thereby accepts responsibility for all necessary coordination of his Work with the work of other trades affected.

16. Governing Law and Venue

A. **T**he Contract shall be governed by the law of the place where the Project is located. Any action arising from or relating from this Contract shall be instituted in a court of competent jurisdiction in Galveston County, Texas.

B. Contractor shall at all times observe and comply with all Federal, State and Local Laws, ordinances and regulations which in any manner effect the contract or the work.

C. Contractor shall comply with all city, county, and state codes, laws, and ordinances in force at the time of award of Contract and applicable to such work.

D. Contractor shall obtain, at Contractor's own expense such permits, certificates, and licenses as may be required in the performance of the specified work.

E. Contractor shall be responsible for obtaining and furnishing all necessary permits and licenses, City, County, State or Federal as are required for the performance of this Contract.

17. Claims for Damages

A. Should either party to the Trade Contract suffer injury or damage to person or property because of any act or omission of the other party or of any of his employees, agents or others for whose acts he is legally liable, claim shall be made, in writing, to such other party within a reasonable time after the first observance of such injury or damage.

B. Notwithstanding the event of any claim, dispute, or other matter in question arising out of or relating to this Agreement or the breach thereof, the Trade Contractor shall carry on the work and maintain the Substantial Completion Date and the Construction Manager shall continue to make payments in accordance with this Agreement.

C. All damage to the work from the action of the elements, or from any unforeseen circumstances in the prosecution of the work shall be repaired by the Trade Contractor at his own costs.

18. Indemnification

The Contractor shall agree to assume all risks and responsibility for, and agrees to indemnify, defend, and save harmless, the County of Galveston, its elected and appointed officials and department heads, and its agents and employees from and against all claims, demands, suits, actions, recoveries, judgments, and costs and expenses including reasonable attorney’s fees for the defense thereof in connection therewith on account of the loss of life, property or injury or damage to the person which shall arise from Contractor’s operations under this Contract, its use of County facilities and/or equipment or from any other breach on the part of the Contractor, its employees, agents or any person(s) in or about the County’s facilities with the expressed or implied consent of the County. Contractor shall pay any judgment with cost which may be obtained against Galveston County resulting from contractor’s operations under this Contract.

Contractor agrees to indemnify and hold the County harmless from all claims of subcontractors, laborers incurred in the performance of this contract. Contractor shall furnish satisfactory evidence that all obligations of this nature herein above designated have been paid, discharged or waived. If Contractor fails to do so, then the County reserves the right to pay unpaid bills of which County has written notice direct and withhold from Contractor's unpaid compensation a sum of money reasonably sufficient to liquidate any and all such lawful claims.

19. Rights and Remedies

A. The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

B. No action or failure to act by the Owner, Construction Manager, Architect or Trade Contractor shall constitute a waiver of any right or duty afforded any of them under the Contract Documents, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

20. Tests

A. If the Contract Documents, laws, ordinances, rules, regulations or order of any public authority having jurisdiction require any portion of the Work to be inspected, tested or approved, the Trade Contractor shall give the Construction Manager timely notice of its readiness so the Architect and Construction Manager may observe such inspection, testing or approval. The Trade Contractor shall bear all costs coordination and supervision of tests to be performed by an independent laboratory selected and paid by Galveston County.

B. If the Architect or Construction Manager or Owner determines that any Work requires special inspection, testing or approval which Subparagraph 19.A does not include, he will, through the Construction Manager, instruct the Trade Contractor to order such special inspection, testing or approval and the Trade Contractor shall give notice as in Subparagraph 19.A. If such special inspection or testing reveals a failure of the work to comply with the requirements of the Contract Documents, the Trade Contractor shall bear all costs thereof, including compensation for the Architect's and Construction Manager's additional services made necessary by such failure. If the Work complies, the Owner shall bear such costs and an appropriate Amendment shall be issued.

C. Required certificates of inspection, testing or approval shall be secured by the Trade Contractor and promptly delivered by him through the Construction Manager to the Architect.

D. If the Architect or Construction Manager is to observe the site visits, tests or approvals required by the Contract Documents, he will do so promptly and, where practicable, at the source of supply.

E. Neither the observations of the Architect or the Construction Manager, in their Administration of the Construction Contract, nor site visits, test or approvals by persons other than the Trade Contractor, shall relieve the Trade Contractor from his obligation to perform the Work in accordance with the Contract Documents.

F. The Trade Contractor shall deliver test samples of any of the materials specified in any of the Sections of his Specifications to an independent testing laboratory selected and approved by the Owner and Construction Manager, if so required. This may apply to materials proposed for use, materials already delivered to the job, or materials already incorporated into the construction.

G. The Trade Contractor shall maintain a file of all test reports. At the completion of the project, these reports will be submitted as an Appendix to the Operations and Maintenance Manual described above.

H. Any materials, which fail to meet the requirements of these Specifications, shall not be used

whether or not previously approved by the Architect. If they have been delivered to the job, they shall be removed. If they have already been incorporated into the construction, the Construction Manager or the Architect may order them removed, or, at the discretion of the Owner, through the Construction Manager they may be permitted to remain in place providing the Trade Contractor agrees to a proper deduction from the contract sum.

I. The services of a testing and inspection engineer selected by the Owner and Architect shall be provided and paid for by the Owner for the tests required in the paragraph 19.F unless specifically stated otherwise or due to deficient work.

21. Interest

A. Payments due and unpaid under the Contract Documents shall bear interest in accordance with applicable law.

22. Time

A. Definitions

1. Unless otherwise provided, the Contract Time is the period of time allotted in the Contract Documents for the Substantial Completion of the Work as defined in Subparagraph (22.A.3) including authorized adjustments thereto.
2. The date of commencement of the Work shall be the date of the Notice to proceed.
3. The date of Substantial Completion of the Work, for each Trade Contractor, or designated portion thereof is the date certified by the Architect when construction is sufficiently complete, in accordance with the Contract Documents, so the Owner can occupy or utilize the Work or designated portion for the use for which it is intended and a Substantial Completion Certificate is issued.
4. The term day as used in the Contract Documents shall mean calendar day unless otherwise specifically designated.

B. Progress and Completion

1. With the Construction Manager's approval, the Trade Contractor shall suspend any work that may be subject to damage by climatic conditions. Under such conditions, the Trade Contractor shall take measures to protect his work and to minimize the impact on progress of the work.

C. Delays and Extension of Time

1. If the Trade Contractor is delayed at anytime in the progress of the Work by any act or neglect of the Owner, Construction Manager, or the Architect, or by any employee of either, or by any separate contractor employed by the Owner, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in transportation, adverse weather conditions not reasonably anticipatable, unavoidable casualties or any causes beyond the Trade Contractor's control, and without his fault or negligence, or by any other cause which the Construction Manager determines may justify the delay, then the Contract Time shall be extended by Contract Amendment for such reasonable time as the Construction Manager may determine.
2. Any claim for extension of time shall be made in writing to the Construction Manager not more than ten (10) days after the commencement of the delay; otherwise, it shall be waived. Any claim for extension of time shall state the cause of the delay and the number of days extension requested. If the cause of the delay is continuing, only one claim is necessary, but the Trade Contractor shall report the termination of the cause for the delay

within ten (10) days after such termination; otherwise, any claim for extension of time based upon that cause shall be waived.

3. In the event of a delay attributable in part to the Trade Contractor and in part to causes or parties for which the Trade Contractor is not responsible, then provided the Trade Contractor has given proper and timely notice hereunder, the delay shall be equitably apportioned among the parties causing the delay and the Trade Contractor shall remain liable for the portion not so excused.
4. If no agreement is made stating the dates upon which interpretations shall be furnished, then no claim for delay shall be allowed on account of failure to furnish such interpretations until fifteen days after written request is made for them, and not then unless such claim is reasonable.
5. No claim for an increase in the Contract Sum for either acceleration or delay will be allowed for extensions of time pursuant to this Paragraph 22.C or for other changes in the Construction Schedules.
6. The permitting of the Trade Contractor or the surety on the performance bond to proceed to complete any work or any part of it after the date of completion or after the date to which the time for completion may have been extended, shall in no way operate as a waiver on the part of the Owner of any of its rights hereunder.
7. Neither the Owner nor the Architect nor the Construction Manager shall have liability to the Trade Contractor or to any other Trade Contractor or Sub-trade contractor for delay, hindrance, or interference in the performance of the Work, however caused, except for delay or hindrance resulting from active interference of Owner or its representatives in such Trade Contractor's execution of the Work, and except for delay or hindrance resulting from defective plans and specifications not reasonably discoverable by the Trade Contractor prior to Contract award.
8. The Trade Contractor shall be liable to the Owner for any other damages sustained as the result of the Trade Contractor's refusal or failure to perform the Work, provided, however, that such refusal or failure is not the result of a justifiable delay as defined in Subparagraph 22.C.1.

23. Payments and Completion

A. Progress Payments

1. Contractor shall make application to Owner by submittal of Pay Request to the Construction Manager for payment utilizing forms provided by Owner for that purpose. Contractor shall state the percentage or the limits of the work performed and request payment for the amount of acceptable work performed. Applications for payment shall be made monthly by Contractor on a regular date set by the Construction Manager.
2. Upon approval of the request for payment by the Construction Manager and Architect the Owner shall then pay the Contractor on or before 45 days thereafter, the total amount of the request, less 5% of the amount thereof, which 5% shall be retained until final payments, and further less all previous payments, and further less all further sums that may be retained by the County under the terms of this agreement
3. Upon the attainment of substantial completion, payment will be made so that the sum of all payments made under the contact equals ninety five Percent (95%) of the total contract amount
4. The Construction Manager may request As-Built Drawings, schedule updates, payrolls

for all labor, and other data supporting payment to subcontractors and/or materials suppliers before processing the requisition..

5. Except in case of bona fide disputes, or where the Trade Contractor has some other justifiable reason for delay, the Trade Contractor shall pay for all transportation and utility services not later than the end of the calendar month following that in which services are rendered and for all materials, tools and other expendable equipment to the extent of ninety five percent (95%) of the cost thereof not later than the end of the calendar month following that in which such materials, tools and equipment are delivered at the site of the Project and in compliance with Texas Law. The Trade Contractor shall pay to each of his Sub-trade contractors, not later than the end of the calendar month in which each payment is made to the Trade Contractor, the representative amount allowed the Trade Contractor on account of the work performed by his trade subcontractors, to the extent of each Sub-trade contractor's interest therein and in compliance with Texas Law. The Trade Contractor shall, by an appropriate agreement with each Sub-trade contractor, also require each Sub-trade contractor to make payments to his suppliers and Sub-trade contractors in a similar manner.
6. Materials, equipment and associated components that are in compliance with the approved submittals and will be incorporated into the structure, may be taken into consideration in computing progress payments, provided the material is delivered on the project site, or is delivered to the Trade Contractor and the material is properly stored in accordance with the following:
    a. Payment for materials, equipment and associated components stored on-site shall be 100% of a valid invoice less 5% retainage, indicating the unit quantity, description of the material or equipment and cost.
    b. Payment for materials, equipment and associated components stored off-site shall be 100% percent of a valid invoice, less 5% retainage, indicating the unit quantity, description of the material or equipment and costs. Before such payment is made, the Trade Contractor shall furnish the Construction Manager with a certified statement giving the exact location of the materials or equipment, that such material or equipment is properly stored and protected, and that it will not be diverted for use or installation at a different project. The Trade Contractor shall furnish the Construction Manager properly executed bills of sale and a certificate of insurance coverage for the material upon which payment is being made.
7. All material and work covered by payments made shall thereupon become the sole property of the Owner but Trade Contractor shall remain responsible to protect same.

B. Payments withheld

1. The Construction Manager may decline to approve an Application for Payment if in his opinion the application is not adequately supported. If the Trade Contractor and Construction Manager cannot agree on a revised amount, the Construction Manager shall process the Application for the amount he deems appropriate. The Construction Manager may also decline to approve any Applications for Payment or, because of subsequently discovered evidence or subsequent site visits, he may nullify in whole or in part any approval previously made to such extent as may be necessary in his opinion because of:
    a. defective work not remedied;
    b. third party claims filed or reasonable evidence indicating probable filing of such

claims;

c. failure of the Trade Contractor to make payments properly to Sub-trade contractors or for labor, materials or equipment;
d. reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
e. damage to the Owner, or another contractor working at the Project;
f. reasonable evidence that the Work will not be completed within the Contract Time; or
g. persistent failure to carry out the Work in accordance with the Contract Documents.
h. no payment shall be made to the Trade Contractor until certificates of insurance or other evidence of compliance by the Trade Contractor with all the requirements of Article 26 have been filed with the Owner and the Construction Manager. Further, no payments on the basis of work performed by a Sub-trade contractor shall be paid until copies of all bonds required and any certificates of insurance required of the Sub-trade contractors under Article 26 have been filed with the Owner and Construction Manager.
i. the filing of a claim against the Project, which claim, is caused by the act or inaction of the Trade Contractor or his Sub-trade contractors;
j. refusal to follow the Project Safety Program issued as a contract document or Trade Contractors Safety Program;
k. failure to maintain record drawings as specified;
l. failure to comply with HUB requirements;
m. failure to comply with EEO Requirements;
n. failure to properly submit a response to a RFP (Request for Proposal) within thirty (30) days of receipt thereof.

2. When the above grounds in subparagraph 23.B.1 are removed, payment shall be made for amounts withheld because of them.

C. Failure of Payment

1. If the Trade Contractor is not paid and is approved for payment by the Construction Manager and has become due and payable, then the Trade Contractor may, upon seven additional days written notice to the Owner and Construction Manager, stop the Work until payment of the amount due has been received. The Contract Sum shall be increased by the amount of the Trade Contractor's reasonable costs of shutdown, delay and startup, which shall be effected by appropriate Contract Amendment in accordance with Paragraph 27.C.

D. Substantial Completion

1. On or about the end of the project, the Trade Contractor shall perform the following in order to achieve Substantial Completion.
    a. When in the opinion of the Trade Contractor the work is substantially complete,.
    b. The Trade Contractor shall notify the Construction Manager, in writing, that the work will be ready for review and test on a definite date.
    c. Notice shall be given at least fifteen (15) days in advance of said date.
    d. The Construction Manager shall forward the notice to the Architect and will attach his endorsement as to whether or not he concurs with the Trade Contractor's statement that the work will be ready for review or test on the date

given, but such endorsement shall not relieve the Trade Contractor of his responsibility in the matter.

e. If the Architect concurs that the Work will be ready for review or test on the date given, the Architect and the Construction Manager will make such review after Trade Contractor submits a thorough list of items to be completed or corrected (Punch List).

f. The Trade Contractor is required to furnish access for the substantial Completion review.

g. Trade Contractor shall have all systems fully functional and operational for the review.

h. The Engineer and Construction Manager will inspect the project utilizing the Contractor's prepared Punch List, noting completed or incomplete items, and prepare a supplemental list of items that have been omitted or incomplete items that were not previously noted. The Architect's Project Representative, at his discretion, may attend and assist in the preparation of the Contractor's punch list.

i. Contractor completes corrections, and Engineer and Construction Manager re-inspect (with Owner) to establish Date of Substantial Completion. **Note:** Any items remaining on date of Substantial Completion are appended to Certificate (AIA G-704).

j. Architect may issue a Certificate of Substantial Completion at this point.

k. Certain warranties and insurances are dependent on the date of Substantial Completion from the above certification. No other date of Substantial Completion will be recognized by the Owner or Trade Contractor.

l. After the Certificate of Substantial Completion has been executed by all parties, it is returned to the Construction Manager. Items on the appended Punch List are to be completed or corrected within the time limits established in the Certificate of Substantial Completion.

2. The project may be considered substantially complete if the work has been completed to the point where the work can be utilized for the general purpose for which it was undertaken and has been certified by the Architect.

3. Progress payment request may not be submitted for more than 95% of the overall contract value at Substantial Completion.

E. Final Completion and Payment

1. Trade Contractor shall be responsible for and make good without extra charge any defects due to faults in labor or material on all parts of the Contract for one year (and longer where noted) after Substantial Completion of the Work as defined in Article 22.A.3.

2. Property not in the Contract but damaged due to defects, shall be repaired or replaced by the Contractor without extra charge.

3. When notified by the Owner or Architect that a defect exists and there is a doubt that the defect might be normal maintenance or a result of lack of normal maintenance, the Owner will send a representative with the Contractor’s representative to determine responsibility. Owner will not pay for such service calls if the defect is judged to be normal maintenance or a result of a lack of normal maintenance.

4. Neither the Final Certificate of Payment or payment of same, nor provision in the Contract Documents shall relieve the Contractor of the responsibility for negligence or

faulty materials or workmanship within the extent and period provided by law and upon written notice, he shall remedy any defects due thereto and pay all expenses for any damage to other Work resulting there from. This guarantee of Work shall not relieve the Contractor of obligations of any Work not according to Plans and Specifications regardless of time of discovery.

5. No final payment will be considered until all deficiencies listed with the Certificate of Substantial Completion have been remedied.
6. Trade Contractor submits written notice to the Construction Manager that work is ready for final review and acceptance, and shall specifically note each item on the Punch List as being complete or the status of any incomplete item.
7. Notice shall be given at least fifteen (15) days in advance of said date.
8. The Construction Manager shall forward the notice to the Architect and will attach his endorsement as to whether or not he concurs with the Trade Contractor's statement that the work will be ready for final review or test on the date given, but such endorsement shall not relieve the Trade Contractor of his responsibility in the matter.
9. If the Architect concurs that the Work will be ready for final review or test on the date given, the Architect and the Construction Manager will make such review with the Trade Contractor and Owner.
10. The Trade Contractor is required to furnish access for the final review.
11. Neither application for final payment nor for the remaining retained percentage shall be made until the Trade Contractor submits to the Construction Manager the following:
    a. an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or his property might in any way be responsible, have been paid or otherwise satisfied,
    b. consent of surety, if any, to final payment,
    c. properly executed " General Release and B and Claim Waiver and General Guarantee" on forms provided by Construction Manager,
    d. specified warranties and guarantees,
    e. other data establishing payment or satisfaction of all such obligations, such as receipts, releases and waivers of bond claims arising out of the Contract, to the extent and in such form as may be designated by the Owner. If any Sub-trade contractor refuses to furnish a release or waiver required by the Owner the Trade Contractor may furnish a bond satisfactory to the Owner to indemnify them against any such claim. If any such claim remains unsatisfied after all payments are made, the Trade Contractor shall refund to the Owner or Construction Manager all moneys that the latter may be compelled to pay in discharging such claim, including all costs and reasonable attorneys' fees.
12. Contractor submits Final Application for Payment and a Certificate of Compliance, which indicates the following:
    a. All Permit Numbers
    b. Utility Release Dates
    c. The building has been duly inspected and found to comply with all code requirements and ordinances.
    d. A Certificate of Occupancy has been issued.
    e. A-E (with Owner) make final inspection
    f. Contractor submits additional final items:
    g. Consent of Surety to Final Payment (AIA G-707)
    h. Contractor's Affidavit of Payment of Debts and Claims (AIA G-706)

i. Contractor's Affidavit of Release of Liens (AIA G-706A with contractors, subcontractors and suppliers separate releases)
j. General Contractor's Guarantee
k. Subcontractors' Guarantees.
l. Maintenance and Instruction Manuals. All manuals will contain an index listing the information submitted. The index sections will be divided and identified by tabbing each section as listed in the index.
m. Record Drawings (reproducible sepias)
n. Final List of Subcontractors (AIA G-805)
o. Affidavits from Contractor Subcontractors and suppliers stating that no asbestos products have been installed in this project.
p. Furnish written warranties to the Owner including specific items in each product warranty stipulated for individual sections.
q. Documents identified as "affidavit" must be notarized.
r. Trade Contractor has documented the turnover of spare stock of materials, spare parts accessories and special tools to the Owner through the Construction Manager,
s. Final Cleaning:
a.The work area shall be thoroughly cleaned inside and outside. Cleaning includes removal of smudges, marks, stains, fingerprints, soil, dirt, spots, dust, lint, and other foreign materials from finished and exposed surfaces.
b. Remove all temporary facilities.

13. If the Work is found acceptable under the Contract Documents and the Contract fully performed, and the Construction Manager, upon receipt of a correct final Application for Payment, recommends to the Owner that such payment be made.
14. The making of final payment shall constitute a waiver of all claims by the Owner or Construction Manager except those arising from:
    a. unsettled claims;
    b. faulty or defective Work appearing after Substantial Completion;
    c. failure of the Work to comply with the requirements of the Contract Documents; or
    d. terms of any special warranties required by the Contract Documents.
15. The acceptance by the Trade Contractor of the final payment shall be, and operate as, a release to the Owner and to the Construction Manager of all claims and of all liability to the Trade Contractor for all things done or furnished in connection with this Trade Contract..
16. Final Payment to Trade Contractor **does not include** payment of **retainage**. Payment of **retainage will be made after project completion and in accordance** with Article 3 of the Agreement between Galveston County and Trade Contractor.

24. Protection of Persons and Property

A. Safety Precautions and Programs

1. The Trade Contractor expressly undertakes, both directly and through his Sub-trade contractors to take every precaution at all times for the protection of persons, including employees and property. The Trade Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work.
2. If the Trade Contractor fails to maintain the safety precautions required by law or directed by the Construction Manager, the Construction Manager may take such steps as necessary and charge the Trade Contractor therefore.
3. The failure of the Construction Manager to take any such action shall not relieve the Trade Contractor of his obligations in Subparagraph 24.A.1.

B. Safety of Persons and Property

1. The Trade Contractor shall submit his safety program to the Construction Manager prior to mobilizing to the job, and shall be responsible for the safety, efficiency and adequacy of his plant, appliances and methods and for any damage, which might result from failure or improper construction, maintenance, or operation. The Trade Contractor shall provide a safety report to the Construction Manager on a weekly basis.
2. The Trade Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:
   a. all employees on the work and all other persons who may be affected thereby;
   b. all the Work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Trade Contractor or any of his Sub-trade contractors;
   c. other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation o r replacement i n the course o f construction.
3. Trade Contractor shall not permit any construction technique or activity, which decreases building security or safety. Trade Contractors shall cooperate fully with the Construction Manager's and Owner's requirements regarding security and safety of the building.
4. The Trade Contractor shall give all notices and comply with all applicable laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the safety of persons or property or their protection from damage, injury or loss.
5. The Trade Contractor shall provide, erect, maintain, dismantle and remove, as required by existing conditions and progress of the Work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying the Owners and users of adjacent utilities to the work. He shall protect the Owner's property from injury or loss arising in connection with this Contract. He shall adequately protect adjacent property as provided by law and the Contract Documents. He shall provide and maintain all passageways, guard fences, light and other facilities for protection required by public authority, local conditions, or any of the Contract Documents. At no time remove, alter or render ineffective any barricades, railings or cover on the project without written permission of the Construction Manager. Where these safety devices are to be turned over to others, upon completion of the work, the devices shall be repaired or replaced so that they meet the required standards prior to turnover.
6. When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Trade Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel. Fuel for cutting and burning torches shall be stored in locations and protected as directed by the Construction Manager. No volatile liquids shall be used for cleaning agents or as fuels for motorized equipment or tools within a building except with the express approval of the Construction Manager. Bulk storage of volatile liquids shall be outside the building at locations directed by the Construction Manager and only so much volatile liquid shall be allowed within the building at any given time.
7. The Trade Contractor shall promptly remedy all damage or loss (other than damage or loss insured under Paragraph 26.B) to any property referred to in Clauses 24.B.2.b and 24.B.2.c caused in whole or in part by the Trade Contractor, his Sub-trade contractors, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any

of them may be liable and for which the Trade Contractor is responsible under Clauses 24.B.2.b and 24.B.2.c except damage or loss attributable to the acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Trade Contractor are in addition to his obligations under Article 5 in the Agreement between Galveston County and Trade Contractor.

8. The Trade Contractor shall take all precautions required to prevent fires as a result of his operations. Where flame cutting torches, blow torches, or welding tools are required to be used within an existing building, their use shall be as approved by the Construction Manager at the site. When welding tools or torches of any type are in use, the Trade Contractor shall have available, in the immediate vicinity of the work, a fire extinguisher of the CO2 type. The fire extinguisher shall be provided and maintained by the Trade Contractor.
9. The Trade Contractor shall advise the Construction Manager, in writing, of all unusual flammable or toxic materials which the Trade Contractor plans to store and use on site.
10. Shielding or similar precautions will be taken adjacent to welding operations
11. The Trade Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the Trade Contractor's superintendent unless otherwise designated by the Trade Contractor in writing to the Construction Manager, and shall attend all project safety meetings scheduled by the Construction Manager.
12. Every employee will be dressed for the work he performs. Minimum dress will consist of long pants, tee shirt, hardhat, safety glasses and work shoes. Shorts, cut-offs, "tank-top" shirts or soft-toed shoes will not be permitted.
13. Each Trade Contractor shall, in a readily visible manner, identify all of his tools, equipment and similar materials, either by paint color or label. The Trade Contractor shall provide his employees with a hard hat bearing his first initial, last name, and his Company name. This information shall be clearly visible at all times.
14. The Trade Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety.
15. Weather protection shall be supplied by the Trade Contractor and shall include any enclosure, supplemental heating, and furnishing and *any* other features (insulation, etc.) for meeting conditions required by the Construction Manager or by the Project Manual relative to the Trade Contractor's work.

25. Emergencies

A. In an emergency affecting the safety or life of individuals, or of the Work, or of adjoining property, the Trade Contractor, without special instruction or authorization from the Owner or Construction Manager or Architect, shall act, at his discretion, to prevent such threatened loss or injury. Also, should he, to prevent threatened loss or injury, be instructed or authorized to act by the Owner or Construction Manager or Architect he shall so act, without appeal. Any additional compensation or extension of time claimed by the Trade Contractor on account of any emergency work shall be determined as provided by Article 26 - Changes in Work.

26. Insurance

A. Trade Contractor shall purchase from and maintain in a company lawfully authorized to do business in the State of Texas and which carry a Best's rating of A-VII or higher such insurance as will protect the Trade Contractor from claims set forth below which may arise out of or result from the Trade

Contractor's operations under this Agreement and for which the Trade Contractor may be legally liable.

1. claims under workers compensation, disability benefit and other similar employee benefit acts which are applicable to the operations to be performed:
2. claims for damages because of bodily injury, occupational sickness or disease, or death of the Trade Contractor's employees or ;
3. claims for damages because of bodily injury, sickness or disease, or death of any person other than the Trade Contractor's employees;
4. claims for damages insured by usual personal injury liability coverage which are sustained (1) by a person as a result of an offense directly or indirectly related to employment of such person by the Trade Contractor, or (2) by any other person;
5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
6. claims for damages because of bodily injury, death or property damage arising out of ownership, maintenance or use of a motor vehicle;
7. claims involving contractual liability insurance applicable to the Trade Contractor's obligations under

B. Trade Contractors Liability Insurance

1. Trade Contractor shall keep in full force and effect, a policy of public liability and property damage insurance issued by a casualty company authorized to do business in the State of Texas, and in standard form approved by the Board of Insurance Commissioners' of the State of Texas, with coverage provision insuring the public from any loss or damage that may arise to any person or property by reason of services rendered by successful Proposer and providing that the amount by reason of services limits of not less than the following sums:
   a. Workmen's Compensation
      1) State Statutory limits
   b. Comprehensive General Liability (including Premises – Operations; Independent Contractor's Protective; Products and Completed Operations; Broad Form Property Damage
      1) Bodily Injury
         i. $100,000.00 each person, each occurrence
         ii. $300,000.00 Aggregate, each occurrence
   c. Property Damage including loss of use
      1) $100,000.00 Each occurrence
   d. Products and Completed Operations to be maintained for one (1) year after Final Payment
   e. Property Damage Liability Insurance will provide X, C or U coverage as applicable

C. Contractual Liability

1. Bodily Injury
   a. $100,000.00 Each Person
   b. $300,000.00 Each occurrence
2. Property Damage
   a. $100,000.00 Each occurrence

D. Personal injury, with Employment Exclusion deleted:

a. $100,000.00 Each occurrence

E. Comprehensive Automobile Liability (including owned, non-owned and hired motor vehicles):
   1. Bodily Injury
      a. $100,000.00 Each Person
      b. $300,000.00 Each occurrence
   2. Property Damage
      a. $100,000.00 Each occurrence

F. Umbrella Liability Coverage:
   1. $1,000,000.00 to provide excess liability coverages required above.

G. Galveston County, Construction Manager, and Architect shall be named as “additional insured” on such policies as are specified above and shall be notified of any changes to the policy during the contractual period.

H. The above requirements do not establish limits of Contractor’s liability.

I. Such insurance is to be provided at the sole cost of Trade Contractor.

J. All policies of insurance shall waive all rights of subrogation against Galveston County, its officers, employees and agents.

K. Galveston County reserves the right to require additional insurance should it be deemed necessary.

L. This insurance required by Subparagraph 26.B-G shall be written for not less than limits of liability listed or required by law, whichever is greater.

M. The insurance required by Subparagraph 26.B-G shall include premises operations (including explosion, collapse and underground coverage), elevators, independent contractors, products and/or completed operations, and contractual liability insurance (on a "blanket basis" designating all written contracts), all including broad form property damage coverage. Liability insurance may be arranged under Commercial General Liability policies for the full limits required or by a combination of underlying policies for lesser limits with the remaining limits provided by an Excess or Umbrella Liability Policy.

N. The insurance required by Subparagraph 26.B-G shall include contractual liability insurance applicable to the Trade Contractor's obligations under Article 5 in the Agreement between Galveston County and Trade Contractor

O. Property Insurance
   1. Unless otherwise provided, the Owner will purchase and maintain property insurance upon the entire Work at the site to the full insurable value thereof. This insurance shall include the interests of the Owner, the Construction Manager, the Trade Contractors and Sub-trade contractor in the Work and shall insure against the perils of fire and extended coverage, and shall include "all risk" insurance for physical loss or damage. This coverage carries a deductible per occurrence, which will be paid by Galveston County. This insurance coverage does not cover the Trade Contractor's or Sub-trade contractor's tools and equipment.
   2. The Owner will effect and maintain such boiler and machinery insurance as may be necessary and/or required by law. This insurance shall include the interest of the Owner, the Construction Manager, the Trade Contractors, and Sub-trade contractors in the Work.
   3. Any loss insured under Paragraph 26.B-G is to be adjusted with the Owner and made payable to the Owner as trustees for the insured's, as their interests may appear.
   4. The Owner, the Construction Manager, the Architect, the Trade Contractors, and the Sub-trade contractors waive all rights against each other and any other contractor or subcontractor engaged in the Project for damages caused by fire or other perils to the

extent covered by insurance provided under Paragraph 26.B, or any other property or consequential loss insurance applicable to the project, equipment used in the Project, or adjacent structures, except such rights as they may have to the proceeds of such insurance. If any policy of insurance requires an endorsement to maintain coverage with such waivers, the owner of such policy will cause the policy to be so endorsed. The Owner will require, by appropriate agreement, written where legally required for validity, similar waivers in favor of the Trade Contractors and Sub-trade contractors by any separate contractor and his subcontractors.

5. The Owner shall deposit in a separate account any money received as trustees, and shall distribute it in accordance with such agreement as the parties in interest may reach.
6. The Owner as trustees shall have power to adjust and settle any loss with the insurers.
7. If the Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion thereof, such occupancy shall not commence prior to a time mutually agreed to by the Owner and Construction Manager and to which the insurance company or companies providing the property insurance have consented by endorsements to the policy or policies. This insurance shall not be cancelled or lapsed on account of such partial occupancy.

27. Changes in the Work

A. Change Authorization/Contract Amendments

1. Changes in the Work may be accomplished after execution of the contract, and without invalidating the Contract, by Change Order, or order for a minor change in the work, subject to the limitations stated in this Article and elsewhere in the contract Documents. A Change Authorization is a written order to the Trade Contractor signed by Owner, in the form of an Agreement Amendment issued after the execution of the Contract, authorizing a Change in the Work or an adjustment in the Contract Sum and/or the Contract Time. The Contract Sum and the Contract Time may be changed only by Written Amendment. An Amendment signed by the Trade Contractor indicates his agreement therewith, including the adjustment in the Contract Sum and/or the Contract Time. Trade Contractor agrees that the dollar amount and time extensions, as applicable, in each Change Order constitutes full compensation to the Trade Contractor for all costs, expenses and damages to the Trade Contractor, whether direct, consequential or otherwise, in anyway incidental to or arising out of, or resulting, directly or indirectly from the work performed or modified by the Trade Contractor. Amendments not formally rejected within ten (10) days after receipt shall be deemed accepted.
2. If unit prices are stated in the Contract Documents or subsequently agreed upon, and if the quantities originally contemplated are so changed in a proposed Change In The Work that application of the agreed unit prices to the quantities of work proposed will cause substantial inequity to the Owner or the Trade Contractor, the applicable unit prices shall be equitably adjusted.

B. Concealed Conditions

1. Should concealed conditions be encountered in the performance of the Work below the surface of the ground or should concealed or unknown conditions in an existing structure be at variance with the conditions indicated by the Contract Documents, or should unknown physical conditions in an existing structure of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in

work of the character provided for in this Contract, be encountered, the Trade Contractor must report the conditions to the Construction Manager before the conditions are disturbed. The Construction Manager shall thereupon notify the Architect.

a. Upon such notices, or upon his own observation of such conditions, the Architect shall promptly make such changes in the Drawings and Project Manual as he finds necessary to conform to the different conditions. Any change in the cost of the work or the time needed for completion resulting from concealed conditions shall be determined in accordance with Article 8 in the Agreement between Galveston County and Trade Contractor provided a notice there of is made within ten (10) days after the first observance of the conditions.

C. Claims for Additional Cost

1. A change in the work may be initiated in one of two ways:
   a. A "Request for Proposal" Form (RFP) from the Construction Manager to the Trade Contractor describing the revision to the work desired. Usually, it is accompanied by revised drawings, sketches or other data.
   b. Formal notification from the Trade Contractor documenting a "concealed condition" requesting investigation by Construction Manager and Architect which causes changes in the Drawings and Project Manual (and a subsequent Request for Proposal on the revised documents).
2. If the Trade Contractor claims that any instructions given to him by the Construction Manager, by drawings or otherwise, involve extra work not covered by the Agreement between Galveston County and Trade Contractor, he shall give the Construction Manager written notice of the additional cost within ten (10) days after the receipt of such instructions and before proceeding to execute the work, except in emergencies endangering life or property, in which case the Trade Contractor shall proceed in accordance with Article 26. Should it not be clear to the Trade Contractor that a change will involve extra work, written notice given within five (5) days that the change may involve extra work will be considered sufficient notice. If it is later determined that the work involved in such instruction shall be recognized as an extra, the amounts of additional compensation to be paid therefore, should be determined in accordance with Article 8 in the Agreement between Galveston County and Trade Contractor. Failure to respond as noted shall waive the Trade Contractor's claim for additional compensation.
3. Timely submittal (Return) of Requests for Proposal is mandatory. RFP's shall be answered and returned within ten (10) days of receipt. Failing to return RFP's within thirty (30) days may constitute basis for withholding progress payments.
4. The Construction Manager will inform the Trade Contractors, and the Trade Contractor will inform the Construction Manager when either party recognizes a proposed change (RFP) may affect the progress of the work as scheduled.
5. Any claim for damages of any character, delays for which the Owner is liable under the Contract Documents, extra work or extra compensation of any other nature, shall be waived unless notice thereof is given to the Construction Manager, in writing, within 10 days after the occurrence of the event which is relied upon to justify the claim or within such time as the event should have reasonably been discovered by the Trade Contractor, and in any event, before extra cost is incurred.

D. Minor Changes in the Work

1. The Architect will have authority to order through the Construction Manager minor

changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order and such changes shall be binding on the Owner, the Construction Manager, and the Trade Contractor. The Trade Contractor shall carry out such written orders promptly.

28. Uncovering and Corrections of Work

A. Uncovering of Work

1. If any portion of the Work should be covered contrary to the request of the Construction Manager or Architect, or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Construction Manager, be uncovered for their observation and replaced, at the Trade Contractor's expense.
2. If any other portion of the Work has been covered which neither the Construction Manager nor the Architect has specifically requested to observe prior to being covered, the Architect or Construction Manager may request to see such Work and it shall be uncovered by the Trade Contractor. If such Work be found in accordance with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Change Order, be charged to the Owner or Construction Manager, as the case may be. If such Work were found not in accordance with the Contract Documents, the Trade Contractor shall pay such costs unless it is found that this condition was caused by a separate trade contractor employed as provided in Article15, and in that event, the separate trade contractor shall be responsible for the payment of such costs.

B. Correction of Work

1. The Trade Contractor shall promptly correct all Work rejected by the Architect or the Construction Manager as defective or as failing to conform to the Contract Documents whether observed before or after Substantial Completion and whether or not fabricated, installed complete. The Trade Contractor shall bear all costs of correcting such rejected Work, including compensation for the Architect's and/or Construction Manager's additional services made necessary thereby.
2. If, within one year after the Date of Substantial Completion of Work or designated portion thereof, or within one year after acceptance by the Owner of designated equipment or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty required by the Contract Documents, the Trade Contractor is notified of defective work he shall correct it promptly. This obligation shall survive the termination of the Contract. The Owner or Construction Manager shall give such notice promptly after discovery of the condition.
3. The Trade Contractor shall remove from the site all portions of the Work which are defective or nonconforming and which have not been corrected under Subparagraphs 8.1, 28.B.1 and 27.8.2, unless removal has been waived by the Owner.
4. If the Trade Contractor fails to correct defective or nonconforming Work as provided in Subparagraphs 8.1, 28.B.1 and 28.B.2, the Owner or Construction Manager may correct it in accordance with Article 9 in the Agreement between Galveston County and Trade Contractor.
5. If the Trade Contractor does not proceed with the correction of such defective or nonconforming work within a reasonable time fixed by written notice from the Construction Manager, the Owner or Construction Manager may remove it and may store

the materials or equipment at the expense of the Trade Contractor. If the Trade Contractor does not pay the cost of such removal and storage within ten days thereafter, the Owner or Construction Manager may upon ten additional days' written notice sell such Work at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs that should have been borne by the Trade Contractor, including compensation for the Construction Manager's additional services made necessary thereby. If such proceeds of sale do not cover all costs, which the Trade Contractor should have home, the difference shall be charged to the Trade Contractor and an appropriate Contract Amendment shall be issued. If the payments then or thereafter due the Trade Contractor are not sufficient to cover such amount, the Trade Contractor shall pay the difference to the Owner or Construction Manager.

6. The Trade Contractor shall bear the cost of making good all work of the Construction Manager or other contractors destroyed or damaged by such removal or correction.
7. Nothing contained in this Paragraph 28.B shall be construed to establish a period of limitation with respect to any other obligation, which the Trade Contractor might have under the Contract Documents. The establishment of the time period of one year after the Date of Substantial Completion or such longer period of time as may be prescribed by law or by the terms of any warranty required by the Contract Documents, relates only to the specific obligation of the Trade Contractor to correct the Work, and has no relation-ship to the time within which his obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings maybe commenced to establish the Trade Contractor's liability with respect to his obligations other than specifically to correct the Work.

29. Termination of the Contract

A. Termination by the Trade Contractor

1. If the Work is stopped, under an order of any court or other public authority having jurisdiction, for a period of three (3) months, through no fault of the Trade Contractor or a Sub-trade contractor or their agents or employees or any other persons performing any of the Work under a contract with the Trade Contractor, or if Galveston County should fail to pay the Trade Contractor in accordance with Article 3 of the Trade contract, the Trade Contractor may, upon thirty (30) additional days written notice terminate the contract and recover from the Owner payment for all Work executed and for any proven loss sustained upon any materials, equipment, tools, construction equipment and machinery.

B. Termination by the Owner

1. If the Trade Contractor is adjudged a bankrupt, or if he makes a general assignment for the benefit of his creditors, or if a receiver is appointed on account of his insolvency, or if he persistently or repeatedly refuses or fails, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials, or if he fails to make prompt payment to Sub-trade contractors or suppliers, or persistently disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or otherwise is guilty of a substantial violation of a provision of the Contract Documents, then the Owner without prejudice to any right or remedy and after giving the Trade Contractor and his surety, if any, ten days written notice, terminate the Contract and take possession of the site and of all materials, equipment, tools, construction equipment and

machinery thereon owned by the Trade Contractor and may finish the work by whatever method he may deem expedient. In such case, the Trade Contractor shall not be entitled to receive any further payment until the Work is finished.

2. If the unpaid balance of the Contract Sum exceeds the costs of finishing the Work, including compensation for the Architect or Construction Manager's additional services made necessary thereby, such excess shall be paid to the Trade Contractor. If such costs exceed the unpaid balance, the Trade Contractor shall pay the difference to the Owner.

C. Termination for Convenience

1. The Owner reserves the right, for its convenience, to terminate the Work of the Trade Contractor(s), in whole or in part, at any time by providing written or telegraphic notice to the Trade Contractor stating the extent and effective date of such termination; whereupon such Trade Contractor(s) shall: (i) stop all work and place no further orders or subcontracts for materials, services, equipment or supplies, except as may be necessary to complete portions of the Work not terminated; (iii) terminate work orders, purchase orders and subcontracts outstanding to the extent that they relate to the terminated portion of the Work; (iv) take any action necessary to protect property in Trade Contractor's possession in which the Owner has or may acquire an interest; (v) complete performance of the un-terminated portion of the Work; and (vi) take any other action toward termination of the Work which the Construction Manager may direct.

2. In the event that all or a portion of the Work of the Trade Contractor(s) is terminated pursuant to Subparagraph 29.C.1 Trade Contractor(s) shall be entitled to payment of those costs relating to the terminated portion of the Work as hereinafter defined. The Owner shall thereafter pay to the Trade Contractor(s), subject to the limitations herein set forth, the sum of the following costs which represent the respective interest of the Trade Contractor(s) to the terminated portion of the Work:

   a. Portion of the Contract Sum related to the work completed by the Trade Contractor immediately prior to Notice of Termination.

   b. Expenses incurred or for which the Trade Contractor is liable as the result of termination by Trade Contractor of respective work orders, purchase orders or subcontracts related to the Notice of Termination including overhead and profit or completed work.

   c. No payment shall be made for work not actually performed. Deductions will be made by Owner for amounts previously paid to Trade Contractor and for any amounts which may be due Owner, or which Owner may offset or withhold by the terms hereof. The total amount of all payments to Trade Contractor shall not exceed in any event, the proportion of the total Contract Sum that the Work actually performed (including materials delivered to the project site minus credits for returned goods or cancelled orders) at the date of termination bears to the entire Work to be performed hereunder.

   d. After receipt of a Notice of Termination, Trade Contractor shall submit to Construction Manager its written termination claim in the form and with the certification which the Owner or Construction Manager may require. Such claims shall be submitted promptly, but in no event more than ninety (90) days after the effective date of termination.

30. Temporary Services and Systems - refer to Division 01500 Temporary Facilities and Control in the Project

Manual

31. Order of Precedence

A. In the event of any conflict or discrepancy in the provisions of the contract documents, the documents shall be interpreted on the basis of the following order or priority:

1. Agreement between Galveston County and Trade Contractor
2. Addenda, with later date having greater priority
3. Proposal Form
4. General Conditions
5. Project Manual
6. Drawings, large scale details and/or schedules
7. Drawings, small scale

32. WAGE RATES

This Contract is a Public Works Contract governed by V.T.C.A., Government Code, Chapter 2258. That Act requires Contractor to pay workers not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the work is performed and not less than the general prevailing rate of per diem wages for legal holiday and overtime work.

Prevailing wage rates determined by the United States Department of Labor in accordance with the Davis-Bacon Act (40 U.S.C. Section 276a et seq) are used in this Contract and are incorporated and made a part hereof.

In the event other crafts or types of workers are required than are listed therein, such workers shall be paid at a rate not less than the prevailing rate for similar workers in the Galveston County area.

Contractor acknowledges that:

A. Pursuant to V.T.C.A., Government Code §2258.022, a violation of the obligation to pay workers the prevailing wages shall result in Contractor paying the County the amount of $60.00 for each worker employed for each calendar day or part of the day that the worker is paid less than the wage rates stipulated in the Contract; and

B. Contractors and Subcontractors shall be required to keep a record showing the name and occupation of each worker employed by Contractor or Subcontractor in the construction of the work called for in the contract and the actual per diem wages paid to each worker.

C. The record shall be submitted weekly on Labor Department forms to the Galveston County Wage Compliance Officer.

Contractor represents it has read this law and the penalties provided prior to entering into this agreement.

D. Wage Rates in force for Galveston County are included in Section 01012 Wage Scale.

33. Force Majeure

If by reason of force Majeure either Party shall be rendered unable, wholly or in part, to carry out its responsibilities under this contract by any occurrence by reason of force Majeure, then the Party unable to carry out its responsibility shall give the other Party notice and full particulars of such force Majeure in

writing within a reasonable time after the occurrence of the event, and such notice shall suspend the Party's responsibility for the continuance of the forced Majeure claimed, but for no longer period.

Force Majeure means acts of God, floods, hurricanes, tropical storms, tornadoes, earthquakes, or other natural disasters, acts of a public enemy, acts of terrorism, sovereign conduct, riots, civil commotion, strikes or lockouts, and other causes that are not occasioned by either Party's conduct which by the exercise of due diligence the Party is unable to overcome and which substantially interferes with operations.

34. Salvage

Any materials, equipment and fixtures specifically ordered to be salvaged under these specifications shall remain the property of County and will be delivered to the site designated by the Program Administrator. All other items shall be disposed of by Contractor in compliance with all applicable laws and regulations.

35. Open Records

Contractor acknowledges that County is a governmental entity and this Agreement is an open record under the Open Records Act and will be discussed and voted upon in a public meeting.

36. Performance and Payment Bond(s)

V.T.C.A., Government Code Chapter 2253, requires a Performance Bond (for contracts in the excess of $100,000) and a Payment Bond (for contracts in excess of $25,000), to be provided by the Contractor. Each bond required shall be equal to the total contract price and shall be issued by a satisfactory surety company. The bond(s) will remain in full force and effect until final completion and acceptance of the work.

The bond(s) are to be made payable to the County of Galveston. They shall be written on forms provided by the surety for public works projects in Texas. A surety licensed to do business in the state of Texas must execute the bond.

END OF SECTION 00106

North County Annex
AHU 1 & 2 Replacement

SECTION 00300 – SAMPLE FORM TABLE OF CONTENTS

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Section #..... Section Name ..... pages
Sample Forms
00031 ..... Sample Performance Bond Form 2
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00033 ..... Sample Waiver, Release and Indemnity Agreement.....2

END OF SECTION 00300

North County Annex
AHU 1 & 2 Replacement

SECTION 00301 – PERFORMANCE BOND

SAMPLE PERFORMANCE BOND FORM

KNOW ALL MEN BY THESE PRESENTS

STATE OF TEXAS

COUNTY OF GALVESTON

THAT WE, _____, a Corporation of the State of Texas, with home office and principal place of business in _____, Texas, hereinafter called "Principal" and _____ a Corporation of the State of _____, hereinafter called "Surety" are held and firmly bond unto Galveston County, hereinafter called "Owner", in the amount of _____ ($_____) Dollars for payment whereof the said principal and surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

The condition of this obligation is such that whereas the Principal has entered into a certain contract with Galveston County, the Owner, dated the _____ day of _____, 19 _____, for the complete construction on the property of the Owner, located in Galveston County, Texas, of the Work described as:

Galveston County North County Annex – Air Handler Replacement – Proposal #B1210222
Galveston County, Texas

which said Contract and Documents referred to therein is herein now referred to and made a part hereof as fully and completely as if copies in detail herein.

NOW, THEREFORE, the condition of this obligation is such that if said Principal shall well and truly and faithfully perform all the undertakings, covenants, terms, conditions, and agreements of said Contract, including, but not limited to, the faithful performance of the Work required in accordance with the plans and specifications, during the original term thereof and extension thereof which may be granted by the Owner with or without notice to the Surety, and if said Principal shall satisfy all claims and demands incurred under such Contract and shall fully indemnify and save harmless the Owner from all costs, damages and reasonable expenses which it may suffer by reason of failure so to do and shall fully reimburse and repay the Owner all outlay and expenses, including attorney's fees, which the Owner may incur in making good any default, and shall reimburse and repay the Owner for all costs, including attorney's fees, which the Owner may incur in the prosecution or defense of any suit or proceeding arising out of the breach or default of the Principal, then this obligation shall be void; otherwise, to remain in full force and effect.

The said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alterations or additions to the terms of the Contract or to the Work to be performed thereunder or of the specifications accompanying the same, shall in anyway affect its obligation on this bond, and it does hereby waive notice of such change, extensions of time, alterations or additions to the terms of the Contract or to the Work or to the specifications thereunder.

It is expressly provided that if any legal action shall be filed upon this bond, venue shall lie in Galveston County, Texas.

Simultaneously with the execution of this Performance Bond, the parties hereto have executed a Payment Bond, reference to which is made for all purposes. Nothing in this Performance Bond shall in any way invalidate or nullify the obligations of the parties as set forth in said Payment Bond.

North County Annex
AHU 1 & 2 Replacement

Provided, however, that this bond is executed pursuant to the provisions of Article 5160 of the revised Civil Statutes of Texas, as amended by Acts of the 61st Legislature, 1969, and liabilities on this bond shall be determined in accordance with the provisions of said Article to the same extent as if it were copies at length herein.

Provided, however, that nothing in the bond shall be construed to limit the rights of the beneficiaries of this Bond which they might have under general, special or the common law of the State of Texas not inconsistent with the terms hereof and not inconsistent with the provisions of Article 5160, as amended.

IN TESTIMONY WHEREOF, the parties hereto have executed this instrument on this _____ day of _____, 20 _____.

_____
(Authorized Signature of Principal)

_____
(Title)

APPROVED AS TO FORM: **ATTEST:**

_____ _____
Owner: *Galveston County* (Secretary of Principal's Corporation)

_____ _____
Attorney Representing Owner (Authorized Signature of Surety)

_____
(Title)

END OF SECTION 00301

North County Annex
AHU 1 & 2 Replacement

SECTION 00302 – PAYMENT BOND

SAMPLE PAYMENT BOND FORM

KNOW ALL MEN BY THESE PRESENTS

STATE OF TEXAS

COUNTY OF GALVESTON

THAT WE, _____, a Corporation of the State of Texas, with home office and principal place of business in _____, Texas, hereinafter called "Principal" and _____ a Corporation of the State of _____, hereinafter called "Surety" are held and firmly bond unto Galveston County, hereinafter called "Owner", for the use and benefit of all persons, firms and corporations who may furnish material or perform labor upon the buildings or improvements hereinafter referred to, in the penal sum of _____ ($_____) Dollars, (the Contract Price), in lawful money of the United States of America, to be paid in Galveston, Texas for payment of which sum well and truly to be made we bind ourselves and our successors, jointly and severally, by these presents.

Galveston County North County Annex – Air Handler Replacement – Proposal #B1210222
Galveston County, Texas

which said Contract and Documents referred to therein is herein now referred to and made a part hereof as fully and completely as if copies in detail herein.

NOW, THEREFORE, the condition of this obligation is such that if the Principal shall promptly make payment to all persons, firms and corporations furnishing materials for, or performing labor in the prosecution of the Work provided for in such Contract, and any extension or modification thereof, then this obligation shall be void; otherwise to remain in full force and effect.

Provided, however, that this bond is executed pursuant to the provisions of Article 5160 of the revised Civil Statutes of Texas, as amended by Acts of the 61st Legislature, 1969, and liabilities on this bond shall be determined in accordance with the provisions of said Article to the same extent as if it were copies at length herein.

Provided, however, that nothing in the bond shall be construed to limit the rights of the beneficiaries of this Bond which they might have under general, special or the common law of the State of Texas not inconsistent with the terms hereof and not inconsistent with the provisions of Article 5160, as amended.

Said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alterations or additions to the terms of the Contract or to the Work to be performed thereunder, or of the specifications accompanying the same, shall in anyway affect its obligation on this bond, and it does hereby waive notice of such change, extension of time, alteration or addition to the terms of the Contract or to the Work or to the specifications thereunder.

No final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder whose claim may be unsatisfied, and it is expressly provided that if any legal action shall be filed upon this bond, venue shall lie in Harris County, Texas.

Simultaneously with the execution of this Payment Bond, the parties hereto have executed a Performance Bond, reference to which is made for all purposes. Nothing in this Payment Bond shall in any way invalidate or nullify the obligations of the parties as set forth in said Performance Bond.

North County Annex
AHU 1 & 2 Replacement

IN TESTIMONY WHEREOF, the parties hereto have executed this instrument on this _____ day of _____, 20 _____.

_____
(Authorized Signature of Principal)

_____
(Title)

APPROVED AS TO FORM:

_____
Owner: *Galveston County*

_____
Attorney Representing Owner

_____
(Title)

ATTEST:

_____
(Secretary of Principal's Corporation)

_____
(Authorized Signature of Surety)

END OF SECTION 00302

North County Annex
AHU 1 & 2 Replacement

SECTION 00303 – CAD RELEASE DOCUMENTS

Sample Form
ELECTRONIC FILES
WAIVER, RELEASE AND INDEMNITY AGREEMENT

This form may be used when and if the Trade Contractor and Ibis Engineering agree to allow the Trade Contractor to use electronic files belonging to the Ibis Engineering as part of the Trade Contractor's work product. Ibis Engineering is under no obligation to Galveston County to provide this service to the Trade Contractor.

Whereas Ibis Engineering has utilized certain electronic CADD files in preparation of drawings for the Project on behalf of Galveston County, and

Whereas, _____, a Subcontractor/Contractor for _____ or

_____, a sub-tier contractor to _____ hereafter "Subcontractors" desires to obtain copies on magnetic disk of certain of Ibis Engineering's computer aided drafting (CADD) files consisting of construction drawings for the Project, hereinafter, "Electronic Media," and

Whereas, Ibis Engineering is willing to provide copies for the convenience of Subcontractors only under certain express conditions of understanding, acknowledgment and covenant as hereinafter provided without qualification.

Now therefore, Ibis Engineering and Subcontractor agree as follows:

1. ACKNOWLEDGEMENT AND LIMITATIONS: It is acknowledged that (1) Ibis Engineering's instruments of professional serves are the hard copy drawings and specifications issued by Ibis Engineering hereinafter "Instrument", (2) the Electronic Media are not substitutions for said Instruments, (3) differences may exist between said Instruments and the Electronic Media which Ibis Engineering is under no obligation to discover or disclose if known, (4) the Electronic Media may be incompatible with the Subcontractor's software and hardware configurations. In all ways, including those enumerated, Subcontractors accept the Electronic Media "as is" and Ibis Engineering is under no obligation to correct, update for changes, enhance or maintain the Electronic Media for Subcontractors. Ibis Engineering does not represent or warrant that the Electronic Media are complete, free from defects, or accurate now or in the future. It is acknowledged, finally, that no client relationship is created by or through this instrument between Ibis Engineering and Subcontractors.

2. WAIVER AND RELEASE: Subcontractors agree all risk of incomplete, inaccurate, defective and variant information contained in the Electronic Media, and waives, quits, and forever discharges and releases the Owner, Ibis Engineering and there officers, directors, employees and successors for every claim arising out of or related to any error, discrepancy, inaccuracy, variation or other defect in the Electronic Media, whether or not resulting in whole or in part from an act, error or omission of Ibis Engineering and whether or not such claim is known or unknown as of the date of this waiver and release.

3. REUSE: The Electronic Media is not reusable for any other project or for additions or extensions of the project identified in the Electronic Media. Ibis Engineering does not authorize release of the Electronic Media to any person or party other than the Subcontractors, and the Subcontractors agree and covenant not to release the Electronic Media to any other party.

4. INDEMNIFICATION: Use of the Electronic Media shall be at the sole risk of the Subcontractors and without liability or legal expense to the Owner or Ibis Engineering; further, Subcontractors shall, to the fullest extent permitted by law, defend, indemnify and hold the Owner, Ibis Engineering and its officers, directors, employees and

successors harmless from all claims, damages, including bodily injury or death, losses and expenses, including attorney fees, arising out of or resulting in whole or in part from the use of the Electronic Media.

5. DISPUTES: Due to the risk of damage, anomalies in transcription or copying and modification during use by Subcontractors where intended or otherwise, it is agreed Ibis Engineering's archived copy of the Electronic Media, if Ibis Engineering chooses to maintain same shall be conclusive, unrebuttable proof in all disputes over the content of the Electronic Media furnished to Subcontractors by this Agreement.

Wherefore, the parties have signed this Release, Waiver and Indemnify Agreement on the

_____ Day of _____, 2012.

DESIGN PROFESSIONAL: IBIS ENGINEERING

By: _____

Title: _____

Date: _____

CONTRACTOR:

_____

By: _____

Title: _____

Date: _____

SUBCONTRACTOR:

_____

By: _____

Title: _____

Date: _____

END OF SECTION 00303

North County Annex
AHU 1 & 2 Replacement

SECTION 01010 – SUMMARY OF WORK

PART 1 -GENERAL

1.1 RELATED DOCUMENTS

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

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. The Project consists of replacement of two existing air handler units for the North County Annex
    a. Project Location: Galveston County North Annex, 174 Calder Rd., League City, Texas.
    b. Owner: County of Galveston.
B. Contract Documents were prepared for the Project by Ibis Engineering, PO Box 55171; Galveston, Texas 77555-5171.
C. The Work will be constructed under a single prime contract.

1.3 WORK HOURS

A. Normal working hours shall be from 7 AM until 6 PM, Monday through Friday.
B. With advance notice given to Owner, Contractor will be allowed to work hours outside of normal operating hours. Provide minimum 5 days advance notice of intent to work outside of normal hours.
C. Provide Owner maximum advance notice before commencement of onsite work.

1.4 CONTRACTOR USE OF PREMISES

A. Use of the Site: Limit use of the premises to work in areas indicated. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.
    a. Owner Occupancy: Building will be fully occupied during entire course of construction.
    b. ONLY ONE AHU MAY BE TAKEN OUT OF SERVICE AT A TIME, THE OTHER UNIT MUST REMAIN OPERATIONAL DURING OCCUPIED HOURS.
    c. Cooperate with the Owner during construction operations to minimize conflicts and facilitate owner usage. Contractor must communicate with Owner on a daily basis to inform him of all current and future planned work scheduling.
    d. Driveways and Entrances: Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
B. Use of the Existing Building: Maintain the existing building in a weather-tight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the construction

period.

C. Contractor may use building restroom facilities approved by Owner.
D. Smoking will not be permitted on site.
E. Keep existing driveways and entrances serving the premises clear and available to Owner's employees at all times. Do not use these areas for parking or storage of materials.
F. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage to storage areas designated by Owner.
G. Lock automotive type vehicles, such as passenger cars and trucks and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.
H. Maintain the existing building in a safe and weathertight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period.
I. Keep public areas such as hallways, stairs, elevator lobbies and toilet rooms free from accumulation of waste material, rubbish or construction debris.
J. Waste Material and Debris: All waste material and debris from this project shall become the property of the contractor and shall be removed from the site. The exterior of the site shall be kept clean and free of material and debris from this project at all times. All waste material and debris generated by any work under this contract shall be handled, transported, stored, and disposed by the contractor and by his subcontractors in accordance with all applicable Federal, State, and local laws, ordinances, regulations, court orders, or other types of rules or rulings having the effect of law including, but not limited to, Executive Order 11752, 17 December 1978; the Federal Water pollution Control Act, as amended, 33 USC, Sec. 1251 et seq; the Clean Air Act, as amended, 42 USC, Sec. 7401 et seq; the Solid Waste Disposal Act, as amended, 41 USC sec 136 et seq; the Endangered Species Act of 1973, as amended, 16 USC, Sec 153 et seq; and the Environmental Protection Agency guidelines on thermal processing and land disposal of solid waste (40 CFR 240 and 241).

1.5 ASBESTOS

A. Immediately halt work and inform Owner should any material be encountered which a) must be disturbed during course of work and b) which Contractor believes to be asbestos.

1.6 SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS

A. Remove and dispose of designated dual deck air handler along hot and chilled water piping and valves in North County Annex, for AHU 1 and AHU 2.
B. Provide new dual deck air handling unit.
C. Provide new hot and chilled water piping and accessories to tie into existing piping.
D. Provide new 3-way bypass control valves and new electronic valve controllers which will replace the existing pneumatic controls. Insulate new piping.
E. Provide new ductwork and accessories to tie into existing ductwork. Insulate new ductwork.
F. Provide interface between new air handling unit’s control system LAN, new electronic valve controllers, and existing control system to allow automated control and monitoring.

PART 2 -PRODUCTS (Not Applicable)

PART 3 -EXECUTION (Not Applicable)

END OF SECTION 01010

North County Annex
AHU 1 & 2 Replacement

SECTION 01012 – WAGE SCALE

CONDITIONS OF THE CONTRACT AND DIVISION 1, as indexed, apply to this Section.

1.1 APPLI CABILITY

A. The Contract is a Public Work and is governed by V.T.C.A., Government Code, Chapter 2258. Proposers are advised that in accordance with the Act's terms, a Contractor is required to pay workers not less than the general prevailing rate of per diem wages for work of similar character in the locality in which the work is performed and not less than the general prevailing rate of per diem wages for legal holiday and overtime work. A copy of the prevailing wages to be paid in the performance of the work called for herein is attached hereto and by reference, made a part hereof. The County's determination of the General Prevailing Rate of per diem wages is final.

Prevailing wage rates determined by the United States Department of Labor in accordance with the Davis-Bacon Act (40 U.S.C. Section 276a et seq) are used in this Contract and are incorporated and made a part hereof.

In the event other crafts or types of workers are required than are listed therein, such workers shall be paid at a rate not less than the prevailing rate for similar workers in the Galveston County area.

B. Pursuant to V.T.C.A., Government Code 2258.022, a violation of the obligation to pay workers the prevailing wages shall result in the Contractor paying the County the amount of $60.00 for each worker employed for each calendar day or part of the day that the worker is paid less than the wage rates stipulated in the Contract; and.

C. Trade Contractors and Subcontractors shall be required to keep a record showing the name and occupation of each worker employed by the Contractor or Subcontractor in the construction of the work called for in the Contract and the actual per diem wages paid to each worker. The record shall be open at all reasonable hours to inspection by the officers and agents of the County.

D. Contractors and Subcontractors shall submit Certified Payroll Reports on U. S. Department of Labor forms (WH-327 or latest edition). The reports must be submitted weekly to the Galveston County Wage Compliance Officer by the Trade Contractor and Subcontractors. Trade Contractor's request for Payments will not be processed or checks issued until all reports are current.

E. Davis-Bacon Wage Determinations - Texas - Galveston County

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GENERAL DECISION: TX20100010 03/12/2010 TX10

Date: March 12, 2010
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North County Annex
AHU 1 & 2 Replacement

General Decision Number: TX20100010 03/12/2010

Superseded General Decision Number: TX20080010

State: Texas

Construction Type: Building

Counties: Chambers, Galveston, Liberty and Waller Counties in Texas.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes & apartments up to & including 4 stories).

Modification Number	Publication Date
0	03/12/2010

ASBE0022-002 06/01/2009

	Rates	Fringes
ASBESTOS WORKER/INSULATOR (Including application of all insulating materials, protective coverings, coatings and finishing to all type of mechanical systems)	$ 20.63	8.30

* BOIL0074-002 08/08/2009

BOILERMAKER	$ 24.70	16.88

CARP0551-004 04/01/2008

Carpenter (including Acoustical Ceiling Work) (CHAMBERS, GALVESTON & WALLER COUNTIES)	$ 21.00	6.43

CARP0551-005 04/01/2008

Carpenter, Acoustical Work Only (LIBERTY COUNTY)	$ 21.00	6.43

ELEC0479-004 09/01/2008

Electricians (Including Pulling Wire, and Low Voltage Wiring and Installation of Fire Alarms, Security Systems, Telephones, and Computers) CHAMBERS (that part east of the Trinity River) AND LIBERTY (that part east of the Trinity River) COUNTIES	$ 25.67	11.32

ELEC0527-001 08/31/2009

ELECTRICIAN (Including
Pulling Wire, and Low Voltage
Wire and Installation of Fire
Alarms, Security Systems,
Telephones, and Computers)
GALVESTON COUNTY.....$ 25.50 8.73

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* ELEC0716-003 09/01/2008

	Rates	Fringes
Electrician (Including Pulling Wire, and Low Voltage Wiring and Installation of Fire Alarms, Security Systems, Telephones, and Computers)		
*LIBERITY AND WALLER COUNTIES		
(* That portion north and west of a line beginning at the Chamnbers-Harris county line and Interstate Route 10; west on Route 10 to the San Jacinto River; south on the San Jacinto River to State Highway 134; southwest and south on State Highway 134 to State Highway 225; east on state Highway 225 to Underwood Road; south on Underwood Road to Spencer Highway to Willow Springs Bayou' south on Willow Springs and Middle Bayou to Clear Lake and the Harris-Galveston county line.)		
.....$ 24.85		7.61

*LIBERITYand WALLER Counties*That portion north and west of a line beginning at the Chambers-Harris county line and Interstate Route 10; west on Route 10 to the San Jacinto River to State Highway 134; Southwest and south on State Highway 134 to State Highway 225; east on State Hi9ghway 255 to Underwood Road; south on Underwood Road to Spencer Highway to
south on Willow Springs and Middle Bayou to Clear Lake and the Harris-Galveston county line.....$ 24.00 7.59

ELEV0031-001 01/01/2010
ELEVATOR MECHANIC.....$ 34.955 20.235
FOOTNOTES: a.- Employer contributes 8% of basic hourly rate for over 5 years' service and 6% of basic hourly rate for 6 months to 5 years' service as Vacation Pay Credit. Paid Holidays: New Year's Day; Memorial Day; Independence Day; Labor Day; Thanksgiving Day; Friday after Thanksgiving Day; Christmas Day

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IRON0135-001 09/01/2008
IRONWORKER, STRUCTURAL
(GALVESTON COUNTY).....$ 26.65 5.50

PLAS0079-002 07/01/2004
PLASTERER
CHAMBERS, LIBERTY & WALLER
COUNTIES.....$ 19.42 1.00

PLAS0681-002 04/01/2005

North County Annex
AHU 1 & 2 Replacement

PLASTERER
Galveston County.....$ 20.15 3.20

PLUM0068-005 10/01/2009
Plumbers (Excluding HVAC Pipe)...$ 28.54 8.78

Pipefitters (Excluding HVAC Pipe)
Galveston and Waller Counties.....$ 28.07 9.31

	Rates	Fringes
PLUM0211-006 11/09/2009		
Pipefitter including HVAC pipe Chambers & Liberty Counties.....$	28.07	9.31
SFTX0669-001 01/01/2010		
SPRINKLER FITTER (Fire Sprinklers).....$	25.90	15.35
SHEE0054-010 07/01/2009		
Sheet Metal (including HVAC Duct, System Installation).....$	25.74	10.17
SUTX2005-011 04/28/2005		
Asbestos Abatement Worker (Ceilings, Floors, & Walls).....$	14.00	0.00
BRICKLAYER.....$	18.00	0.00
Carpenter (excluding Acoustical Ceiling Work)		
LIBERTY COUNTY.....$	13.52	3.18
CEMENT MASON/CONCRETE FINISHER...$	12.76	0.00
DRYWALL FINISHER/TAPER.....$	12.21	0.92
Drywall Hanger (Including Metal Stud Install).....$	12.49	1.38
Formbuilder/Formsetter		
CHAMBERS, LIBERTY & WALLER COUNTIES.....$	11.66	0.00
GALVESTON COUNTY.....$	11.61	0.00
GLAZIER		
CHAMBERS, LIBERTY, & WALLER COUNTIES.....$	14.55	2.46
GALVESTON COUNTY.....$	14.00	1.60
INSULATOR -BATT AND FOAM.....$	11.00	0.00

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IRONWORKER, REINFORCING.....$ 12.02            0.00

IRONWORKER, STRUCTURAL
     CHAMBERS, LIBERTY, &
     WALLER COUNTIES.....$ 16.15            0.00

Laborers:
     COMMON, CHAMBERS COUNTY.....$  9.31            0.00
     COMMON, GALVESTON COUNTY....$ 10.46            0.00
     COMMON, LIBERTY COUNTY......$  8.53            0.00
     COMMON, WALLER COUNTY.......$  8.74            0.00
     MASON TENDER (BRICK)........$ 10.27            0.00
     MASON TENDER (CEMENT).......$  9.88            0.00
     PIPELAYER...................$ 12.34            0.00
     PLASTERER TENDER............$ 12.90            2.51

LATHER.....................$ 16.90            3.61

Painter - Brush, Roller &
Spray.....................$ 11.14            0.00

Pipefitter (HVAC Pipe Only)
     GALVESTON COUNTY............$ 19.28            3.71
     WALLER COUNTIES.............$ 15.00            3.53

POWER EQUIPMENT OPERATOR:
     Asphalt Paver...............$ 13.50            0.25
     Backhoe.....................$ 12.50            0.00
     Crane.......................$ 18.53            3.24
     Forklift....................$ 14.53            0.00
     Slab & Wall Saw.............$ 15.54            3.83

ROOFER.....................$ 11.38            0.00

TILE FINISHER..................$ 11.86            0.53

TILE SETTER....................$ 15.71            1.01

TRUCK DRIVER...................$ 10.75            1.47
----------------------------------------------------------------

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.
================================================================

Unlisted classifications needed for work not included within
the scope of the classifications listed may be added after
award only as provided in the labor standards contract clauses
(29CFR 5.5 (a) (1) (ii)).

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In the listing above, the "SU" designation means that rates
listed under the identifier do not reflect collectively
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bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board

U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

END OF SECTION 01012

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SECTION 01013 – EMPLOYMENT VERIFICATION

Employment Verification

The Immigration Reform and Control Act (IRCA) of 1986 prohibit contractors from knowingly hiring illegal workers. Accordingly, Contractors and Subcontractors must collect information regarding an employee's identity and employment eligibility and document that information on Form I-9. In addition, Contractors and Subcontractors will be required to utilize E-Verify to verify that the information their employees provided was valid or that the documents presented were genuine. Contractors and Subcontractors shall also be required to keep a record on each employee showing compliance with this requirement. The records shall be open at all reasonable hours to inspection by the Galveston County Wage Compliance Officer. Each violation of this requirement shall result in the Contractor and/ or Subcontractor paying the County the amount of $60.00 for each employee employed for each calendar day or part of the day that the Contractor or Subcontractor failed to comply with the requirements of this general condition.

END OF SECTION 01013

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SECTION 01020 – ALLOWANCES

CONDITIONS OF THE CONTRACT AND DIVISION 1, as indexed, apply to this Section.

PART 1 - GENERAL

A. SCO PE

1. The Contractor shall include in his proposal the allowances stated in this and following Sections of the Project Manual. Allowance may pertain to purchase and delivery only, or to purchase, delivery, and installation, or to services only, or to contingency fund.

2. All of the Contractor's overhead and profit shall be included in the base proposal for listed allowance items whether such sums are used in the completion of the project or not.

3. If the allowance is stated for purchase and delivery only, all of the Contractor's handling costs on site and other expenses contemplated for the allowance material and equipment shall be included in the allowance.

4. If the allowance is stated for purchase, delivery, and installation, all of the Contractor's handling costs on site and other expenses contemplated for the allowance material and equipment shall be included in the allowance.

5. If the allowance is stated for services only, all of the Contractor's handling costs on site and other expenses contemplated for the services shall be included in the allowance.

6. If the allowance is stated for contingency, all of the handling costs on site and other expenses contemplated for the allowance material and equipment shall be included in the allowance.

7. The Contractor shall purchase the allowance materials and equipment as directed by the Architect in writing. If the actual cost of the required work is more or less than all the allowance estimates, the Contract Sum will be adjusted accordingly by Change Order at the conclusion of the project.

8. The Architect cannot certify applications for payment of any allowance item unless a fully executed Allowance Authorization is on file with the Owner, Architect, and Contractor.

PART 2 - ALLOWANCES

B. ITEMS

1. Contingency Allowance: None

END OF SECTION 01020

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SECTION 01025 – SCHEDULE OF VALUES

CONDITIONS OF THE CONTRACT AND DIVISION 1, as indexed, apply to this Section.

PART 1 – GENERAL

1.1 SCOPE

Provide a detailed breakdown of the agreed Contract Sum showing values allocated to each of the various parts of the work, as specified herein and in other provisions of the Contract Documents. The schedule of values is to be prepared in conformance with this section in order to assist the Architect with timely processing of all Application for Payments.

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

1.2 SUBMITTAL S

A. Prior to the first Application for Payment, submit a proposed schedule of values to the Architect, as outlined below:
    1. Meet with the Architect and determine additional data, if any, required to be submitted.
    2. Secure the Architect's approval of the schedule of values prior to submitting the first Application for Payment. This will allow the Architect to certify the Application for Payment in the timeliest manner.

1.3 SCHEDULE OF VALUES

The Schedule of Values shall be broken down into item costs for each specification section as labor and materials as a minimum.

A. Schedule of Values - Items in addition to Specification sections.
Mobilization
Submittals and shop drawings
Temporary Facilities
Clean Up
Building Permit
Bonds, Insurance
General Contractors Fee
Misc. Mechanical Accessories
Demolition
Rough-In Labor (Electrical, Plumbing, Mechanical)
Rough-In Material (Electrical, Plumbing, Mechanical)
Finish Labor (Electrical, Plumbing, Mechanical)
Finish Material (Electrical, Plumbing, Mechanical)
Allowances (each listed separately)
Project Close-out Documents and O&M Manuals

B. The Schedule of Values must be submitted on AIA Document G703

END OF SECTION 01025

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SECTION 01045 – CUTTING AND PATCHING

CONDITIONS OF THE CONTRACT AND DIVISION 1, as indexed, apply to this Section.

PART 1 - GENERAL

1.1 SCO PE

A. Furnish all labor, materials, equipment and services necessary or incidental to completion of "Cutting and patching" includes cutting into existing construction to provide for the installation or performance of other work and subsequent fitting, and patching required to restore surfaces to their original condition.
   1. Cutting and patching is performed for coordination of the work, to uncover work for access or inspection, to obtain samples for testing, to permit alterations to be performed, to remove and replace work not conforming to Contract requirements, or for other similar purposes.
   2. Cutting and patching performed during the manufacture of products, or during the initial fabrication, erection, or installation processes is not considered to be "cutting and patching" under this definition. Drilling of holes to install fasteners and similar operations is also not considered to be cutting and patching.

1.2 SUBMITTAL S

A. Submit written request in advance of cutting or alteration which affects:
   1. Structural integrity of any element of the project
   2. Integrity of weather-exposed or moisture-resistant element
   3. Efficiency, maintenance, or safety of any operational element
   4. Visual qualities of sight-exposed elements
   5. Work of Owner or separate contractor
   6. Any work in or around any known or potential area in which asbestos or lead based products exist.

B. Procedural Proposal for Cutting and Patching: Where prior consent for cutting and patching is required, submit proposed procedures for this work well in advance of the time work will be performed, and request consent to proceed. Include the following information, as applicable, in the submittal:
   1. Describe the nature of the work and how it is to be performed, indicating why cutting and patching cannot be avoided. Describe anticipated results of the work in terms of changes to and effects upon existing work, including structural, operational and visual changes, as well as other significant elements.
   2. List products to be used and firms that will perform work.
   3. Give dates when work is expected to be performed.
   4. List utilities that will be disturbed or otherwise be affected by work, including those that will be relocated and those that will be temporarily out of service. Indicate how long utility services will be disrupted.
   5. Where cutting and patching of structural work involves the additional reinforcement, submit details and engineering calculations to show how that reinforcement is integrated with the original structure to satisfy requirements.
   6. Consent by the Architect to proceed with cutting and patching work does not waive the Architect's right to later require complete removal and replacement of work found to be cut and patched in an unsatisfactory manner.

1.4 QUA LITY ASSURANCE

A. Requirements for Structural Work: Do not cut and/or patch structural work without the written direction of the structural engineer.

B. Operational and Safety Limitations: Do not cut and patch operational elements or safety related components in a manner that would result in a reduction of their capacity, to perform in the manner intended, including energy performances, or that would result in increased maintenance, or decreased operational life, or decreasing safety. Before cutting and patching the following elements of work, and similar work elements where directed, obtain the Architect's consent to proceed with cutting and patching.
1. Shoring, bracing, and sheeting
2. Primary operational systems and equipment
3. Water/moisture vapor/air/smoke barriers, membranes and flashings
4. Noise and vibration control elements and systems
5. Control, communication, conveying, and electrical wiring systems

C. Visual Requirements: Do not cut and patch work exposed on the building's exterior or in its occupied spaces, in a manner that would, in the Architect's opinion, result in lessening the building's aesthetic qualities. Do not cut and patch work in a manner that would result in substantial visual evidence of cut and patch work. Remove and replace work judged by the Architect to be cut or patched in a visually unsatisfactory manner. If possible, retain the original installer or fabricator, or another recognized, experienced and specialized firm to cut and patch the following categories of exposed work:
1. Architectural concrete finishes
2. Brick and concrete unit masonry
3. Ornamental metal
4. Roofing
5. Preformed metal panels
6. Window system
7. Gypsum or cement plaster
8. Acoustical ceilings
9. Carpeting
10. Wall covering
11. HVAC enclosure, cabinets or covers

1.5 PAY MENT FOR COSTS

A. Cost for work necessary to accommodate installation of new work shall be borne By the Contractor or subcontractor responsible for installing new work.

B. Costs caused by ill-timed or defective work, or work not conforming to contract documents, including costs for additional services of the Architect and other Design Consultants shall be borne by the party responsible in the judgment of Architect, for ill-timed, rejected or non-conforming work.

C. Costs for work performed on instruction of Owner, other than the correction of defective or non-conforming work shall be responsibility of the Owner, who shall issue an appropriate Change Order for the increase in costs.

PART 2 - PRODUCTS

2.1 MATE RIALS

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

B. For any change in material, submit a request for substitution under the provisions of the General Conditions.

PART 3 - EXECUTION

3.1 GE NERAL

A. Execute cutting, fitting, and patching to complete work, and to:
1. Fit several parts together which will integrate with other work.
2. Uncover work to install ill-timed work.
3. Remove and replace defective and non-conforming work.
4. Remove samples of installed work for testing.
5. Provide openings in elements of work for penetrations of mechanical and electrical work.
6. Fill and refinish existing holes and damaged areas.

3.2 INSPECTION

A. Before cutting, examine the surface to be cut and patched and the conditions under which the work is to be performed. If unsafe or otherwise unsatisfactory conditions are encountered, take corrective action before proceeding with the work.

3.3 PREP ARATION

A. To prevent failure, provide temporary support of work to be cut.

B. Protect other work during cutting and patching to prevent damage. Provide protection from adverse weather conditions for that part of the project that may be exposed during cutting and patching operations.

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

3.4 PERFO RMANCE

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

B. Cut the work using methods that are least likely to damage work to be retained or adjoining work. Where possible, review the proposed procedures with the original installer; comply with original installer's recommendations.
1. In general, where cutting is required, use hand or small power tools designed for sawing or grinding, not hammering and chipping. Cut through concrete and masonry using a cutting machine such as a carborundum saw or core drill to ensure a neat hole. To avoid marring

existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces. Temporarily cover the opening when not in use.

2. Comply with requirements of applicable sections of Division 2 when cutting and patching, excavating and backfilling.
3. Bypass utility services such as pipe and conduit, before cutting, where such utility services are shown or required to be removed, relocated or abandoned. Cut-off conduit and pipe in walls or partitions to be removed. After bypassing and cutting, cap, valve or plug, and seal tight the remaining portion of pipe and conduit to prevent entrance of moisture or other foreign matter.

C. Patching: Patch with seams that are durable and as visible as possible. Comply with specified tolerances for the work.

1. Where feasible, inspect and test patched areas to demonstrate integrity of work.
2. Restore exposed finishes of patched areas, and where necessary, extend finish restoration into retained adjoining work in a manner that will eliminate evidence of patching and refinishing.
3. Where removal of walls or partitions extend one finished area into another finished area, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. If necessary to achieve uniform color and appearance, remove the existing floor and wall coverings and replace with new materials.
   a. Where a patch occurs in a smooth painted surface, extend final paint coat over the entire unbroken surface containing the patch, after the patched area has received prime and base coat.
4. Patch, repair or rehang existing ceilings as necessary to provide an even plane surface of uniform appearance.

D. Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

E. At penetrations of fire-rated wall, ceiling, or floor construction, completely seal voids with fire-rated material, full thickness of the construction element.

F. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

3.5 CLEANING

A. Thoroughly clean areas and spaces where work is performed or used as access to work. Completely remove paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finish is applied. Restore damaged pipe covering to its original condition.

END OF SECTION 01045

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SECTION 01090 – DEFINITIONS AND STANDARDS

PART 1 -GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes:
    a. Quality assurance.
    b. Definitions.

1.3 QUALITY ASSURANCE

A. For products or workmanship specified by associations, trades, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
B. Conform to reference standard by date of issue current on date of Contract Documents.
C. Obtain copies of standards when required by Contract Documents.
D. Maintain copy at job site during submittals, planning, and progress of the specific work, until Substantial Completion.
E. If the specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.
F. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.4 DEFINITIONS

A. Indicated: The term “indicated” is a cross reference to graphic representations, notes, or schedules on drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in contract documents. Where terms such as “shown”, “noted”, “scheduled”, and “specified” are used in lieu of “indicated”, it is for purpose of helping reader locate cross-reference, and no limitation is intended except as specifically noted.
B. Directed, Requested, Etc.: Where not otherwise explained, terms such as “directed”, “requested”, “authorized”, “selected”, “approved”, “required”, “accepted”, and “permitted” mean “directed by Engineer”, etc. However, no such implied meaning will be interpreted to extend Engineer’s responsibility into Contractor’s area of construction supervision.
C. Furnish: The term “furnish” is used to mean supply and deliver to project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
D. Install: The term “install” is used to describe operations at project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations, as applicable in each instance.
E. Provide: The term “provide” is used to mean furnish and install, complete and ready for intended use, as applicable in each instance.

1.5 SCHEDULE OF REFERENCES

AMCA	Air Movement and Control Association
ANSI	American National Standards Institute
ARI	Air-Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
IEEE	Institute of Electrical and Electronics Engineers
NEC	National Electric Code
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
SBC	Standard Building Code
SMC	Standard Mechanical Code
SPC	Standard Plumbing Code
SGC	Standard Gas Code
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
UL	Underwriter's Laboratories, Inc.
UBC	Uniform Building Code
UMC	Uniform Mechanical Code

PART 2 -PRODUCTS (Not Applicable)

PART 3 -EXECUTION (Not Applicable)

END OF SECTION 01090

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SECTION 01092 – ABBREVIATIONS AND SYMBOLS

CONDITIONS OF THE CONTRACT AND DIVISION 1, as indexed, apply to this Section.

PART 1 - GENERAL

1.1 The following is a list of typical abbreviations:

Acoustical Society of America	ASA
Adhesive & Sealant Council, Inc.	ASC
Air Conditioning & Refrigeration Institute	ARI
Aluminum Association	AA
American Association of State Highway Officials	AASHO
American Concrete Institute	ACI
American Council of Independent Laboratories	ACIL
American Hardboard Association	AHA
American Hotdip Galvanizers Association	AHGA
American Institute of Architects	AIA
American Institute of Steel Constructors	AISC
American Institute of Timber Construction	AITC
American Iron & Steel Institute	AISI
American National Standards Institute, Inc.	ANSI
American Plywood Association	PA
American Society for Testing & Material	ASTM
American Society of Civil Engineers	ASCE
American Society of Heating, Refrigeration and Air Conditioning Engineers	ASHRAE
American Society of Mechanical Engineers	ASME
American Subcontractors Association	ASA
American Welding Society	AWS
American Wood Preserver's Institute	ASPI
Architectural Aluminum Manufacturers Association	AAMA
Architectural Woodwork Institute	AWI
Asphalt Institute	AI
Associated General Contractors of America	AGC
Brick Institute of America	BIA
Building Research Institute	BRI
California Redwood Association	CRA
Chain Link Fence Manufacturers Institute	CLFM
Concrete Reinforcing Steel Institute	CRSI
Construction Specification Institute	CSI
Door and Hardware Institute	DHI
Facing Tile Institute	FTI
Federal Specifications	FS
Flat Glass Marketing Association	FGMA
Gypsum Association	GA
Hardwood Plywood Manufacturers Association	HPMA
International Conference of Building Officials	ICBO
Joint Sealer Manufacturers Association	JSMA
Maple Flooring Manufacturers Association	MFMA
Metal Lath Association	MLA
National Association of Architectural Metal Manufacturers	NAAMM
National Association of Mirror Manufacturers	NAMM

National Bureau of Lathing & Plastering	NBLP
National Clay Pipe Institute	NCPI
National Concrete Masonry Association	NCMA
National Electrical Manufacturers Association	NEMA
National Environmental Systems Contractors	NESC
National Fire Protection Association	NFPA
National Forest Products Association	NFPA
National Hardware Lumber Association	NHLA
National Ornamental Metal Manufacturers Association	NOMMA
National Paint, Varnish and Lacquer Association	NPVLA
National Ready Mixed Concrete Association	NRMCA
National Roofing Contractors Association	NRCA
National Society of Professional Engineers	NSPE
National Woodwork Manufacturers Association, Inc.	NWMA
Painting and Decorating Contractors of America	PDCA
Perlite Institute, Inc.	PI
Portland Cement Association	PCA
Resilient Floor Covering Institute	RFCI
Rubber and Vinyl Floor Council	RVFC
Southern Building Code Congress	SBC
Southern Forest Products Association	SFPA
Southern Hardwood Lumber Manufacturing Association	SHLMA
Steel Deck Institute	SDI
Steel Door Institute	SDI
Steel Joist Institute	SJI
Steel Structures Painting Council	SSPC
Tile Council of America, Inc.	TCA
Underwriter's Laboratories, Inc.	UL
Venetian Blind Institute	VBI
Vinyl Fabrics Institute	VFI
West Coast Lumber Inspection Bureau	WCLIB
Western Red Cedar Lumber Association	WRCLA
Western Wood Products Association	WWPA

END OF SECTION 01092

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SECTION 01200 – PROJECT MEETINGS

CONDITIONS OF THE CONTRACT AND DIVISION 1, as indexed, apply to this Section.

PART 1 - GENERAL

1.1 SCOPE

A. Contractor is required to participate in a series of regular project meetings. These meetings are scheduled by the Contractor for the benefit of the Owner and the project.

B. These meetings include pre-construction conferences, progress meetings, pre-installation conferences, and close-out meetings.

1.2 PRECONSTRUCTION CONFERENCE

A. Contractor will administer site mobilization conference at project site for clarification of Owner and Contractor responsibilities, in use of site and for review of administration procedures.

1.3 PROGRESS MEETINGS

A. Contractor shall schedule and administer all project meetings after mobilization conference throughout progress of the work at bi-weekly intervals, plus any special called meetings, and all pre-installation conferences.
B. Contractor shall make physical arrangements for meetings, preside at meetings, record minutes, and distribute copies of minutes within two days to Owner, Architect, participants, and those affected by decisions made at meetings.
C. Required Attendance: Job Superintendent, Project Coordinator, Owner, and Architect as appropriate to agenda topics for each meeting.
D. Suggested Agenda: Review of work progress, status of progress schedule and adjustments thereto, delivery schedules, submittals, maintenance of quality standards, pending changes and substitutions, and other items affecting progress of the work.

1.5 INSTALLATI ON CONFERENCES

A. When required in individual Specification section, Contractor shall convene installation conferences prior to commencing work of the section.
B. Require attendance of entities directly affecting, or affected by, work of the section.
C. Review conditions of installation, preparation and installation procedures, and coordinate with related work.

END OF SECTION 01200

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SECTION 01210 - ALLOWANCES

PART 1 -GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements governing allowances.
    a. Certain materials and equipment are specified in the Contract Documents by allowances. In some cases, these allowances include installation. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.
B. Types of allowances include the following:
    a. Contingency allowances.

1.3 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Engineer of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
B. At Engineer's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
C. Purchase products and systems selected by Engineer from the designated supplier.

1.4 SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.
B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

1.5 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed by Engineer for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.
C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.
D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner

by Change Order.

PART 2 -PRODUCTS (Not Used)

PART 3 -EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

END OF SECTION 01210

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SECTION 01290 – PAYMENT PROCEDURES

PART 1 -GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.3 DEFINITIONS

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

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
    a. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
        i. Application for Payment forms with Continuation Sheets.
        ii. Submittals Schedule.
    b. Submit the Schedule of Values to Engineer at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
    c. Subschedules: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.
B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.
    a. Identification: Include the following Project identification on the Schedule of Values:
        i. Project name and location.
        ii. Name of Engineer.
        iii. Engineer's project number.
        iv. Contractor's name and address.
        v. Date of submittal.
    b. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
        i. Related Specification Section or Division.
        ii. Description of the Work.
        iii. Name of subcontractor.

iv. Name of manufacturer or fabricator.
v. Name of supplier.
vi. Change Orders (numbers) that affect value.
vii. Dollar value. (Percentage of the Contract Sum to nearest one-tenth percent, adjusted to total 100 percent.)

c. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
d. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
e. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
    i. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance or bonded warehousing if required.
f. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
g. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
h. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Engineer and paid for by Owner.
    a. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
B. Payment Application Times: Payment application times will be determined in conjunction with Owner and Engineer at pre-construction meeting.
C. Payment Application Forms: Use forms provided by Owner for Applications for Payment. Sample copies are included in this specifications manual.
D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Engineer will return incomplete applications without action.
    a. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
    b. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
E. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to Engineer by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
    a. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of

mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
    a. List of subcontractors.
    b. Schedule of Values.
    c. Contractor's Construction Schedule (preliminary if not final).
    d. Products list.
    e. Schedule of unit prices.
    f. List of Contractor's staff assignments.
    g. List of Contractor's principal consultants.
    h. Certificates of insurance and insurance policies.
    i. Performance and payment bonds.
    j. Data needed to acquire Owner's insurance.

H. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
    a. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
    b. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

I. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted.

PART 2 -PRODUCTS (Not Used)

PART 3 -EXECUTION (Not Used)

END OF SECTION 01290

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SECTION 01300 – SUBMITTALS

CONDITIONS OF THE CONTRACT AND DIVISION 1, as indexed, apply to this Section.

PART 1 - GENERAL

1.1 SCO PE

A. Contractor is required to provide shop drawings, submittals, or manufacturer's data to allow the Architect to review them. The Contractor may also submit request for information (RFI). All submittals will be submitted to the Construction Manager.

B. Each project manual section has submittal requirements listed and the time required for submittal.

C. Contractor is required to list submittals as a separate item on their Schedule of Values and Application for Payment.

D. The Architect cannot certify payment to the Contractor for submittals if the submittal review process is not complete in the time frame listed in the project manual or a time frame mutually agreed by the Architect, and Owner.

1.2 PROCEDURES

A. Contractor creates shop drawings, product data, or samples as required by specific sections of the specifications. The Contractor is responsible for confirming and correcting all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating the work with that of all trades, and performing all work in a safe and satisfactory manner.

B. Apply Contractor's stamp, signed, to each item submitted, certifying that review and verification of products, field dimensions, adjacent construction work and coordination of information is in accordance with the requirements of the work and Contract Documents.

C. Trade Contractor transmits each item to the Construction Manager agent with approved form identifying project, contractor, subcontractor, major supplier; identify pertinent drawing sheet and detail number and specification section number, as appropriate. Identify any deviations from Contract Documents. No deviations will be allowed without prior approval through the substitution process.

D. The CMa will not review submittals that have not been thoroughly reviewed by the Trade Contractor. If the documents have obvious errors that have not been noted by those reviews the documents will be returned to the Trade Contractor with a request to revise and resubmit from the CMa.

E. Within 2 weeks of receipt of submittal the CMa will review the submittal for compliance with contract documents and transmit them to the Architect for review.

F. The Architect will not review submittals that have not been thoroughly reviewed by the CMa and Trade Contractor. If the documents have obvious errors that have not been noted by those reviews the documents will be returned to the CMa with a request to revise and resubmit from the Architect. There will be no partial payments considered for submittals in the review process.

G. Within 2 weeks of receipt of submittal the Architect and/or Engineer will review the submittal for compliance with contract documents and notify the CMa that the submittal is ready to be picked up.

H. The CMa will notify the Trade Contractor that the review has been completed and the submittal may be picked up.

I. The CMa will retain 1 copy of the submittals on site. The Architect will retain 2 file copies of the submittal. The Engineers will retain 1 copy of any submittals that they are required to review.

J. One copy of the submittals retained by the Architect will be delivered to the Owner at the conclusion of the project.

K. Contractor will revise and resubmit submittals requested to be revised and resubmitted. He will identify all changes made since the previous submittal. The process will then start over. The Architect will not certify applications for payment of submittals that are in the review process.

L. The CMa and Architect are not obligated to review submittals that are requested to be revised and resubmitted a second time and may request additional funding from the Owner to do so. The Architect and CMa may request that the Owner claim the expense of repeated re-submittals to the Architect and CMa from the Trade Contractor for submittals resubmitted more than once.

M. Note that most submittals are required within a short period of time of signing the contract. Refer to the specification Section to determine the exact time.

1.3 SHOP DRAWINGS AND PRODUCT DATA

A. Provide 4 copies to be retained for the CMa, Architect, and Owner's files and any number required for the Contractor to complete his work.

B. Manufacturer's Instructions:
When work is specified to comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, at least two weeks prior to start of such work.

C. All dimensions indicated on the drawings are based on the specific models and manufacturers of products, equipment, fixtures and miscellaneous items specified. If the Contractor uses an approved product by another listed manufacturer which is different than the specific model and manufacturer listed in these specifications, then the Contractor shall be solely responsible for the coordination of any dimensional changes required, including structural, relocation of walls, equipment, fixtures, ceilings and miscellaneous items. When dimensional changes are required in these situations, the Contractor shall submit a proposed modification drawing to the Architect for review prior to proceeding with the work. All causes and effects of the dimensional change shall be indicated on the Contractor's drawing submittal.

1.4 SAMPLES

A. Submit a full range of requested manufacturer's colors, textures, and patterns for Architect's selection. Submit samples for selection of finishes in accordance with approved schedule, and in such sequence as to cause no delay in the work or in the work of any other Contractor.

B. Submit samples to illustrate functional characteristics of the product, with integral parts and attachment devices. Coordinate submittal of different categories for interfacing work.

C. Submittals shall contain:
1. Date of submission and dates of any previous submissions
2. Project title and number
3. Contract identification
4. Names of Contractor, Supplier, Manufacturer
5. Identification of sample, with specification section number

D. Resubmission Requirements for Samples:
1. Make any corrections or changes in the submittals required by the Architect and resubmit until approved. Refer to paragraph 1.2.I above.
2. Submit new samples as required for initial submittal.

E. Submit the number specified in the respective Specification section; minimum of two, one will be retained by Architect. Reviewed samples may be used in the work if so indicated in the specification section.

1.5 MANUFACTURER'S CERTIFICATES AND WARRANTIES

A. Submit required certificates and warranties in duplicate.

END OF SECTION 01300

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SECTION 01310 – CONSTRUCTION SCHEDULE

CONDITIONS OF THE CONTRACT AND DIVISION 1, as indexed, apply to this Section.

PART 1 - GENERAL

1.1 SCO PE

A. The Trade Contractor shall coordinate his schedule with the Construction Manager Agent so that the entire work proceeds smoothly and without interruption. Refer to Article 2 of the Contract for Construction.

END OF SECTION 01310

SECTION 01410 – TESTING LABORATORY SERVICES

CONDITIONS OF THE CONTRACT AND DIVISION 1, as indexed, apply to this Section.

PART 1 - GENERAL

1.1 SCOPE

A. The Contractor shall allow in his proposal the coordination and supervision of tests to be performed by an independent laboratory selected by the Owner.

B. All testing laboratory services shall be provided and paid for by the Owner outside of this Contract or by allowance amount inside this Contract. The Owner will select a material testing lab and notify the Contractor as soon as possible.

C. The Owner will pay for the initial testing laboratory services of materials that comply with the requirements of the contract documents. If the materials tested do not comply with the requirements of the contract documents the Contractor shall be required to replace those materials, unless the Owner exercises their option to accept the work under Article 12.3 – Acceptance of Non-Conforming Work, and pay for all testing of replacement materials. Refer to Article 12 – Uncovering and Correction of Work in the General Conditions.

D. The Contractor shall cooperate with the testing laboratory in all matters pertaining to the work. The Owner retains the option to add to or delete any or all testing specified herein.

1.2 REQUIREMENTS

A. Conditions of the Contract: Inspections and testing required by laws, ordinances, rules, regulations, orders, approvals, or public authorities.

B. Respective Sections of Specifications: Certification of products.

C. Each Specification Section Listed: Laboratory test required and standards for testing.

D. Testing laboratory inspection, sampling and testing is required for:
01 Section 02200 - Earthwork
02 Section 02220 - Trenching and Backfilling
03 Section 02240 - Soil Stabilization
04 Section 03300 - Cast-In-Place Concrete
05 Section 03311 - Insulating Concrete
06 Section 03410 - Precast Concrete Panels
07 Section 04200 - Unit Masonry
08 Section 05120 - Structural Steel
09 Section 07255 - Sprayed Fireproofing
10 Section 07511 - Built-Up Roofing
11 Section 15056 - Earthwork
12 As requested by the Owner or Architect

1.3 AUTHORITIES AND DUTIES OF THE LABORATORY

A. The laboratory is not authorized to revoke, alter, relax, enlarge, or release any requirement of the Specifications, or to approve or accept any portion of the work. When it appears that the material

furnished or work performed by the Contractor fails to fulfill specification requirements, the testing laboratory shall promptly notify the Contractor, Construction manager, Architect, supplier and/or subcontractor providing or preparing the materials or work being tested of such deficiencies.

B. The laboratory shall promptly distribute copies of the laboratory test and inspection reports. Standard distribution shall include copies of all reports to the Owner, Architect, Construction Manager, and Contractor. The structural engineer, civil engineer, MEP engineer, concrete supplier, and any outside consultants shall receive copies of the testing results regarding their particular phase of the project.

1.4 TESTING LABORATORY GUIDELINES AND PROCEDURES

A. Technicians scheduled to perform specific testing services must be qualified to review and perform other services that overlap (i.e., earthwork, foundation inspections, rebar inspection, and concrete), when scheduled concurrently at the project site.

B. Technician time for services performed will be reimbursed at a regular time rate. Compensation at the overtime rate will be considered for any hours over eight hours spent at the job site on a single day, field testing services performed on a Saturday or Sunday, and any field services performed on a recognized holiday.

C. Concrete design mixes will receive a cursory review with any discrepancies reported to the Architect. No compensation will be considered for these reviews.

D. Nuclear density testing will be based on a daily rental rate for the actual testing equipment; compensation on a per test basis will not be considered.

E. Report distribution shall include the Owner, Architect, Construction Manager, Contractor, Civil Engineer, Structural Engineer, and others requesting or requiring review of the specific testing results.

F. There will be a three-hour minimum for each scheduled testing service. Vehicle charges will be included on a $25.00 per trip basis.

G. Cylinder pick-up will be handled by the technician performing the test on a scheduled pick-up day. If there are no testing services scheduled, the cylinder pick-up fee will be $40.00 on week days, and $50.00 on weekends and holidays, with no technician time or vehicle charge.

H. Structural steel inspections shall include a plant visit reviewing shop fabrication, welding and an overall review of the shop fabrication quality control standards. Structural steel field inspection shall include a 100% visual review of all field fillet welds and initial frequency of 25% ultrasonic testing of full field penetration welds. There shall be 100% visual review of all bolted connections, and a minimum of two (2) bolts tested at every bolted connection.

I. The Contractor shall bear the responsibility of scheduling all testing services. The Contractor and the testing laboratory shall assume full responsibility to coordinate the testing services. Cancellations and/or failed tests will be reimbursable to the Owner by the responsible party for the cancellation or failure of a test or service.

1.5 TESTS CONDUCTED

A. Earthwork:
01 Subgrade under building slabs and paving.

a. In place density tests for each 500 square yards of existing subgrade material.

02 Select earth fill and fill under building slabs and paving.
- a. Proctor curve for one type of fill material. If the original choice of material does not meet the specifications, the Contractor shall pay for additional testing.
- b. In place density test for each 500 square yards of compacted new fill material, ASTM D2922 or AASHTO T99.
- c. Liquid limit of fill material, ASTM D423 or AASHTO T89.
- d. Plastic limit and plasticity index of all fill material, ASTM D424 or AASHTO T90 and T91.

03 Soil Stabilization:
- a. Various tests relative to the requirements of Texas Highway Department Standard Specification for Construction of Highways, Streets and Bridges.

04 References:
- a. American Society for Testing and Materials
  ASTM D423
  ASTM D424-59 (1971), Plastic Limit and Plastic Index of Soils
  ASTM D698-78, Measure-Weight Relations of Soils and Soil Aggregate using 5.5 lbs. (2-49-KG) Rammer and 12-in. (305 mm) drop.
  ASTM D2922-71 (1976)
- b. American Assoc. of State, Highway and Transportation Officials
  AASHTO T89-76, Determining the Liquid Limit of Soils
  AASHTO T90-70, Determining the Plastic Limit and Plasticity Index of Soils
  AASHTO T91
  AASHTO T99-74, Moisture-Density Relations of Soils

B. Cast-In-Place Concrete: (Volumes 2A, 3, 5, and 8A)

01 Design concrete mixes and test aggregates proposed for use therein.

02 Determine the quality of the concrete as outlined in ASTM C-L143.

03 Provide full time services for the review of all drilled pier foundation inspections. Including a daily report noting grid lines and locations of each pier drilled. After the foundation shaft has been drilled, the lab shall test an undisturbed sample and verify that it meets or exceeds the design specification.

04 Provide full-time services for all structural building concrete drilled piers, grade beams, slab on grade, columns, and other miscellaneous structural concrete. Included within this scope of work is the review of all the rebar placement, size, spacing of stirrups, and miscellaneous placement requirements.

05 Cast two (2) concrete cylinders for every 50 cubic yards of structural concrete for compressive strength testing. Cast three (3) concrete cylinders for every 100 cubic yards of building slab and concrete paving for compressive strength testing.

06 Reference: American Society for Testing and Materials ASTM C143, Slump of Portland Cement Concrete

B. Cast-In-Place Concrete: (Volume 7A)

01 Design concrete mixes and test aggregates proposed for use therein.

02 Determine the quality of the concrete as outlined in ASTM C-L143.

03 Provide full time services for the review of all pile installations. Including a daily report noting grid lines and locations of each pier drilled. After the foundation shaft has been drilled, the lab shall test an undisturbed sample and verify that it meets or exceeds the design specification.

04 Provide full-time services for all structural building concrete drilled piers, grade beams, slab on grade, columns, and other miscellaneous structural concrete. Included within this scope of work is the review of all the rebar placement, size, spacing of stirrups, and miscellaneous placement requirements.

05 Cast three (3) concrete cylinders for every 75 cubic yards of structural concrete for compressive strength testing. Cast three (3) concrete cylinders for every 100 cubic yards of building slab and concrete paving for compressive strength testing.
06 Reference: American Society for Testing and Materials ASTM C143, Slump of Portland Cement Concrete.
07 Also refer to Section 03300, 3.7.

C. Structural Steel:
01 Radiographic inspection shall be provided for all welds called for on the drawings as full penetration butt welds. If welds are inaccessible to radiograph, welds shall have ultrasonic inspection.
02 The testing of welded connections indicated on the drawings shall be paid for from the testing laboratory allowance; however, in the event the fabricator obtains approval from the structural engineers for additional welds not shown on the drawings, the cost of testing those additional welds shall be paid for by the Contractor.
03 Reference 1.04, 08 for further testing guidelines.

D. Lightweight Insulating Fill: Test in accordance with ASTM C495
01 Types of Tests:
a. Field: Wet density
b. Lab: Dry density and 28-day compressive strength
02 Number of Test Sets:
a. One per 5,000 square feet.
b. Not less than one for each day's work

E. Roofing (if requested by Architect) during construction, before final completion of building.
01 Time: Any time during construction before final completion of building, refer to Built-Up Roofing Section - 07511.
02 Size: Cut 4” x 36” strip across roof plies.
03 Inspection: Architect may use samples for confirming number of plies, bonding of plies, weight of bitumen and softening temperature.
04 Patching: Fill in area where samples have been removed with plastic cement of other filler. Hot mop patch plies to overlap each other so sample area becomes equal to typical roof.
05 Number: As directed by Architect.

F. Mortar Mix Testing: Provide pre-construction and construction evaluation of mortars per ASTM C780-87.

END OF SECTION 01410

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SECTION 01420 – NOTIFICATION OF ARCHITECT REQUIREMENTS

CONDITIONS OF THE CONTRACT AND DIVISION 1, as indexed, apply to this Section.

PART 1 - GENERAL

1.1 SCOPE

A. It is required for the Trade Contractor to coordinate his activities with the Construction Manager Agent (CMa) in advance and the CMa will notify the Engineer of necessary scheduling. This will allow the project to proceed smoothly and without interruption. The Architect and Consulting Engineers generally require 48 hours notice to plan their work and will be appreciative of your cooperation.

B. In general, the Trade Contractor shall notify the CMa to notify the Architect whenever there is need of clarification or interpretation of the Contract Documents. This may be done without notice however, the Architect and/or Engineer may not be available immediately so plan ahead.

C. The CMa shall notify the Architect 48 hours in advance of certain stages of construction. The Project Superintendent shall notify the CMa on a regular basis of the ongoing work. These stages shall include, but not necessarily be limited to the following:
1. 07100 - Concealment of flashing
2. 07200 - Concealment of insulation
3. 07500 - Roofing and sheet metal work
4. 07900, 08800 - Installation of building and glazing sealants.

D. In addition to notifying the Architect, the Trade Contractor via the CMa shall also notify the Structural Engineer (48 hours) prior to the following stages (It is acceptable to request that the Architect notify the Engineer instead of the CMa doing so):
1. Drilling and placing the first footings.
2. Pouring the first grade beams.
3. Structural steel framing completion.

PART 2 - PROJECT MEETINGS

2.1 PREC ONSTRUCTION CONFERENCE

A. The Trade Contractor shall contact the CMa at least ten (10) days prior to commencing construction, in order to schedule a pre-construction meeting with the Architect and Owner. This meeting must occur prior to commencement of any construction.

2.2 PROGRESS MEETINGS

A. CMa shall schedule and administer project meetings throughout progress of the work.

B. CMa shall make physical arrangements for meetings, preside at meetings, record minutes, and distribute copies within two (2) days to the Architect, participants, and those affected by decisions made at meetings.

C. Required Attendance: Job Superintendent, Project Coordination, Owner, and Architect as appropriate to agenda topics for each meeting.

D. Suggested Agenda: Review of work progress, status of progress schedule and adjustments thereto, delivery schedules, submittals, maintenance of quality standards, pending changes and substitutions, and other items affecting progress of work. This is a good time to review the upcoming Application for Payment.

2.3 PREIN STALLATION CONFERENCES

A. For each individual Specification section or each subcontractor, convene a pre-installation conference prior to commencing work of that Section.

B. Require attendance of entities directly affecting or affected by work of that section.

C. Review conditions of installation, preparation and installation procedures, and coordinate with related work.

END OF SECTION 01420

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SECTION 01500 – TEMPORARY FACILITIES AND CONTROLS

CONDITIONS OF THE CONTRACT AND DIVISION 1, as indexed, apply to this Section.

PART 1 - GENERAL

1.1 QUALITY ASSURANCE

A. Environmental Protection: Provide environmental protection as required by authorities having jurisdiction and as indicated in Contract Documents.

1.2 GENERAL TRADE CONTRACTOR REQUIREMENTS

A. Each Trade Contractor shall be responsible for furnishing, installing or otherwise providing any or all of the following temporary facilities, structures or services as they may be necessary or required for or during, performance of the work of his Contract

1. Temporary field office facilities complete, including all furniture, heat, cooling, lighting, telephone, plumbing and toilet fixtures as he may require for his exclusive use. (Site location and number are subject to approval of the Construction Manager).
2. Temporary storage facilities, sheds or buildings as may be required for the proper protection or storage of materials and/or equipment. (Site location and number are subject to approval of Construction Manager).
3. Temporary extension from, and hookup to, all temporary utilities which have been provided to a common point for use by the Trade Contractors during construction.
4. Maintenance, cleanup and removal of all temporary facilities provided by the Trade Contractor for his exclusive use.
5. Furnishing, erection, maintenance and removal of all temporary hoists and scaffolding as may be required by the Trade Contractor for the performance of the work of his Contract.
6. Temporary drainage and dewatering measures including all pumping, drainage, erosion control or other work required to protect the work of the Trade Contractor while in progress.
7. All temporary facilities, structures, services or items of work specifically required or defined in the Scope of Work of the Contract (Proposal Package) or otherwise required by the Contract Documents for his work.
8. Distribution of drinking water for his construction personnel.
9. At the end of the day's work, all work subject to damage by adverse weather conditions shall be covered or otherwise protected as required. Weather protection shall be adequate to permit each Trade Contractor to work on a continuous basis without shutdown due to temperature or weather conditions as far as possible.
10. No temporary service shall be removed or disconnected until the new parts have been installed to replace them, properly connected and ready for use. The changing over from temporary to permanent work shall be done expeditiously, and if possible so that no part of the building or premises shall be without adequate service. If this is not possible, the procedure must be planned and submitted to the Construction Manager for approval.

1.3 TEMPORARY ELECTRICITY AND LIGHTING

Owner will pay cost of energy used directly to utility. Exercise measures to conserve energy. Utilize Owner's existing power service.

B. Electric power for use in temporary trailers shall be available to the Trade Contractor from a central location in the trailer area. The Trade Contractor shall furnish any required extensions from this location at his own expense.

C. Provide temporary electric feeder from existing building electrical service at location as directed. Do not disrupt Owner's use of service.

D. Complement existing power service capacity and characteristics as required.

E. Galveston County will provide power outlets for construction operations, with branch wiring and distribution boxes located as required. Trade Contractor must provide flexible power cords as required.

F. All contractors must share the system provided and average usage is anticipated. Any contractor anticipating fabrication area or operations must coordinate his needs through the Construction Manager. If additional distribution is required and available at the control service, it will be provided at the Trade Contractor's expense.

G. Connecting and disconnecting Trade Contractor tools and equipment to (and from) the above distribution system will be performed by qualified personnel, ALL grounding as required by the National Electrical Code, OSHA or any and all local codes, including approved ground fault interrupters shall be furnished and installed at the Trade Contractors expense.

H. Galveston County will have installed temporary lighting in all areas and rooms. Temporary lighting shall be a minimum of 2 watt per square foot. For all areas 3,200 or less, 100-watt lamps spaced approximately at 20 foot centers shall be used. Each room or enclosed area shall have, at least, one lighting and one tool outlet. Where 100 watt lights are used, the outlets shall consist of double weatherproof sockets. One (1) socket shall be used for the 100-watt lamp and the other socket shall be used for portable power tools. Any temporary lighting required beyond the foregoing shall be provided by the party requiring the same and the work will be paid for by the Trade Contractor.

I. The electric service and distribution provided by Galveston County includes:

1. The central service will be installed from the Utility Company's service point to the central distribution point on-site. Distribution from this point to the central connection point in the trailer area will be installed including any transformers, main disconnected switch or switches, any metering, supports, protective enclosure and grounding.

2. Service will terminate in a panel board equipped with circuit breakers. Service characteristics available will be 120/208 volts, three phase, 4 wire web, unless otherwise specified. Total capacity to be shared shall be 400 amps. Use of electricity for basic heating of trailers will not be allowed.
3. The distribution will be extended in the building five (5) designated distribution points. These distribution locations will provide:
   a. Panel board for breakers for lighting and hand tool circuits throughout the area served.
   b. Panel board and breakers for twenty (20) 20 amp circuits for connection of bench tools, such as, pipe threaders, etc.

1.4 TEMPORARY HEATING

A. It is not anticipated that the permanent building system will be utilized to provide "temporary heat" during the major portion of construction operations.

B. Within these parameters the Trade Contractor must provide any supplemental heat required to perform his work

C. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless indicated otherwise in product sections.

D. It is anticipated that activation, testing and balancing of the building heating/cooling system will be critical to the completion and acceptance of the project and therefore actuation, of the permanent system will be scheduled for the earliest possible time

1.5 TEMPORARY COOLING

A. Will not be provided.

B. It is anticipated that activation, testing and balancing of the building heating/cooling system will be critical to the completion and acceptance of the project and therefore actuation, of the permanent system will be scheduled for the earliest possible time

1.6 TEMPORARY VENTILATION

A. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

B. Utilize existing ventilation equipment. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations.

1.7 TELEPHONE SERVICE

A. Provide, maintain, and pay for telephone service to field office at time of project mobilization.

1.8 TEMPORARY WATER SERVICE

A. Owner will pay cost of temporary water. Exercise measures to conserve energy. Utilize Owner's existing water system, extend and supplement with temporary devices as needed to maintain specified conditions for construction operations.

B. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.

C. Potable water shall be available to the Trade Contractor at a central location. Extensions of the water supply for Trade Contractor's exclusive use shall be the responsibility of the Trade Contractor.

D. All Trade Contractors are responsible for providing their own hoses to bring water from the hose rack location to their work **areas**. Only heavy-duty 3/4" hose in good conditions will be permitted in use in the interior of the building. The discharge end of each hose shall be equipped with a means of positive shut off. The use of hoses, which leak at connections or elsewhere throughout their length, will not be permitted. All hoses shall be disconnected from hose bibs when not in use and before the end of each work day.

1.9 TEMPORARY SANITARY FACILITIES

A. The Construction Manager will provide temporary toilets, excluding Trade Contractor's trailer hookup.

B. The Construction Manager will provide rubbish containers and rubbish disposal service unless noted otherwise in the Proposal Form. The Trade Contractor must not use these containers for the disposal of earth, surplus or slop concrete, hazardous materials, and/or steel stock. Each Trade Contractor must dispose of these elements at his own expense.

1.10 FIELD OFFICES AND SHEDS

A. Designated existing spaces may be used for field offices and for storage:

B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.

C. Storage Areas And Sheds: Size to storage requirements for products of individual Sections, allowing for access and orderly provision for maintenance and for inspection of products to requirements of Section 01600.

D. Maintenance And Cleaning: Daily janitorial services for offices; periodic cleaning and maintenance for office and storage areas. Maintain approach walks free of mud, water, and snow.

E. Removal: At completion of Work remove buildings, foundations, utility services, and debris. Restore areas.

1.11 VEHICULAR ACCESS

A. Provide unimpeded access for emergency vehicles. Maintain 20-foot width driveways with turning space between and around combustible materials.

B. Provide and maintain access to fire hydrants and control valves free of obstructions.

1.12 PARKING

A. Use of designated existing on-site streets and driveways used for construction traffic is permitted. Tracked vehicles not allowed on paved areas.

B. Use of designated areas of existing parking facilities used by construction personnel is permitted.

C. Do not allow heavy vehicles or construction equipment in parking areas.

D. Maintenance:
1. Maintain traffic and parking areas in a sound condition free of excavated material, construction equipment, products, mud, snow, and ice.
2. Maintain existing and permanent paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

E. Removal, Repair:
1. Repair existing facilities damaged by use, to original condition.

1.13 PROGRESS CLEANING AND WASTE REMOVAL

A. Salvage nonhazardous demolition and construction waste and recycle.

B. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

C. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

D. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

E. Collect and remove waste materials, debris, and rubbish from site weekly and dispose off-site.

F. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.14 TRAFFIC REGULATION

A. Signs, Signals, And Devices:
1. Post Mounted and Wall Mounted Traffic Control and Informational Signs: As approved by local jurisdictions.
2. Automatic Traffic Control Signals: As approved by local jurisdictions.
3. Traffic Cones and Drums, Flares and Lights: As approved by local jurisdictions.
4. Flag-person Equipment: As required by local jurisdictions.

B. Flag Persons: Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.

C. Flares and Lights: Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

D. Haul Routes: Consult with authority having jurisdiction, establish public thoroughfares to be used for haul routes and site access.

1.15 BARRIERS

A. Galveston County will provide barriers to prevent unauthorized entry to construction areas to allow for authorized use of site, and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way.

C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.16 ENCLOSURES AND FENCING

A. Galveston County will provide fence around construction site; equipped with vehicular and pedestrian gates with locks.

B. Exterior Enclosures:
1. Galveston County will provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons.

1.17 SECURITY

A. Security Program:
1. Protect Work existing premises and Owner's operations from theft, vandalism, and unauthorized entry.
2. Initiate program in coordination with Owner's existing security system at project mobilization.
3. Maintain program throughout construction period until Owner acceptance precludes the need for Contractor security.

B. Entry Control:
1. Restrict entrance of persons and vehicles into Project site and existing facilities.
2. Allow entrance only to authorized persons with proper identification.
3. Maintain log of workers and visitors, make available to Owner on request.
4. Coordinate access of Owner's personnel to site in coordination with Owner's security forces.

C. Personnel Identification:
1. Provide identification badge to each person authorized to enter premises.
2. Badge To Include: Personal photograph, name and employer.
3. Maintain a list of accredited persons, submit copy to Owner on request.
4. Require return of badges at expiration of their employment on the Work.

D. Restrictions:
1. Do not allow cameras on site or photographs taken except by written approval of Owner.
2. The Construction Manager will provide temporary fire safety equipment for general use. Each Trade Contractor shall provide their own fire extinguishers for their trailers, and for use, as required when cutting and burning are performed

E. Site Security, Personnel and Property Protection
1. Contractor shall maintain the security of the worksite and shall restrict access to the site to the following:
   a. its employees;
   b. employees of subcontractors;
   c. representatives of manufacturers whose goods are utilized in the work and are called to the site by either the Contractor or the Program Administrator; and
   d. agents and/or employees of the County.
2. Contractor shall provide adequate protection to persons on the worksite, adjacent properties, and utilities as is necessary to keep each free of damage or injury.
3. Contractor shall take proper means to protect adjacent or adjoining properties which might be injured or seriously affected by construction undertaken under this Agreement from any damage or injury by reason of said process of construction. Contractor shall be liable for any and all claims for such damage on account of its failure to fully protect all adjoining properties.

4. At no time remove, alter or render ineffective any barricades, railings or cover on the project without written permission of the Construction Manager. Where these safety devices are to be turned over to others, upon completion of the work, the devices shall be repaired or replaced so that they meet the required standards prior to turnover.
5. When performing any cutting, removal, creating opening or holes, etc., the Trade Contractor, by use of barricades, flagmen, or other means, shall provide protective measures to assure that other workmen or the public are not exposed to potential injury by the operation being conducted.
6. The Trade Contractor shall be responsible for handling and transporting (including lifting) his material and equipment to the location of need in a timely manner.
7. Any vertical lifting device, whether stationary material hoist, mobile crane or other means, a Trade Contractor plans to use will be implemented only after prior coordination and approval of the Construction Manager.

1.18 DUST CONTROL

A. Execute Work by methods to minimize raising dust from construction operations.

B. Provide positive means to prevent air-borne dust from dispersing into atmosphere.

1.19 NOISE CONTROL

A. Provide methods, means, and facilities to minimize noise from noise produced by construction operations.

1.20 PEST CONTROL

A. Provide methods, means, and facilities to prevent pests and insects from entering the facility.

1.21 POLLUTION CONTROL

A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

1.22 RODENT CONTROL

A. Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

1.23 HOUSEKEEPING - CLEANING AND RUBBISH REMOVAL

A. Each Trade Contractor shall be responsible for daily and final cleanup and continuous removal of all rubbish and debris from the building and site. The Construction Manager shall provide, erect, locate, and maintain a rubbish chute and/or rubbish collection dumpster system for use of all trades. Each Trade Contractor shall be responsible to deposit his daily rubbish into these chutes or dumpster locations as designated and provided by the Construction Manager. Failure of a Trade Contractor to do so will require that this be done by the Construction Manager after proper notice to the Trade Contractor and labor for doing so shall be charged to the responsible Trade Contractor

B. The jobsite shall be maintained in a neat orderly condition and kept free from accumulations of waste materials and rubbish during the entire construction period. Trade Contractor will remove all crates, cartons and other flammable waste materials or trash from the work areas at the end of each working day.

C. Elevator shafts, electrical closets, pipe and duct shafts, chases, furred spaces and similar spaces

which are generally unfinished, shall be cleaned and left free from rubbish, loose plaster, mortar drippings, extraneous construction materials, dirt and dust before substantial completion review.

D. Each Trade Contractor shall be responsible for cleaning all surfaces as necessary to make them free of spatters or other deposits of paint, plaster, mortar, concrete, adhesives, roofing, dirt, soil, oil, or any other material foreign to the surface involved. The Construction Manager shall back-charge to the guilty party the cost of cleaning which is required by accidental soiling or damage by another Trade Contractor.

E. Each Trade Contractor is responsible to share the task of litter cleanup (e.g., coffee cups, lunch wrappers, etc.).

F. However, to insure proper cleanup, notwithstanding the Trade Contractor's obligations to cleanup any debris resulting from his own operations, and following proper notices the Construction Manager will undertake the cleanup and disposal of litter and other debris whose source is unidentifiable. The cost of this special cleanup detail will be assessed weekly against all Trade Contractors on a per capita basis and invoiced monthly. If any cleanup invoice is not paid within thirty (30) days, it will be back-charged against the respective Trade Contractor's monthly payment application.

G. The Trade Contractor shall be responsible to maintain his own trailer, storage and work areas in a sanitary condition to minimize the hazard of attracting vermin and breeding mosquitoes. If the Trade Contractor fails to comply, the Construction Manager may do so, and the cost thereof shall be charged to the Trade Contractor. Rodent extermination materials shall be those approved by the local health department or other agency having jurisdiction.

H. Use only cleaning materials and methods recommended by manufacturer of surface to be cleaned. Use cleaning materials only on surfaces recommended by cleaning material manufacturer. Each Trade Contractor shall be responsible for assuring that affected employees are provided with, and required to use, all needed personal protective devices in connection with cleaning.

I. At completion of work, each Trade Contractor shall remove tools, equipment, machinery, and surplus materials from the project site and perform whatever additional cleaning is specified in the Proposal Form.

J. Vehicle cleaning - Trucking

1. The Construction Manager (on the Site Utilization Plan) will designate the wash-down area to be utilized by the Trade Contractors. The "wheel wash station" will be equipped with a hose connection and drainage area. The Trade Contractor shall provide manpower, hose and other supplemental scrapers, brushes, etc., which may be required to satisfactorily clean his vehicles leaving the site. The construction of this temporary facility may be included in the "Scope of Work" of the excavation or site Preparation Proposal Package, Review scope of work carefully.
2. All vehicles shall be cleaned of all mud and debris before leaving the site. Each Trade Contractor shall be responsible for providing whatever personnel may be required to perform the required vehicle cleaning throughout the progress of his work. The wash-down area shall not be used for cleaning out of concrete mix trucks.
3. Cleaning of concrete equipment shall be performed at locations designated by the Construction Manager. Cleaning shall be conducted in such a manner as to prevent spillage of fluid or concrete to the ground or penetration of existing ground soil. The responsible Trade Contractor shall remove from the site all residues accumulated from the cleaning operations of concrete equipment..
4. All trucks leaving the site with earthen materials or loose debris shall be loaded in a manner that will prevent dropping of materials on streets, and when necessary, shall have suitable coverings fastened over the load before they enter surrounding paved streets. Trucks bringing earthen materials over paved streets to the site shall be similarly loaded and covered. The Trade Contractor shall conform to all local regulations regarding load limits and be responsible for any costs due to failure to comply with the above.

1.24 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.

B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.

C. Clean and repair damage caused by installation or use of temporary work.

D. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

END OF SECTION 01500

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SECTION 01630 - SUBSTITUTIONS

CONDITIONS OF THE CONTRACT AND DIVISION 1, as indexed, apply to this Section

PART 1 – GENERAL

1.1 SCO PE

A. Comply with all requirements of the Contract Documents, including, but not limited to, specified sizes, dimensions, materials, finishes, products, manufacturers, suppliers, brands, processes, procedures, tolerances, sequences, etc.
B. If, for some reason, all the multiple requirements cannot be met and the Bidder/proposer wishes to request a substitution of products in place of those specified, the Bidder/proposer or Contractor may make a formal request to the Architect for consideration.
C. Substitution of products considered and accepted by the Owner and Architect will be included in addenda prior to the proposal date. Request must be made at least ten (10) days prior to the proposal date to be included in addenda.

1.2 BIDDER/PROPOSER or CONTRACTOR

A. By making requests for substitutions the Bidder/proposer represents that he has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified.
B. The Bidder/proposer represents that the Contractor will provide the same warranty for the substitute product that the Contractor would have provided for the specified product.
C. The Bidder/proposer certifies that the cost data presented is complete and includes all related costs under this Contract except the Architect's redesign cost and waives all claims for additional costs related to the substitution that subsequently become apparent.
D. The Bidder/proposer will coordinate the installation of the accepted substitute, make such changes as may be required for the Work to be completed in all respects.
E. The Bidder/proposer will notify the Architect of any space accommodations required by a substitution.
F. The Bidder/proposer will notify the Architect of any known disadvantage as compared to the specified item.
G. The Bidder/proposer will submit justifying data on which the Architect can base a decision.

1.3 AR CHITECTS DUTIES AND RESPONSIBILITIES

A. The Architect has no obligation to entertain any proposed substitution unless the Contract can not be fulfilled under the original requirements.
B. The Architect will analyze only proposed substitutions that he perceives likely to benefit the Owner by lower costs, improved quality or saving time.

1.4 PROPOSED SUBSTITUTIONS DURING PROPOSAL PERIOD

A. Request must be submitted to the Architect in sufficient time before the proposal date to permit evaluation and notifying Bidder/proposers, if approved. This time is a minimum of ten (10) day prior to proposal date.

B. Substitutions, if approved, will be by written Addenda to all Bidder/proposers. No oral, telephonic, or other method will be used to acknowledge accepted substitutions. If it is not in an addenda it is not acceptable to include it in a proposal.

1.5 PROPOSED SUBSTITUTIONS AFTER CONTRACT AWARD

A. Must be submitted so as not to interfere with the completion of the Work, and within 30 days after the Contract Date, except for emergencies.

B. Substitutions, if approved, will be by Change Order.

1.6 VOLUNT ARY ALTERNATE PROPOSAL SUBSTITUTIONS

A. Will not be accepted. Additions of such voluntary alternate proposals to the Proposal may make the proposal void.

END OF SECTION 01630

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SECTION 01700 – CONTRACT CLOSEOUT

PART 1 -GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout including, but not limited to, the following:
    a. Inspection procedures.
    b. Project record document submittal.
    c. Operation and maintenance manual submittal.
    d. Submittal of warranties.
    e. Final cleaning.
B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 16.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
    a. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
    b. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
    c. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
    d. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
    e. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
    f. Complete startup testing of systems.
    g. Submit test/adjust/balance records.
    h. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
B. Inspection Procedures: Submit a written request for inspection for Substantial Completion. On receipt of a request for inspection, the Engineer will either proceed with inspection or advise the Contractor of unfilled requirements. The Engineer will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
    a. The Engineer will repeat inspection when requested and assured that the Work is

substantially complete.

b. Results of the completed inspection will form the basis of requirements for final acceptance.

1.4 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
    a. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.
    b. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
    c. Submit consent of surety to final payment.
    d. Submit a final liquidated damages settlement statement, if applicable.
B. Inspection and Re-inspection Procedure:
    a. Submit a written request for final inspection for acceptance. Submit a copy of the Punch List with item-by-item signed certification that each item has been completed. Where work is not complete and cannot be completed expeditiously for reasons beyond Contractor control, list reasons why such work items are not complete.
    b. The Engineer will re-inspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Engineer.
    c. Upon completion of first re-inspection, if all deficiencies have been adequately corrected, the Engineer will prepare a certificate of final acceptance. If the Work is incomplete, the Engineer will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
    d. If subsequent re-inspection(s) is necessary, the previous process will be repeated. Contractor will reimburse Engineer at a rate of $120 per hour for all re-inspections, including travel time.

1.5 RECORD DOCUMENT SUBMITTALS

A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the Engineer's reference during normal working hours.
B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
    a. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.

b. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.
c. Note related change-order numbers where applicable.

C. Maintenance Manuals: Organize operation and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual, heavy-duty, 2-inch (51-mm) , 3-ring, vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:
    a. Emergency instructions.
    b. Spare parts list.
    c. Copies of warranties.
    d. Wiring diagrams.
    e. Inspection procedures.
    f. Shop Drawings and Product Data.

PART 2 -PRODUCTS (Not Applicable)

PART 3 -EXECUTION

3.1 CLOSEOUT PROCEDURES

A. Operation and Maintenance Instructions: Arrange for each Installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. Provide instruction by manufacturer's representatives if installers are not experienced in operation and maintenance procedures. Include a detailed review of the following items:
    a. Maintenance manuals.
    b. Record documents.
    c. Spare parts and materials.
    d. Tools.
    e. Lubricants.
    f. Fuels.
    g. Identification systems.
    h. Control sequences.
    i. Hazards.
    j. Cleaning.
    k. Warranties and bonds.
    l. Maintenance agreements and similar continuing commitments.

B. As part of instruction for operating equipment, demonstrate the following procedures:
    a. Startup.
    b. Shutdown.
    c. Emergency operations.
    d. Noise and vibration adjustments.
    e. Safety procedures.
    f. Economy and efficiency adjustments.
    g. Effective energy utilization.

3.2 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
    a. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
        i. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
        ii. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
        iii. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
        iv. Remove tools, construction equipment, machinery, and surplus material from Project site.
        v. Remove snow and ice to provide safe access to building.
        vi. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
        vii. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
        viii. Sweep concrete floors broom clean in unoccupied spaces.
        ix. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
        x. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
        xi. Remove labels that are not permanent.
        xii. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
        xiii. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
        xiv. Provide touch-up paint to scratched or marred surfaces. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
        xv. Replace parts subject to unusual operating conditions.
        xvi. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

xvii. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

xviii. Clean ducts, blowers, and coils if units were operated without filters during construction.

xix. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

xx. Leave Project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01700

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SECTION 01710 – GUARANTEES & CERTIFICATES & CLOSE-OUT

CONDITIONS OF THE CONTRACT AND DIVISION 1, as indexed, apply to this Section.

PART 1 - GENERAL

1.1 SCOPE

A. Contractor shall be responsible for and make good without extra charge any defects due to faults in labor or material on all parts of the Contract for one year (and longer where noted) after Substantial Completion of the Work as defined in the General Conditions.

B. Property not in the Contract but damaged due to defects, shall be repaired or replaced by the Contractor without extra charge.

C. When notified by the Owner or Architect that a defect exists and there is a doubt that the defect might be normal maintenance or a result of lack of normal maintenance, the Owner will send a representative with the Contractor's representative to determine responsibility. Owner will not pay for such service calls if the defect is judged to be normal maintenance or a result of a lack of normal maintenance.

D. Neither the Final Certificate of Payment or payment of same, nor provision in the Contract Documents shall relieve the Contractor of the responsibility for negligence or faulty materials or workmanship within the extent and period provided by law and upon written notice, he shall remedy any defects due thereto and pay all expenses for any damage to other Work resulting there from. This guarantee of Work shall not relieve the Contractor of obligations of any Work not according to Plans and Specifications regardless of time of discovery.

1.2 WARRANTY

A. In addition to the General Contractor's one-year warranty, guarantees shall be submitted to the Architect in duplicate prior to application for final payment. Unless specified otherwise in their respective sections, all guarantees shall be for a period of one year from the date of Substantial Completion as evidenced by the Architect's Certificate of Substantial Completion. All guarantees shall include all labor, material and delivery costs required to correct defective material or installation. Guarantees include but are not limited to:
1. Built-up Roofing (20-year)
2. Custom Hollow Metal
3. Dampproofing and Waterproofing (2-year)
4. Sealants (2-year)

B. Refer to Section 01630 for substitutions.

1.3 SUBST ANTIAL COMPLETION AND CLOSE-OUT

A. On or about the end of the project, the following items shall be performed in order to achieve Substantial Completion and project close-out:
1. Contractor submits a thorough list of items to be completed or corrected (Punch List), along with a written request for Substantial Completion and inspection of the work.
2. The Architect and Engineer will inspect the project utilizing the Contractor's prepared Punch List, noting completed or incomplete items, and prepare a supplemental list of items that have been omitted or incomplete items that were not previously noted. The Architect's Project Representative, at his discretion, may attend and assist in the preparation of the Contractor's punch list.

3. Contractor completes corrections, and Architect and Engineer re-inspect (with Owner) to establish Date of Substantial Completion. **Note:** Any items remaining on date of Substantial Completion are appended to Certificate (AIA G-704).
4. After the Certificate of Substantial Completion has been executed by all parties, it is returned to the Architect. Items on the appended Punch List are to be completed or corrected within the time limits established in the Certificate of Substantial Completion.
5. Final Change Order executed (including allowance adjustments).
6. Contractor submits written notice that work is ready for final inspection and acceptance, and shall specifically note each item on the Punch List as being complete or the status of any incomplete item.
7. Contractor submits Final Application for Payment and a Certificate of Compliance, which indicates the following:
   a. All Permit Numbers
   b. Utility Release Dates
   c. The building has been duly inspected and found to comply with all code requirements and ordinances.
   d. A Certificate of Occupancy has been issued.
8. A-E (with Owner) make final inspection
9. Contractor submits additional final items:
   a. Consent of Surety to Final Payment (AIA G-707)
   b. Contractor's Affidavit of Payment of Debts and Claims (AIA G-706)
   c. Contractor's Affidavit of Release of Liens (AIA G-706A with contractors, subcontractors and suppliers separate releases)
   d. General Contractor's Guarantee
   e. Subcontractors' Guarantees.
   f. Maintenance and Instruction Manuals. All manuals will contain an index listing the information submitted. The index sections will be divided and identified by tabbing each section as listed in the index.
   g. Record Drawings (reproducible sepias)
   h. Final List of Subcontractors (AIA G-805)
   i. Affidavits from Contractor Subcontractors and suppliers stating that no asbestos products have been installed in this project.
   j. Furnish written warranties to the Owner including specific items in each product warranty stipulated for individual sections.
   k. Documents identified as "affidavit" must be notarized.
10. Final Cleaning:
    a. The work area shall be thoroughly cleaned inside and outside. Cleaning includes removal of smudges, marks, stains, fingerprints, soil, dirt, spots, dust, lint, and other foreign materials from finished and exposed surfaces.
    b. Remove all temporary facilities.

B. All close-out documents shall be submitted in three ring binders with index tabs, detailed Table of Contents and page numbers. The close-out documents must be neatly organized and easily useable, as determined by the Architect and Owner.

C. Final release of retainage will not be certified by the Architect until the Contractor completes all of the above mentioned requirements.

D. Terminal Inspection:
1. Immediately prior to expiration of the one-year guarantee period, the Contractor shall make an inspection of the work in the company of the Architect and the Owner. The Architect and the Owner shall be given not less than ten (10) days notice prior to the anticipated date of terminal inspection.
2. Where any portion of the work has proven to be defective and requires replacement, repair or adjustment, the Contractor shall immediately provide materials and labor necessary to remedy such defective work, and shall execute such work without delay until completed to the satisfaction of the Architect and the Owner, even though the date of completion of the corrective work may extend beyond the expiration date of the guarantee period.

3. The Contractor shall not be responsible for correction of work which has been damaged because of neglect or abuse by the Owner, nor the replacement of parts necessitated by normal wear in use.

END OF SECTION 01710

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SECTION 01730 – OPERATION AND MAINTENANCE DATA

PART 1 -GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
    a. Operation and maintenance documentation directory.
    b. Operation manuals for systems, subsystems, and equipment.
    c. Maintenance manuals for the care and maintenance of products, materials, finishes, systems and equipment.

1.3 DEFINITIONS

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

1.4 SUBMITTALS

A. Initial Submittal: Submit draft copy of each manual at least 15 days before requesting inspection for Substantial Completion. Include a complete operation and maintenance directory. Engineer will return draft and mark whether general scope and content of manual are acceptable.
B. Final Submittal: Submit 1 copy of each manual in final form at least 15 days before final inspection. Engineer will return copy with comments within 15 days after final inspection.
    a. Correct or modify each manual to comply with Engineer's comments. Submit 2 copies of each corrected manual within 15 days of receipt of Engineer's comments.

1.5 COORDINATION

A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 -PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Organization: Include a section in the directory for each of the following:

a. List of documents.
b. List of systems.
c. List of equipment.
d. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with the same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 MANUALS, GENERAL

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
    a. Title page.
    b. Table of contents.
    c. Manual contents.
B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:
    a. Subject matter included in manual.
    b. Name and address of Project.
    c. Name and address of Owner.
    d. Date of submittal.
    e. Name, address, and telephone number of Contractor.
    f. Name and address of Engineer.
    g. Cross-reference to related systems in other operation and maintenance manuals.
C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
    a. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
    a. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
        i. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
        ii. Identify each binder on front and spine, with printed title "OPERATION

AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

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

2.3 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
    a. System, subsystem, and equipment descriptions.
    b. Performance and design criteria if Contractor is delegated design responsibility.
    c. Operating standards.
    d. Operating procedures.
    e. Operating logs.
    f. Wiring diagrams.
    g. Control diagrams.
    h. Precautions against improper use.
    i. License requirements including inspection and renewal dates.
B. Descriptions: Include the following:
    a. Product name and model number.
    b. Manufacturer's name.
    c. Equipment identification with serial number of each component.
    d. Equipment function.
    e. Operating characteristics.
    f. Limiting conditions.
    g. Performance curves.
    h. Engineering data and tests.
    i. Complete nomenclature and number of replacement parts.
C. Operating Procedures: Include the following, as applicable:
    a. Startup procedures.
    b. Equipment or system break-in procedures.
    c. Routine and normal operating instructions.
    d. Regulation and control procedures.
    e. Instructions on stopping.
    f. Normal shutdown instructions.
    g. Seasonal and weekend operating instructions.
    h. Required sequences for electric or electronic systems.
    i. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.4 PRODUCT MAINTENANCE MANUAL

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

2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
B. Source Information: List each system, subsystem, and piece of equipment included in the manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
    a. Standard printed maintenance instructions and bulletins.
    b. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
    c. Identification and nomenclature of parts and components.
    d. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
    a. Test and inspection instructions.
    b. Troubleshooting guide.
    c. Precautions against improper maintenance.
    d. Disassembly; component removal, repair, and replacement; and reassembly instructions.
    e. Aligning, adjusting, and checking instructions.
    f. Demonstration and training videotape, if available.
E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
    a. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
    b. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
    a. Include procedures to follow and required notifications for warranty claims.

PART 3 -EXECUTION

3.1 MANUAL PREPARATION

A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
B. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
    a. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
    b. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
C. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
    a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
D. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence

and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.

a. Do not use original Project Record Documents as part of operation and maintenance manuals.
b. Comply with requirements of newly prepared Record Drawings in Division 1 Section "Project Record Documents."

E. Comply with Division 1 Section "Closeout Procedures" for the schedule for submitting operation and maintenance documentation.

END OF SECTION 01730

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SECTION 01731 – CUTTING AND PATCHING

PART 1 -GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for cutting and patching.

1.3 DEFINITIONS

A. Cutting: Removal of existing construction necessary to permit installation or performance of other Work.
B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.4 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would change their load-carrying capacity or load-deflection ratio.
    a. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:
        i. Structural concrete.
        ii. Structural steel.
        iii. Lintels.
        iv. Structural decking.
B. Operational Limitations: Do not cut and patch operating elements or related components in a manner that would result in reducing their capacity to perform as intended. Do not cut and patch operating elements or related components in a manner that would result in increased maintenance or decreased operational life or safety.
C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities. Do not cut and patch construction in a manner that would result in visual evidence of cutting and patching. Remove and replace construction cut and patched in a visually unsatisfactory manner.

1.5 WARRANTY

A. Existing Warranties: Replace, patch, and repair material and surfaces cut or damaged by methods and with materials in such a manner as not to void any warranties required or existing.

PART 2 -PRODUCTS

2.1 MATERIALS, GENERAL

A. Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible if identical materials are unavailable or cannot be used. Use materials whose installed performance will equal or surpass that of existing materials.
B. Plaster: Comply with ASTM C 842.
    a. Base Coat: Ready-mixed, sand aggregate gypsum plaster base.
    b. Finish Coat: Ready-mixed gypsum finish plaster.

PART 3 -EXECUTION

3.1 INSPECTION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed before cutting. If unsafe or unsatisfactory conditions are encountered, take corrective action before proceeding.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of work to be cut.
B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.
C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
D. Avoid cutting existing pipe, conduit, or ductwork serving the building but scheduled to be removed or relocated until provisions have been made to bypass them.

3.3 PERFORMANCE

A. General: Surfaces, structures, equipment, walls, ceilings, or other elements which are left with holes, scratches, gashes, dents, or other damage as a result of work of this contract must be patched, regardless of whether specifically indicated in drawings or not.
B. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
    a. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.
C. Cutting: Cut existing construction using methods least likely to damage elements retained or adjoining construction. Where possible, review proposed procedures with the original Installer; comply with the original Installer's recommendations.
    a. In general, where cutting, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
    b. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

c. Cut through concrete and masonry using a cutting machine, such as a Carborundum saw or a diamond-core drill.
d. Comply with requirements of applicable Division 2 Sections where cutting and patching requires excavating and backfilling.
e. Where services are required to be removed, relocated, or abandoned, by-pass utility services, such as pipe or conduit, before cutting. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.

D. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
   a. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
   b. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
   c. Where removing walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
      i. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing the patch after the area has received primer and second coat.
   d. Patch, repair, or re-hang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

E. Plaster Installation: Comply with manufacturer's instructions and install thickness and coats as indicated.
   a. Unless otherwise indicated, provide 3-coat work.
   b. Finish gypsum plaster to match existing adjacent surfaces. Sand lightly to remove trowel marks and arrises.
   c. Cut, patch, point-up, and repair plaster to accommodate other construction.

3.4 CLEANING

A. Provide all necessary measures to protect flooring.
B. Replace all ceiling tiles damaged during construction process with new ones to match existing.
C. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar items. Thoroughly clean equipment, piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.

END OF SECTION 01731

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SECTION 01815 – TESTING, ADJUSTING, AND BALANCING (TAB)

CONDITIONS OF THE AGREEMENT, DIVISION 0, AND DIVISION 1, as indexed, apply to this Section.

PART 1 - GENERAL

1.25 SUBSTITUTION

A. Refer to Section 01630 Substitutions for substitutions.

1.26 SCOPE

A. This section provides for testing, adjusting, and balancing of the mechanical system. Testing, Adjusting and Balancing shall be performed in accordance with ASHRAE - 1991 HVAC Applications: Chapter 34, Testing, Adjusting and Balancing.

B. The work shall be performed by a certified member of the Associated Air Balance Council (AABC).

1.3 SUBMITTALS

A. Test Reports
1. Submit test report forms for review minimum 90 days prior to requesting final review by A/E.
2. Furnish six individually bound copies of test data. Neatly type and arrange data. Include with the data the date tested, personnel present, weather conditions, nameplate record of test instrument and list all measurements taken, both prior to and after any corrections are made to the system. Record all failures and corrective action taken to remedy incorrect situation.
3. A/E will retain one copy. Remaining copies will be returned for inclusion in operation and maintenance manuals. Refer to Section 15052.
4. Submit draft copies of report for review prior to final acceptance of project. Provide final copies for A/E and for inclusion in operating and maintenance manuals.

B. Include a set of reduced drawings with air outlets and equipment identified to correspond with data sheets and indicating thermostat locations.

1.4 REFERENCES

A. AABC - National Standards for Field Measurement and Instrumentation, Total System Balance.

B. ASHRAE - 1991 HVAC Applications Handbook: Chapter 34, Testing, Adjusting and Balancing.

1.5 SYSTEM BALANCING

A. Quality Assurance
1. Company specializing in the testing, adjusting and balancing of systems specified with a minimum of three years of documented experience and a member in good standing, certified to perform services, of the AABC. Perform work under supervision of AABC Certified Test and Balance Engineer.

2. Perform total system balance in accordance with AABC National Standards for Field Measurement and Instrumentation, Total System Balance.

B. General
1. Conform to the specifications which include, but are not limited to, the following:
   a. Air and water flows balanced to specified quantities.
   b. Temperature regulation verification by hourly readings for three consecutive eight-hour days.
   c. Three inspections within 90 days of occupancy for temperature verification.
   d. Opposite season adjustment of systems.

C. Submit reports on AABC National Standards for Total System Balance forms and include the following information:
1. Title Page
   a. Company name.
   b. Company address.
   c. Company telephone number.
   d. Project name.
   e. Project location.
   f. Project A/E.
   g. Project Contractor.
   h. Project altitude.
2. Air Moving Equipment
   a. Location.
   b. Manufacturer.
   c. Model.
   d. Air flow, specified and actual.
   e. Return air flow, specified and actual.
   f. Outside air flow, specified and actual.
   g. Total static pressure (total external), specified and actual.
   h. Inlet pressure.
   i. Discharge pressure.
   j. Fan RPM.
3. Fan Data
   a. Location.
   b. Manufacturer.
   c. Model.
   d. Air flow, specified and actual.
   e. Total static pressure (total external), specified and actual.
   f. Inlet pressure.
   g. Discharge pressure.
   h. Fan RPM.
4. Return Air/Outside Air Data
   a. Identification/location.
   b. Design air flow.
   c. Actual air flow.
   d. Design return air flow.
   e. Actual return air flow.
   f. Design outside air flow.
   g. Actual outside air flow.
   h. Return air temperature.
   i. Outside air temperature.
   j. Required mixed air temperature.

k. Actual mixed air temperature.
l. Design outside/return air ratio.
m. Actual outside/return air ratio.

5. Electric Motors
   a. Manufacturer.
   b. HP/BHP.
   c. Phase, voltage, amperage; nameplate, actual, no load.
   d. RPM.
   e. Service factor.
   f. Starter size, rating, heater elements.
   g. Exercise starters through its entire operating sequence.
6. V-Belt Drive
   a. Identification/location.
   b. Required driven RPM.
   c. Driven sheave, diameter and RPM.
   d. Belt, size and quantity.
   e. Motor sheave, diameter and RPM.
   f. Center-to-center distance, maximum, minimum and actual.
7. Duct Traverse
   a. System zone/branch.
   b. Duct size.
   c. Area.
   d. Design velocity.
   e. Design air flow.
   f. Test velocity.
   g. Test air flow.
   h. Duct static pressure.
   i. Air temperature.
   j. Air correction factor.
8. Air Distribution Test Sheet
   a. Air terminal number.
   b. Room number/location.
   c. Terminal type.
   d. Terminal size.
   e. Area factor (as tested in the field).
   f. Design velocity.
   g. Design air flow.
   h. Test (final) velocity.
   i. Test (final) air flow.
   j. Percent of design air flow.
9. Pump Data
   a. Identification/number.
   b. Manufacturer.
   c. Size/model.
   d. Impeller.
   e. Service.
   f. Design flow rate, pressure drop, BHP.
   g. Actual flow rate, pressure drop, BHP.
   h. Discharge pressure.
   i. Suction pressure.
   j. Total operating head pressure.
   k. Shut off, discharge and suction pressure.

l. Shut off, total head pressure.

10. Chemical Water Treatment: Certify that chemical treatment systems are acceptable and meet requirements of local ordinances.

11. Chillers
    a. Identification/number.
    b. Manufacturer.
    c. Capacity.
    d. Model.
    e. Evaporator entering water temperature, design and actual.
    f. Evaporator leaving water temperature, design and actual.
    g. Evaporator pressure drop, design and actual.
    h. Evaporator water flow rate, design and actual.
    i. Condenser entering air temperature, design and actual.
12. Cooling Coil Data
    a. Identification/number.
    b. Location.
    c. Service.
    d. Manufacturer.
    e. Air flow, design and actual.
    f. Entering air DB temperature, design and actual.
    g. Entering air WB temperature, design and actual.
    h. Leaving air DB temperature, design and actual.
    i. Leaving air WB temperature, design and actual.
    j. Water flow, design and actual.
    k. Water pressure drop, design and actual.
    l. Entering water temperature, design and actual.
    m. Leaving water temperature, design and actual.
    n. Air pressure drop, design and actual.
13. Heating Coil Data
    a. Identification/number.
    b. Location.
    c. Service.
    d. Manufacturer.
    e. Air flow, design and actual.
    f. Water flow, design and actual.
    g. Water pressure drop, design and actual.
    h. Entering water temperature, design and actual.
    i. Leaving water temperature, design and actual.
    j. Entering air temperature, design and actual.
    k. Leaving air temperature, design and actual.
    l. Air pressure drop, design and actual.

14. Sound Level Report
    a. Location.
    b. Octave bands - equipment off.
    c. Octave bands - equipment on.
15. Vibration Tests
    a. Location of Points
        1) Fan bearing, drive end.
        2) Fan bearing, opposite end.

3) Motor bearing, center (if applicable).
4) Motor bearing, drive end.
5) Motor bearing, opposite end.
6) Casing (bottom or top).
7) Casing (side).
8) Duct after flexible connection (discharge).
9) Duct after flexible connection (suction).

b. Test Readings
1) Horizontal, velocity and displacement.
2) Vertical, velocity and displacement.
3) Axial, velocity and displacement.
c. Normally acceptable readings, velocity and acceleration.
d. Unusual conditions at time of test.
e. Vibration source (if non-complying).

16. Duct Leak Test
a. Description of ductwork under test.
b. Duct design operating pressure.
c. Duct design test static pressure.
d. Duct capacity, air flow.
e. Maximum allowable leakage duct capacity times leak factor.
f. Test Apparatus
1) Blower.
2) Orifice, tube size.
3) Orifice size.
4) Calibrated.
g. Test static pressure.
h. Test orifice differential pressure.
i. Leakage.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.1 PREPARATION

A. Furnish proposed test procedures, recording forms, list of personnel and test equipment for A/E review.

B. Follow recommended procedures for testing as published by test equipment manufacturer.

C. Provide instruments required for testing, adjusting and balancing operations. Make instruments available to A/E to facilitate spot checks during testing.

D. Provide any additional balancing devices required for complete system balancing.

3.2 AIR DISTRIBUTION SYSTEM

A. Installation Tolerances

1. Adjust air handling systems to scheduled values plus or minus 5 percent for supply systems and plus or minus 10 percent for return and exhaust systems.

B. Test Procedures

1. Adjust all new air handling and distribution systems to provide design supply, return, and exhaust air quantities.
2. Make air quantity measurements in ducts by pitot tube traverse of entire cross sectional area of duct.
3. Measure air quantities at air inlets and outlets.
4. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.
5. Use volume control devices to regulate air quantities only to extent that adjustments do not create objectionable air motion or sound levels. Control volume by internal duct devices such as dampers and splitters.
6. Vary total system air quantities by adjustment of sheaves. Provide drive changes required. Vary branch air quantities by damper regulation.
7. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.
8. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.
9. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
10. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.
11. Where modulating dampers are provided, take measurements and balance at extreme conditions.
12. Measure building static pressure and adjust supply, return, and exhaust air systems to provide required relationship between each to maintain positive static pressure near the building entries to outside (not to exceed 0.05 inches).
13. Constant volume systems shall be tested as follows:
    a. Test run fan/motor combinations, volume dampers and controls.
    b. Maximum Allowable Damper Leakage: 2 percent of design air flow at inlet static pressure.
    c. Set volume with damper operator attached to assembly allowing modulation from 100 percent of design cooling air flow to 100 percent design heating air flow.
    d. Check control sequence.
    e. Provide record data that represents actually measured, or observed condition.
    f. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
    g. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
    h. Leave systems in proper working order, replace adjustable sheaves with permanent fixed position sheaves, replace belt guards, closing access doors, and restoring thermostats to specified settings.
    i. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by A/E.
    j. Check and adjust systems for opposite season performance approximately six months after final acceptance and submit report.

3.2 HYDRONIC SYSTEM BALANCING

A. Adjust all new and existing water systems to provide required or design quantities.

B. Use calibrated metered fittings and pressure gauges to determine flow rates for system balance. Where flow metering devices are not installed, base flow balance on temperature difference across various heat transfer elements in the system.

C. Adjust systems to provide specified pressure drops and flows through heat transfer elements prior to thermal testing. Perform balancing by measurement of temperature differential in conjunction with air balancing.

D. Balance system with automatic control valves fully open to heat transfer elements.

E. Adjust water distribution systems by means of balancing cocks, valves, and fittings. Do not use service or shut-off valves for balancing unless indexed for balance point. Adjust hydronic systems to plus or minus 10 percent of design conditions indicated.

F. Where available pump capacity is less than total flow requirements or individual system parts, full flow in one part may be simulated by temporary restriction of flow to other parts.

3.3 EQUIPMENT TESTS

A. Record the following hot water coil performance data:
1. Air entering/leaving; dry bulb temperatures.
2. Water entering/leaving temperature.

B. Record the following cooling coil performance:
1. Air entering/leaving; wet and dry bulb temperatures.
2. Water entering/leaving temperatures.
3. Suction/liquid line temperatures.

3.4 EQUIPMENT POWER READINGS

A. Record the following information for each motor:
1. Equipment designation.
2. Manufacturer.
3. Unit model number and serial number.
4. Motor nameplates horsepower; nameplate voltage; phase and full load amperes.
5. Heater coil in starter.
   a. Raising in amperes.
   b. Manufacturer's recommendation.
6. Motor RPM/driven equipment RPM.
7. Power reading (voltage, amperes of all legs at motor terminals).

3.5 BOILERS

A. Check for proper operation and with operation at near design conditions, record the following:
1. Manufacturer, model number, serial number and nameplate.
2. Water flow in GPM, entering and leaving water temperature and water pressure drop in feet.
3. Type of fuel and heating value.
4. Rate of fuel consumption.
5. Capacity in MBH.

B. Observe demonstration that all controls and safety devices are functioning properly. Record observations.

3.7 CHILLERS

A. Balance flow of water through each evaporator to be within a range of 100 percent to 110 percent of design flow with all pumps operating. With only one pump operating, the maximum flow shall not exceed the maximum tube velocity recommended by the manufacturer.

B. Observe demonstration that all safety interlocks and controls are functioning properly. Record observations.

C. With each chiller operating at near design temperature conditions, measure and record the following:
1. Manufacturer, model number, serial number, and all nameplate data.
2. Evaporator water entering temperature, leaving temperature, pressure drop (ft.) and GPM.
3. Evaporator refrigerant temperatures and pressures (using instruments furnished with the machine by the manufacturer).
4. Volts and amps for each phase.
5. Power factor.
6. Condenser air entering temperature and leaving temperature.

END OF SECTION 01815

North County Annex
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SECTION 15050 – BASIC MECHANICAL MATERIALS AND METHODS

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 the following basic mechanical materials and methods to complement other Division 15 Sections.
    a. Piping materials and installation instructions common to most piping systems.
    b. Concrete base construction requirements.
    c. Escutcheons.
    d. Dielectric fittings.
    e. Flexible connectors.
    f. Mechanical sleeve seals.
    g. Equipment nameplate data requirements.
    h. Labeling and identifying mechanical systems and equipment is specified in Division 15 Section "Mechanical Identification."
    i. Nonshrink grout for equipment installations.
    j. Field-fabricated metal and wood equipment supports.
    k. Installation requirements common to equipment specification sections.
    l. Mechanical demolition.
    m. Cutting and patching.
    n. Touchup painting and finishing.
    o. Mechanical identification.
B. Pipe and pipe fitting materials are specified in Division 15 piping system Sections.

1.3 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawl spaces, and tunnels.
B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
C. Exposed, Exterior Installations: Exposed to view outdoors, or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.
E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants, but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.
F. The following are industry abbreviations for plastic materials:
    a. HDPE: High Density Polyethylene plastic.
    b. CPVC: Chlorinated polyvinyl chloride plastic.
    c. PE: Polyethylene plastic.
    d. PVC: Polyvinyl chloride plastic.

G. The following are industry abbreviations for rubber materials:
   a. CR: Chlorosulfonated polyethylene synthetic rubber.
   b. EPDM: Ethylene propylene diene terpolymer rubber.

1.4 QUALITY ASSURANCE

A. Comply with ASME A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.
B. Equipment Selection: Equipment of higher electrical characteristics, physical dimensions, capacities, and ratings may be furnished provided such proposed equipment is approved in writing and connecting mechanical and electrical services, circuit breakers, conduit, motors, bases, and equipment spaces are increased. Additional costs shall be approved in advance by appropriate Contract Modification for these increases. If minimum energy ratings or efficiencies of equipment are specified, equipment must meet design and commissioning requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and prevent entrance of dirt, debris, and moisture.
B. Protect stored pipes and tubes from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor, if stored inside.
C. Protect flanges, fittings, and piping specialties from moisture and dirt.
D. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

1.6 SEQUENCING AND SCHEDULING

A. Coordinate mechanical equipment installation with other building components.
B. Arrange for pipe spaces, chases, slots, and openings in building structure during progress of construction to allow for mechanical installations.
C. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components, as they are constructed.
D. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work.
E. Coordinate installation of identifying devices after completing covering and painting, if devices are applied to surfaces. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 -PRODUCTS

2.1 PIPE AND PIPE FITTINGS

A. Refer to individual Division 15 piping Sections for pipe and fitting materials and joining methods.
B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.2 JOINING MATERIALS

A. Refer to individual Division 15 piping Sections for special joining materials not listed below.
B. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
    a. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch (3.2-mm) maximum thickness, unless thickness or specific material is indicated.
        i. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
        ii. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.
    b. AWWA C110, rubber, flat face, 1/8 inch (3.2 mm) thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.
C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.
D. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
E. Solder Filler Metals: ASTM B 32.
    a. Alloy Sn95 or Alloy Sn94: Approximately 95 percent tin and 5 percent silver, with 0.10 percent lead content.
    b. Alloy E: Approximately 95 percent tin and 5 percent copper, with 0.10 percent maximum lead content.
    c. Alloy HA: Tin-antimony-silver-copper zinc, with 0.10 percent maximum lead content.
    d. Alloy HB: Tin-antimony-silver-copper nickel, with 0.10 percent maximum lead content.
    e. Alloy Sb5: 95 percent tin and 5 percent antimony, with 0.20 percent maximum lead content.
F. Brazing Filler Metals: AWS A5.8.
    a. BCuP Series: Copper-phosphorus alloys.
    b. BAg1: Silver alloy.
G. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
H. Solvent Cements: Manufacturer's standard solvent cements for the following:
    a. ABS Piping: ASTM D 2235.
    b. CPVC Piping: ASTM F 493.
    c. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
    d. PVC to ABS Piping Transition: ASTM D 3138.
I. Plastic Pipe Seals: ASTM F 477, elastomeric gasket.
J. Flanged, Ductile-Iron Pipe Gasket, Bolts, and Nuts: AWWA C110, rubber gasket, carbon-steel bolts and nuts.

2.3 DIELECTRIC FITTINGS

A. General: Assembly or fitting with insulating material isolating joined dissimilar metals, to prevent galvanic action and stop corrosion.
B. Description: Combination of copper alloy and ferrous; threaded, solder, plain, and weld-neck end types and matching piping system materials.
C. Insulating Material: Suitable for system fluid, pressure, and temperature.
D. Dielectric Unions: Factory-fabricated, union assembly, for 125-psig minimum working pressure at 180 deg F .
E. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150-or 300-psig (1035-or 2070-kPa) minimum working pressure as required to suit system pressures.
F. Dielectric-Flange Insulation Kits: Field-assembled, companion-flange assembly, full-face or

ring type. Components include neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.

a. Provide separate companion flanges and steel bolts and nuts for 150-or 300-psig (1035or 2070-kPa) minimum working pressure as required to suit system pressures.

G. Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig (2070-kPa) minimum working pressure at 225 deg F (107 deg C).

H. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig (2070-kPa) minimum working pressure at 225 deg F (107 deg C) .

2.4 MECHANICAL SLEEVE SEALS

A. Description: Modular design, with interlocking rubber links shaped to continuously fill annular space between pipe and sleeve. Include connecting bolts and pressure plates.

2.5 PIPING SPECIALTIES

A. Sleeves: The following materials are for wall, floor, slab, and roof penetrations:
   a. For slab penetrations: PVC Pipe: ASTM D 1785, Schedule 40.
   b. For wall penetrations: Steel Pipe: ASTM A 53, Type E, Grade A, Schedule 40, galvanized, plain ends.

B. Escutcheons: Manufactured wall, ceiling, and floor plates; deep-pattern type if required to conceal protruding fittings and sleeves.
   a. ID: Closely fit around pipe, tube, and insulation of insulated piping.
   b. OD: Completely cover opening.
   c. Stamped Steel: Split plate, with concealed hinge, set screw, and chrome-plated finish.

2.6 GROUT

A. Non-shrink, Nonmetallic Grout: ASTM C 1107, Grade B.
   a. Characteristics: Post-hardening, volume-adjusting, dry, hydraulic-cement grout, nonstaining, non-corrosive, nongaseous, and recommended for interior and exterior applications.
   b. Design Mix: 5000-psig (34.5-MPa) , 28-day compressive strength.
   c. Packaging: Premixed and factory packaged.

2.7 MECHANICAL IDENTIFICATION

A. Equipment Nameplates: Metal permanently fastened to equipment with data engraved or stamped.
   a. Data: Manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and essential data.
   b. Location: Accessible and visible.
   c. Nameplates with typed lettering subject to fading will not be accepted .

B. Lettering: Manufacturer's standard preprinted captions.

C. Access Panel Markers: 1/16-inch-(2-mm-) thick, engraved plastic-laminate markers, with abbreviated terms and numbers corresponding to concealed valve. Provide 1/8-inch (3-mm) center hole for attachment.

D. Engraved Plastic-Laminate Signs: ASTM D 709, Type I, cellulose, paper-base, phenolic-

resinlaminate engraving stock; Grade ES-2, black surface, black phenolic core, with white melamine subcore, unless otherwise indicated. Fabricate in sizes required for message. Provide holes for mechanical fastening.

a. Engraving: Engraver's standard letter style, of sizes and with terms to match equipment identification.
b. Thickness: 1/16 inch (2 mm) , unless otherwise indicated.
c. Fasteners: Self-tapping, stainless-steel screws or contact-type, permanent adhesive.

E. Lettering and Graphics: Coordinate names, abbreviations, and other designations used in mechanical identification with corresponding designations indicated. Use numbers, letters, and terms indicated for proper identification, operation, and maintenance of mechanical systems and equipment.

PART 3 -EXECUTION

3.1 PIPING SYSTEMS -COMMON REQUIREMENTS

A. General: Install piping as described below, unless piping Sections specify otherwise. Individual Division 15 piping Sections specify unique piping installation requirements.
B. General Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated, unless deviations to layout are approved on Coordination Drawings.
C. Install piping at indicated slope.
D. Install components with pressure rating equal to or greater than system operating pressure.
E. Install piping in concealed interior and exterior locations, except in equipment rooms and service areas.
F. Install piping free of sags and bends, and with a minimum of elbows.
G. Install exposed interior and exterior piping at right angles or parallel to building walls. Diagonal runs are prohibited, unless otherwise indicated.
H. Install piping tight to slabs, beams, joists, columns, walls, and other building elements. Allow sufficient space above removable ceiling panels to allow for ceiling panel removal.
I. Install piping to allow application of insulation plus 1-inch (25-mm) clearance around insulation.
J. Locate groups of pipes parallel to each other, spaced to permit valve servicing.
K. Install fittings for changes in direction and branch connections.
L. Install couplings according to manufacturer's written instructions.
M. Install pipe escutcheons for pipe penetrations of concrete and masonry walls, wall board partitions, and suspended ceilings according to the following:
    a. Insulated and uninsulated Piping Wall Escutcheons: Cast brass or stamped steel, with set screw.
N. Install sleeves for pipes passing through future concrete floor slabs.
    a. Install sleeves large enough to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pipe or pipe insulation.
    b. Use the following sleeve materials:
        i. PVC Pipe Sleeves: For pipes smaller than 6-inch NPS (DN150) .
O. Aboveground, Exterior-Wall, Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Size sleeve for 1-inch (25-mm) annular clear space between pipe

and sleeve for installing mechanical sleeve seals.

a. Install steel pipe for sleeves smaller than 6 inches (150 mm) in diameter.
b. Assemble and install mechanical sleeve seals according to manufacturer's written instructions. Tighten bolts that cause rubber sealing elements to expand and make watertight seal.

P. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestopping materials. Refer to Division 7 Section "Firestopping" for materials.
Q. Verify final equipment locations for roughing-in.
R. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.
S. Piping Joint Construction: Join pipe and fittings as follows and as specifically required in individual piping specification Sections:
    a. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
    b. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
    c. Soldered Joints: Construct joints according to AWS's "Soldering Manual," Chapter "The Soldering of Pipe and Tube"; or CDA's "Copper Tube Handbook."
    d. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," Chapter "Pipe and Tube."
    e. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
        i. Note internal length of threads in fittings or valve ends, and proximity of internal seat or wall, to determine how far pipe should be threaded into joint.
        ii. Apply appropriate tape or thread compound to external pipe threads, unless dry seal threading is specified.
        iii. Align threads at point of assembly.
        iv. Tighten joint with wrench. Apply wrench to valve end into which pipe is being threaded.
        v. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
    f. Welded Joints: Construct joints according to AWS D10.12, "Recommended Practices and Procedures for Welding Low Carbon Steel Pipe," using qualified processes and welding operators according to "Quality Assurance" Article.
    g. Flanged Joints: Align flange surfaces parallel. Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Assemble joints by sequencing bolt tightening to make initial contact of flanges and gaskets as flat and parallel as possible. Use suitable lubricants on bolt threads. Tighten bolts gradually and uniformly using torque wrench.
T. Piping Connections: Make connections according to the following, unless otherwise indicated:
    a. Install unions, in piping 2-inch NPS (DN50) and smaller, adjacent to each valve and at final connection to each piece of equipment with 2-inch NPS (DN50) or smaller threaded pipe connection.
    b. Install flanges, in piping 2-1/2-inch NPS (DN65) and larger, adjacent to flanged valves and at final connection to each piece of equipment with flanged pipe connection.
    c. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.2 EQUIPMENT INSTALLATION -COMMON REQUIREMENTS

A. Install equipment to provide maximum possible headroom, if mounting heights are not indicated.
B. Install equipment according to approved submittal data. Portions of the Work are shown only in diagrammatic form. Refer conflicts to Architect.
C. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.
D. Install mechanical equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
E. Install equipment giving right of way to piping installed at required slope.
F. Install flexible connectors on equipment side of shutoff valves, horizontally and parallel to equipment shafts if possible.

3.3 PAINTING AND FINISHING

A. Apply paint to exposed piping according to the following, unless otherwise indicated:
    a. Interior, Ferrous Piping: Use semi-gloss, acrylic-enamel finish. Include finish coat over enamel undercoat and primer.
    b. Interior, Galvanized-Steel Piping: Use semigloss, acrylic-enamel finish. Include two finish coats over galvanized metal primer.
    c. Interior, Ferrous Supports: Use semi-gloss, acrylic-enamel finish. Include finish coat over enamel undercoat and primer.
    d. Exterior, Ferrous Piping: Use semi-gloss, acrylic-enamel finish. Include two finish coats over rust-inhibitive metal primer.
    e. Exterior, Galvanized-Steel Piping: Use semi-gloss, acrylic-enamel finish. Include two finish coats over galvanized metal primer.
    f. Exterior, Ferrous Supports: Use semi-gloss, acrylic-enamel finish. Include two finish coats over rust-inhibitive metal primer.
B. Do not paint piping specialties with factory-applied finish.
C. Damage and Touchup: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

3.4 CONCRETE BASES

A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions.
    a. Construct concrete bases of dimensions indicated, but not less than 4 inches (100 mm) larger in both directions than supported unit.
    b. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around the full perimeter of the base.
    c. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
    d. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
    e. Install anchor bolts to elevations required for proper attachment to supported

equipment.

f. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
g. Use 3000-psi , 28-day compressive-strength concrete and reinforcement as specified in Division 3 Section "[Cast-in-Place Concrete] [Cast-in-Place Concrete (Limited Applications)]."
h. Chamfer exterior corners and edges of permanently exposed concrete.

3.5 ERECTION OF METAL SUPPORTS AND ANCHORAGE

A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.
B. Field Welding: Comply with AWS D1.1, "Structural Welding Code--Steel."

3.6 DEMOLITION

A. If pipe, ductwork, insulation, or equipment to remain is damaged or disturbed, remove damaged portions and install new products of equal capacity and quality.
B. Accessible Work: Remove indicated exposed pipe and ductwork in its entirety.
C. Work Abandoned in Place: Cut and remove underground pipe a minimum of 2 inches (50 mm) beyond face of adjacent construction. Cap and patch surface to match existing finish.
D. Removal: Remove indicated equipment from Project site.
E. Temporary Disconnection: Remove, store, clean, reinstall, reconnect, and make operational equipment indicated for relocation.

3.7 CUTTING AND PATCHING

A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces necessary for mechanical installations. Perform cutting by skilled mechanics of trades involved.
B. Repair cut surfaces to match adjacent surfaces.

3.8 GROUTING

A. Install nonmetallic, non-shrink, grout for mechanical equipment base bearing surfaces, pump and other equipment base plates, and anchors. Mix grout according to manufacturer's written instructions.
B. Clean surfaces that will come into contact with grout.
C. Provide forms as required for placement of grout.
D. Avoid air entrapment during placing of grout.
E. Place grout, completely filling equipment bases.
F. Place grout on concrete bases to provide smooth bearing surface for equipment.
G. Place grout around anchors.
H. Cure placed grout according to manufacturer's written instructions.

3.9 EQUIPMENT IDENTIFICATION

A. Install and permanently fasten equipment nameplates on each major item of mechanical equipment that does not have nameplate or has nameplate that is damaged or located where not easily visible. Locate nameplates where accessible and visible.
B. Install equipment markers with permanent adhesive on or near each major item of mechanical equipment. Data required for markers may be included on signs, and markers may be omitted if both are indicated.

a. Letter Size: Minimum 1 inch . Include secondary lettering one-half the size of principal lettering.
b. Locate markers where accessible and readily visible.

C. Install access panel markers with screws on equipment access panels.
D. Install identification markers, at a minimum, on the following items:
a. Air Handler Units.
b. Switches

END OF SECTION 15050

North County Annex
AHU 1 & 2 Replacement

SECTION 15060 – HANGERS AND SUPPORTS

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 the following hangers and supports for mechanical system piping and equipment:
    a. Steel pipe hangers and supports.
    b. Trapeze pipe hangers.
    c. Metal framing systems.
    d. Thermal-hanger shield inserts.
    e. Fastener systems.

1.3 DEFINITIONS

A. MSS: Manufacturers Standardization Society for the Valve and Fittings Industry.
B. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.4 SUBMITTALS

A. Product Data: For each type of pipe hanger, channel support system component, and thermal-hanger shield insert indicated.

PART 2 -PRODUCTS

2.1 MANUFACTURED UNITS

2.2 STEEL PIPE HANGERS AND SUPPORTS

A. Description: MSS SP-58, Types 1 through 58, factory-fabricated components. Refer to Part 3 "Hanger and Support Applications" Article for where to use specific hanger and support types.
B. Manufacturers:
    a. AAA Technology & Specialties Co., Inc.
    b. Bergen-Power Pipe Supports.
    c. B-Line Systems, Inc.; a division of Cooper Industries.
    d. Carpenter & Paterson, Inc.
    e. Empire Industries, Inc.
    f. ERICO/Michigan Hanger Co.

g. Globe Pipe Hanger Products, Inc.
h. Grinnell Corp.
i. GS Metals Corp.
j. National Pipe Hanger Corporation.
k. PHD Manufacturing, Inc.
l. PHS Industries, Inc.
m. Piping Technology & Products, Inc.
n. Tolco Inc.

C. Galvanized, Metallic Coatings: Pregalvanized or hot dipped.
D. Nonmetallic Coatings: Plastic coating, jacket, or liner.
E. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion for support of bearing surface of piping.

2.3 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop-or field-fabricated pipe-support assembly made from structural-steel shapes with MSS SP-58 hanger rods, nuts, saddles, and U-bolts.

2.4 METAL FRAMING SYSTEMS

A. Description: MFMA-3, shop-or field-fabricated pipe-support assembly made of steel channels and other components.
B. Manufacturers:
a. B-Line Systems, Inc.; a division of Cooper Industries.
b. ERICO/Michigan Hanger Co.; ERISTRUT Div.
c. GS Metals Corp.
d. Power-Strut Div.; Tyco International, Ltd.
e. Thomas & Betts Corporation.
f. Tolco Inc.
g. Unistrut Corp.; Tyco International, Ltd.
C. Coatings: Manufacturer's standard finish, unless bare metal surfaces are indicated.
D. Nonmetallic Coatings: Plastic coating, jacket, or liner.

2.5 THERMAL HANGER SHIELD INSERTS:

A. 100-psi (690-kPa) minimum compressive-strength insulation, encased in sheet metal shield.
a. Material for Cold Piping: ASTM C 552, Type I cellular glass or water-repellent-treated, ASTM C 533, Type I calcium silicate with vapor barrier.
b. For Clevis or Band Hanger: Insert and shield cover lower 180 degrees of pipe.
c. Insert Length: Extend 2 inches (50 mm) beyond sheet metal shield for piping operating below ambient air temperature.
B. Manufacturers:
a. Carpenter & Paterson, Inc.
b. ERICO/Michigan Hanger Co.
c. PHS Industries, Inc.
d. Pipe Shields, Inc.
e. Rilco Manufacturing Company, Inc.
f. Value Engineered Products, Inc.

2.6 FASTENER SYSTEMS

A. Mechanical-Expansion Anchors: Insert-wedge-type stainless steel, for use in hardened Portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
    a. Manufacturers:
        i. B-Line Systems, Inc.; a division of Cooper Industries.
        ii. Empire Industries, Inc.
        iii. Hilti, Inc.
        iv. ITW Ramset/Red Head.
        v. MKT Fastening, LLC.
        vi. Powers Fasteners.

2.7 MISCELLANEOUS MATERIALS

A. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, non-shrink and nonmetallic grout; suitable for interior and exterior applications.
    a. Properties: Non-staining, non-corrosive, and non-gaseous.
    b. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

2.8 PAINTING

A. Prepare and paint for corrosion protection all exterior metal supports and products.

PART 3 -EXECUTION

3.1 HANGER AND SUPPORT APPLICATIONS

A. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Specification Sections.
B. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:
    a. Adjustable Steel Clevis Hangers (MSS Type 1): For suspension of non-insulated or insulated stationary pipes, NPS 1/2 to NPS 30 .
    b. Pipe Saddle Supports (MSS Type 36): For support of pipes, NPS 4 to NPS 36 (DN100 to DN900) , with steel pipe base stanchion support and cast-iron floor flange.
    c. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes, NPS 2-1/2 to NPS 20 (DN65 to DN500) , from single rod if horizontal movement caused by expansion and contraction might occur.
    d. Complete Pipe Rolls (MSS Type 44): For support of pipes, NPS 2 to NPS 42 (DN50 to DN1050) , if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.
    e. Pipe Roll and Plate Units (MSS Type 45): For support of pipes, NPS 2 to NPS 24 (DN50 to DN600) , if small horizontal movement caused by expansion and contraction might occur and vertical adjustment is not necessary.
    f. Adjustable Pipe Roll and Base Units (MSS Type 46): For support of pipes, NPS 2 to NPS 30 (DN50 to DN750) , if vertical and lateral adjustment during installation

might be required in addition to expansion and contraction.

C. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:
    a. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches (150 mm) for heavy loads.
    b. Steel Clevises (MSS Type 14): For 120 to 450 deg F (49 to 232 deg C) piping installations.
    c. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
    d. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
    e. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F (49 to 232 deg C) piping installations.
D. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:
    a. Steel Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
    b. Protection Shields (MSS Type 40): Of length recommended by manufacturer to prevent crushing insulation.
    c. Thermal-Hanger Shield Inserts: For supporting insulated pipe, 360-degree insert of high-density, 100-psi (690-kPa) minimum compressive-strength, water-repellent-treated calcium silicate or cellular-glass pipe insulation, same thickness as adjoining insulation with vapor barrier and encased in 360-degree sheet metal shield.

3.2 HANGER AND SUPPORT INSTALLATION

A. Pipe Hanger and Support Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.
B. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
C. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
D. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
E. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.9, "Building Services Piping," is not exceeded.
F. Insulated Piping: Comply with the following:
    a. Attach clamps and spacers to piping.
        i. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
        ii. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
        iii. Do not exceed pipe stress limits according to ASME B31.9.
    b. Install MSS SP-58, Type 39 protection saddles, if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
        i. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 (DN100) and larger if pipe is installed on rollers.
    c. Install MSS SP-58, Type 40 protective shields on cold piping with vapor barrier. Shields shall span arc of 180 degrees.

i. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 (DN100) and larger if pipe is installed on rollers.

d. Shield Dimensions for Pipe: Not less than the following:
   i. NPS 1/4 to NPS 3-1/2 (DN8 to DN90): 12 inches (305 mm) long and 0.048 inch (1.22 mm) thick.
e. Insert Material: Length at least as long as protective shield.
f. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.3 ADJUSTING

A. Hanger Adjustment: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

END OF SECTION 15060

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SECTION 15075 – MECHANICAL IDENTIFICATION

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 mechanical identification materials and devices.

1.3 QUALITY ASSURANCE

A. Comply with ASME A13.1, "Scheme for the Identification of Piping Systems" for lettering size, length of color field, colors, and viewing angles of identification devices.

PART 2 -PRODUCTS

2.1 IDENTIFYING DEVICES AND LABELS

A. General: Products specified are for applications referenced in other Division 15 Sections. If more than single type is specified for listed applications, selection is Installer's option.
B. Equipment Nameplates: Metal permanently fastened to equipment with data engraved or stamped.
    a. Data: Manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and essential data.
    b. Location: Accessible and visible.
C. Pressure-Sensitive Pipe Markers: Manufacturer's standard preprinted, color-coded, pressure-sensitive, vinyl type with permanent adhesive.
D. Pipes with OD, Including Insulation, Less Than 6 Inches (150 mm) : Full-band pipe markers, extending 360 degrees around pipe at each location.
E. Lettering: Manufacturer's standard preprinted captions.
F. Lettering: Use piping system terms indicated and abbreviate only as necessary for each application length.
    a. Arrows: Either integrally with piping system service lettering, to accommodate both directions, or as separate unit, on each pipe marker to indicate direction of flow.
G. Access Panel Markers: 1/16-inch-(2-mm-) thick, engraved plastic-laminate markers, with abbreviated terms and numbers corresponding to concealed valve. Provide 1/8-inch (3-mm) center hole for attachment.
H. Engraved Plastic-Laminate Signs: ASTM D 709, Type I, cellulose, paper-base, phenolic-resinlaminate engraving stock; Grade ES-2, black surface, black phenolic core, with white melamine subcore, unless otherwise indicated. Fabricate in sizes required for message. Provide holes for mechanical fastening.
    a. Engraving: Engraver's standard letter style, of sizes and with terms to match equipment identification.

b. Thickness: 1/16 inch (2 mm) , unless otherwise indicated.
c. Fasteners: Self-tapping, stainless-steel screws or contact-type, permanent adhesive.

I. Plastic Equipment Markers: Manufacturer's standard laminated plastic, in the following color codes:
   a. Green: Cooling equipment and components.
   b. Red: Heating equipment and components.
   c. Terminology: Match schedules as closely as possible. Include the following:
      i. Name and plan number.
   d. Size: 2-1/2 x 4 inches for equipment.

J. Lettering and Graphics: Coordinate names, abbreviations, and other designations used in mechanical identification with corresponding designations indicated. Use numbers, letters, and terms indicated for proper identification, operation, and maintenance of mechanical systems and equipment.

PART 3 -EXECUTION

3.1 LABELING AND IDENTIFYING PIPING SYSTEMS

A. Install pipe markers on each system. Include arrows showing normal direction of flow.
B. Marker Type: Plastic markers, with application systems. Install on pipe insulation segment where required for hot, non-insulated pipes.
C. Fasten markers on pipes and insulated pipes smaller than 6 inches (150 mm) OD by one of following methods:
   a. Snap-on application of pre-tensioned, semi-rigid plastic pipe marker.
   b. Adhesive lap joint in pipe marker overlap.
   c. Laminated or bonded application of pipe marker to pipe or insulation.
   d. Taped to pipe or insulation with color-coded plastic adhesive tape, not less than 3/4 inch (20 mm) wide, lapped a minimum of 1-1/2 inches (40 mm) at both ends of pipe marker, and covering full circumference of pipe.
D. Fasten markers on pipes and insulated pipes 6 inches (150 mm) in diameter and larger by one of following methods:
   a. Laminated or bonded application of pipe marker to pipe or insulation.
   b. Taped to pipe or insulation with color-coded plastic adhesive tape, not less than 1-1/2 inches (40 mm) wide, lapped a minimum of 3 inches (75 mm) at both ends of pipe marker, and covering full circumference of pipe.
   c. Strapped to pipe or insulation with manufacturer's standard stainless-steel bands.
E. Locate pipe markers and color bands where piping is exposed in finished spaces; machine rooms Spaced at a maximum of 20-foot (15-m) intervals along each run.

3.2 EQUIPMENT SIGNS AND MARKERS

A. Install engraved plastic-laminate signs or equipment markers on or near each major item of mechanical equipment. Include signs for the following general categories of equipment:

3.3 ADJUSTING AND CLEANING

A. Relocate mechanical identification materials and devices that have become visually blocked by work of this or other Divisions.
B. Clean faces of identification devices and glass frames of valve charts.

3.4 SCHEDULE

A. At a minimum, install identification markers on the following items:
   a. Air handler.
   b. Switches
   c. Hot water piping.
   d. Chilled water piping.
   e. Outside air duct.
   f. Hot and Cold Duct
   g. Condensate piping.
   h. Expansion tanks

END OF SECTION 15075

North County Annex
AHU 1 & 2 Replacement

SECTION 15083 – PIPE INSULATION

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 preformed, rigid and flexible pipe insulation; insulating cements; field-applied jackets; accessories and attachments; and sealing compounds.

1.3 SUBMITTALS

A. Product Data: Identify thermal conductivity, thickness, and jackets (both factory and field applied, if any), for each type of product indicated.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the U.S. Department of Labor, Bureau of Apprenticeship and Training.
B. Fire-Test-Response Characteristics: As determined by testing materials identical to those specified in this Section according to ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and sealer and cement material containers with appropriate markings of applicable testing and inspecting agency.
    a. Insulation Installed Indoors: Flame-spread rating of 25 or less, and smoke-developed rating of 50 or less.
    b. Insulation Installed Outdoors: Flame-spread rating of 75 or less, and smoke-developed rating of 150 or less.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Ship insulation materials in containers marked by manufacturer with appropriate ASTM specification designation, type and grade, and maximum use temperature.

1.6 COORDINATION

A. Coordinate size and location of supports, hangers, and insulation shields specified in Division 15 Section "Hangers and Supports."
B. Coordinate clearance requirements with piping Installer for insulation application.
C. Coordinate installation and testing of steam or electric heat tracing.

1.7 SCHEDULING

A. Schedule insulation application after testing piping systems.

PART 2 -PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    a. Mineral-Fiber Insulation:
        i. CertainTeed Manson.
        ii. Knauf FiberGlass GmbH.
        iii. Owens-Corning Fiberglas Corp.
        iv. Schuller International, Inc.
    b. Cellular-Glass Insulation:
        i. Pittsburgh-Corning Corp.
    c. Flexible Elastomeric Thermal Insulation:
        i. Armstrong World Industries, Inc.
        ii. Rubatex Corp.
    d. Closed-Cell Phenolic-Foam Insulation:
        i. Kooltherm Insulation Products, Ltd.

2.2 INSULATION MATERIALS

A. No mineral-fiber insulation will be allowed for use on any chilled water piping systems.
B. Cellular-Glass Insulation: Inorganic, foamed or cellulated glass, annealed, rigid, hermetically sealed cells, incombustible.
    a. Preformed Pipe Insulation, without Jacket: Comply with ASTM C 552, Type II, Class 1.
    b. Preformed Pipe Insulation, with Jacket: Comply with ASTM C 552, Type II, Class 2.
C. Closed-Cell Phenolic-Foam Insulation: Preformed pipe insulation of rigid, expanded, closed-cell structure. Comply with ASTM C 1126, Type III, Grade 1.
D. Flexible Elastomeric Thermal Insulation: Closed-cell, sponge-or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials and Type II for sheet materials.
    a. Adhesive: As recommended by insulation material manufacturer.
    b. Ultraviolet-Protective Coating: As recommended by insulation manufacturer.
E. Prefabricated Thermal Insulating Fitting Covers: Comply with ASTM C 450 for dimensions used in preforming insulation to cover valves, elbows, tees, and flanges.

2.3 FIELD-APPLIED JACKETS

A. General: ASTM C 921, Type 1, unless otherwise indicated.
B. Foil and Paper Jacket: Laminated, glass-fiber-reinforced, flame-retardant kraft paper and aluminum foil.
C. Heavy PVC Fitting Covers: Factory-fabricated fitting covers manufactured from 30-mil-(0.75mm-) thick, high-impact, ultraviolet-resistant PVC.
    a. Shapes: 45-and 90-degree, short-and long-radius elbows, tees, valves, flanges, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply

covers for lavatories for the disabled.
   b. Adhesive: As recommended by insulation material manufacturer.

D. Aluminum Jacket: Aluminum roll stock, ready for shop or field cutting and forming to indicated sizes. Comply with ASTM B 209 (ASTM B 209M), 3003 alloy, H-14 temper.
   a. Finish and Thickness: Smooth finish, 0.010 inch (0.25 mm) thick.
   b. Moisture Barrier: 1-mil-(0.025-mm-) thick, heat-bonded polyethylene and kraft paper.
   c. Elbows: Preformed, 45-and 90-degree, short-and long-radius elbows; same material, finish, and thickness as jacket.

2.4 ACCESSORIES AND ATTACHMENTS

A. Glass Cloth and Tape: Comply with MIL-C-20079H, Type I for cloth and Type II for tape. Woven glass-fiber fabrics, plain weave, pre-sized a minimum of 8 oz./sq. yd. (270 g/sq. m) .
   a. Tape Width: 4 inches (100 mm) .

2.5 VAPOR RETARDERS

A. Mastics: Materials recommended by insulation material manufacturer that are compatible with insulation materials, jackets, and substrates.

PART 3 -EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation and other conditions affecting performance of insulation application.
B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Preparation: Clean and dry pipe and fitting surfaces. Remove materials that will adversely affect insulation application.

3.3 GENERAL APPLICATION REQUIREMENTS

A. Apply insulation materials, accessories, and finishes according to the manufacturer's written instructions; with smooth, straight, and even surfaces; free of voids throughout the length of piping, including fittings, valves, and specialties.
B. Refer to schedules at the end of this Section for materials, forms, jackets, and thicknesses required for each piping system.
C. Use accessories compatible with insulation materials and suitable for the service. Use accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
D. Apply insulation with longitudinal seams at top and bottom of horizontal pipe runs.
E. Apply multiple layers of insulation with longitudinal and end seams staggered.
F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Seal joints and seams with vapor-retarder mastic on insulation indicated to receive a vapor retarder.
H. Keep insulation materials dry during application and finishing.
I. Apply insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by the insulation material manufacturer.
J. Apply insulation with the least number of joints practical.
K. Apply insulation over fittings, valves, and specialties, with continuous thermal and vapor-retarder integrity, unless otherwise indicated. Refer to special instructions for applying insulation over fittings, valves, and specialties.
L. Hangers and Anchors: Where vapor retarder is indicated, seal penetrations in insulation at hangers, supports, anchors, and other projections with vapor-retarder mastic.
    a. Apply insulation continuously through hangers and around anchor attachments.
    b. For insulation application where vapor retarders are indicated, extend insulation on anchor legs at least 12 inches (300 mm) from point of attachment to pipe and taper insulation ends. Seal tapered ends with a compound recommended by the insulation material manufacturer to maintain vapor retarder.
    c. Install insert materials and apply insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by the insulation material manufacturer.
    d. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect the jacket from tear or puncture by the hanger, support, and shield.
M. Insulation Terminations: For insulation application where vapor retarders are indicated, taper insulation ends. Seal tapered ends with a compound recommended by the insulation material manufacturer to maintain vapor retarder.
N. Apply adhesives and mastics at the manufacturer's recommended coverage rate.
O. Apply insulation with integral jackets as follows:
    a. Pull jacket tight and smooth.
    b. Circumferential Joints: Cover with 3-inch-(75-mm-) wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip and spaced 4 inches (100 mm) o.c.
    c. Longitudinal Seams: Overlap jacket seams at least 1-1/2 inches (40 mm). Apply insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches (100 mm)
        i. Exception: Do not staple longitudinal laps on insulation having a vapor retarder.
    d. Vapor-Retarder Mastics: Where vapor retarders are indicated, apply mastic on seams and joints and at ends adjacent to flanges, unions, valves, and fittings.
    e. At penetrations in jackets for thermometers and pressure gages, fill and seal voids with vapor-retarder mastic.
P. Interior Wall and Partition Penetrations: Apply insulation continuously through walls and floors.
Q. Fire-Rated Wall and Partition Penetrations: Apply insulation continuously through penetrations of fire-rated walls and partitions.
    a. Firestopping and fire-resistive joint sealers are specified in Division 7 Section "Firestopping."

3.4 CELLULAR-GLASS INSULATION APPLICATION

A. Apply insulation to straight pipes and tubes as follows:

a. Secure each layer of insulation to pipe with wire, tape, or bands without deforming insulation materials.
b. Where vapor retarders are indicated, seal longitudinal seams and end joints with vapor-retarder mastic.
c. For insulation with factory-applied jackets, secure laps with outward clinched staples at 6 inches (150 mm) o.c.
d. For insulation with factory-applied jackets with vapor retarders, do not staple longitudinal tabs but secure tabs with additional adhesive as recommended by the insulation material manufacturer and seal with vapor-retarder mastic.

B. Apply insulation to flanges as follows:
a. Apply preformed pipe insulation to outer diameter of pipe flange.
b. Make width of insulation segment the same as overall width of the flange and bolts, plus twice the thickness of the pipe insulation.
c. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of cellular-glass block insulation of the same thickness as pipe insulation.
d. Apply canvas jacket material with manufacturer's recommended adhesive, overlapping seams at least 1 inch (25 mm) , and seal joints with vapor-retarder mastic.

C. Apply insulation to fittings and elbows as follows:
a. Apply premolded insulation sections of the same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.
b. When premolded sections of insulation are not available, apply mitered sections of cellular-glass insulation. Secure insulation materials with wire, tape, or bands.
c. Cover fittings with heavy PVC fitting covers. Overlap PVC covers on pipe insulation jackets at least 1 inch (25 mm) at each end. Secure fitting covers with manufacturer's attachments and accessories. Seal seams with tape and vapor-retarder mastic.

D. Apply insulation to valves and specialties as follows:
a. Apply premolded segments of cellular-glass insulation or glass-fiber blanket insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation. For check valves, arrange insulation for access to stainer basket without disturbing insulation.
b. Apply insulation to flanges as specified for flange insulation application.
c. Use preformed heavy PVC fitting covers for valve sizes where available. Secure fitting covers with manufacturer's attachments and accessories. Seal seams with tape and vapor-retarder mastic.
d. For larger sizes where PVC fitting covers are not available, seal insulation with canvas jacket and sealing compound recommended by the insulation material manufacturer.

3.5 CLOSED-CELL PHENOLIC-FOAM INSULATION APPLICATION

A. Apply insulation to straight pipes and tubes as follows:
a. Secure each layer of insulation to pipe with wire, tape, or bands without deforming insulation materials.
b. Where vapor retarders are indicated, seal longitudinal seams and end joints with vapor-retarder mastic.
c. For insulation with factory-applied jackets, secure laps with outward clinched staples at 6 inches (150 mm) o.c.

d. For insulation with factory-applied jackets with vapor retarders, do not staple longitudinal tabs but secure tabs with additional adhesive as recommended by the insulation material manufacturer and seal with vapor-retarder mastic.

B. Apply insulation to flanges as follows:
   a. Apply preformed pipe insulation to outer diameter of pipe flange.
   b. Make width of insulation segment the same as overall width of the flange and bolts, plus twice the thickness of the pipe insulation.
   c. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of block insulation of the same material and thickness as pipe insulation.
   d. Apply canvas jacket material with manufacturer's recommended adhesive, overlapping seams at least 1 inch (25 mm) , and seal joints with vapor-retarder mastic.

C. Apply insulation to fittings and elbows as follows:
   a. Apply premolded insulation sections of the same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.
   b. When premolded sections of insulation are not available, apply mitered sections of phenolic-foam insulation. Secure insulation materials with wire, tape, or bands.
   c. Cover fittings with heavy PVC fitting covers. Overlap PVC covers on pipe insulation jackets at least 1 inch (25 mm) at each end. Secure fitting covers with manufacturer's attachments and accessories. Seal seams with tape and vapor-retarder mastic.

D. Apply insulation to valves and specialties as follows:
   a. Apply premolded insulation sections of the same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.
   b. When premolded sections of insulation are not available, apply mitered segments of phenolic-foam insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation. For check valves, arrange insulation for access to stainer basket without disturbing insulation.
   c. Apply insulation to flanges as specified for flange insulation application.
   d. Use preformed heavy PVC fitting covers for valve sizes where available. Secure fitting covers with manufacturer's attachments and accessories. Seal seams with tape and vapor-retarder mastic.
   e. For larger sizes where PVC fitting covers are not available, seal insulation with canvas jacket and sealing compound recommended by the insulation material manufacturer.

3.6 FLEXIBLE ELASTOMERIC THERMAL INSULATION APPLICATION

A. Apply insulation to straight pipes and tubes as follows:
   a. Check valves, fabricate removable sections of insulation arranged to allow access to strainer basket.
   b. Apply insulation to flanges as specified for flange insulation application.
   c. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive. Cement to avoid openings in insulation that will allow passage of air to the pipe surface.

3.7 FIELD-APPLIED JACKET APPLICATION

A. Apply glass-cloth jacket directly over bare insulation or insulation with factory-applied jackets.
    a. Apply jacket smooth and tight to surface with 2-inch (50-mm) overlap at seams and joints.
    b. Embed glass cloth between two 0.062-inch-(1.6-mm-) thick coats of jacket manufacturer's recommended adhesive.
    c. Completely encapsulate insulation with jacket, leaving no exposed raw insulation.
    d. Follow manufacturer's written instructions for applying insulation.
    e. Seal longitudinal seams and end joints with manufacturer's recommended adhesive. Cement to avoid openings in insulation that will allow passage of air to the pipe surface.

B. Apply insulation to flanges as follows:
    a. Apply pipe insulation to outer diameter of pipe flange.
    b. Make width of insulation segment the same as overall width of the flange and bolts, plus twice the thickness of the pipe insulation.
    c. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of the same thickness as pipe insulation.
    d. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive. Cement to avoid openings in insulation that will allow passage of air to the pipe surface.

C. Apply insulation to fittings and elbows as follows:
    a. Apply mitered sections of pipe insulation.
    b. Secure insulation materials and seal seams with manufacturer's recommended adhesive. Cement to avoid openings in insulation that will allow passage of air to the pipe surface.

D. Apply insulation to valves and specialties as follows:
    a. Apply preformed valve covers manufactured of the same material as pipe insulation and attached according to the manufacturer's written instructions.
    b. Apply cut segments of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation. For Foil and Paper Jackets:
    c. Draw jacket material smooth and tight.
    d. Apply lap or joint strips with the same material as jacket.
    e. Secure jacket to insulation with manufacturer's recommended adhesive.
    f. Apply jackets with 1-1/2-inch (40-mm) laps at longitudinal seams and 3-inch-(75-mm-) wide joint strips at end joints.
    g. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-retarder mastic.

E. Apply metal jacket with 2-inch (50-mm) overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches (300 mm) o.c. and at end joints.

3.8 FINISHES

A. Flexible Elastomeric Thermal Insulation:
    a. After adhesive has fully cured, apply two coats of the insulation manufacturer's recommended protective coating.
    b. Provide aluminum jacketing on exterior insulation.

3.9 INTERIOR INSULATION APPLICATION SCHEDULE

A. Service: Chilled-water supply and return.
    a. Operating Temperature: 35 to 75 deg F (2 to 24 deg C) .
    b. Insulation Material: Pre-insulated piping, or Cellular glass, with jacket, or Closed-cell phenolic foam.
    c. Insulation Thickness, pre-insulated pipe: Refer to specifications section 15181.
    d. Insulation Thickness, Cellular glass: Apply the following insulation thicknesses:
        i. Steel Pipe, 1.5” and smaller: 1.5”
        ii. Steel Pipe, 2” to 12”: 2”
    e. Insulation Thickness, Closed-cell phenolic foam: Apply the following insulation thicknesses:
        i. Steel Pipe, 1.5” and smaller: 1”
        ii. Steel Pipe, 2” to 4”: 1.5”
        iii. Steel Pipe, 5” to 12”: 2”
    f. Field-Applied Jacket: None.
    g. Vapor Retarder Required: Yes.
    h. Finish: Paint with owner-approved color where exposed to view; no finish in unexposed areas.
B. Service: Heating hot-water supply and return.
    a. Operating Temperature: 100 to 200 deg F (38 to 93 deg C) .
    b. Insulation Material: Mineral fiber.
    c. Insulation Thickness:
        i. Steel Pipe, 2” and smaller: 1”
        ii. Steel Pipe, 2.5” to 12”: 1-1/2”
    d. Field-Applied Jacket: None.
    e. Vapor Retarder Required: No.
    f. Finish: None.
C. Service: Condensate drain piping.
    a. Operating Temperature: 40 deg F to 60 deg F.
    b. Insulation Material: Flexible elastomeric.
    c. Insulation Thickness: 3/4”
    d. Field-Applied Jacket: None.
    e. Vapor Retarder Required: No.

END OF SECTION 15083

North County Annex
AHU 1 & 2 Replacement

SECTION 15100 - VALVES

PART 1 -GENERAL

1.1 SUMMARY

A. This Section includes general duty valves common to several mechanical piping systems.

1.2 QUALITY ASSURANCE

A. Single-Source Responsibility: Comply with the requirements specified in Division 1 Section "Materials and Equipment," under "Source Limitations" Paragraph.
B. ASME Compliance: Comply with ASME B31.9 for building services piping and ASME B31.1 for power piping.
C. MSS Compliance: Comply with the various MSS Standard Practice documents referenced.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Prepare valves for shipping as follows:
    a. Protect internal parts against rust and corrosion.
    b. Protect threads, flange faces, grooves, and weld ends.
    c. Set globe and gate valves closed to prevent rattling.
    d. Set ball and plug valves open to minimize exposure of functional surfaces.
    e. Set butterfly valves closed or slightly open.
    f. Block check valves in either closed or open position.
B. Use the following precautions during storage:
    a. Maintain valve end protection.
    b. Store indoors and maintain valve temperature higher than ambient dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

PART 2 -PRODUCTS

2.1 BASIC, COMMON FEATURES

A. Design: Rising stem or rising outside screw and yoke stems, except as specified below.
    a. Non-rising stem valves may be used only where headroom prevents full extension of rising stems.
B. Pressure and Temperature Ratings: As indicated in the "Application Schedule" of Part 3 of this Section and as required to suit system pressures and temperatures.
C. Sizes: Same size as upstream pipe, unless otherwise indicated.
D. Operators:
    a. Handwheels: For valves other than quarter turn.
    b. Gear Drive: For quarter-turn valves NPS 8 (DN 200) and larger.
    c. Lever Handles: For quarter-turn valves 6 inches (DN150) and smaller, except for plug valves, which shall have square heads.

E. Extended Stems: Where insulation is indicated or specified, provide extended stems arranged to receive insulation.
F. Bypass and Drain Connections: Comply with MSS SP-45 bypass and drain connections.
G. Threads: ASME B1.20.1.
H. Flanges: ASME B16.1 for cast iron, ASME B16.5 for steel, and ASME B16.24 for bronze valves.

2.2 COPPER-ALLOY BALL VALVES

A. Manufacturers:
    a. Two-Piece, Copper-Alloy Ball Valves:
        i. Conbraco Industries, Inc.; Apollo Div.
        ii. Crane Co.; Crane Valve Group; Crane Valves.
        iii. Crane Co.; Crane Valve Group; Jenkins Valves.
        iv. Crane Co.; Crane Valve Group; Stockham Div.
        v. DynaQuip Controls.
        vi. Flow-Tek, Inc.
        vii. Grinnell Corporation.
        viii. Hammond Valve.
        ix. Honeywell Braukmann.
        x. Jamesbury, Inc.
        xi. Jomar International, LTD.
        xii. Kitz Corporation of America.
        xiii. Legend Valve & Fitting, Inc.
        xiv. Milwaukee Valve Company.
        xv. Nexus Valve Specialties.
        xvi. NIBCO INC.
        xvii. R & M Energy Systems (Borger, TX).
        xviii. Red-White Valve Corp.
        xix. Richards Industries; Marwin Ball Valves.
        xx. Watts Industries, Inc.; Water Products Div.
B. Ball Valves, 4 Inches (DN100) and Smaller: MSS SP-110, Class 150, 600-psi (4140-kPa) CWP, ASTM B 584 bronze body and bonnet, 2-piece construction; chrome-plated brass ball, standard port for 1/2-inch (DN15) valves and smaller and conventional port for 3/4-inch (DN20) valves and larger; blowout proof; bronze or brass stem; teflon seats and seals; threaded or soldered end connections:
    a. Operator: Vinyl-covered steel lever handle.
    b. Stem Extension: For valves installed in insulated piping.
    c. Memory Stop: For operator handles.

2.3 FERROUS-ALLOY BALL VALVES

A. Manufacturers:
    a. American Valve, Inc.
    b. Conbraco Industries, Inc.; Apollo Div.
    c. Cooper Cameron Corp.; Cooper Cameron Valves Div.
    d. Crane Co.; Crane Valve Group; Stockham Div.
    e. Flow-Tek, Inc.
    f. Foster Valve Co.
    g. Hammond Valve.
    h. Jamesbury, Inc.

i. Jomar International, LTD.
j. Kitz Corporation of America.
k. KTM Products, Inc.
l. McCANNA, Incorporated.
m. Milwaukee Valve Company.
n. NIBCO INC.
o. PBM, Inc.
p. Richards Industries; Marwin Ball Valves.
q. Worcester Controls.

B. Ferrous-Alloy Ball Valves, General: MSS SP-72, with flanged ends.
C. Ferrous-Alloy Ball Valves: Class 150, full port.

2.4 GRAY-IRON SWING CHECK VALVES

A. Manufacturers:
   a. Type II, Gray-Iron Swing Check Valves with Composition to Metal Seats:
      i. Crane Co.; Crane Valve Group; Crane Valves.
      ii. Crane Co.; Crane Valve Group; Stockham Div.
      iii. Mueller Co.
      iv. Watts Industries, Inc.; Water Products Div.

B. Gray-Iron Swing Check Valves, General: MSS SP-71.
C. Type II, Class 125, gray-iron, swing check valves with composition to metal seats.

2.5 FERROUS-ALLOY WAFER CHECK VALVES

A. Available Manufacturers:
   a. Dual-Plate, Ferrous-Alloy, Double-Flanged-Type Check Valves:
      i. Crane Co.; Crane Valve Group; Crane Valves.
      ii. Gulf Valve Co.
      iii. Techno Corp.
B. Ferrous-Alloy Wafer Check Valves, General: API 594, spring loaded.
C. Single-Plate, Class 125 or 150, Ferrous-Alloy, Double-Flanged Check Valves: Flanged-end body.

2.6 GLOBE VALVES

A. Manufacturers:
   a. Type I, Cast-Iron Globe Valves with Metal Seats:
      i. Cincinnati Valve Co.
      ii. Crane Co.; Crane Valve Group; Crane Valves.
      iii. Crane Co.; Crane Valve Group; Jenkins Valves.
      iv. Crane Co.; Crane Valve Group; Stockham Div.
      v. Grinnell Corporation.
      vi. Hammond Valve.
      vii. Kitz Corporation of America.
      viii. Milwaukee Valve Company.
      ix. NIBCO INC.
      x. Powell, Wm. Co.
      xi. Red-White Valve Corp.

xii. Walworth Co.

B. Globe Valves, 2-1/2 Inches (DN65) and Smaller: MSS SP-80; Class 125, 200-psi (1380-kPa) CWP, or Class 150, 300-psi (2070-kPa) CWP; ASTM B 62 cast-bronze body and screwed bonnet, rubber, bronze, or teflon disc, silicon bronze-alloy stem, teflon-impregnated packing with bronze nut, threaded or soldered end connections; and with aluminum or malleable-iron handwheel.

C. Globe Valves, 3 Inches (DN80) and Larger: MSS SP-85, Class 125, 200-psi (1380-kPa) CWP, ASTM A 126 cast-iron body and bolted bonnet with bronze fittings, renewable bronze seat and disc, brass-alloy stem, outside screw and yoke, teflon-impregnated packing with cast-iron follower, flanged end connections; and with cast-iron handwheel.

2.7 FERROUS-ALLOY BUTTERFLY VALVES

A. Manufacturers:
   a. Flanged, Ferrous-Alloy Butterfly Valves:
      i. Bray International, Inc.
      ii. Cooper Cameron Corp.; Cooper Cameron Valves Div.
      iii. Grinnell Corporation.
      iv. Mueller Steam Specialty.
      v. Tyco International, Ltd.; Tyco Valves & Controls.

B. Butterfly Valves: MSS SP-67, 200-psi (1380-kPa) CWP, for tight shutoff, 150-psi (1035-kPa) maximum pressure differential, ASTM A 126 cast-iron body and bonnet, extended neck, stainless-steel stem, field-replaceable EPDM or Buna N sleeve and stem seals, fully flanged style:
   a. Disc Type: Elastomer-coated ductile iron.
   b. Gear Drive: For quarter-turn valves NPS 8 (DN 200) and larger.
   c. Operator for Sizes 2 Inches (DN50) to 6 Inches (DN150) : Standard lever handle with memory stop.

2.8 CHAINWHEEL ACTUATORS

A. Manufacturers:
   a. Babbitt Steam Specialty Co.
   b. Roto Hammer Industries, Inc.

B. Description: Valve actuation assembly with sprocket rim, brackets, and chain.
   a. Sprocket Rim with Chain Guides: Aluminum, of type and size required for valve.
   b. Brackets: Type, number, size, and fasteners required to mount actuator on valve.
   c. Chain: Hot-dip, galvanized steel, of size required to fit sprocket rim.

PART 3 -EXECUTION

3.1 EXAMINATION

A. Examine piping system for compliance with requirements for installation tolerances and other conditions affecting performance of valves. Do not proceed with installation until unsatisfactory conditions have been corrected.
B. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
C. Operate valves from fully open to fully closed positions. Examine guides and seats made accessible by such operation.
D. Examine threads on valve and mating pipe for form and cleanliness.
E. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Check gasket material for proper size, material composition suitable for service, and freedom from defects and damage.
F. Do not attempt to repair defective valves; replace with new valves.

3.2 VALVE INSTALLATION

A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
B. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
C. Locate valves for easy access and provide separate support where necessary. Where piping arrangement permits, manual shutoff valves are to be located as close to unit as practical, while leaving adequate room for coil disconnect and removal, and are to be no higher than 6'-6" AFF. Where shutoff valves serve an above-ceiling unit (such as a VAV box) accessible only by ladder, the shutoff valves should be close enough to the unit so that maintenance personnel can shut the vales and access the control panel without having to relocate the ladder. Where piping configuration makes it impossible to locate shutoff valves in the manner described above, obtain approval from Owner and/or Engineer for alternate location.
D. Install valves in horizontal piping with stem at or above center of pipe.
E. Install valves in position to allow full stem movement.
F. Install chainwheel operators on valves NPS 8 and larger and more than 90 inches above floor. Extend chains to 60 inches above finished floor elevation.

3.3 THREADED CONNECTIONS

A. Note the internal length of threads in valve ends and proximity of valve internal seat or wall to determine how far pipe should be threaded into valve.
B. Align threads at point of assembly.
C. Apply appropriate tape or thread compound to the external pipe threads, except where dry seal threading is specified.
D. Assemble joint, wrench tight. Wrench on valve shall be on the valve end into which the pipe is being threaded.

3.4 FLANGED CONNECTIONS

A. Align flange surfaces parallel.
B. Assemble joints by sequencing bolt tightening to make initial contact of flanges and gaskets as flat and parallel as possible. Use suitable lubricants on bolt threads. Tighten bolts gradually and uniformly with a torque wrench.
C. For dead-end service, butterfly valves require flanges both upstream and downstream for proper shutoff and retention.

3.5 VALVE END SELECTION

A. Select valves with the following ends or types of pipe/tube connections:
    a. 2.5 Inches (DN80) and Larger: Flanged.

3.6 APPLICATION SCHEDULE

A. General Application: Use ball and butterfly valves for shutoff and throttling duty.
B. Chilled and Hot Water: Use the following valve types:
    a. NPS 2-1/2 and Smaller: Ball Valves, with stem extension and memory stop.
    b. NPS 3 and larger: Butterfly valves.

3.7 ADJUSTING

A. Adjust or replace packing after piping systems have been tested and put into service, but before final adjusting and balancing. Replace valves if leak persists.

END OF SECTION 15100

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SECTION 15122 – METERS AND GAGES

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 meters and gages for mechanical systems.

1.3 SUBMITTALS

A. Product Data: Include scale range, ratings, and calibrated performance curves for each meter, gage, fitting, specialty, and accessory specified.

PART 2 -PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    a. Digital Variable Angle Thermometers:
        i. Weiss Instruments, Inc. DVU-25 or approved equal.
    b. Pressure Gages:
        i. AMETEK, Inc.; U.S. Gauge Div.
        ii. Dresser Industries, Inc.; Instrument Div.; Ashcroft Commercial Sales Operation.
        iii. Dresser Industries, Inc.; Instrument Div.; Weksler Instruments Operating Unit.
        iv. Ernst Gage Co.
        v. Marsh Bellofram.
        vi. Noshok, Inc.
        vii. Trerice: H. O. Trerice Co.
        viii. Weiss Instruments, Inc.
        ix. WIKA Instruments Corp.
        x. Winter's Thermogauges, Inc.
    c. Test Plugs:
        i. Flow Design, Inc.
        ii. MG Piping Products Co.
        iii. National Meter.
        iv. Peterson Equipment Co., Inc.
        v. Sisco Manufacturing Co.

vi. Trerice: H. O. Trerice Co.
vii. Watts Industries, Inc.; Water Products Div.

2.2 THERMOMETERS, GENERAL

A. Solar powered, local digital readout, variable angle.

a. Case: Hi-impact ABS
b. Range: -40/300˚F
c. Display: 3/8" LCD digits, wide ambient formula
d. Accuracy: 1% of reading or 1° whichever is greater
e. Resolution: 1/10° between -19.9/199.9 °f (-28/93 °C)
f. Recalibration: Internal potentiometer
g. LUX rating: 10 Lux (one foot-candle)
h. Update: 10 seconds
i. Ambient operating temperature: -30/140˚F
j. Ambient operating humidity: 100%
k. Sensor: Glass passivated thermistor.

2.3 SEPARABLE SOCKETS

A. Description: Fitting with protective socket for installation in threaded pipe fitting to hold fixed thermometer stem.

a. Material: Steel, for use in steel piping.
b. Extension-Neck Length: Nominal thickness of 2 inches (50 mm) , but not less than thickness of insulation. Omit extension neck for sockets for piping not insulated.
c. Insertion Length: To extend to one-third of diameter of pipe.
d. Heat-Transfer Fluid: Oil or graphite.

2.4 THERMOMETER WELLS

A. Description: Fitting with protective well for installation in threaded pipe fitting to hold test thermometer.

a. Material: Brass, for use in copper piping.
b. Material: Stainless Steel, for use in steel piping.
c. Extension-Neck Length: Nominal thickness of 2 inches (50 mm) , but not less than thickness of insulation. Omit extension neck for wells for piping not insulated.
d. Insertion Length: To extend to one-third of diameter of pipe.
e. Heat-Transfer Fluid: Oil or graphite.

2.5 PRESSURE GAGES

A. Description: ASME B40.1, phosphor-bronze bourdon-tube type with bottom connection; dry type, unless liquid-filled-case type is indicated.
B. Case: Drawn steel, brass, or aluminum with 4-1/2-inch-(115-mm-) diameter, glass lens.
C. Connector: Brass, NPS 1/4 (DN8) .
D. Scale: White-coated aluminum with permanently etched markings.
E. Accuracy: Grade B, plus or minus 2 percent of middle 50 percent of scale.
F. Range: Comply with the following:

a. Fluids under Pressure: Two times the operating pressure.
b. Heating Hot Water: 0 to 60 psig.
c. Chilled and Hot Water: 0 to +60 psig.

2.6 PRESSURE-GAGE FITTINGS

A. Valves: NPS 1/4 (DN8) stainless-steel needle type.
B. Syphons: NPS 1/4 (DN8) coil of brass tubing with threaded ends.
C. Snubbers: ASME B40.5, NPS 1/4 (DN8) brass bushing with corrosion-resistant porous-metal disc of material suitable for system fluid and working pressure.

2.7 TEST PLUGS

A. Description: Nickel-plated, brass-body test plug in NPS 1/2 (DN15) fitting.
B. Body: Length as required to extend beyond insulation.
C. Pressure Rating: 500 psig (3450 kPa) minimum.
D. Core Insert: Self-sealing valve, suitable for inserting 1/8-inch (3-mm) OD probe from dial-type thermometer or pressure gage.
E. Core Material for Water: 20 to 200 deg F , chlorosulfonated polyethylene synthetic rubber.
F. Test-Plug Cap: Gasketed and threaded cap, with retention chain or strap.

PART 3 -EXECUTION

3.1 METER AND GAGE INSTALLATION, GENERAL

A. Install meters, gages, and accessories according to manufacturer's written instructions for applications where used.

3.2 THERMOMETER INSTALLATION

A. Install thermometers and adjust vertical and tilted positions.
B. Install in the following locations, plus in any locations indicated in drawings.
    a. Inlet and outlet of each hydronic boiler and chiller.
C. Install separable sockets in vertical position in piping tees where fixed thermometers are indicated.
    a. Install with socket extending to one-third of diameter of pipe.
    b. Fill sockets with oil or graphite.
D. Install thermometer wells in vertical position in piping tees where test thermometers are indicated.
    a. Install with stem extending to one-third of diameter of pipe.
    b. Fill wells with oil or graphite.

3.3 PRESSURE-GAGE INSTALLATION

A. Install pressure gages in piping tees with pressure-gage valve located on pipe at most readable position.
B. Install pressure gages in piping at chillers at same elevation.

C. Install liquid-filled-type pressure gages at suction and discharge of each pump.
   a. **Do not install pressure gages downstream of discharge check valve, nor upstream of strainer.**
D. Install pressure-gage needle valve and snubber in piping to pressure gages.
E. Install pressure gages of pressure ranges expected to be encountered in system. If system pressure turns out to be beyond range of the gage installed, replace gage with one whose range includes actual operating range. Estimated pressure range expected is as follows, contractor to confirm:

   a. Chilled Water Pumps: 0 to 60 psig.
   b. Condenser Water Pumps: -15 to 60 psig.
   c. Chillers / chilled water: 0 to 60 psig.
   d. Chillers / condenser water: 0 to 60 psig.

3.4 TEST PLUG INSTALLATION

A. Install test plugs in the following locations:

   a. Within six inches of every DDC hydronic temperature sensor.
   b. Within six inches of every DDC hydronic pressure sensor.
   c. Within six inches of every pressure gage.
   d. Inlet and outlet of every piece of hydronic equipment.
   e. Any other locations, as indicated in drawings.

B. On inlet and outlet of any give piece of equipment, install test plugs at same elevations, equal to elevation at pressure gages.

3.5 ADJUSTING AND CLEANING

A. Calibrate meters according to manufacturer's written instructions, after installation.
B. Adjust faces of meters and gages to proper angle for best visibility.
C. Clean windows of meters and gages and clean factory-finished surfaces. Replace cracked and broken windows, and repair scratched and marred surfaces with manufacturer's touchup paint.

END OF SECTION 15122

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SECTION 15181 – HYRDRONIC PIPING

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 piping, special-duty valves, and hydronic specialties for hot-water heating, chilled-water cooling, and condenser water systems; makeup water for these systems; blowdown drain lines; and condensate drain piping.

1.3 SUBMITTALS

A. Product Data: For each type of special-duty valve indicated. Include flow and pressure drop curves based on manufacturer's testing for diverting fittings, calibrated balancing valves, and automatic flow-control valves.
B. Welding Certificates: Copies of certificates for welding procedures and personnel.
C. Maintenance Data: For hydronic specialties and special-duty valves to include in maintenance manuals specified in Division 1.

1.4 QUALITY ASSURANCE

A. Welding: Qualify processes and operators according to the ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
B. ASME Compliance: Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation. Safety valves and pressure vessels shall bear the appropriate ASME label. Fabricate and stamp air separators and expansion tanks to comply with the ASME Boiler and Pressure Vessel Code, Section VIII, Division 1.

1.5 COORDINATION

A. Coordinate layout and installation of hydronic piping and suspension system components with other construction, including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.
B. Coordinate pipe sleeve installations for foundation wall penetrations.
C. Coordinate piping installation with roof curbs, equipment supports, and roof penetrations. Roof specialties are specified in Division 7 Sections.
D. Coordinate pipe fitting pressure classes with products specified in related Sections.
E. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into base. Concrete, reinforcement, and formwork requirements are specified in Division 3 Sections.
F. Coordinate installation of pipe sleeves for penetrations through exterior walls and floor assemblies.

PART 2 -PRODUCTS

2.1 PIPING MATERIALS

A. General: Refer to Part 3 "Piping Applications" Article for applications of pipe and fitting materials.

2.2 STEEL PIPE AND FITTINGS

A. Steel Pipe, NPS 2 (DN 50) and Smaller: ASTM A 53, Type S (seamless) or Type F (furnacebutt welded), Grade A, Schedule 40, black steel, plain ends.
B. Steel Pipe, NPS 2-1/2 through NPS 12 (DN 65 through DN 300) : ASTM A 53, Type E (electric-resistance welded), Grade A, Schedule 40, black steel, plain ends.
    a. Steel Pipe Nipples: ASTM A 733, made of ASTM A 53, Schedule 40, black steel; seamless for NPS 2 (DN 50) and smaller and electric-resistance welded for NPS 2-1/2 (DN 65) and larger.
C. Cast-Iron Threaded Fittings: ASME B16.4; Classes 125 and 250.
D. Malleable-Iron Unions: ASME B16.39; Classes 150, 250, and 300.
E. Cast-Iron Pipe Flanges and Flanged Fittings: ASME B16.1, Classes 25, 125, and 250; raised ground face, and bolt holes spot faced.
F. Wrought-Steel Fittings: ASTM A 234/A 234M, wall thickness to match adjoining pipe.
G. Wrought Cast-and Forged-Steel Flanges and Flanged Fittings: ASME B16.5, including bolts, nuts, and gaskets of the following material group, end connections, and facings:
    a. Material Group: 1.1.
    b. End Connections: Butt welding.
    c. Facings: Raised face.
H. Welding Materials: Comply with Section II, Part C, of the ASME Boiler and Pressure Vessel Code for welding materials appropriate for wall thickness and for chemical analysis of pipe being welded.
I. Gasket Material: Thickness, material, and type suitable for fluid to be handled; and design temperatures and pressures.

2.3 PRE-INSULATED STEEL PIPE AND FITTINGS

A. Pre-insulated Steel Pipe

    a. ASTM A 53 ERW, Grade A, Schedule 40, black steel, beveled ends, welded; service temperature 35˚F to 210˚F.
    b. Polyurethane insulation, 2.5 PCF density, 0.14 / inch k-value at 75˚F.
    c. PVC clad outer jacket, white, low pressure rated, seamless, ASTM D-1784, Class 1, Type 1.
    d. Waterproof mastic over ends of each joint.
    e. Urethane insulation kits for fittings and couplings, with PVC jacket.

2.4 PLASTIC PIPE AND FITTINGS

A. PVC Plastic Pipe Fittings: Socket-type pipe fittings, ASTM D 2467 for Schedule 80 pipe.

    a. PVC Solvent Cement: ASTM D 2564.

2.5 COPPER TUBE AND FITTINGS

A. Annealed-Temper Copper Tubing: ASTM B 88, Type K (ASTM B 88M, Type A).
B. Wrought-Copper Fittings: ASME B16.22.
C. Solder Filler Metals: ASTM B 32, 95-5 tin antimony.

2.6 VALVES

A. Gate, globe, check, ball, and butterfly valves are specified in Division 15 Section "Valves."
B. Refer to Part 3 "Valve Applications" Article for applications of each valve.
C. Calibrated Balancing Valves, NPS 2 (DN 50) and Smaller: Bronze body, ball type, 125-psig (860-kPa) working pressure, 250 deg F (121 deg C) maximum operating temperature, and having threaded ends. Valves shall have calibrated orifice or venturi, connections for portable differential pressure meter with integral seals, and be equipped with a memory stop to retain set position.
D. Calibrated Balancing Valves, NPS 2-1/2 (DN 65) and Larger: Cast-iron or steel body, ball type, 125-psig (860-kPa) working pressure, 250 deg F (121 deg C) maximum operating temperature, and having flanged or grooved connections. Valves shall have calibrated orifice or venturi, connections for portable differential pressure meter with integral seals, and be equipped with a memory stop to retain set position.

2.7 HYDRONIC SPECIALTIES

A. Manual Air Vent: Bronze body and nonferrous internal parts; 150-psig (1035-kPa) working pressure; 225 deg F (107 deg C) operating temperature; manually operated with screwdriver or thumbscrew; with NPS 1/8 (DN 6) discharge connection and NPS 1/2 (DN 15) inlet connection.
B. Y-Pattern Strainers: 125-psig (860-kPa) working pressure; cast-iron body (ASTM A 126, Class B), flanged ends for NPS 2-1/2 (DN 65) and larger, threaded connections for NPS 2 (DN 50) and smaller, bolted cover, perforated stainless-steel basket, and bottom drain connection.
C. Spherical, Rubber, Flexible Connectors: Fiber-reinforced rubber body with steel flanges drilled to align with Classes 150 and 300 steel flanges; operating temperatures up to 250 deg F (121 deg C) and pressures up to 150 psig (1035 kPa) .

PART 3 -EXECUTION

3.1 PIPING APPLICATIONS

A. Above Ground:

    a. Chilled and Hot Water, NPS 2 (DN 50) and Smaller: use Schedule 40 steel pipe with threaded joints.
    b. Chilled and Hot Water, NPS 2-1/2 (DN 65) and Larger: use Schedule 40 steel pipe or pre-insulated steel pipe; with welded and flanged joints.

B. Below Ground:

a. Chilled and Hot Water, NPS 2 (DN 50) and Smaller: use Schedule 40 use pre-insulated steel pipe with threaded joints.
b. Chilled and Hot Water, NPS 2-1/2 (DN 65) and Larger: use Schedule 40 pre-insulated steel pipe; with welded and flanged joints.

C. Condensate Drain Lines: Type K copper with soldered joints.

3.2 VALVE APPLICATIONS

A. General-Duty Valve Applications: Unless otherwise indicated, use the following valve types:

a. Shutoff Duty: Ball and butterfly valves.
b. Throttling Duty: Ball and butterfly valves.

B. Install shutoff duty valves at each branch connection to supply mains, at supply connection to each piece of equipment, unless only one piece of equipment is connected in the branch line. Install throttling duty valves at each branch connection to return mains, at return connections to each piece of equipment, and elsewhere as indicated.
C. Install check valves at each pump discharge and elsewhere as required to control flow direction.

3.3 PIPING INSTALLATIONS

A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping installation requirements.
B. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.
C. Install drains, consisting of a tee fitting, NPS 3/4 (DN 20) ball valve, and short NPS 3/4 (DN 20) threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.
D. Install piping at a uniform grade of 0.2 percent upward in direction of flow.
E. Reduce pipe sizes using eccentric reducer fitting installed with level side up.
F. Unless otherwise indicated, install branch connections to mains using tee fittings in main pipe, with the takeoff coming out the bottom of the main pipe. For up-feed risers, install the takeoff coming out the top of the main pipe.
G. Anchor piping for proper direction of expansion and contraction.
H. Provide concrete thrust blocks at all changes in direction 45 degrees or greater for underground piping.

3.4 HANGERS AND SUPPORTS

A. Hanger, support, and anchor devices are specified in Division 15 Section "Hangers and Supports." Comply with requirements below for maximum spacing of supports.
B. Install hangers for steel piping with the following maximum spacing and minimum rod sizes:

a. NPS 3/4 (DN 20): Maximum span, 7 feet (2.1 m); minimum rod size, 1/4 inch .
b. NPS 1 (DN 25): Maximum span, 7 feet (2.1 m); minimum rod size, 1/4 inch .

c. NPS 1-1/2 (DN 40): Maximum span, 9 feet (2.7 m); minimum rod size, 3/8 inch .
d. NPS 2 (DN 50): Maximum span, 10 feet (3 m); minimum rod size, 3/8 inch .
e. NPS 2-1/2 (DN 65): Maximum span, 11 feet (3.4 m); minimum rod size, 3/8 inch .
f. NPS 3 (DN 80): Maximum span, 12 feet (3.7 m); minimum rod size, 3/8 inch .
g. NPS 4 (DN 100): Maximum span, 14 feet (4.3 m); minimum rod size, 1/2 inch .
h. NPS 6 (DN 150): Maximum span, 17 feet (5.2 m); minimum rod size, 1/2 inch .
i. NPS 8 (DN 200): Maximum span, 19 feet (5.8 m); minimum rod size, 5/8 inch (16 mm).
j. NPS 10 (DN 250): Maximum span, 20 feet (6.1 m); minimum rod size, 3/4 inch (19 mm).
k. NPS 12 (DN 300): Maximum span, 23 feet (7 m); minimum rod size, 7/8 inch (22 mm).

3.5 PIPE JOINT CONSTRUCTION

A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for joint construction requirements for soldered and brazed joints in copper tubing; threaded, welded, and flanged joints in steel piping; and solvent-welded joints for PVC and CPVC piping.

3.6 HYDRONIC SPECIALTIES INSTALLATION

A. Install manual air vents at high points in piping, at heat-transfer coils, and elsewhere as required for system air venting.

3.7 TERMINAL EQUIPMENT CONNECTIONS

A. Size for supply and return piping connections shall be same as for equipment connections.
B. Install control valves in accessible locations close to connected equipment.
C. Install ports for pressure and temperature gages at coil inlet connections.

3.8 FIELD QUALITY CONTROL

A. Prepare hydronic piping according to ASME B31.9 and as follows:

a. Leave joints, including welds, uninsulated and exposed for examination during test.
b. Provide temporary restraints for expansion joints that cannot sustain reactions due to test pressure. If temporary restraints are impractical, isolate expansion joints from testing.
c. Flush system with clean water. Clean strainers.
d. Isolate equipment from piping. If a valve is used to isolate equipment, its closure shall be capable of sealing against test pressure without damage to valve. Install blinds in flanged joints to isolate equipment.
e. Install safety valve, set at a pressure no more than one-third higher than test pressure, to protect against damage by expanding liquid or other source of overpressure during test.

B. Perform the following tests on hydronic piping:

a. Use ambient temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.

b. While filling system, use vents installed at high points of system to release trapped air. Use drains installed at low points for complete draining of liquid.
c. Check expansion tanks to determine they are not air bound and system is full of water.
d. Subject piping system to hydrostatic test pressure that is not less than 1.5 times the design pressure. Test pressure shall not exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed either 90 percent of specified minimum yield strength or 1.7 times "SE" value in Appendix A of ASME B31.9, "Building Services Piping."
e. After hydrostatic test pressure has been applied for at least 10 minutes, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.
f. Prepare written report of testing.

3.9 ADJUSTING

A. Perform these adjustments before operating the system:

a. Open valves to fully open position. Close coil bypass valves.
b. Check pump for proper direction of rotation.
c. Set automatic fill valves for required system pressure.
d. Check air vents at high points of system and determine if all are installed and operating freely (automatic type), or bleed air completely (manual type).
e. Set temperature controls so all coils are calling for full flow.
f. Check and set operating temperatures of boilers, chillers, and cooling towers to design requirements.
g. Lubricate motors and bearings.

3.10 CLEANING

A. Flush hydronic piping systems with clean water. Remove and clean or replace strainer screens. After cleaning and flushing hydronic piping systems, but before balancing, remove disposable fine-mesh strainers in pump suction diffusers.

END OF SECTION 15181

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SECTION 15725 – MODULAR AIR-HANDLING UNITS

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 dual deck, modular air-handling units with coils for indoor installations.
B. Related Sections include the following:

    a. Division 15 Section "Metal Ductwork."
    b. Division 15 Section "HVAC Instrumentation and Controls."
    c. Division 15 Section "Sequence of Operation."

1.3 SUBMITTALS

A. Product Data: For each modular air-handling unit scheduled. Include the following:

    a. Certified fan-performance curves with system operating conditions indicated.
    b. Certified fan-sound power ratings.
    c. Certified coil-performance ratings with system operating conditions indicated.
    d. Motor ratings, electrical characteristics, and motor and fan accessories.
    e. Material gages and finishes.
    f. Filters with performance characteristics.
    g. Dampers, including housings, linkages, and operators.

B. Shop Drawings: Signed and sealed by a qualified professional engineer.

    a. Design Calculations: Calculate requirements for selecting vibration isolators and for designing vibration isolation bases.
    b. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include auxiliary motor slides and rails, and base weights.
    c. Wiring Diagrams: Power, signal, and control wiring.

C. Coordination Drawings: Submit with Shop Drawings. Show mechanical-room layout and relationships between components and adjacent structural and mechanical elements. Show support locations, type of support, and weight on each support. Indicate and certify field measurements.
D. Field Quality-Control Test Reports: From manufacturer.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain modular air-handling units through one source from a single

manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
C. NFPA Compliance: Modular air-handling units and components shall be designed, fabricated, and installed in compliance with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems."
D. ARI Certification: Modular indoor air-handling units and their components shall be factory tested according to ARI 430, "Central-Station Air-Handling Units," and shall be listed and labeled by ARI.
E. Comply with NFPA 70.

1.5 COORDINATION

A. Coordinate size and location of structural-steel support members.

1.6 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

    a. Filters: One set for each modular air-handling unit.
    b. Fan Belts : One set for each modular air-handling unit fan.
    c. Gaskets: One set for each access door.

PART 2 -PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Carrier; Div. of United Technologies Corp.
    b. ClimateCraft
    c. Engineered Air.
    d. McQuay International.
    e. Trane Company (The); Worldwide Applied Systems Group.
    f. York International Corporation.

2.2 MANUFACTURED UNITS

A. Modular air-handling units shall be factory assembled and consist of fans, motor and drive assembly, coils, damper, filters, condensate pans, control devices, and accessories.
B. Configuration of modular air-handling units shall be as set forth in the project construction drawings and equipment schedules, and in accordance with this specification.
C. Units shall be delivered prewired, bearing an approved label with all of the necessary identification marks, electrical data, and any necessary cautions as required by the National Electrical Code.

2.3 CABINET

A. Materials: Formed and reinforced double-wall insulated panels. Units shall be equipped for installation indoors.

   a. Outside Casing: galvanized steel.
   b. Inside Casing: galvanized steel.
   c. Floor Plate: galvanized steel.

B. Cabinet Insulation: Units shall be internally insulated. Comply with NFPA 90A or NFPA 90B.

   a. Materials: 2" thick nominal 3 lb/cu.ft. density acoustic insulation; Thermal Conductivity (k-Value): 0.26 at 75 deg F mean temperature.
   b. Fire-Hazard Classification: Maximum flame-spread index of 25 and smoke-developed index of 50, when tested according to ASTM C 411.
   c. Liner Adhesive: Comply with NFPA 90A or NFPA 90B and ASTM C 916.
   d. Location and Application: Encased between outside and inside casing.

C. Access Doors: Provide access doors large enough for easy access to accommodate periodic maintenance and inspection.

   a. Location: Provide access doors to fans and motors, filters, dampers and operators, access plenums, and electrical control panels. Same materials and finishes as cabinet, complete with hinges, latches, handles, and gaskets. Inspection and access panels and doors shall be sized and located to allow periodic maintenance and inspections.
   b. Construction: Provide an extruded aluminum perimeter frame with steel sheets front and back (sheets shall match cabinet construction) and pressure inject with 2.2 lbs/cu.ft. of polyurethane foam to create a seamless rigid 2" double wall door with an insulating value of R13.
   c. Thermal Breaks: Door shall incorporate a high density polyurethane thermal break. Frame shall be fabricated from aluminum extrusions, thermally broke.
   d. Gaskets: Press fitted into the frame slots for easy field replacement.
   e. Hardware: Each door is complete with a minimum of two stainless steel hinges and two lever lock handles.
   f. Access Panels: Lift out access panels either bolted or secured with two or more cam-lock fasteners must be provided in locations where non-regular access is required.

D. Condensate Drain Pans: Formed sections of stainless-steel sheet complying with requirements in ASHRAE 62. Fabricate IAQ drain pans with slopes in three planes to collect condensate from cooling coils (including coil piping connections and return bends) and humidifiers when units are operating at maximum catalogued face velocity across cooling coil. To prevent moisture carryover, extend drain pan a minimum of 12" past the leaving face of the cooling coil. Unit drain pan shall be a minimum of 3" deep to permit cleaning and inspection.

   a. Double-Wall Construction (full 2" thick): Fill space between walls with NFPA 90A compliant insulation and seal moisture tight.

b. Drain Connections: One end of pan. Coordinate with drawing.

2.4 FAN SECTION

A. Fan-Section Construction: Belt-driven centrifugal fans consisting of housing, wheel, fan shaft, bearings, motor, drive assembly, and support structure and equipped with formed-steel channel base for integral mounting of fan, motor, and casing panels. Mount fan with spring vibration isolation, minimum of 1 inch. Motor, fan bearings, and drive assembly shall be located inside the fan plenum to minimize bearing wear and to allow for internal vibration isolation of the fan-motor assembly.
B. Centrifugal Fan Housings: Formed-and reinforced-steel panels to make curved scroll housings with shaped cutoff, spun-metal inlet bell, and access doors or panels to allow entry to internal parts and components.

    a. Panel Bracing: Steel angle-or channel-iron member supports for mounting and supporting fan scroll, wheel, motor, and accessories.
    b. Performance Class: AMCA 99-2408, Class II.

C. Fan Assemblies: Statically and dynamically balanced and designed for continuous operation at maximum rated fan speed and motor horsepower.
D. Backward-Inclined Fan Wheels: Steel construction with curved inlet flange, backplate, and backward-inclined blades.
E. Forward-Curved Fan Wheels: Galvanized-steel construction with inlet flange, backplate, and shallow blades with inlet and tip curved forward in direction of airflow and mechanically secured to flange and backplate; cast-steel hub swaged to backplate and fastened to shaft with set screws.
F. Shafts: Statically and dynamically balanced and designed for continuous operation at maximum rated fan speed and motor horsepower, with final alignment and belt adjustment made after installation.

    a. Turned, ground, and polished hot-rolled steel with keyway. Ship with a protective coating of lubricating oil.
    b. Designed to operate at no more than 70 percent of first critical speed at top of fan's speed range.

G. Grease-Lubricated Shaft Bearings: Self-aligning, pillow-block-type, ball or roller bearings with adapter mount and two-piece, cast-iron housing.

    a. Ball-Bearing Rating Life: ABMA 9, L10 of 120,000 hours.
    b. Roller-Bearing Rating Life: ABMA 11, L 10 of 120,000 hours.

H. Belt Drives: Factory mounted, with final alignment and belt adjustment made after installation and with 1.5 service factor based on fan motor.

    a. Pulleys: Cast iron or cast steel with split, tapered bushing; dynamically balanced at factory.
    b. Motor Pulleys: Adjustable pitch for use with 5-hp motors and smaller; fixed pitch for use with motors larger than 5 hp. Select pulley so pitch adjustment is at the

middle of adjustment range at fan design conditions.
c. Belts: Oil resistant, nonsparking, and nonstatic; matched for multiple belt drives.
d. Motor Mount: Adjustable for belt tensioning.

I. Vibration Control: Vertical spring type isolators with leveling bolts, bridge bearing waffled pads with minimum 1 inch static deflection designed to achieve high isolation efficiency. Fans (other than plug fans) shall be attached to the discharge panel by a polyvinyl chloride coated polyester woven fabric, with a sealed double locking fabric to metal connection.
J. Fan-Section Source Quality Control:

a. Sound Power Level Ratings: Comply with AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Fans shall bear AMCA-certified sound ratings seal.
b. Factory test fan performance for flow rate, pressure, power, air density, rotation speed, and efficiency. Establish ratings according to AMCA 210, "Laboratory Methods of Testing Fans for Rating."

2.5 MOTORS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use. Comply with NFPA 70.
B. Coordinate features of motors, installed units, and accessory devices and features that comply with the following:

a. Premium efficiency, designed and labeled for inverter use.
b. Matched to torque and horsepower requirements of the load.
c. Matched to ratings and characteristics of supply circuit and required control sequence.

C. Ratings, characteristics, and features coordinated with and approved by controller manufacturer.

a. Designed with critical vibration frequencies outside operating range..
b. Temperature Rise: Matched to rating for Class B insulation.
c. Insulation: Class H.
d. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.

D. Torque Characteristics: Sufficient to accelerate driven loads satisfactorily.
E. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range.
F. Temperature Rating: 50 deg C maximum temperature rise at 40 deg C ambient for continuous duty at full load (Class A Insulation).
G. Service Factor: 1.15 for poly-phase motors and 1.35 for single-phase motors.
H. Motor Construction: NEMA MG 1, general purpose, continuous duty, Design B mounted on adjustable base.
I. Bearings: The following features are required:

a. Ball or roller bearings with inner and outer shaft seals.
b. Grease lubricated. Provide grease lines for motor and shaft lubrication, extended to the to a common mounting on access side of fan.
c. Designed to resist thrust loading where belt or other drives produce lateral or axial thrust in motor.

J. Enclosure Type: The following features are required: ODP.
K. Overload Protection: Built-in, automatically resetting, thermal-overload protection.
L. Noise Rating: Quiet.
M. Efficiency: Premium, as defined in NEMA MG 1.
N. Nameplate: Indicate ratings, characteristics, construction, special features, and full identification of manufacturer.
O. Starters, Electrical Devices, and Wiring: Electrical devices and connections are specified in Division 16 Sections.

2.6 COILS

A. Coil Sections: Common or individual, insulated, stainless-steel casings for heating and cooling coils. Design and construct to facilitate removal and replacement of coil for maintenance and to ensure full airflow through coils.
B. Water Coils: Circuited to provide adequate tube velocities to meet design requirements. Internal turbulators are not acceptable.

a. Piping Connections: Schedule 40 steel pipe, threaded, on same end.
b. Tubes: 1/2" outer diameter copper tubes.
c. Fins: Aluminum fins, rippled for maximum heat transfer.
d. Fin and Tube Joint: Mechanical bond by mechanical expansion of tubes.
e. Headers: Seamless copper tube with brazed joints, prime coated.
f. Frames: Galvanized steel.
g. Ratings: Design tested and rated according to ASHRAE 33 and ARI 410.
h. Working-Pressure Ratings: 200 psig, 325 deg F .
i. Source Quality Control: Test to 300 psig underwater.

C. Auxiliary Drain: Return bends and headers of coils shall be fully concealed within the air-handling unit. Provide auxiliary drain pan complete with drain connection at headered end of cooling coils. Exterior header covers will not be acceptable.
D. Coil Removal: Coils shall be removable from the unit at the header end, unless shown otherwise on drawings.
E. Drain and Vent: All water coils shall be equipped with a capped vent tapping at the top of the return header, and a capped drain tapping at the bottom of the supply header.

2.7 FILTER SECTION

A. Filters: Comply with NFPA 90A.
B. Filter Section: Provide filter holding frames arranged for vertical orientation, with access doors on both sides of unit. Filters shall be removable from one side.
C. Extended-Surface, Disposable Panel Filters: Factory-fabricated, dry, extended-surface filters with holding frames.

a. Media: Two inch thick, fibrous material formed into deep-V-shaped pleats and held

by self-supporting wire grid.
b. Media and Media-Grid Frame: Nonflammable cardboard.
c. Filter Efficiency: MERV 8, according to ASHRAE 52.2-2007.

D. Rigid Filter Section: Provide filter holding frames arranged for flat or angular orientation, with access doors on both sides of unit. Filter modules shall be designed to slide out of the unit. Side removal 2" filters shall slide into a formed metal track, sealing against metal spacers at each end of the track. Provide adequately sized access doors to allow easy removal of filters.

PART 3 -EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions for compliance with requirements for installation tolerances and other conditions affecting performance.
B. Examine roughing-in of hydronic and condensate drainage piping systems and electrical services to verify actual locations of connections before installation.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Base Mounted Units: Support on structural concrete. Rotating components shall be internally isolated.
B. Arrange installation of units to provide access space around modular air-handling units for service and maintenance. All access doors, valves, and any part requiring routine maintenance must be accessible from the existing walkway. Access door must not be block by any section of pipe, insulation, or hanger/support.

3.3 CONNECTIONS

A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
B. Install piping adjacent to machine to allow service and maintenance.
C. Connect piping to modular air-handling units mounted on vibration isolators with flexible connectors.
D. Connect condensate drain pans using Type M copper tubing. Extend to nearest equipment or floor drain. Construct deep trap at connection to drain pan and install cleanouts at changes in direction.
E. Hot-and Chilled-Water Piping: Comply with applicable requirements in Division 15 Section "Hydronic Piping." Connect to supply and return coil tappings with shutoff or balancing valve and union or flange at each connection.
F. Duct installation and connection requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connections.
G. Electrical: Comply with applicable requirements in Division 16 Sections for power wiring, switches, and motor controls.

H. Ground equipment according to Division 16 Section "Grounding and Bonding."
I. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections. Report results in writing.

    a. Leak Test: After installation, fill water coils with water and test coils and connections for leaks. Repair leaks and retest until no leaks exist.
    b. Fan Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation. Remove malfunctioning units, replace with new units, and retest.
    c. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.5 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.
B. Final Checks before Startup: Perform the following:

    a. Verify that shipping, blocking, and bracing are removed.
    b. Verify that unit is secure on mountings and supporting devices and that all connections to piping, ducts, and electrical systems are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
    c. Perform cleaning and adjusting specified in this Section.
    d. Disconnect fan drive from motor, verify proper motor rotation direction, and verify free fan wheel rotation and smooth bearing operations. Reconnect fan drive system, align belts, and install belt guards.
    e. Lubricate bearings, pulleys, belts, and other moving parts with factory-recommended lubricants.
    f. Set outside-air damper to fully open position.
    g. Comb coil fins for parallel orientation.
    h. Install clean filters.
    i. Verify that manual and automatic volume control and fire and smoke dampers in connected duct systems are in fully open position.

C. Starting procedures for modular air-handling units include the following:

    a. Energize motor; verify proper operation of motor, drive system, and fan wheel. Adjust fan to indicated rpm. Replace fan and motor pulleys as required to achieve design conditions.
    b. Measure and record motor electrical values for voltage and amperage.
    c. Manually operate dampers from fully closed to fully open position and record fan performance.

3.6 ADJUSTING

A. Adjust damper linkages for proper damper operation.

3.7 CLEANING

A. Clean modular air-handling units internally, on completion of installation, according to manufacturer's written instructions. Clean fan interiors to remove foreign material and construction dirt and dust. Vacuum clean fan wheels, cabinets, and coils entering air face.
B. After completing system installation and testing, adjusting, and balancing modular air-handling and air-distribution systems, clean filter housings and install new filters.

END OF SECTION 15725

North County Annex
AHU 1 & 2 Replacement

SECTION 15815 – METAL DUCTS

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 metal ducts for supply, return, outside, and exhaust air-distribution systems in pressure classes from minus 2-to plus 10-inch wg . Metal ducts include the following:

   a. Rectangular ducts and fittings.
   b. Double-wall, round spiral-seam ducts and formed fittings.
   c. Duct liner.

B. Related Sections include the following:

   a. Division 15 Section "Duct Accessories" for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.3 SYSTEM DESCRIPTION

A. The new AHU's will attach to existing air movement and distribution equipment and other air system components which are not part of the work scope. These systems must perform as originally intended with the new system installed and operational. Provide duct layout and configuration drawings and shop drawings stamped by a registered professional engineer for the new replacement air handler. Accompany the submittal with calculations showing that proposed layout will provide original design (existing) results without increasing system total pressure.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated, include furnished specialties, and accessories.

1.5 QUALITY ASSURANCE

A. NFPA Compliance:

   a. NFPA 90A, "Installation of Air Conditioning and Ventilating Systems."
   b. NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

PART 2 -PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

    c. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 SHEET METAL MATERIALS

A. Comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods, unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
B. Galvanized Sheet Steel: Lock-forming quality; complying with ASTM A 653/A 653M and having G60 (Z180) coating designation; ducts shall have mill-phosphatized finish for surfaces exposed to view.
C. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts.
D. Tie Rods: Galvanized steel, 1/4-inch (6-mm) minimum diameter for lengths 36 inches (900 mm) or less; 3/8-inch (10-mm) minimum diameter for lengths longer than 36 inches (900 mm).

2.3 DUCT LINER

A. Fibrous-Glass Liner: Comply with NFPA 90A or NFPA 90B and with NAIMA AH124.

    a. Manufacturers:

        i. CertainTeed Corp.; Insulation Group.
        ii. Johns Manville International, Inc.
        iii. Knauf Fiber Glass GmbH.
        iv. Owens Corning.

    b. Materials: ASTM C 1071; surfaces exposed to air stream shall be coated to prevent erosion of glass fibers.

        i. Thickness: 1 inch.
        ii. Thermal Conductivity (k-Value): 0.26 at 75 deg F mean temperature.
        iii. Fire-Hazard Classification: Maximum flame-spread index of 25 and smoke-developed index of 50 when tested according to ASTM E 84.
        iv. Liner Adhesive: Comply with NFPA 90A or NFPA 90B and with ASTM C 916.
        v. Mechanical Fasteners: Galvanized steel suitable for adhesive attachment, mechanical attachment, or welding attachment to duct without damaging liner when applied as recommended by manufacturer and without causing leakage in duct.

- Tensile Strength: Indefinitely sustain a 50-lb-(23-kg-) tensile, dead-load test perpendicular to duct wall.
- Fastener Pin Length: As required for thickness of insulation and without projecting more than 1/8 inch (3 mm) into air stream.
- Adhesive for Attaching Mechanical Fasteners: Comply with fire-hazard classification of duct liner system.

2.4 SEALANT MATERIALS

A. Joint and Seam Sealants, General: The term "sealant" is not limited to materials of adhesive or mastic nature but includes tapes and combinations of open-weave fabric strips and mastics.
B. Tape Sealing System: Woven-fiber tape impregnated with gypsum mineral compound and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
C. Water-Based Joint and Seam Sealant: Flexible, adhesive sealant, resistant to UV light when cured, UL 723 listed, and complying with NFPA requirements for Class 1 ducts.
D. Solvent-Based Joint and Seam Sealant: One-part, nonsag, solvent-release-curing, polymerized butyl sealant formulated with a minimum of 75 percent solids.
E. Flanged Joint Mastic: One-part, acid-curing, silicone, elastomeric joint sealant complying with ASTM C 920, Type S, Grade NS, Class 25, Use O.
F. Flange Gaskets: Butyl rubber or EPDM polymer with polyisobutylene plasticizer.

2.5 HANGERS AND SUPPORTS

A. Hanger Materials: Galvanized sheet steel or threaded steel rod.

    a. Hangers Installed in Corrosive Atmospheres: Electro-galvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.
    b. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards-Metal and Flexible" for steel sheet width and thickness and for steel rod diameters.
    c. Galvanized-steel straps attached to aluminum ducts shall have contact surfaces painted with zinc-chromate primer.

B. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
C. Trapeze and Riser Supports: Steel shapes complying with ASTM A 36/A 36M.

    a. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.
    b. Supports for Stainless-Steel Ducts: Stainless-steel support materials.
    c. Supports for Aluminum Ducts: Aluminum support materials unless materials are electrolytically separated from ducts.

2.6 RECTANGULAR DUCT FABRICATION

A. Fabricate ducts, elbows, transitions, offsets, branch connections, and other construction according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" and

complying with requirements for metal thickness, reinforcing types and intervals, tie-rod applications, and joint types and intervals.

a. Lengths: Fabricate rectangular ducts in lengths appropriate to reinforcement and rigidity class required for pressure class.
b. Deflection: Duct systems shall not exceed deflection limits according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible."

B. Transverse Joints: Prefabricated slide-on joints and components constructed using manufacturer's guidelines for material thickness, reinforcement size and spacing, and joint reinforcement.
C. Formed-On Flanges: Construct according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible," Figure 1-4, using corner, bolt, cleat, and gasket details.

a. Duct Size: Maximum 30 inches (750 mm) wide and up to 2-inch wg (500-Pa) pressure class.
b. Longitudinal Seams: Pittsburgh lock sealed with non-curing polymer sealant.

D. Cross Breaking or Cross Beading: Cross break or cross bead duct sides 19 inches (480 mm) and larger and 0.0359 inch (0.9 mm) thick or less, with more than 10 sq. ft. (0.93 sq. m) of non-braced panel area unless ducts are lined.

2.7 APPLICATION OF LINER IN RECTANGULAR DUCTS

A. Adhere a single layer of indicated thickness of duct liner with at least 90 percent adhesive coverage at liner contact surface area. Attaining indicated thickness with multiple layers of duct liner is prohibited.
B. Apply adhesive to transverse edges of liner facing upstream that do not receive metal nosing.
C. Butt transverse joints without gaps and coat joint with adhesive.
D. Fold and compress liner in corners of rectangular ducts or cut and fit to ensure butted-edge overlapping.
E. Do not apply liner in rectangular ducts with longitudinal joints, except at corners of ducts, unless duct size and standard liner product dimensions make longitudinal joints necessary.
F. Secure liner with mechanical fasteners 4 inches (100 mm) from corners and at intervals not exceeding 12 inches (300 mm) transversely; at 3 inches (75 mm) from transverse joints and at intervals not exceeding 18 inches (450 mm) longitudinally.
G. Secure transversely oriented liner edges facing the air stream with metal nosings that have either channel or "Z" profiles or are integrally formed from duct wall. Fabricate edge facings at the following locations:

a. Fan discharges.
b. Intervals of lined duct preceding unlined duct.
c. Upstream edges of transverse joints in ducts where air velocities are greater than 2500 fpm (12.7 m/s) or where indicated.

H. Terminate inner ducts with buildouts attached to fire-damper sleeves, dampers, turning vane assemblies, or other devices. Fabricated buildouts (metal hat sections) or other buildout means are optional; when used, secure buildouts to duct walls with bolts, screws, rivets, or welds.

PART 3 -EXECUTION

3.1 DUCT APPLICATIONS

A. Static-Pressure Classes: Unless otherwise indicated, construct ducts according to the following:

   a. Supply Ducts: 2-inch wg.
   b. Return Ducts (Negative Pressure): 1-inch wg.

3.2 DUCT INSTALLATION

A. Construct and install ducts according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible," unless otherwise indicated.
B. Install round ducts in lengths not less than 12 feet (3.7 m) unless interrupted by fittings.
C. Install ducts with fewest possible joints.
D. Install fabricated fittings for changes in directions, size, and shape and for connections.
E. Install couplings tight to duct wall surface with a minimum of projections into duct. Secure couplings with sheet metal screws. Install screws at intervals of 12 inches (300 mm) , with a minimum of 3 screws in each coupling.
F. Install ducts, unless otherwise indicated, vertically and horizontally and parallel and perpendicular to building lines; avoid diagonal runs.
G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
H. Install ducts with a clearance of 1 inch (25 mm) , plus allowance for insulation thickness.
I. Conceal ducts from view in finished spaces. Do not encase horizontal runs in solid partitions unless specifically indicated.
J. Coordinate layout with suspended ceiling, fire-and smoke-control dampers, lighting layouts, and similar finished work.
K. Seal all joints and seams. Apply sealant to male end connectors before insertion, and afterward to cover entire joint and sheet metal screws.
L. Electrical Equipment Spaces: Route ducts to avoid passing through transformer vaults and electrical equipment spaces and enclosures.
M. Non-Fire-Rated Partition Penetrations: Where ducts pass through interior partitions and exterior walls and are exposed to view, conceal spaces between construction openings and ducts or duct insulation with sheet metal flanges of same metal thickness as ducts. Overlap openings on 4 sides by at least 1-1/2 inches (38 mm) .
N. Fire-Rated Partition Penetrations: Where ducts pass through interior partitions and exterior walls, install appropriately rated fire dampers, sleeves, and firestopping sealant. Fire and smoke dampers are specified in Division 15 Section "Duct Accessories." Firestopping materials and installation methods are specified in Division 7 Section "Through-Penetration Firestop Systems."
O. Protect duct interiors from the elements and foreign materials until building is enclosed. Follow SMACNA's "Duct Cleanliness for New Construction."
P. Paint interiors of metal ducts that do not have duct liner for 24 inches (600 mm) upstream of registers and grilles. Apply one coat of flat, black, latex finish coat over a compatible galvanized-steel primer. Paint materials and application requirements are specified in

Division 9 painting Sections.

3.3 SEAM AND JOINT SEALING

A. Seal duct seams and joints according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for duct pressure class indicated.

    a. For pressure classes lower than 2-inch wg (500 Pa) , seal transverse joints.

B. Seal ducts before external insulation is applied.

3.4 HANGING AND SUPPORTING

A. Support horizontal ducts within 24 inches (600 mm) of each elbow and within 48 inches (1200 mm) of each branch intersection.
B. Support vertical ducts at maximum intervals of 16 feet (5 m) and at each floor.
C. Install upper attachments to structures with an allowable load not exceeding one-fourth of failure (proof-test) load.

3.5 CONNECTIONS

A. Make connections to equipment with flexible connectors according to Division 15 Section "Duct Accessories."
B. Comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.6 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections according to SMACNA's "HVAC Air Duct Leakage Test Manual" and prepare test reports:

    a. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and for compliance with test requirements.
    b. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If pressure classes are not indicated, test entire system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure. Give seven days' advance notice for testing.
    c. Maximum Allowable Leakage: Comply with requirements for Leakage Class 3 for round and flat-oval ducts, Leakage Class 12 for rectangular ducts in pressure classes lower than and equal to 2-inch wg (500 Pa) (both positive and negative pressures), and Leakage Class 6 for pressure classes from 2-to 10-inch wg (500 to 2500 Pa) .
    d. Remake leaking joints and retest until leakage is equal to or less than maximum allowable.

3.7 CLEANING NEW SYSTEMS

A. Mark position of dampers and air-directional mechanical devices before cleaning, and perform cleaning before air balancing.
B. Use service openings, as required, for physical and mechanical entry and for inspection.

    a. Create other openings to comply with duct standards.

b. Disconnect flexible ducts as needed for cleaning and inspection.
c. Remove and reinstall ceiling sections to gain access during the cleaning process.

C. Clean the following metal duct systems by removing surface contaminants and deposits:

a. Air outlets and inlets (registers, grilles, and diffusers).
b. Supply, return, and exhaust fans including fan housings, plenums (except ceiling supply and return plenums), scrolls, blades or vanes, shafts, baffles, dampers, and drive assemblies.
c. Air-handling unit internal surfaces and components including mixing box, coil section, air wash systems, spray eliminators, condensate drain pans, humidifiers and dehumidifiers, filters and filter sections, and condensate collectors and drains.
d. Coils and related components.
e. Return-air ducts, dampers, and actuators except in ceiling plenums and mechanical equipment rooms.
f. Supply-air ducts, dampers, actuators, and turning vanes.

D. Mechanical Cleaning Methodology:

a. Clean metal duct systems using mechanical cleaning methods that extract contaminants from within duct systems and remove contaminants from building.
b. Use vacuum-collection devices that are operated continuously during cleaning. Connect vacuum device to downstream end of duct sections so areas being cleaned are under negative pressure.
c. Use mechanical agitation to dislodge debris adhered to interior duct surfaces without damaging integrity of metal ducts, duct liner, or duct accessories.
d. Clean fibrous-glass duct liner with HEPA vacuuming equipment; do not permit duct liner to get wet.
e. Clean coils and coil drain pans according to NADCA 1992. Keep drain pan operational. Rinse coils with clean water to remove latent residues and cleaning materials; comb and straighten fins.

E. Cleanliness Verification:

a. Visually inspect metal ducts for contaminants.
b. Where contaminants are discovered, re-clean and re-inspect ducts.

END OF SECTION 15815

North County Annex
AHU 1 & 2 Replacement

SECTION 15820 – DUCT ACCESSORIES

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 the following:

a. Backdraft dampers.
b. Volume dampers.
c. Motorized control dampers.
d. Turning vanes.
e. Duct-mounted access doors and panels.
f. Flexible connectors.
g. Turning vanes.
h. Duct accessory hardware.

1.3 SUBMITTALS

A. Product Data: For the following:

a. Manual-volume dampers.
b. Duct-mounted access doors and panels.
c. Motorized control dampers.
d. Flexible connectors.

1.4 QUALITY ASSURANCE

A. NFPA Compliance: Comply with the following NFPA standards:

a. NFPA 90A, "Installation of Air Conditioning and Ventilating Systems."
b. NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

PART 2 -PRODUCTS

2.1 SHEET METAL MATERIALS

A. Galvanized, Sheet Steel: Lock-forming quality; ASTM A 653/A 653M, G90 (Z275) coating designation; mill-phosphatized finish for surfaces of ducts exposed to view.
B. Carbon-Steel Sheets: ASTM A 366/A 366M, cold-rolled sheets, commercial quality, with oiled, exposed matte finish.

C. Aluminum Sheets: ASTM B 209 (ASTM B 209M) , Alloy 3003, Temper H14, sheet form; with standard, one-side bright finish for ducts exposed to view and mill finish for concealed ducts.
D. Extruded Aluminum: ASTM B 221 (ASTM B 221M) , Alloy 6063, Temper T6.
E. Reinforcement Shapes and Plates: Galvanized steel reinforcement where installed on galvanized, sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.
F. Tie Rods: Galvanized steel, 1/4-inch (6-mm) minimum diameter for 36-inch (900-mm) length or less; 3/8-inch (10-mm) minimum diameter for lengths longer than 36 inches (900 mm) .

2.2 BACKDRAFT DAMPERS

A. Manufacturers:

a. Air Balance, Inc.
b. American Warming and Ventilating.
c. CESCO Products.
d. Duro Dyne Corp.
e. Greenheck.
f. Penn Ventilation Company, Inc.
g. Prefco Products, Inc.
h. Ruskin Company.
i. Vent Products Company, Inc.

B. Description: Multiple-blade, parallel action gravity balanced, with[center-pivoted] blades of maximum 6-inch (150-mm) width, with sealed edges, assembled in rattle-free manner with 90degree stop, steel ball bearings, and axles; adjustment device to permit setting for varying differential static pressure.
C. Frame: 0.063-inch thick extruded aluminum, with welded corners.
D. Blades: 0.050-inch thick aluminum sheet.
E. Blade Seals: Neoprene.
F. Blade Axles: Nonferrous.
G. Tie Bars and Brackets: Aluminum.
H. Return Spring: Adjustable tension.

2.3 MOTORIZED CONTROL DAMPERS

A. Available Manufacturers:

a. Air Balance, Inc.
b. Duro Dyne Corp.
c. Greenheck.
d. McGill AirFlow Corporation.
e. METALAIRE, Inc.
f. Nailor Industries Inc.
g. Penn Ventilation Company, Inc.
h. Ruskin Company.

B. General Description: AMCA-rated, parallel-blade design; minimum of 0.1084-inch-(2.8-mm-) thick, galvanized-steel frames with holes for duct mounting; minimum of 0.0635-inch-

(1.61mm-) thick, galvanized-steel damper blades with maximum blade width of 8 inches (203 mm) .

a. Secure blades to 1/2-inch-(13-mm-) diameter, zinc-plated axles using zinc-plated hardware, with nylon blade bearings, blade-linkage hardware of zinc-plated steel and brass, ends sealed against spring-stainless-steel blade bearings, and thrust bearings at each end of every blade.
b. Operating Temperature Range: From minus 40 to plus 200 deg F (minus 40 to plus 93 deg C).
c. Provide closed-cell neoprene edging.

2.4 VOLUME DAMPERS

A. General: Factory fabricated with required hardware and accessories. Stiffen damper blades for stability. Include locking device to hold single-blade dampers in a fixed position without vibration. Close duct penetrations for damper components to seal duct consistent with pressure class.

a. Pressure Classifications of 2-Inch wg or Higher: End bearings or other seals for ducts with axles full length of damper blades and bearings at both ends of operating shaft.

B. Standard Volume Dampers: Multiple-blade, opposed-blade design, standard leakage rating, with linkage outside air stream, and suitable for horizontal or vertical applications.

a. Steel Frames: Hat-shaped, galvanized, sheet steel channels, minimum of 0.064 inch (1.62 mm) thick, with mitered and welded corners; frames with flanges where indicated for attaching to walls; and flangeless frames where indicated for installing in ducts.
b. Roll-Formed Steel Blades: 0.064-inch-(1.62-mm-) thick, galvanized, sheet steel.
c. Blade Axles: Galvanized steel.
d. Tie Bars and Brackets: Galvanized steel.

C. Jackshaft: 1-inch-(25-mm-) diameter, galvanized steel pipe rotating within a pipe-bearing assembly mounted on supports at each mullion and at each end of multiple-damper assemblies.

a. Length and Number of Mountings: Appropriate to connect linkage of each damper of a multiple-damper assembly.

D. Damper Hardware: Zinc-plated, die-cast core with dial and handle made of 3/32-inch-(2.4-mm-) thick zinc-plated steel, and a 3/4-inch (19-mm) hexagon locking nut. Include center hole to suit damper operating-rod size. Include elevated platform for insulated duct mounting.

2.5 DUCT-MOUNTED ACCESS DOORS AND PANELS

A. General: Fabricate doors and panels airtight and suitable for duct pressure class.
B. Frame: Galvanized, sheet steel, with bend-over tabs and foam gaskets.

C. Door: Double-wall, galvanized, sheet metal construction with insulation fill and thickness, and number of hinges and locks as indicated for duct pressure class. Include vision panel where indicated. Include 1-by-1-inch (25-by-25-mm) butt or piano hinge and cam latches.
D. Seal around frame attachment to duct and door to frame with neoprene or foam rubber.
E. Insulation: 1-inch-(25-mm-) thick, fibrous-glass or polystyrene-foam board.

2.6 FLEXIBLE CONNECTORS

A. General: Flame-retarded or noncombustible fabrics, coatings, and adhesives complying with UL 181, Class 1.
B. Standard Metal-Edged Connectors: Factory fabricated with a strip of fabric 3-1/2 inches (89 mm) wide attached to two strips of 2-3/4-inch-(70-mm-) wide, 0.028-inch-(0.7-mm-) thick, galvanized, sheet steel or 0.032-inch (0.8-mm) aluminum sheets. Select metal compatible with connected ducts.
C. Conventional, Indoor System Flexible Connector Fabric: Glass fabric double coated with polychloroprene.

    a. Minimum Weight: 26 oz./sq. yd. (880 g/sq. m) .
    b. Tensile Strength: 480 lbf/inch (84 N/mm) in the warp, and 360 lbf/inch (63 N/mm) in the filling.

2.7 TURNING VANES

A. Fabricate to comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for vanes and vane runners. Vane runners shall automatically align vanes.
B. Manufactured Turning Vanes: Fabricate 1-1/2-inch wide, single-vane, curved blades of galvanized sheet steel set 3/4 inch (19 mm) o.c.; support with bars perpendicular to blades set 2 inches (50 mm) o.c.; and set into vane runners suitable for duct mounting.

    a. Manufacturers:

        i. Ductmate Industries, Inc.
        ii. Duro Dyne Corp.
        iii. METALAIRE, Inc.
        iv. Ward Industries, Inc.

C. Acoustic Turning Vanes: Fabricate airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.

2.8 ACCESSORY HARDWARE

A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments, and length to suit duct insulation thickness.
B. Splitter Damper Accessories: Zinc-plated damper blade bracket; 1/4-inch (6-mm) , zinc-plated operating rod; and a duct-mounted, ball-joint bracket with flat rubber gasket and square-head set screw.
C. Flexible Duct Clamps: Stainless-steel band with cadmium-plated hex screw to tighten band with a worm-gear action, in sizes 3 to 18 inches (75 to 450 mm) to suit duct size.
D. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to

gasoline and grease.

PART 3 -EXECUTION

3.1 INSTALLATION

A. Install duct accessories according to applicable details shown in SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for metal ducts and NAIMA's "Fibrous Glass Duct Construction Standards" for fibrous-glass ducts.
B. Install flexible duct manufactured support elbows at all flexible duct connections to terminal air devices.
C. Install volume dampers in lined duct; avoid damage to and erosion of duct liner.
D. Install backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.
E. Provide balancing dampers at points on supply, return, and exhaust systems where branches lead from larger ducts as required for air balancing. Install at a minimum of two duct widths from branch takeoff.
F. Provide test holes at fan inlet and outlet and elsewhere as indicated.
G. Install duct access panels downstream from volume dampers, turning vanes, and equipment.

    a. Install duct access panels to allow access to interior of ducts for cleaning, inspecting, adjusting, and maintaining accessories and terminal units.
    b. Install access panels on side of duct where adequate clearance is available.

H. Install the following sizes for duct-mounting, rectangular access doors:

    a. One-Hand or Inspection Access: 8 by 5 inches (200 by 125 mm).
    b. Two-Hand Access: 12 by 6 inches (300 by 150 mm).
    c. Head and Hand Access: 18 by 10 inches (460 by 250 mm).
    d. Head and Shoulders Access: 21 by 14 inches (530 by 355 mm).
    e. Body Access: 25 by 14 inches (635 by 355 mm).
    f. Body Plus Ladder Access: 25 by 17 inches (635 by 430 mm).

I. Install flexible connectors immediately adjacent to equipment in ducts associated with fans and motorized equipment supported by vibration isolators.
J. Connect diffusers or light troffer boots to low pressure ducts with maximum 6 foot lengths of flexible duct clamped or strapped in place.

3.2 ADJUSTING

A. Adjust duct accessories for proper settings.
B. Final positioning of manual-volume dampers is specified in Division 15 Section "Testing, Adjusting, and Balancing."

END OF SECTION 15820

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SECTION 15855 – DIFFUSERS, REGISTERS, AND GRILLES

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 ceiling-and wall-mounted diffusers, registers, and grilles.
B. Related Sections include the following:

    a. Division 15 Section "Duct Accessories" for fire and smoke dampers and volume-control dampers not integral to diffusers, registers, and grilles.

1.3 SUBMITTALS

A. Product Data: For each product indicated, include the following:

    a. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.
    b. Diffuser, Register, and Grille Schedule: Indicate Drawing designation, room location, quantity, model number, size, and accessories furnished.

B. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

    a. Ceiling suspension assembly members.
    b. Method of attaching hangers to building structure.
    c. Size and location of initial access modules for acoustical tile.
    d. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
    e. Duct access panels.

PART 2 -PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

    a. Products: As scheduled on drawings or Engineer approved equivalent.

2.2 SOURCE QUALITY CONTROL

A. Verification of Performance: Rate diffusers, registers, and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

PART 3 -EXECUTION

3.1 EXAMINATION

A. Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance.
B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install diffusers, registers, and grilles level and plumb.
B. Insulate back surfaces of supply diffusers, registers, and grilles.
C. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practicable. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.
D. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

3.3 ADJUSTING

A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION 15855

North County Annex
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SECTION 15990 – TESTING, ADJUSTING, AND BALANCING

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 testing, adjusting, and balancing HVAC systems to produce design objectives, including the following:

   a. Balancing airflow within distribution systems, including submains, branches, and terminals, to indicated quantities according to specified tolerances.
   b. Adjusting total HVAC systems to provide indicated quantities.
   c. Measuring electrical performance of HVAC equipment.
   d. Setting quantitative performance of HVAC equipment.
   e. Reporting results of the activities and procedures specified in this Section.

1.3 DEFINITIONS

A. Adjust: To regulate fluid flow rate and air patterns at the terminal equipment, such as to reduce fan speed or adjust a damper.
B. Balance: To proportion flows within the distribution system, including submains, branches, and terminals, according to design quantities.
C. Draft: A current of air, when referring to localized effect caused by one or more factors of high air velocity, low ambient temperature, or direction of airflow, whereby more heat is withdrawn from a person's skin than is normally dissipated.
D. Procedure: An approach to and execution of a sequence of work operations to yield repeatable results.
E. Report Forms: Test data sheets for recording test data in logical order.
F. Static Head: The pressure due to the weight of the fluid above the point of measurement. In a closed system, static head is equal on both sides of the pump.
G. System Effect: A phenomenon that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
H. System Effect Factors: Allowances used to calculate a reduction of the performance ratings of a fan when installed under conditions different from those presented when the fan was performance tested.
I. Terminal: A point where the controlled medium, such as fluid or energy, enters or leaves the distribution system.
J. Test: A procedure to determine quantitative performance of a system or equipment.
K. Testing, Adjusting, and Balancing Agent: The entity responsible for performing and reporting the testing, adjusting, and balancing procedures.
L. AABC: Associated Air Balance Council.
M. AMCA: Air Movement and Control Association.
N. CTI: Cooling Tower Institute.
O. NEBB: National Environmental Balancing Bureau.

P. SMACNA: Sheet Metal and Air Conditioning Contractors' National Association.

1.4 SUBMITTALS

A. Quality-Assurance Submittals: Within 30 days from the Contractor's Notice to Proceed, submit 2 copies of evidence that the testing, adjusting, and balancing Agent and this Project's testing, adjusting, and balancing team members meet the qualifications specified in the "Quality Assurance" Article below.
B. Contract Documents Examination Report: Within 45 days from the Contractor's Notice to Proceed, submit 2 copies of the Contract Documents review report as specified in Part 3 of this Section.
C. Strategies and Procedures Plan: Within 60 days from the Contractor's Notice to Proceed, submit 2 copies of the testing, adjusting, and balancing strategies and step-by-step procedures as specified in Part 3 "Preparation" Article below. Include a complete set of report forms intended for use on this Project.
D. Certified Testing, Adjusting, and Balancing Reports: Submit 2 copies of reports prepared, as specified in this Section, on approved forms certified by the testing, adjusting, and balancing Agent.
E. Warranty: Submit 2 copies of special warranty specified in the "Warranty" Article below.

1.5 QUALITY ASSURANCE

A. Agent Qualifications: Engage a testing, adjusting, and balancing agent certified by either AABC or NEBB.
B. Certification of Testing, Adjusting, and Balancing Reports: Certify the testing, adjusting, and balancing field data reports. This certification includes the following:

    a. Review field data reports to validate accuracy of data and to prepare certified testing, adjusting, and balancing reports.
    b. Certify that the testing, adjusting, and balancing team complied with the approved testing, adjusting, and balancing plan and the procedures specified and referenced in this Specification.

C. Testing, Adjusting, and Balancing Reports: Use standard forms from either AABC's "National Standards for Testing, Adjusting, and Balancing" or NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems."
D. Instrumentation Type, Quantity, and Accuracy: As described in NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems," Section II, "Required Instrumentation for NEBB Certification."
E. Instrumentation Calibration: Calibrate instruments at least every 6 months or more frequently if required by the instrument manufacturer.

1.6 COORDINATION

A. Coordinate the efforts of factory-authorized service representatives for systems and equipment, HVAC controls installers, and other mechanics to operate HVAC systems and equipment to support and assist testing, adjusting, and balancing activities.
B. Cooperate with the Owner during testing, adjusting, and balancing operations to minimize conflicts with the Owner's operations. Provide 7 days' advance notice for each test. Include scheduled test dates and times.
C. Perform testing, adjusting, and balancing after leakage and pressure tests on air and water

distribution systems have been satisfactorily completed.

1.7 WARRANTY

A. General Warranty: The national project performance guarantee specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
B. Special Guarantee: Provide a guarantee on NEBB forms stating that NEBB will assist in completing the requirements of the Contract Documents if the testing, adjusting, and balancing Agent fails to comply with the Contract Documents. Guarantee includes the following provisions:

    a. The certified Agent has tested and balanced systems according to the Contract Documents.
    b. Systems are balanced to optimum performance capabilities within design and installation limits.

PART 2 -PRODUCTS (Not Applicable)

PART 3 -EXECUTION

3.1 EXAMINATION

A. Examine Contract Documents to become familiar with project requirements and to discover conditions in systems' designs that may preclude proper testing, adjusting, and balancing of systems and equipment.

    a. Contract Documents are defined in the General and Supplementary Conditions of the Contract.
    b. Verify that balancing devices are required by the Contract Documents. Verify that quantities and locations of these balancing devices are accessible and appropriate for effective balancing and for efficient system and equipment operation.

B. Examine approved submittal data of HVAC systems and equipment.
C. Examine project record documents described in Division 1 Section "Project Record Documents."
D. Examine Engineer's design data, including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.
E. Examine equipment performance data, including fan and pump curves. Relate performance data to project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system. Calculate system effect factors to reduce the performance ratings of HVAC equipment when installed under conditions different from those presented when the equipment was performance tested at the factory. To calculate system effects for air systems, use tables and

charts found in AMCA 201, "Fans and Systems," Sections 7 through 10; or in SMACNA's "HVAC Systems-Duct Design," Sections 5 and 6. Compare this data with the design data and installed conditions.

F. Examine system and equipment installations to verify that they are complete and that testing, cleaning, adjusting, and commissioning specified in individual Specification Sections have been performed.
G. Examine system and equipment test reports.
H. Examine HVAC system and equipment installations to verify that indicated balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers, are properly installed, and their locations are accessible and appropriate for effective balancing and for efficient system and equipment operation.
I. Examine systems for functional deficiencies that cannot be corrected by adjusting and balancing.
J. Examine air-handling equipment to ensure clean filters have been installed, bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.
K. Examine plenum ceilings, utilized for supply air, to verify that they are airtight. Verify that pipe penetrations and other holes are sealed.
L. Examine equipment for installation and for properly operating safety interlocks and controls.
M. Examine automatic temperature system components to verify the following:

    a. Dampers, valves, and other controlled devices operate by the intended controller.
    b. Dampers and valves are in the position indicated by the controller.
    c. Integrity of valves and dampers for free and full operation and for tightness of fully closed and fully open positions.
    d. Automatic modulating and shutoff valves, including 2-way valves and 3-way mixing and diverting valves, are properly connected.
    e. Thermostats and humidistats are located to avoid adverse effects of sunlight, drafts, and cold walls.
    f. Sensors are located to sense only the intended conditions.
    g. Sequence of operation for control modes is according to the Contract Documents.
    h. Controller set points are set at design values. Observe and record system reactions to changes in conditions. Record default set points if different from design values.
    i. Interlocked systems are operating.
    j. Changeover from heating to cooling mode occurs according to design values.

N. Report deficiencies discovered before and during performance of testing, adjusting, and balancing procedures.

3.2 PREPARATION

A. Prepare a testing, adjusting, and balancing plan that includes strategies and step-by-step procedures.
B. Complete system readiness checks and prepare system readiness reports. Verify the following:

    a. Permanent electrical power wiring is complete.
    b. Automatic temperature-control systems are operational.
    c. Equipment and duct access doors are securely closed.

d. Balance, smoke, and fire dampers are open.
e. Windows and doors can be closed so design conditions for system operations can be met.

3.3 GENERAL TESTING AND BALANCING PROCEDURES

A. Perform testing and balancing procedures on each system according to the procedures contained in NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" and this Section.
B. Cut insulation, ducts, and equipment cabinets for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. After testing and balancing, close probe holes and patch insulation with new materials identical to those removed. Restore vapor barrier and finish according to the insulation Specifications for this Project.
C. Mark equipment settings with paint or other suitable, permanent identification material, including damper-control positions, valve indicators, fan-speed-control levers, and similar controls and devices, to show final settings.

3.4 FUNDAMENTAL AIR SYSTEMS' BALANCING PROCEDURES

A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.
B. Prepare schematic diagrams of systems' "as-built" duct layouts.
C. Determine the best locations in main and branch ducts for accurate duct airflow measurements.
D. Check the airflow patterns from the outside-air louvers and dampers and the return-and exhaust-air dampers, through the supply-fan discharge and mixing dampers.
E. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
F. Verify that motor starters are equipped with properly sized thermal protection.
G. Check dampers for proper position to achieve desired airflow path.
H. Check for airflow blockages.
I. Check condensate drains for proper connections and functioning.
J. Check for proper sealing of air-handling unit components.

3.5 GENERAL PROCEDURES FOR HYDRONIC SYSTEMS

A. Prepare test reports with pertinent design data, and number in sequence starting at pump to end of system. Check the sum of branch-circuit flows against the approved pump flow rate. Correct variations that exceed plus or minus 5 percent.
B. Prepare schematic diagrams of systems' "as-built" piping layouts.
C. Prepare hydronic systems for testing and balancing according to the following, in addition to the general preparation procedures specified above:

a. Open all manual valves for maximum flow.
b. Check liquid level in expansion tank.
c. Check makeup water-station pressure gage for adequate pressure for highest vent.
d. Check flow-control valves for specified sequence of operation, and set at indicated flow.
e. Set differential-pressure control valves at the specified differential pressure. Do not set at fully closed position when pump is positive-displacement type unless several terminal valves are kept open.

f. Set system controls so automatic valves are wide open to heat exchangers.
g. Check pump-motor load. If motor is overloaded, throttle main flow-balancing device so motor nameplate rating is not exceeded.
h. Check air vents for a forceful liquid flow exiting from vents when manually operated.

3.6 PROCEDURES FOR AIR HANDLER SYSTEM

A. Adjust fan to deliver total indicated airflow within the maximum allowable fan speed listed by fan manufacturer.

a. Measure total airflow.

i. Where sufficient space in ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow.

b. Measure fan static pressure as follows to determine actual static pressure:

i. Measure outlet static pressure as far downstream from the fan as practical and upstream from restrictions in ducts such as elbows and transitions.
ii. Measure static pressure directly at the fan outlet or through the flexible connection.
iii. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from the flexible connection, and downstream from duct restrictions.
iv. Measure inlet static pressure of double-inlet fans through the wall of the plenum that houses the fan.

c. Measure static pressure across each component that makes up an air-handling unit, rooftop unit, and other air-handling and -treating equipment.

i. Report the cleanliness status of filters and the time static pressures are measured.

d. Measure static pressures entering and leaving other devices, such as sound traps, heat-recovery equipment, and air washers, under final balanced conditions.
e. Review Record Documents to determine variations in design static pressures versus actual static pressures. Calculate actual system-effect factors. Recommend adjustments to accommodate actual conditions.
f. Adjust fans, belts, and pulley sizes to achieve indicated air-handling-unit performance. Mechanical contractor to provide sheaves/pulleys as required.
g. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload will occur. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.

B. Adjust volume damper for main duct to indicated airflow within specified tolerances.

a. Measure static pressure at a point downstream from the balancing damper, and adjust volume damper until the proper static pressure is achieved.

C. Measure air outlets and inlets without making adjustments.

a. Measure terminal outlets using a direct-reading hood or outlet manufacturer's written instructions and calculating factors.

D. Adjust air outlets and inlets for the space to indicated airflows within specified tolerances of indicated values.

a. Adjust each outlet in space to within specified tolerances of indicated quantities without generating noise levels above the limitations prescribed by the Contract Documents.
b. Adjust patterns of adjustable outlets for proper distribution without drafts.

3.7 PROCEDURES FOR HEAT-TRANSFER COILS

A. Water Coils: Measure the following data for each coil:

a. Entering-and leaving-water temperature.
b. Water flow rate and pressure drop.
c. Dry-bulb temperature of entering and leaving air.
d. Wet-bulb temperature of entering and leaving air for cooling coils.
e. Airflow and air pressure drop.

B. Make all reasonable efforts to obtain inlet air conditions as near as possible to design conditions.

3.8 MOTORS

A. Motors: Test at final balanced conditions and record the following data:

a. Manufacturer, model, and serial numbers.
b. Motor horsepower rating.
c. Motor rpm.
d. Efficiency rating if high-efficiency motor.
e. Nameplate and measured voltage, each phase.
f. Nameplate and measured amperage, each phase.
g. Starter thermal-protection-element rating.

3.9 TEMPERATURE-CONTROL VERIFICATION

A. Verify that controllers are calibrated and commissioned.
B. Check transmitter and controller locations and note conditions that would adversely affect control functions.
C. Record controller settings and note variances between set points and actual measurements.
D. Check the operation of limiting controllers (i.e., high-and low-temperature controllers).
E. Check free travel and proper operation of control devices such as damper and valve operators.

F. Check the sequence of operation of control devices. Note air pressures and device positions and correlate with airflow and water flow measurements. Note the speed of response to input changes.
G. Check the interaction of interlock and lockout systems.
H. Record voltages of power supply and controller output. Determine whether the system operates on a grounded or non-grounded power supply.

3.10 TOLERANCES

A. Set HVAC system airflow and water flow rates within the following tolerances:

    a. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus 5 to plus 10 percent.
    b. Air Outlets and Inlets: 0 to minus 10 percent.

3.11 REPORTING

A. General: Computer printout in letter-quality font, on standard bond paper, in 3-ring binder, tabulated and divided into sections by tested and balanced systems.
B. Include a certification sheet in front of binder signed and sealed by the certified testing and balancing engineer.

    a. Include a list of the instruments used for procedures, along with proof of calibration.

C. Final Report Contents: In addition to the certified field report data, include the following:

    a. Fan curves.
    b. Manufacturers' test data.
    c. Field test reports prepared by system and equipment installers.
    d. Other information relative to equipment performance, but do not include approved Shop Drawings and Product Data.

D. General Report Data: In addition to the form titles and entries, include the following data in the final report, as applicable:

    a. Title page.
    b. Name and address of testing, adjusting, and balancing Agent.
    c. Project name.
    d. Project location.
    e. Architect's name and address.
    f. Engineer's name and address.
    g. Contractor's name and address.
    h. Report date.
    i. Signature of testing, adjusting, and balancing Agent who certifies the report.
    j. Summary of contents, including the following:

        i. Design versus final performance.
        ii. Notable characteristics of systems.
        iii. Description of system operation sequence if it varies from the Contract Documents.

k. Nomenclature sheets for each item of equipment.
l. Data for terminal units, including manufacturer, type size, and fittings.
m. Notes to explain why certain final data in the body of reports vary from design values.
n. Test conditions for fans and pump performance forms, including the following:

i. Settings for outside-, return-, and exhaust-air dampers.
ii. Conditions of filters.
iii. Cooling coil, wet-and dry-bulb conditions.
iv. Face and bypass damper settings at coils.
v. Fan drive settings, including settings and percentage of maximum pitch diameter.
vi. Settings for supply-air, static-pressure controller.
vii. Other system operating conditions that affect performance.

E. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present with single-line diagrams and include the following:

a. Quantities of outside, supply, return, and exhaust airflows.
b. Water flow rates.
c. Duct, outlet, and inlet sizes.
d. Pipe and valve sizes and locations.
e. Terminal units.
f. Balancing stations.

F. Fan Test Reports: For supply, return, and exhaust fans, include the following:

a. Fan Data: Include the following:

i. System identification.
ii. Location.
iii. Make and type.
iv. Model number and size.
v. Manufacturer's serial number.
vi. Arrangement and class.
vii. Sheave make, size in inches (mm) , and bore.
viii. Sheave dimensions, center-to-center and amount of adjustments in inches (mm).

b. Motor Data: Include the following:

i. Make and frame type and size.
ii. Horsepower and rpm.
iii. Volts, phase, and hertz.
iv. Full-load amperage and service factor.
v. Sheave make, size in inches (mm) , and bore.
vi. Sheave dimensions, center-to-center and amount of adjustments in inches (mm).
vii. Number of belts, make, and size.

c. Test Data: Include design and actual values for the following:

i. Total airflow rate in cfm (L/s) .
ii. Total system static pressure in inches wg (Pa) .
iii. Fan rpm.
iv. Discharge static pressure in inches wg (Pa) .
v. Suction static pressure in inches wg (Pa) .

G. System-Coil Reports: For reheat coils and water coils of terminal units, include the following:

a. Unit Data: Include the following:

i. System and air-handling unit identification.
ii. Location and zone.
iii. Coil make and size.

b. Test Data: Include design and actual values for the following:

i. Airflow rate in cfm (L/s) .
ii. Entering-water temperature in deg F (deg C) .
iii. Leaving-water temperature in deg F (deg C) .
iv. Water pressure drop in feet of head or psig (kPa) .
v. Entering-air temperature in deg F (deg C) .
vi. Leaving-air temperature in deg F (deg C) .

H. Fan Test Reports: For supply, return, and exhaust fans, include the following:

a. Fan Data:

i. System identification.
ii. Location.
iii. Make and type.
iv. Model number and size.
v. Manufacturer's serial number.
vi. Arrangement and class.
vii. Sheave make, size in inches (mm) , and bore.
viii. Sheave dimensions, center-to-center, and amount of adjustments in inches (mm).

b. Motor Data:

i. Make and frame type and size.
ii. Horsepower and rpm.
iii. Volts, phase, and hertz.
iv. Full-load amperage and service factor.
v. Sheave make, size in inches (mm) , and bore.
vi. Sheave dimensions, center-to-center, and amount of adjustments in inches (mm).

vii. Number of belts, make, and size.

c. Test Data (Indicated and Actual Values):

i. Total airflow rate in cfm (L/s) .
ii. Total system static pressure in inches wg (Pa) .
iii. Fan rpm.
iv. Discharge static pressure in inches wg (Pa) .
v. Suction static pressure in inches wg (Pa) .

I. Instrument Calibration Reports: For instrument calibration, include the following:

a. Report Data: Include the following:

i. Instrument type and make.
ii. Serial number.
iii. Application.
iv. Dates of use.
v. Dates of calibration.

END OF SECTION 15990

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SECTION 16050 – BASIC ELECTRICAL MATERIALS AND METHODS

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 the following:

a. Electrical equipment coordination and installation.
b. Sleeves for raceways and cables.
c. Sleeve seals.
d. Electrical identification.
e. Common electrical installation requirements.

1.3 DEFINITIONS

A. ATS: Acceptance Testing Specifications.
B. EPDM: Ethylene-propylene-diene terpolymer rubber.
C. NBR: Acrylonitrile-butadiene rubber.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

1.5 QUALITY ASSURANCE

A. Test Equipment Suitability and Calibration: Comply with NETA ATS, "Suitability of Test Equipment" and "Test Instrument Calibration."

1.6 COORDINATION

A. Coordinate arrangement, mounting, and support of electrical equipment:

a. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
b. To provide for ease of disconnecting the equipment with minimum interference to other installations.
c. To allow right of way for piping and conduit installed at required slope.
d. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.

B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.
C. Coordinate location of access panels and doors for electrical items that are behind finished

surfaces or otherwise concealed. Access doors and panels are specified in Division 8 Section "Access Doors and Frames."

D. Coordinate electrical testing of electrical, mechanical, and architectural items, so equipment and systems that are functionally interdependent are tested to demonstrate successful interoperability.

PART 2 -PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

    a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
    b. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 SLEEVES FOR RACEWAYS AND CABLES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.
B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.
C. Sleeves for Rectangular Openings: Galvanized sheet steel with minimum 0.052-or 0.138-inch (1.3-or 3.5-mm) thickness as indicated and of length to suit application.
D. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 7 Section "Through-Penetration Firestop Systems."

2.3 ELECTRICAL IDENTIFICATION

A. Identification Devices: A single type of identification product for each application category. Use colors prescribed by ANSI A13.1, NFPA 70, and these Specifications.
B. Raceway and Cable Labels: Comply with ANSI A13.1, Table 3, for minimum size of letters for legend and minimum length of color field for each raceway and cable size.
C. Tape Markers for Wire: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.
D. Engraved-Plastic Labels, Signs, and Instruction Plates: Engraving stock, melamine plastic laminate punched or drilled for mechanical fasteners 1/16-inch (1.6-mm) minimum thickness for signs up to 20 sq. in. (129 sq. cm) and 1/8-inch (3.2-mm) minimum thickness for larger sizes. Engraved legend in black letters on white background.
E. Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws or No. 10/32 stainless-steel machine screws with nuts and flat and lock washers.

PART 3 -EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

A. Comply with NECA 1.
B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
E. Right of Way: Give to raceways and piping systems installed at a required slope.

3.2 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.
B. Coordinate sleeve selection and application with selection and application of firestopping.
C. C. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
D. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
E. Rectangular Sleeve Minimum Metal Thickness:

    a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and no side greater than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm) .
    b. For sleeve cross-section rectangle perimeter equal to, or greater than, 50 inches (1270 mm) and 1 or more sides equal to, or greater than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

F. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
G. Cut sleeves to length for mounting flush with both surfaces of walls.
H. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level.
I. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed.
J. Seal space outside of sleeves with grout for penetrations of concrete and masonry and with approved joint compound for gypsum board assemblies.
K. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Refer to Division 7 Section "Joint Sealants" for materials and installation.
L. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with firestop materials. Comply with Division 7 Section "Through-Penetration Firestop Systems."

M. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
N. Aboveground, Exterior-Wall Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
O. Underground, Exterior-Wall Penetrations: Install cast-iron "wall pipes" for sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway or cable and sleeve for installing mechanical sleeve seals.

3.3 SLEEVE-SEAL INSTALLATION

A. Install to seal underground, exterior wall penetrations.
B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.4 IDENTIFICATION MATERIALS AND DEVICES

A. Install at locations for most convenient viewing without interference with operation and maintenance of equipment. Provide labels for all of the following:

    a. Panelboards and switchboards.
    b. Receptacles.
    c. Motor Starters
    d. 3-pole Circuit Breakers
    e. Disconnects
    f. Contactors

B. Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations indicated in the Contract Documents or required by codes and standards. Use consistent designations throughout Project.
C. Self-Adhesive Identification Products: Clean surfaces before applying.
D. Color-code 208/120-V system secondary service, feeder, and branch-circuit conductors throughout the secondary electrical system as follows:

    Consult Galveston Count Facilities Manager

E. Color-code 480/277-V system secondary service, feeder, and branch-circuit conductors throughout the secondary electrical system as follows:

    Consult Galveston Count Facilities Manager

F. Install warning, caution, and instruction signs where required to comply with 29 CFR, Chapter XVII, Part 1910.145, and where needed to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.

3.5 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 7 Section "Through-Penetration Firestop Systems."

3.6 FIELD QUALITY CONTROL

A. Inspect installed sleeve and sleeve-seal installations and associated firestopping for damage and faulty work.

END OF SECTION 16050

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SECTION 16060 – GROUNDING AND BONDING

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 grounding of electrical systems and equipment. Grounding requirements specified in this Section may be supplemented by special requirements of systems described in other Sections.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

    a. Comply with UL 467.

PART 2 -PRODUCTS

2.1 GROUNDING CONDUCTORS

A. Equipment Grounding Conductors: Insulated with green-colored insulation.
B. Bare Copper Conductors: Comply with the following:

    a. Solid Conductors: ASTM B 3.
    b. Assembly of Stranded Conductors: ASTM B 8.
    c. Tinned Conductors: ASTM B 33.

2.2 CONNECTOR PRODUCTS

A. Comply with IEEE 837 and UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items.
B. Bolted Connectors: Bolted-pressure-type connectors, or compression type.
C. Welded Connectors: Exothermic-welded type, in kit form, and selected per manufacturer's written instructions.

PART 3 -EXECUTION

3.1 APPLICATION

A. In raceways, use insulated equipment grounding conductors.
B. Equipment Grounding Conductor Terminations: Use bolted pressure clamps.

3.2 EQUIPMENT GROUNDING CONDUCTORS

A. Comply with NFPA 70, Article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by NFPA 70 are indicated.
B. Install insulated equipment grounding conductors in all feeders and circuits.

3.3 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
B. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers and supports is not transmitted to rigidly mounted equipment. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then, use a bolted clamp. Bond straps directly to the basic structure taking care not to penetrate any adjacent parts. Install straps only in locations accessible for maintenance.

3.4 CONNECTIONS

A. General: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

    a. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.
    b. Make connections with clean, bare metal at points of contact.
    c. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
    d. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
    e. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

B. Equipment Grounding Conductor Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.
C. Non-contact Metal Raceway Terminations: If metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to

grounding bus or terminal in housing. Bond electrically noncontinuous conduits at entrances and exits with grounding bushings and bare grounding conductors, unless otherwise indicated.

D. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.
E. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.

3.5 FIELD QUALITY CONTROL

A. After installing grounding system but before permanent electrical circuitry has been energized, test for compliance with requirements.
B. Perform the following tests; prepare and submit reports.

    a. Test completed grounding system at service disconnect enclosure grounding terminal, at individual ground rods, and at test wells. Make tests at ground rods prior to connecting conductors.

        i. Measure ground resistance not less than three days after last trace of precipitation, and without soil being moistened by any means.
        ii. Perform tests by fall of potential method according to IEEE 81.

    b. Measured ground resistance is not to exceed 8 ohms.
    c. Report results of testing in writing to Architect.
    d. If resistance to ground exceeds specified values, provide in report recommendations to reduce ground resistance.

END OF SECTION 16060

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SECTION 16120 – CONDUCTORS AND CABLES

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 building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

1.3 QUALITY ASSURANCE

A. Listing and Labeling: Provide wires and cables specified in this Section that are listed and labeled.

    a. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.

B. Comply with NFPA 70.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver wires and cables according to NEMA WC 26.

1.5 COORDINATION

A. Coordinate layout and installation of cables with other installations.
B. Revise locations and elevations from those indicated, as required to suit field conditions and as approved by Engineer.

PART 2 -PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Wires and Cables:

        i. Alcan Aluminum Corporation; Alcan Cable Div.
        ii. American Insulated Wire Corp.; Leviton Manufacturing Co.
        iii. BICC Brand-Rex Company.

iv. Carol Cable Co., Inc.
v. Senator Wire & Cable Company.
vi. Southwire Company.

b. Connectors for Wires and Cables:

i. AMP Incorporated.
ii. General Signal; O-Z/Gedney Unit.
iii. Monogram Co.; AFC.
iv. Square D Co.; Anderson.
v. 3M Company; Electrical Products Division.

2.2 BUILDING WIRES AND CABLES

A. UL-listed building wires and cables with conductor material, insulation type, cable construction, and rating as specified in Part 3 "Wire and Insulation Applications" Article.
B. Rubber Insulation Material: Comply with NEMA WC 3.
C. Thermoplastic Insulation Material: Comply with NEMA WC 5.
D. Cross-Linked Polyethylene Insulation Material: Comply with NEMA WC 7.
E. Ethylene Propylene Rubber Insulation Material: Comply with NEMA WC 8.
F. Conductor Material: Copper.
G. Stranding: Solid conductor for No. 10 AWG and smaller; stranded conductor for larger than No. 10 AWG.

2.3 CONNECTORS AND SPLICES

A. UL-listed, factory-fabricated wiring connectors of size, ampacity rating, material, type, and class for application and service indicated. Comply with Project's installation requirements and as specified in Part 3 "Wire and Insulation Applications" Article.

PART 3 -EXECUTION

3.1 EXAMINATION

A. Examine raceways and building finishes to receive wires and cables for compliance with requirements for installation tolerances and other conditions affecting performance of wires and cables. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 WIRE AND INSULATION APPLICATIONS

A. Feeders: Type THHN/THWN, in raceway.
B. Branch Circuits: Type THHN/THWN, in raceway.
C. Class 1 Control Circuits: Type THHN/THWN, in raceway.
D. Class 2 Control Circuits: Type THHN/THWN, in raceway.

3.3 INSTALLATION

A. Install wires and cables as indicated, according to manufacturer's written instructions and NECA's "Standard of Installation."
B. Remove existing wires from raceway before pulling in new wires and cables.
C. Pull Conductors: Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
E. Install exposed cables, parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
F. Support cables according to Division 16 Section "Basic Electrical Materials and Methods."
G. Seal around cables penetrating fire-rated elements according to Division 7 Section "Firestopping."
H. Identify wires and cables according to Division 16 Section "Basic Electrical Materials and Methods."

3.4 CONNECTIONS

A. Conductor Splices: Keep to minimum.
B. Install splices and tapes that possess equivalent or better mechanical strength and insulation ratings than conductors being spliced.
C. Use splice and tap connectors compatible with conductor material.
D. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches (300 mm) of slack.
E. Connect outlets and components to wiring and to ground as indicated and instructed by manufacturer.
F. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.5 FIELD QUALITY CONTROL

A. Testing: On installation of wires and cables and before electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

    a. Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA ATS, Section 7.3.1. Certify compliance with test parameters.

B. Correct malfunctioning conductors and cables at Project site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units and retest.

END OF SECTION 16120

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SECTION 16130 – RACEWAYS AND BOXES

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 raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

   a. Raceways include the following:

      i. RNC.
      ii. IMC.
      iii. EMT.
      iv. FMC.
      v. LFNC.
      vi. Wireways.

   b. Boxes, enclosures, and cabinets include the following:

      i. Device boxes.
      ii. Pull and junction boxes.
      iii. Cabinets and hinged-cover enclosures.

1.3 DEFINITIONS

A. EMT: Electrical metallic tubing.
B. ENT: Electrical nonmetallic tubing.
C. FMC: Flexible metal conduit.
D. IMC: Intermediate metal conduit.
E. LFMC: Liquidtight flexible metal conduit.
F. LFNC: Liquidtight flexible nonmetallic conduit.
G. RMC: Rigid metal conduit.
H. RNC: Rigid nonmetallic conduit.

1.4 SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

1.5 QUALITY ASSURANCE

A. Listing and Labeling: Provide raceways and boxes specified in this Section that are listed and labeled.

a. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.

B. Comply with NECA's "Standard of Installation."
C. Comply with NFPA 70.

1.6 COORDINATION

A. Coordinate layout and installation of raceways and boxes with other construction elements to ensure adequate headroom, working clearance, and access.

PART 2 -PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Metal Conduit and Tubing:

i. Alflex Corp.
ii. Anamet, Inc.; Anaconda Metal Hose.
iii. Anixter Brothers, Inc.
iv. Carol Cable Co., Inc.
v. Cole-Flex Corp.
vi. Electri-Flex Co.
vii. Flexcon, Inc.; Coleman Cable Systems, Inc.
viii. Grinnell Co.; Allied Tube and Conduit Div.
ix. Monogram Co.; AFC.
x. Spiraduct, Inc.
xi. Triangle PWC, Inc.
xii. Wheatland Tube Co.

b. Conduit Bodies and Fittings:

i. American Electric; Construction Materials Group.
ii. Crouse-Hinds; Div. of Cooper Industries.
iii. Emerson Electric Co.; Appleton Electric Co.
iv. Hubbell, Inc.; Killark Electric Manufacturing Co.
v. Lamson & Sessions; Carlon Electrical Products.
vi. O-Z/Gedney; Unit of General Signal.
vii. Scott Fetzer Co.; Adalet-PLM.
viii. Spring City Electrical Manufacturing Co.

c. Non-metallic Conduit And Tubing:

i. American International.

ii. Anamet Electrical, Inc.; Anaconda Metal Hose.
iii. Arnco Corp.
iv. Cantex Inc.
v. Certainteed Corp.; Pipe & Plastics Group.
vi. Condux International.
vii. ElecSYS, Inc.
viii. Electri-Flex Co.
ix. Lamson & Sessions; Carlon Electrical Products.
x. Manhattan/CDT/Cole-Flex.
xi. RACO; Division of Hubbell, Inc.
xii. Spiralduct, Inc./AFC Cable Systems, Inc.
xiii. Thomas & Betts Corporation.

d. Metal Wireways:

i. Hoffman Engineering Co.
ii. Keystone/Rees, Inc.
iii. Square D Co.

e. Surface Metal Raceways:

i. Airey-Thompson Co., Inc.; A-T Power Systems.
ii. American Electric; Construction Materials Group.
iii. Butler Manufacturing Co.; Walker Division.
iv. Wiremold Co. (The); Electrical Sales Division.

f. Boxes, Enclosures, and Cabinets:

i. American Electric; FL Industries.
ii. Butler Manufacturing Co.; Walker Division.
iii. Crouse-Hinds; Div. of Cooper Industries.
iv. Electric Panelboard Co., Inc.
v. Erickson Electrical Equipment Co.
vi. Hoffman Engineering Co.; Federal-Hoffman, Inc.
vii. Hubbell Inc.; Killark Electric Manufacturing Co.
viii. Hubbell Inc.; Raco, Inc.
ix. Lamson & Sessions; Carlon Electrical Products.
x. O-Z/Gedney; Unit of General Signal.
xi. Parker Electrical Manufacturing Co.
xii. Robroy Industries, Inc.; Electrical Division.
xiii. Scott Fetzer Co.; Adalet-PLM.
xiv. Spring City Electrical Manufacturing Co.
xv. Thomas & Betts Corp.
xvi. Woodhead Industries, Inc.; Daniel Woodhead Co.

2.2 METAL CONDUIT AND TUBING

A. Rigid Steel Conduit: ANSI C80.1.
B. IMC: ANSI C80.6.
C. EMT and Fittings: ANSI C80.3.

a. Fittings: Compression type.

D. LFMC: Flexible steel conduit with PVC jacket.
E. FMC: Zinc-coated steel.
F. Fittings: NEMA FB 1; compatible with conduit/tubing materials.

2.3 NONMETALLIC CONDUIT AND TUBING

A. ENT: NEMA TC 13.
B. RNC: NEMA TC 2, Schedule 40 and Schedule 80 PVC.
C. ENT and RNC Fittings: NEMA TC 3; match to conduit or tubing type and material.
D. LFNC: UL 1660.

2.4 METAL WIREWAYS

A. Material: Sheet metal sized and shaped as indicated.
B. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
C. Select features, unless otherwise indicated, as required to complete wiring system and to comply with NFPA 70.
D. Wireway Covers: Screw-cover type.
E. Finish: Manufacturer's standard enamel finish.

2.5 NON-METALLIC WIREWAYS

A. Description: Fiberglass polyester, extruded and fabricated to size and shape indicated, with no holes or knockouts. Cover is gasketed with oil-resistant gasket material and fastened with captive screws treated for corrosion resistance. Connections are flanged, with stainless-steel screws and oil-resistant gaskets.
B. Description: PVC plastic, extruded and fabricated to size and shape indicated, with snap-on cover and mechanically coupled connections with plastic fasteners.
C. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
D. Select features, unless otherwise indicated, as required to complete wiring system and to comply with NFPA 70.

2.6 SURFACE RACEWAYS

A. Surface Metal Raceways: Galvanized steel with snap-on covers. Finish with manufacturer's standard prime coating.
B. Surface Nonmetallic Raceways: 2-piece construction, manufactured of rigid PVC compound with matte texture and manufacturer's standard color.
C. Types, sizes, and channels as indicated and required for each application, with fittings that match and mate with raceways.

2.7 OUTLET AND DEVICE BOXES

A. Sheet Metal Boxes: NEMA OS 1.

2.8 PULL AND JUNCTION BOXES

A. Small Sheet Metal Boxes: NEMA OS 1.

2.9 BOXES, ENCLOSURES, AND CABINETS

A. Sheet Metal Outlet and Device Boxes: NEMA OS 1.
B. Cast-Metal Outlet and Device Boxes: NEMA FB 1, Type FD, with gasketed cover.
C. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
D. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous hinge cover and flush latch.

    a. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

E. Cabinets: NEMA 250, Type 1, galvanized steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel. Hinged door in front cover with flush latch and concealed hinge. Key latch to match panelboards. Include metal barriers to separate wiring of different systems and voltage, and include accessory feet where required for freestanding equipment.

PART 3 -EXECUTION

3.1 EXAMINATION

A. Examine surfaces to receive raceways, boxes, enclosures, and cabinets for compliance with installation tolerances and other conditions affecting performance of raceway installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 WIRING METHODS

A. Outdoors: Use the following wiring methods:

    a. Exposed: Rigid steel or IMC.
    b. Concealed: Rigid steel or IMC.
    c. Underground, Single Run or Grouped: RNC.
    d. Damp or Wet Locations: RNC.
    e. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
    f. Boxes and Enclosures: NEMA 250, Type 3R or Type 4.

B. Indoors: Use the following wiring methods:

    a. Exposed: EMT.
    b. Concealed: EMT.
    c. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC; except in wet or damp locations, use LFMC.
    d. Damp or Wet Locations: Rigid steel conduit.
    e. Boxes and Enclosures: NEMA 250, Type 1, except as follows:

i. Damp or Wet Locations: NEMA 250, Type 4, stainless steel.

C. Minimum Raceway Size: 3/4-inch trade size .
D. Raceway Fittings: Compatible with raceways and suitable for use and location.

a. Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.
b. PVC Externally Coated, Rigid Steel Conduits: Use only fittings approved for use with that material. Patch all nicks and scrapes in PVC coating after installing conduits.

E. Do not install aluminum conduits embedded in or in contact with concrete.

3.3 INSTALLATION

A. Install raceways, boxes, enclosures, and cabinets as indicated, according to manufacturer's written instructions.
B. Minimum Raceway Size: 3/4-inch trade size (DN21) .
C. Conceal conduit and EMT, unless otherwise indicated, within finished walls, ceilings, and floors.
D. Raceways Embedded in Slabs: Install in middle 1/3 of slab thickness where practical and leave at least 2 inches (50 mm) of concrete cover.

a. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.
b. Space raceways laterally to prevent voids in concrete.
c. Run conduit larger than 1-inch trade size (DN 27) parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
d. Change from nonmetallic tubing to Schedule 80 nonmetallic conduit, rigid steel conduit, or IMC before rising above the floor.

E. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
F. Install raceways level and square and at proper elevations. Provide adequate headroom.
G. Complete raceway installation before starting conductor installation.
H. Support raceways as specified in Division 16 Section "Basic Electrical Materials and Methods."
I. Use temporary closures to prevent foreign matter from entering raceways.
J. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portion of bends is not visible above the finished slab.
K. Make bends and offsets so ID is not reduced. Keep legs of bends in the same plane and straight legs of offsets parallel, unless otherwise indicated.
L. Use raceway fittings compatible with raceways and suitable for use and location. For intermediate steel conduit, use threaded rigid steel conduit fittings, unless otherwise indicated.
M. Run concealed raceways, with a minimum of bends, in the shortest practical distance considering the type of building construction and obstructions, unless otherwise indicated.
N. Install exposed raceways parallel to or at right angles to nearby surfaces or structural members, and follow the surface contours as much as practical.

a. Run parallel or banked raceways together, on common supports where practical.
b. Make bends in parallel or banked runs from same centerline to make bends parallel. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.

O. Join raceways with fittings designed and approved for the purpose and make joints tight.

a. Make raceway terminations tight. Use bonding bushings or wedges at connections subject to vibration. Use bonding jumpers where joints cannot be made tight.
b. Use insulating bushings to protect conductors.

P. Terminations: Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against the box. Where terminations are not secure with 1 locknut, use 2 locknuts: 1 inside and 1 outside the box.
Q. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into the hub so the end bears against the wire protection shoulder. Where chase nipples are used, align raceways so the coupling is square to the box and tighten the chase nipple so no threads are exposed.
R. Label j-boxes with information on electrical circuits fed through the box.
S. Install pull wires in empty raceways. Use monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of the pull wire.
T. Flexible Connections: Use maximum of 6 feet (1830 mm) of flexible conduit for recessed and semi-recessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Use liquidtight flexible conduit in wet or damp locations. Install separate ground conductor across flexible connections.
U. Surface Raceways: Install a separate, green, ground conductor in raceways from junction box supplying the raceways to receptacle or fixture ground terminals.

a. Select each surface raceway outlet box, to which a lighting fixture is attached, of sufficient diameter to provide a seat for the fixture canopy.
b. Where a surface raceway is used to supply a fluorescent lighting fixture having central-stem suspension with a backplate and a canopy (with or without extension ring), no separate outlet box is required.
c. Provide surface metal raceway outlet box, and the backplate and canopy, at the feed-in location of each fluorescent lighting fixture having end-stem suspension.
d. Where a surface metal raceway extension is made from an existing outlet box on which a lighting fixture is installed, no additional surface-mounted outlet box is required. Provide a backplate slightly smaller than the fixture canopy.

V. Install hinged-cover enclosures and cabinets plumb. Support at each corner.

3.4 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer, who ensure coatings, finishes, and cabinets are without damage or deterioration at the time of Substantial Completion.

a. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

b. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.5 CLEANING

A. On completion of installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.

END OF SECTION 16130

North County Annex
AHU 1 & 2 Replacement

SECTION 16442 - PANELBOARDS

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 load centers and panelboards, overcurrent protective devices, and associated auxiliary equipment rated 600 V and less for the following types:

    a. Overcurrent protective devices.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
B. Comply with NEMA PB 1.
C. Comply with NFPA 70.

PART 2 -PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Overcurrent Protective Devices, Controllers, Contactors, and Accessories:

        i. Eaton Corp.; Cutler-Hammer Products.
        ii. General Electric Co.; Electrical Distribution & Control Div.
        iii. Siemens Energy & Automation, Inc.
        iv. Square D Co.

2.2 OVERCURRENT PROTECTIVE DEVICES

A. Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents.

    a. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable

magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

B. Molded-Case Circuit-Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.

   a. Lugs: Mechanical style, suitable for number, size, trip ratings, and material of conductors.
   b. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
   c. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.

PART 3 -EXECUTION

3.1 INSTALLATION

A. Circuit Directory: Create a new, updated directory to indicate both existing and new installed circuit loads. Obtain approval before installing. Use a computer to create directory; handwritten directories are not acceptable. Deliver directory file electronically to Owner.
B. Wiring in Panelboard Gutters: Arrange conductors into groups and bundle and wrap with wire ties.

3.2 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 16 Section "Basic Electrical Materials and Methods."

3.3 CONNECTIONS

A. Install equipment grounding connections for panelboards with ground continuity to main electrical ground bus.
B. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

END OF SECTION 16442

County of Galveston
Purchasing Department
Building Construction - Vendor Qualification Packet

(rev. 1.2, May 23, 2011)

All interested parties seeking consideration for qualified vendor status with the County of Galveston **should complete and return only the following attached forms to:**

Galveston County Purchasing Department
722 Moody Avenue, (21st Street), 5th Floor
Galveston, Texas 77550
(409) 770-5371 ***office***
(409) 621-7987 ***fax***

Form PEID: Person /Entity Information Data

Form W-9: Request for Taxpayer Identification Number and Certification
(please note that the included form may not be the latest revised form issued by the Internal Revenue Service. Please check the IRS website at http://www.irs.gov/pub/irs-pdf/fw9.pdf for the latest revision of this form.)

Form CIQ: Conflict of Interest Questionnaire
(please note that the included form may not be the latest revised form issued by the State of Texas Ethics Commission. Please check the Texas Ethics Commission website at for the latest revision of this form. Please note that Galveston County Purchasing Agent is not responsible for the filing of this form with the Galveston County Clerk per instructions of the State of Texas Ethics Commission).

Certificate(s) of Insurance: **If the person or entity seeking qualified vendor status with the County will be performing work at or on any County owned facility and/or property, Certificate(s) of Insurance are required to be submitted prior to performing any work.**

Insurance requirements are as follows:

Public Liability and Property Damage Insurance:

Please refer to Article 26 of the General Conditions of the Contract.

Procurement Policy - Special Note:

Understand that it is, according to Texas Local Government Code, Section 262.011, Purchasing Agents, subsections (d), (e), and (f), the sole responsibility of the Purchasing Agent to supervise all procurement transactions.

Therefore, be advised that all procurement transactions require proper authorization in the form of a Galveston County purchase order from the Purchasing Agent's office prior to commitment to deliver supplies, materials, equipment, including contracts for repair, service, and maintenance agreements. Any commitments made without proper authorization from the Purchasing Agent's office, pending

Commissioners' Court approval, may become the sole responsibility of the individual making the commitment including the obligation of payment.

Code of Ethics - Statement of Purchasing Policy:

Public employment is a public trust. It is the policy of Galveston County to promote and balance the objective of protecting the County's integrity and the objective of facilitating the recruitment and retention of personnel needed by Galveston County. Such policy is implemented by prescribing essential standards of ethical conduct without creating unnecessary obstacles to entering public office.

Public employees must discharge their duties impartially so as to assure fair competitive access to governmental procurement by responsible contractors. Moreover, they should conduct themselves in such a manner as to foster public confidence in the integrity of the Galveston County procurement organization.

To achieve the purpose of these instructions, it is essential that those doing business with Galveston County also observe the ethical standards prescribed here.

General Ethical Standards: It shall be a breach of ethics to attempt to realize personal gain through public employment with Galveston County by any conduct inconsistent with the proper discharge of the employee's duties.

It shall be a breach of ethics to attempt to influence any public employee of Galveston County to breach the standards of ethical conduct set forth in this code.

It shall be a breach of ethics for any employee of Galveston County to participate directly or indirectly in procurement when the employee knows that:

- The employee or any member of the employee's immediate family has a financial interest pertaining to the procurement.

- A business or organization in which the employee, or any member of the employee's immediate family, has a financial interest pertaining to the procurement.

- Any other person, business or organization with which the employee or any member of the employee's immediate family is negotiating or has an arrangement concerning prospective employment is involved in the procurement.

Gratuities: It shall be a breach of ethics to offer, give or agree to give any employee of Galveston County, or for any employee or former employee of Galveston County to solicit, demand, accept or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, preparation of any part of a program requirement or purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any program requirement or a contract or subcontract, or to any solicitation or proposal therefore pending before this government.

Kickbacks: It shall be a breach of ethics for any payment, gratuity or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime contractor or higher tier subcontractor for any contract for Galveston County, or any person associated therewith, as an inducement for the award of a subcontract or order.

Contract Clause: The prohibition against gratuities and kickbacks prescribed above shall be conspicuously set forth in every contract and solicitation by Galveston County.

Confidential Information: It shall be a breach of ethics for any employee or former employee of Galveston County to knowingly use confidential information for actual or anticipated personal gain, or for the actual or anticipated gain of any person.

Questions/Concerns:
If you have any questions or concerns regarding the information or instructions contained within this packet, please contact any member of the Purchasing Department staff at **(409) 770-5371**.

CONFLICT OF INTEREST DISCLOSURE REPORTING

Proposer may be required under Chapter 176 of the Texas Local Government Code to complete and file a conflict of interest questionnaire (CIQ Form). If so, the completed CIQ Form must be filed with the County Clerk of Galveston County, Texas.

If Proposer has an employment or other business relationship with an officer of Galveston County or with a family member of an officer of Galveston County that results in the officer or family member of the officer receiving taxable income that exceeds $2,500.00 during the preceding 12-month period, then Proposer **MUST** complete a CIQ Form and file the original of the CIQ Form with the County Clerk of Galveston County.

If Proposer has given an officer of Galveston County or a family member of an officer of Galveston County one or more gifts with an aggregate value of more than $250.00 during the preceding 12-months, then Proposer **MUST** complete a CIQ Form and file the original of the CIQ Form with the County Clerk of Galveston County.

The Galveston County Clerk has offices at the following locations:

Galveston County Clerk
Galveston County Justice Center, Suite 2001
600 59th Street
Galveston, Texas 77551

Galveston County Clerk
North County Annex, 1st Floor
174 Calder Road
League City, Texas 77573

Again, if Proposer is required to file a CIQ Form, the original completed form is filed with the Galveston County Clerk (not the Purchasing Agent).

For Proposer's convenience, a blank CIQ Form is enclosed with this proposal. Blank CIQ Forms may also be obtained by visiting the Galveston County Clerk's website and/or the Purchasing Agent's website – both of these web sites are linked to the Galveston County homepage, at http://www.co.galveston.tx.us.

As well, blank CIQ Forms may be obtained by visiting the Texas Ethics Commission website, specifically at http://www.ethics.state.tx.us/whatsnew/conflict_forms.htm.

Chapter 176 specifies deadlines for the filing of CIQ Forms (both initial filings and updated filings).

It is Proposer's sole responsibility to file a true and complete CIQ Form with the Galveston County Clerk if Proposer is required to file by the requirements of Chapter 176. Proposer is advised that it is an offense to fail to comply with the disclosure reporting requirements dictated under Chapter 176 of the Texas Local Government Code.

If you have questions about compliance with Chapter 176, please consult your own legal counsel. Compliance is the individual responsibility of each person, business, and agent who is subject to Chapter 176 of the Texas Local Government Code.

COUNTY of GALVESTON
Purchasing Department

rev. 1.3, March 29, 2010

FORM PEID:	Request for Person-Entity Identification Data

Instructions: Please type or print clearly when completing sections 1 thru 4 and return completed form to:

Galveston County Purchasing Agent
722 Moody Avenue (21st. Street), 5th Floor
Galveston, Texas 77550
(409) 770-5371 *office*
(409) 621-7987 *fax*

1.

Business Name:	
Attention Line:	

2.

Physical Address:			
City:		State:	Zip+4:

3.

Billing / Remit Address:			
City:		State:	Zip+4

4.

Main Contact Person:	
Main Phone Number:	
Fax Number:	
E-mail Address:	

Areas below are for County use only.

Requested By:	Phone / Ext. #
Department:	Date:

Action Requested - Check One:	IFAS PEID Vendor Number:	
( ) Add New	( ) Change Data	( ) Re-activate
( ) Inactivate	( ) Employee	( ) Attorney
( ) Landlord	( ) Foster Parent	( ) Refund
( ) One Time	( ) Foster Child	

Form **W-9**
(Rev. October 2007)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give form to the requester. Do not send to the IRS.

Print or type See **Specific Instructions** on page 2.

Name (as shown on your income tax return)

Business name, if different from above

Check appropriate box: ☐ Individual/Sole proprietor ☐ Corporation ☐ Partnership
☐ Limited liability company. Enter the tax classification (D=disregarded entity, C=corporation, P=partnership) ▶ _____
☐ Other (see instructions) ▶

☐ Exempt payee

Address (number, street, and apt. or suite no.)

Requester's name and address (optional)

City, state, and ZIP code

List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on Line 1 to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Social security number

or

Employer identification number

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
3. I am a U.S. citizen or other U.S. person (defined below).

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the Certification, but you must provide your correct TIN. See the instructions on page 4.

Sign Here | **Signature of U.S. person** ▶ **Date** ▶

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Purpose of Form

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),

2. Certify that you are not subject to backup withholding, or

3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.

Note. If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,
- An estate (other than a foreign estate), or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business. Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.

The person who gives Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States is in the following cases:

- The U.S. owner of a disregarded entity and not the entity,

- The U.S. grantor or other owner of a grantor trust and not the trust, and
- The U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

Foreign person. If you are a foreign person, do not use Form W-9. Instead, use the appropriate Form W-8 (see Publication 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items:

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.

2. The treaty article addressing the income.

3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.

4. The type and amount of income that qualifies for the exemption from tax.

5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity not subject to backup withholding, give the requester the appropriate completed Form W-8.

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 28% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,

2. You do not certify your TIN when required (see the Part II instructions on page 3 for details),

3. The IRS tells the requester that you furnished an incorrect TIN,

4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or

5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See the instructions below and the separate Instructions for the Requester of Form W-9.

Also see *Special rules for partnerships* on page 1.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of $50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a $500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Name

If you are an individual, you must generally enter the name shown on your income tax return. However, if you have changed your last name, for instance, due to marriage without informing the Social Security Administration of the name change, enter your first name, the last name shown on your social security card, and your new last name.

If the account is in joint names, list first, and then circle, the name of the person or entity whose number you entered in Part I of the form.

Sole proprietor. Enter your individual name as shown on your income tax return on the "Name" line. You may enter your business, trade, or "doing business as (DBA)" name on the "Business name" line.

Limited liability company (LLC). Check the "Limited liability company" box only and enter the appropriate code for the tax classification ("D" for disregarded entity, "C" for corporation, "P" for partnership) in the space provided.

For a single-member LLC (including a foreign LLC with a domestic owner) that is disregarded as an entity separate from its owner under Regulations section 301.7701-3, enter the owner's name on the "Name" line. Enter the LLC's name on the "Business name" line.

For an LLC classified as a partnership or a corporation, enter the LLC's name on the "Name" line and any business, trade, or DBA name on the "Business name" line.

Other entities. Enter your business name as shown on required federal tax documents on the "Name" line. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on the "Business name" line.

Note. You are requested to check the appropriate box for your status (individual/sole proprietor, corporation, etc.).

Exempt Payee

If you are exempt from backup withholding, enter your name as described above and check the appropriate box for your status, then check the "Exempt payee" box in the line following the business name, sign and date the form.

Generally, individuals (including sole proprietors) are not exempt from backup withholding. Corporations are exempt from backup withholding for certain payments, such as interest and dividends.

Note. If you are exempt from backup withholding, you should still complete this form to avoid possible erroneous backup withholding.

The following payees are exempt from backup withholding:

1. An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2),

2. The United States or any of its agencies or instrumentalities,

3. A state, the District of Columbia, a possession of the United States, or any of their political subdivisions or instrumentalities,

4. A foreign government or any of its political subdivisions, agencies, or instrumentalities, or

5. An international organization or any of its agencies or instrumentalities.

Other payees that may be exempt from backup withholding include:

6. A corporation,

7. A foreign central bank of issue,

8. A dealer in securities or commodities required to register in the United States, the District of Columbia, or a possession of the United States,

9. A futures commission merchant registered with the Commodity Futures Trading Commission,

10. A real estate investment trust,

11. An entity registered at all times during the tax year under the Investment Company Act of 1940,

12. A common trust fund operated by a bank under section 584(a),

13. A financial institution,

14. A middleman known in the investment community as a nominee or custodian, or

15. A trust exempt from tax under section 664 or described in section 4947.

The chart below shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 15.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 9
Broker transactions	Exempt payees 1 through 13. Also, a person registered under the Investment Advisers Act of 1940 who regularly acts as a broker
Barter exchange transactions and patronage dividends	Exempt payees 1 through 5
Payments over $600 required to be reported and direct sales over $5,000[1]	Generally, exempt payees 1 through 7[2]

[1] See Form 1099-MISC, Miscellaneous Income, and its instructions.

[2] However, the following payments made to a corporation (including gross proceeds paid to an attorney under section 6045(f), even if the attorney is a corporation) and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, and payments for services paid by a federal executive agency.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are a single-member LLC that is disregarded as an entity separate from its owner (see *Limited liability company (LLC)* on page 2), enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note. See the chart on page 4 for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local Social Security Administration office or get this form online at *www.ssa.gov*. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at *www.irs.gov/businesses* and clicking on Employer Identification Number (EIN) under Starting a Business. You can get Forms W-7 and SS-4 from the IRS by visiting *www.irs.gov* or by calling 1-800-TAX-FORM (1-800-829-3676).

If you are asked to complete Form W-9 but do not have a TIN, write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note. Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

Caution: *A disregarded domestic entity that has a foreign owner must use the appropriate Form W-8.*

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if items 1, 4, and 5 below indicate otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). Exempt payees, see *Exempt Payee* on page 2.

Signature requirements. Complete the certification as indicated in 1 through 5 below.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account)	The actual owner of the account or, if combined funds, the first individual on the account [1]
3. Custodian account of a minor (Uniform Gift to Minors Act)	The minor [2]
4. a. The usual revocable savings trust (grantor is also trustee)	The grantor-trustee [1]
b. So-called trust account that is not a legal or valid trust under state law	The actual owner [1]
5. Sole proprietorship or disregarded entity owned by an individual	The owner [3]
For this type of account:	**Give name and EIN of:**
6. Disregarded entity not owned by an individual	The owner
7. A valid trust, estate, or pension trust	Legal entity [4]
8. Corporate or LLC electing corporate status on Form 8832	The corporation
9. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
10. Partnership or multi-member LLC	The partnership
11. A broker or registered nominee	The broker or nominee
12. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity

[1] List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

[2] Circle the minor's name and furnish the minor's SSN.

[3] You must show your individual name and you may also enter your business or "DBA" name on the second name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

[4] List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships* on page 1.

Note. If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Secure Your Tax Records from Identity Theft

Identity theft occurs when someone uses your personal information such as your name, social security number (SSN), or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

Call the IRS at 1-800-829-1040 if you think your identity has been used inappropriately for tax purposes.

Victims of identity theft who are experiencing economic harm or a system problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

Protect yourself from suspicious emails or phishing schemes. Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to *phishing@irs.gov*. You may also report misuse of the IRS name, logo, or other IRS personal property to the Treasury Inspector General for Tax Administration at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at: *spam@uce.gov* or contact them at *www.consumer.gov/idtheft* or 1-877-IDTHEFT(438-4338).

Visit the IRS website at *www.irs.gov* to learn more about identity theft and how to reduce your risk.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons who must file information returns with the IRS to report interest, dividends, and certain other income paid to you, mortgage interest you paid, the acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA, or Archer MSA or HSA. The IRS uses the numbers for identification purposes and to help verify the accuracy of your tax return. The IRS may also provide this information to the Department of Justice for civil and criminal litigation, and to cities, states, the District of Columbia, and U.S. possessions to carry out their tax laws. We may also disclose this information to other countries under a tax treaty, to federal and state agencies to enforce federal nontax criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism.

You must provide your TIN whether or not you are required to file a tax return. Payers must generally withhold 28% of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to a payer. Certain penalties may also apply.

CONFLICT OF INTEREST QUESTIONNAIRE

FORM CIQ

For vendor or other person doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 1491, 80th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code by a person who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the person meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the person becomes aware of facts that require the statement to be filed. *See* Section 176.006, Local Government Code.

A person commits an offense if the person knowingly violates Section 176.006, Local Government Code. An offense under this section is a Class C misdemeanor.

OFFICE USE ONLY

Date Received

1 **Name of person who has a business relationship with local governmental entity.**

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.**

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date the originally filed questionnaire becomes incomplete or inaccurate.)

3 **Name of local government officer with whom filer has employment or business relationship.**

_____

Name of Officer

This section (item 3 including subparts A, B, C & D) must be completed for each officer with whom the filer has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the filer of the questionnaire?

☐ Yes ☐ No

B. Is the filer of the questionnaire receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership of 10 percent or more?

☐ Yes ☐ No

D. Describe each employment or business relationship with the local government officer named in this section.

4

_____ _____

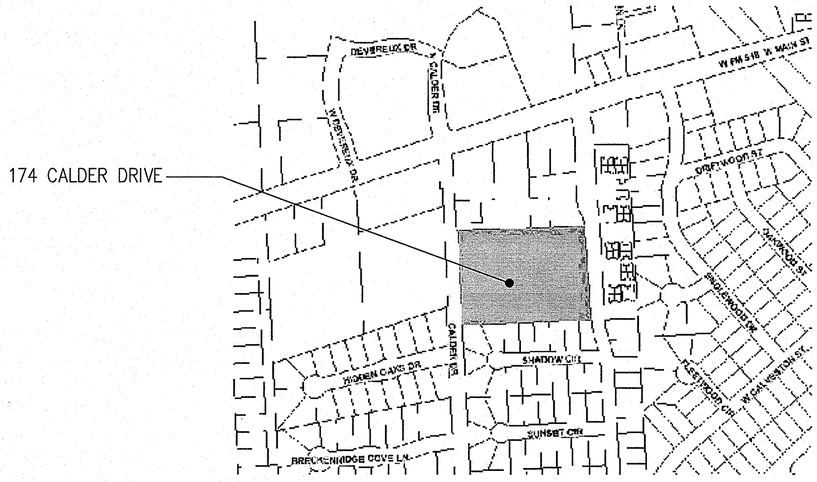
Signature of person doing business with the governmental entity Date

Adopted 06/29/2007

GALVESTON COUNTY NORTH COUNTY ANNEX

174 CALDER DR. LEAGUE CITY, TEXAS 77573

AIR HANDLER REPLACEMENT



REG # F-11156
P.O. Box 55171 Galveston, Texas 77555
PH 409.621.6740

GALVESTON COUNTY NORTH COUNTY ANNEX
174 CALDER DR. LEAGUE CITY, TEXAS
AIR HANDLER REPLACEMENT

REVISIONS

DATE 16 MAY, 2011
DESCRIPTION

DRAWN BY CZQ

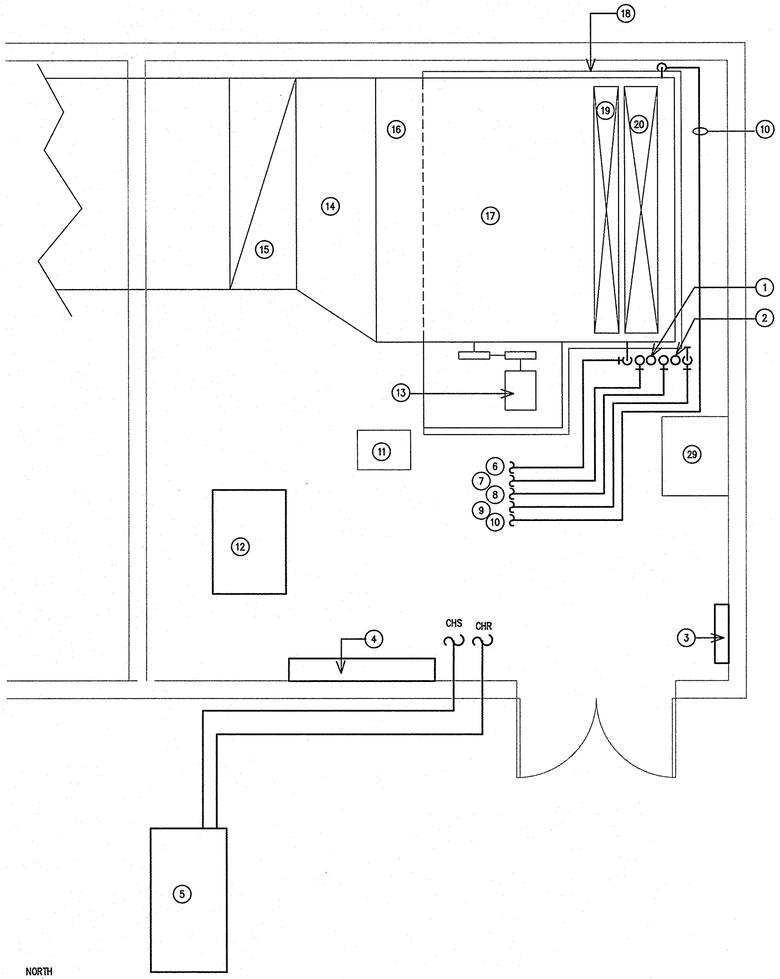
APPROVED BY NH

SHEET NO.

COVER

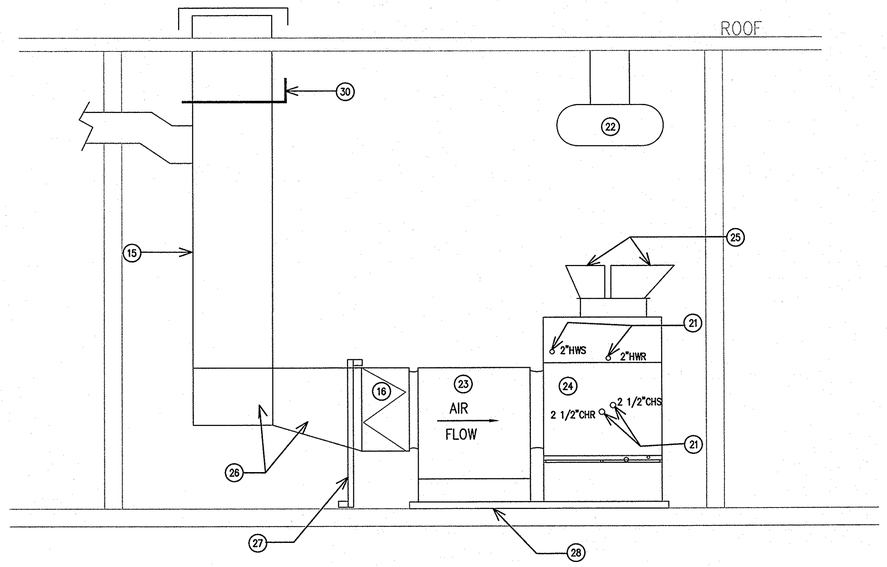
KEYED NOTES:

1. RELOCATE 1/2" HW EXP. VENT
2. RELOCATE 1/2" CHW EXP. VENT
3. EXISTING DIGITAL CONTROL SYSTEMS PANELS, TO REMAIN.
4. EXISTING MOTOR CONTROL CENTER, AHU-1 & AHU-2, TO REMAIN, CONTRACTOR TO VERIFY
5. EXISTING YORK CHILLER PLANT TO REMAIN.
6. REMOVE 2" CONDENSATION DRAIN AND DISCARD
7. RELOCATE 1/2" HW EXP. DRAIN
8. RELOCATE 1/2" CHW EXP. DRAIN
9. REMOVE 1/2" GUTTER DRAIN AND DISCARD
10. REMOVE 1/2" GUTTER DRAIN AND DISCARD
11. EXISTING 3" CURB FOR PUMP
12. EXISTING WELL-McLAIN BOILER, TO REMAIN
13. REMOVE EXISTING 25hp FAN MOTOR. REMOVE CONDUIT AND CONDUCTOR BACK TO MCC.
14. REMOVE TRANSION DUCT BETWEEN FILTER AND HORIZONTAL RETURN FLANGE AND DISCARD.
15. PROVIDE TEMPORARY SUPPORT TO VERTICAL RETURN DUCT THROUGH ROOF DURING CONSTRUCTION
16. REMOVE EXISTING LOW VELOCITY FILTER SECTION AND STANCHIONS AND DISCARD.
17. REMOVE/DISMANTLE EXISTING COIL SECTION AND FAN SECTION AND DISCARD.
18. EXISTING 3" CURB FOR AIR HANDLER.
19. HOT DISCHARGE
20. COLD DISCHARGE
21. SEE ISOMETRIC DRAWING FOR DEMOLITION/REMOVAL OF CHS, CHR, HWS, HWR PIPING.
22. HOT WATER AND CHILLED WATER EXPANSION TANKS, SUSPENDED FROM CEILING.
23. REMOVE EXISTING FAN SECTION AND SUPPORTS AND DISCARD.
24. REMOVE EXISTING COIL SECTION AND SUPPORTS AND DISCARD.
25. REMOVE EXISITNG DISCHARGE DUCTS TO FIRST FLANGE AND DISCARD.
26. REMOVE EXISTING TRANSITION AND ELBOW DUCTS.
27. REMOVE EXISTING SUPPORT STANCHION AND DISCARD.
28. EXISTING CURB TO REMAIN
29. EXISTING 3" CONCRETE CURB FOR TRANSFORMER.
30. EXISTING PNEUMATIC DAMPER OPERATIONS TO BE CONVERTED TO ELECTRIC, REMOVE AS NEEDED.



NORTH

1 EXISTING PLAN – AHU1
SCALE: 3/8" = 1'-0"



2 EXISTING ELEVATION – AHU1
SCALE: 3/8" = 1'-0"

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STATE OF TEXAS
JANET MURRAY HOFFMAN
92117
LICENSED
PROFESSIONAL ENGINEER

GALVESTON COUNTY NORTH COUNTY ANNEX
174 CALDER DR. LEAGUE CITY, TEXAS
AIR HANDLER REPLACEMENT

THE STATE OF TEXAS NOTARIZATION COUNTY OF GALVESTON

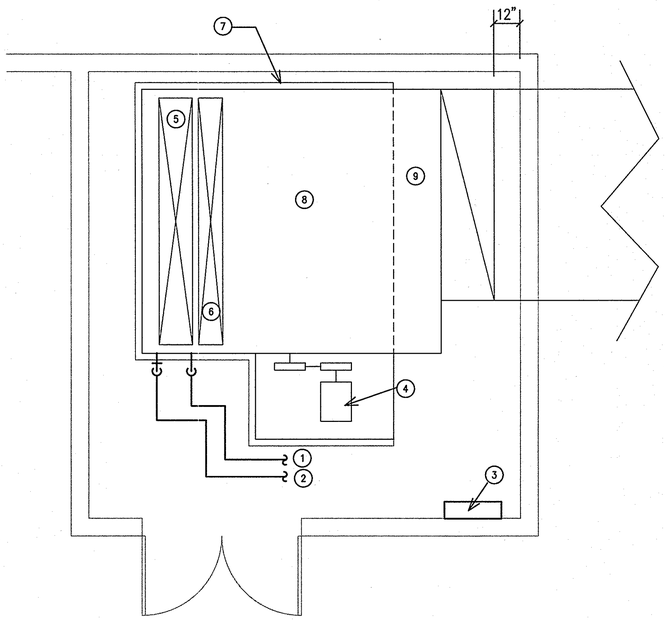
REVISIONS

DATE 16 MAY, 2011
DESCRIPTION AHU-1 EXISTING PLAN AND ELEVATION
DRAWN BY CZQ
APPROVED BY NH

SHEET NO.
M-1.0

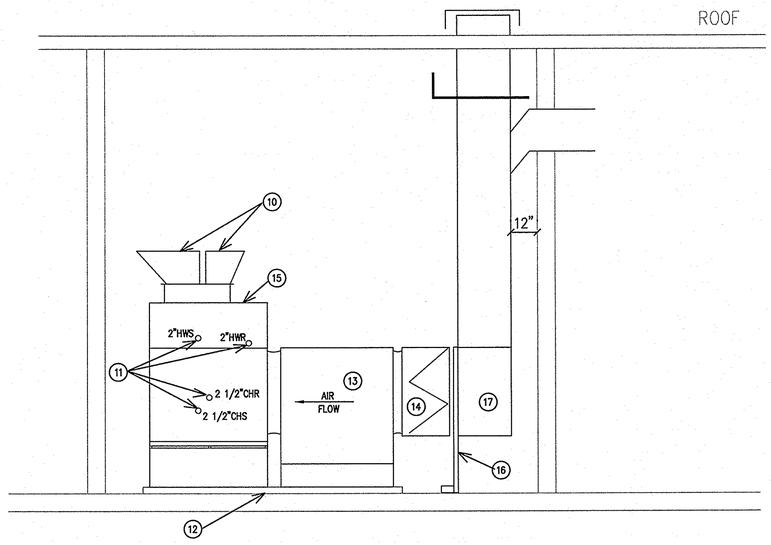
KEYED NOTES:

1. REMOVE 2" CONDENSATION DRAIN AND DISCARD
2. REMOVE 1/2" GUTTER DRAIN AND DISCARD
3. MOTOR DISCONNECT SWITCH, TO REMAIN, CONTRACTOR TO CONFIRM.
4. REMOVE EXISTING 25hp FAN MOTOR. REMOVE CONDUIT AND CONDUCTOR BACK TO MOTOR DISCONNECT SWITCH.
5. COLD DISCHARGE
6. HOT DISCHARGE
7. EXISTING 3" CURB FOR AIR HANDLER
8. REMOVE/DISMANTAL EXISTING COIL SECTION AND FAN SECTION AND DISCARD
9. REMOVE EXISTING LOW VELOCITY FILTER SECTION AND STANCHIONS AND DISCARD.
10. REMOVE EXISTING DISCHARGE DUCTS TO FIRST FLANGE AND DISCARD.
11. SEE ISOMETRIC DRAWING FOR DEMOLITION/REMOVAL OF CHS, CHR, HWS, HWR PIPING.
12. EXISTING CURB TO REMAIN.
13. REMOVE EXISTING FAN SECTION AND SUPPORTS AND DISCARD.
14. REMOVE EXISTING LOW VELOCITY FILTER SECTION AND DISCARD.
15. REMOVE EXISTING COIL SECTION AND SUPPORTS AND DISCARD.
16. REMOVE EXISTING SUPPORT STANCHION AND DISCARD.
17. REMOVE EXISTING TRANSITION AND ELBOW DUCTS AND DISCARD.
18. EXISTING PNEUMATIC DAMPER OPERATIONS TO BE CONVERTED TO ELECTRIC, REMOVE AS NEEDED.



NORTH

1 EXISTING PLAN – AHU2
SCALE: 3/8" = 1'-0"



2 EXISTING ELEVATION – AHU2
SCALE: 3/8" = 1'-0"

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STATE OF TEXAS
JANET MARIAN HOFFMAN
102117
LICENSED
PROFESSIONAL ENGINEER

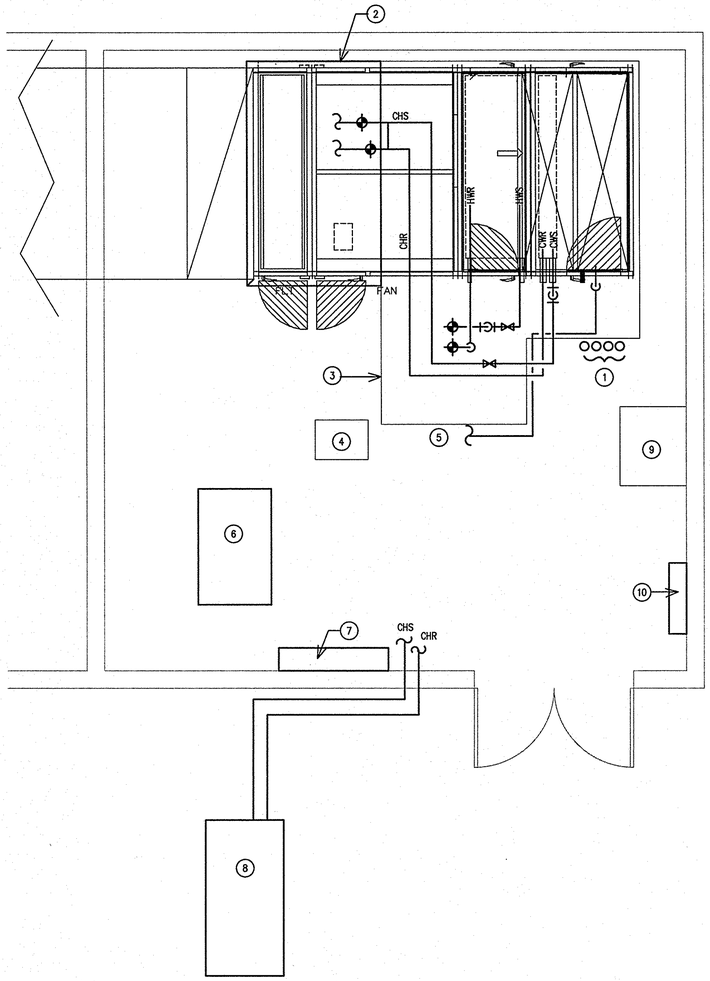
GALVESTON COUNTY NORTH COUNTY ANNEX
174 CALDER DR. LEAGUE CITY, TEXAS
AIR HANDLER REPLACEMENT

THE STATE OF TEXAS
REGISTERED
COUNTY OF GALVESTON

REVISIONS

DATE
16 MAY, 2011
DESCRIPTION
AHU-2
EXISTING PLAN AND ELEVATION
DRAWN BY CZQ
APPROVED BY NH

SHEET NO.
M-1.1



LEGEND
⊕ = TIE INTO EXISTING (NEW UNION OR FLANGE CONNECTION
CONTRACTOR TO CONFIRM TIE-IN LOCATION PRIOR TO COMMENCING WORK. CONFIRM LOCATION SELECTED WITH ENGINEER.

NORTH

1 NEW PLAN – AHU1
SCALE: 3/8" = 1'-0"

NOTES:

1.) CONTRACTOR SHALL CONFIRM EXISTING HOT AND COLD COIL SIZES AND FAN UNIT, AND SHALL SIZE REPLACEMENT UNIT COILS AND FAN TO MATCH EXISTING. COORDINATE AND CONFIRM WITH ENGINEER.

2.) PRIOR TO COMMENCING WORK, CONTRACTOR SHALL CONFIRM ALL CLEARANCES NECESSARY TO ASSURE THAT REPLACEMENT AIR HANDLER UNIT WILL FIT IN THE EXISTING SPACE.

3.) CONTRACTOR SHALL VERIFY ALL DUCT SIZES, JOINT LOCATIONS ARRANGEMENTS PRIOR TO COMMENCING WORK AND SHALL PROVIDE APPROPRIATE TRANSITIONS TO THE EXISTING SYSTEM.

4.) CONTRACTOR SHALL LOCATE AND IDENTIFY ALL AFFECTED CONTROL POINT LOCATIONS AND SETTINGS PRIOR TO COMMENCING WORK.

5.) EXCEPT AS NOTED FOR THE OUTSIDE AIR DAMPERS HEREWITH AND HW AND CHW BYPASS VALVES ON SHEET M3.0, ANY OTHER EXISTING CONTROL POINTS ARE TO BE RETAINED, INSPECTED AND RE-USED. POINTS FOUND TO BE DEFICIENT SHALL BE REPLACED BY THE CONTRACTOR. THE NEW AHU MAY REQUIRE ADDITIONAL CONTROL POINTS; THESE SHALL BE PROVIDED BY THE CONTRACTOR AND SHALL BE INCORPORATED INTO THE EXISTING CONTROLS SCHEME, BY THE CONTRACTOR.

6.) CONTRACTOR SHALL CONFIRM HOT WATER AND CHILLED WATER TIE-IN LOCATIONS PRIOR TO COMMENCING WORK. CONTRACTOR SHALL RE-PIPE ACCORDINGLY TO MATCH ACTUAL NEW COIL ARRANGEMENT.

7.) CONTRACTOR SHALL INSTALL NEW CONDUCTORS BETWEEN THE MOTOR AND THE MAIN PANEL.

8.) CONTRACTOR SHALL CONFIRM SIZE AND SUITABILITY OF THE EXISTING ELECTRICAL CONDUIT BETWEEN MOTOR AND MAIN PANEL AND SHALL INSTALL NEW WHERE DEFICIENT.

9.) CONTRACTOR SHALL FURNISH NEW TEMPERATURE INSTRUMENTS, TEST PORTS, AND VALVES.

10.) RE-INSULATE ALL NEW OR DISTURBED HOT AND COLD WATER PIPING, FITTINGS, AND VALVES. INSULATION TO MATCH EXISTING TYPE, THICKNESS, AND COVERING.

11.) PAINT ALL NEW INSULATION TO MATCH EXISTING.

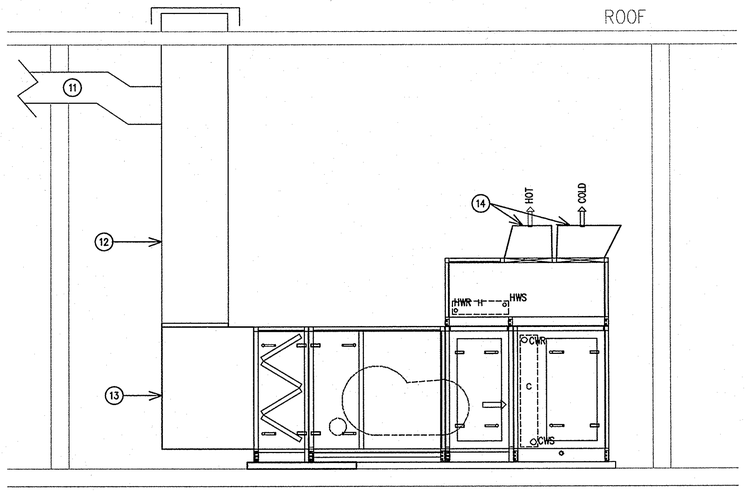
12.) PAINT ALL NEW AND/OR RELOCATED NON-INSULATED PIPES AND LINES TO MATCH EXISTING/ PREVIOUS.

13.) PERMANENTLY MARK ALL NEW CHW AND HW SUPPLY AND RETURN LINES, VALVES, THERMOMETERS, CONDENSATE LINES, DRAIN LINES, AHU'S AND OTHER DEVICES USING PRE-PRINTED SQUARE BLOCK LETTERS. LETTER SIZE SHALL BE PROPORTIONAL TO THE PIPE OR DEVICE SIZE. MARK FLOW DIRECTION OF PIPES WITH ARROWS IN PROPORTION TO THE SIZE OF THE LETTERING. PROVIDE SAMPLES FOR CLIENT APPROVAL PRIOR TO PURCHASE/INSTALLATION.

14.) LABEL ALL NEW AND EXISTING ELECTRICAL DISCONNECTS AND BREAKERS ASSOCIATION WITH AHU'S WITH PERMANENT PREPRINTED LABELS OR PLACARDS.

KEYED NOTES:

1. RELOCATE 1/2" HOT AND COLD EXPANSION TANK LINES SUCH AS TO PRECLUDE INTERFACE WITH NEW COIL ACCESS DOORS AND TO PRECLUDE PERSONNEL INTERFACE.
2. PROVIDE NEW PORTION OF CONCRETE CURB TO SUPPORT NEW AHU AND FILTER SECTION. ELEVATION TO MATCH EXISTING CURB. PREPARE EXISTING CONCRETE FLOOR TO ENSURE GOOD BOND.
3. PAINT OR MARK UNUSED PORTION OF EXISTING CURB WITH SAFETY PAINT.
4. EXISTING PUMP PAD.
5. PROVIDE NEW CONDENSATION DRAIN, TRAPPED, AND IN ACCORDANCE WITH MANUFACTURERS REQUIREMENTS.
6. EXISTING WEIL-McLAIN BOILER.
7. EXISTING MOTOR CONTROL CENTER, AHU-1 AND AHU-2 CONTRACTOR TO INSPECT EXISTING MOTOR CONTROLLER/STARTER (LOCATED IN AHU-1 MACHINERY ROOM), TO ASSURE COMPATIBILITY WITH NEW AHU MOTOR AND PROVIDE NEW CONTROLLER/STARTER IF NOT COMPATIBLE.
8. EXISTING YORK CHILLER
9. EXISTING TRANSFORMER CURB
10. CONTROL SYSTEMS PANEL
11. EXISTING RETURN DUCT
12. EXISTING RETURN RISER
13. PROVIDE NEW TRANSITION DUCTWORK BETWEEN NEW FILTER SECTION AND EXISTING RETURN RISER.
14. PROVIDE NEW TRANSITION DUCT BETWEEN NEW AHU-1 AND EXISTING SUPPLY DUCT.
15. INSTALL NEW ELECTRIC DAMPER OPERATORS AND DIGITAL CONTROLLERS.



2 NEW ELEVATION – AHU1
SCALE: 3/8" = 1'-0"

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STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

GALVESTON COUNTY NORTH COUNTY ANNEX
174 CALDER DR. LEAGUE CITY, TEXAS
AIR HANDLER REPLACEMENT

STATE OF TEXAS
THE COUNTY OF GALVESTON

REVISIONS

DATE 16 MAY, 2011
DESCRIPTION AHU-1 NEW PLAN AND ELEVATION
DRAWN BY CZQ
APPROVED BY NH

SHEET NO.
M-2.0

NOTES:

1.) CONTRACTOR SHALL CONFIRM EXISTING HOT AND COLD COIL SIZES AND FAN UNIT, AND SHALL SIZE REPLACEMENT UNIT COILS AND FAN TO MATCH EXISTING. COORDINATE AND CONFIRM WITH ENGINEER.

2.) PRIOR TO COMMENCING WORK, CONTRACTOR SHALL CONFIRM ALL CLEARANCES NECESSARY TO ASSURE THAT REPLACEMENT AIR HANDLER UNIT WILL FIT IN THE EXISTING SPACE.

3.) CONTRACTOR SHALL VERIFY ALL DUCT SIZES, JOINT LOCATIONS ARRANGEMENTS PRIOR TO COMMENCING WORK AND SHALL PROVIDE APPROPRIATE TRANSITIONS TO THE EXISTING SYSTEM.

4.) CONTRACTOR SHALL LOCATE AND IDENTIFY ALL AFFECTED CONTROL POINT LOCATIONS AND SETTINGS PRIOR TO COMMENCING WORK.

5.) EXCEPT AS NOTED FOR THE OUTSIDE AIR DAMPERS HEREWITH AND HW AND CHW BYPASS VALVES ON SHEET M3.0, ANY OTHER EXISTING CONTROL POINTS ARE TO BE RETAINED, INSPECTED AND RE-USED. POINTS FOUND TO BE DEFICIENT SHALL BE REPLACED BY THE CONTRACTOR. THE NEW AHU MAY REQUIRE ADDITIONAL CONTROL POINTS; THESE SHALL BE PROVIDED BY THE CONTRACTOR AND SHALL BE INCORPORATED INTO THE EXISTING CONTROLS SCHEME, BY THE CONTRACTOR.

6.) CONTRACTOR SHALL CONFIRM HOT WATER AND CHILLED WATER TIE-IN LOCATIONS PRIOR TO COMMENCING WORK. CONTRACTOR SHALL RE-PIPE ACCORDINGLY TO MATCH ACTUAL NEW COIL ARRANGEMENT.

7.) CONTRACTOR SHALL INSTALL NEW CONDUCTORS BETWEEN THE MOTOR AND THE MAIN PANEL.

8.) CONTRACTOR SHALL CONFIRM SIZE AND SUITABILITY OF THE EXISTING ELECTRICAL CONDUIT BETWEEN MOTOR AND MAIN PANEL AND SHALL INSTALL NEW WHERE DEFICIENT.

9.) CONTRACTOR SHALL FURNISH NEW TEMPERATURE INSTRUMENTS, TEST PORTS, AND VALVES.

10.) RE-INSULATE ALL NEW OR DISTURBED HOT AND COLD WATER PIPING, FITTINGS, AND VALVES. INSULATION TO MATCH EXISTING TYPE, THICKNESS, AND COVERING.

11.) PAINT ALL NEW INSULATION TO MATCH EXISTING.

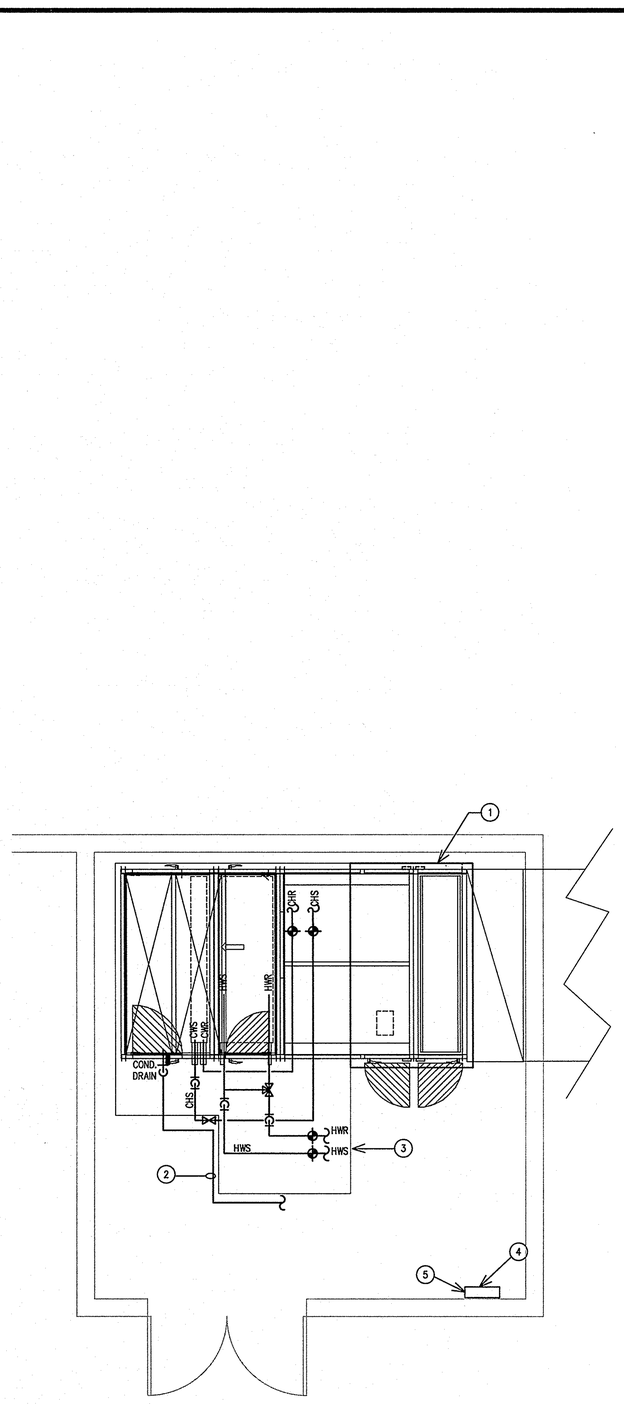
12.) PAINT ALL NEW AND/OR RELOCATED NON-INSULATED PIPES AND LINES TO MATCH EXISTING/ PREVIOUS.

13.) PERMANENTLY MARK ALL NEW CHW AND HW SUPPLY AND RETURN LINES, VALVES, THERMOMETERS, CONDENSATE LINES, DRAIN LINES, AHU'S AND OTHER DEVICES USING PRE-PRINTED SQUARE BLOCK LETTERS. LETTER SIZE SHALL BE PROPORTIONAL TO THE PIPE OR DEVICE SIZE. MARK FLOW DIRECTION OF PIPES WITH ARROWS IN PROPORTION TO THE SIZE OF THE LETTERING. PROVIDE SAMPLES FOR CLIENT APPROVAL PRIOR TO PURCHASE/INSTALLATION.

14.) LABEL ALL NEW AND EXISTING ELECTRICAL DISCONNECTS AND BREAKERS ASSOCIATION WITH AHU'S WITH PERMANENT PREPRINTED LABELS OR PLACARDS.

KEYED NOTES:

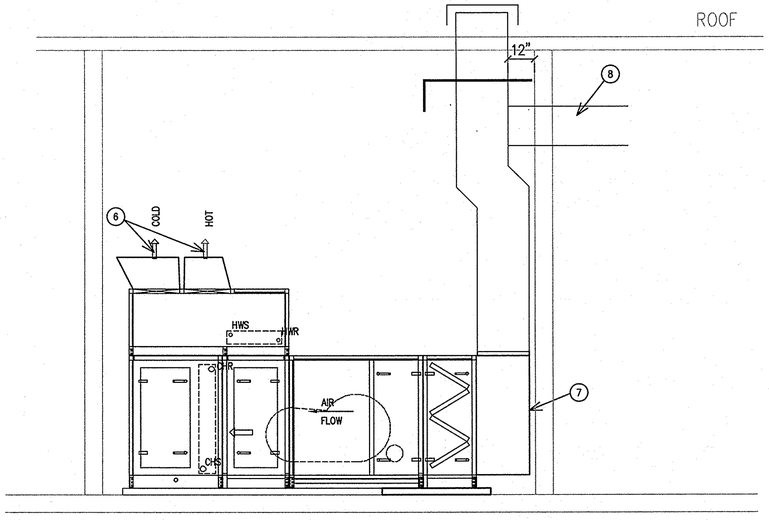
1. PROVIDE NEW PORTION OF CONCRETE CURB TO SUPPORT NEW AHU AND FILTER SECTION. ELEVATION TO MATCH EXISTING CURB. PREPARE EXISTING CONCRETE FLOOR TO ENSURE GOOD BOND.
2. PROVIDE NEW TRAPPED CONDENSATION DRAIN IN ACCORDANCE WITH NEW AHU MANUFACTURERS REQUIREMENTS.
3. PAINT OR MARK UNUSED PORTION OF EXISTING CURB WITH SAFETY PAINT.
4. MOTOR DISCONNECT – CONTRACTOR TO INSPECT EXISTING MOTOR CONTROLLER/STARTER (LOCATED IN AHU-1 MACHINERY ROOM), TO ASSURE COMPATIBILITY WITH NEW AHU MOTOR AND PROVIDE NEW CONTROLLER/STARTER IF NOT COMPATIBLE. CONTRACTOR WILL NEED TO SUPPLY NEW COMPATIBLE MOTOR DISCONNECT, AS REQUIRED PER NEC 430.102. CONTRACTOR SHALL COORDINATE WITH CONTROL SYSTEMS CONTRACTOR AND ENGINEER. CONTRACTOR TO INSTALL NEW CONDUCTORS BACK TO MCC IF EXISTING CONDUCTORS ARE INSUFFICIENT FOR NEW MOTOR.
5. MOTOR DISCONNECT SWITCH – PANELBOARD MOUNTS ON WALL.
6. PROVIDE NEW TRANSITION DUCT BETWEEN NEW AHU-2 AND EXISTING SUPPLY DUCTS.
7. PROVIDE NEW TRANSITION DUCTWORK BETWEEN NEW FILTER SECTION AND EXISTING RETURN AND OUTSIDE AIR.
8. INSTALL NEW ELECTRIC DAMPER OPERATORS AND DIGITAL CONTROLLERS.



LEGEND

= TIE INTO EXISTING (NEW UNION OR FLANGE CONNECTION

CONTRACTOR TO CONFIRM TIE-IN LOCATION PRIOR TO COMMENCING WORK. CONFIRM LOCATION SELECTED WITH ENGINEER.



NORTH

1 NEW PLAN – AHU2
SCALE: 3/8" = 1'-0"

2 NEW ELEVATION – AHU2
SCALE: 3/8" = 1'-0"

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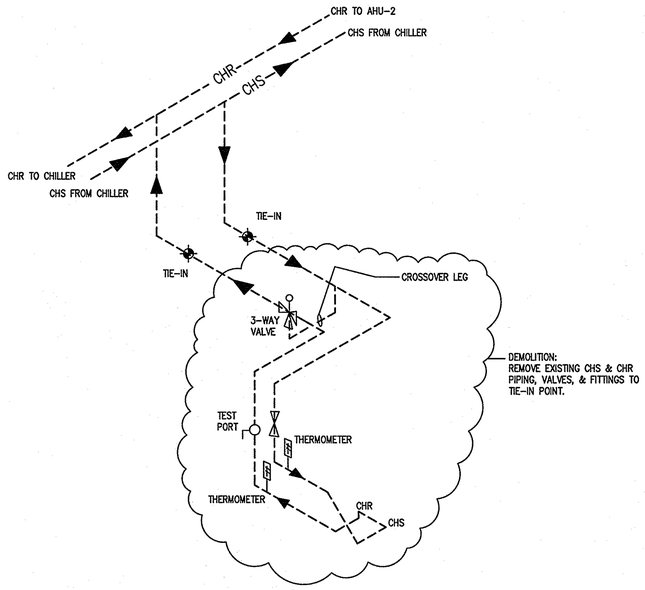
GALVESTON COUNTY NORTH COUNTY ANNEX
174 CALDER DR. LEAGUE CITY, TEXAS
AIR HANDLER REPLACEMENT

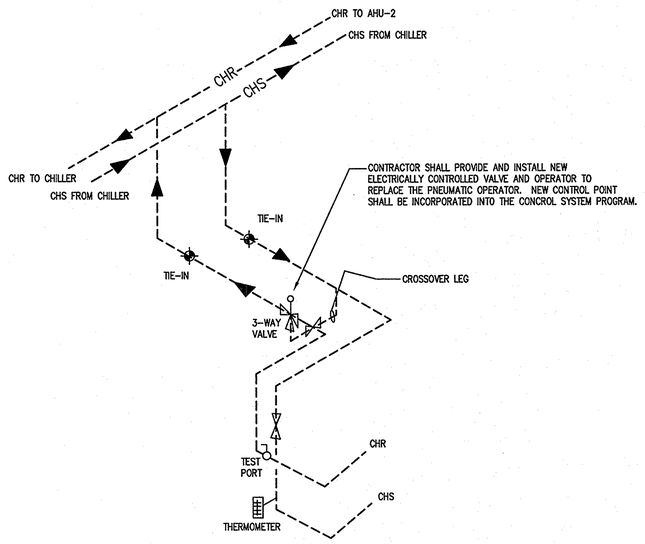
REVISIONS

DATE
16 MAY, 2011
DESCRIPTION
AHU-2
NEW PLAN AND ELEVATION
DRAWN BY CZQ
APPROVED BY NH

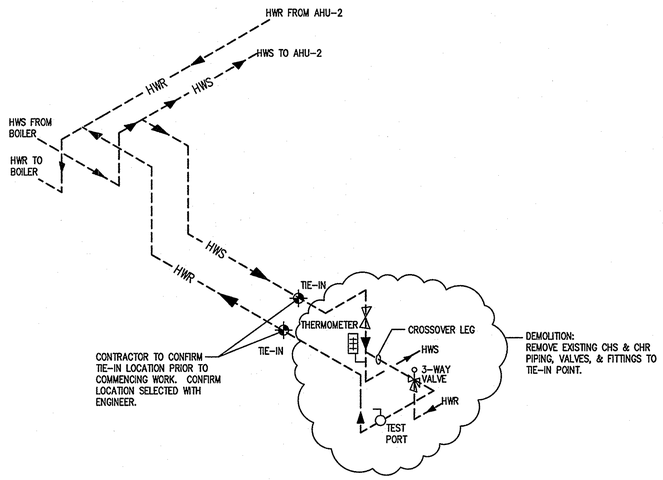
SHEET NO.
M-2.1



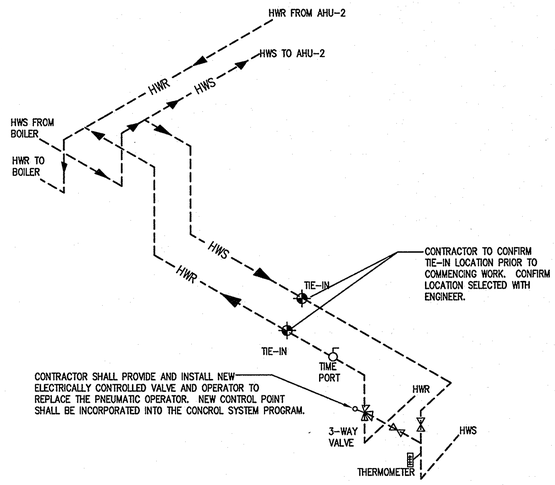
1 EXISTING CHILLED WATER ISOMETRIC – AHU-1



3 NEW CHILLED WATER ISOMETRIC – AHU-1



2 EXISTING HOT WATER ISOMETRIC – AHU-1



4 NEW HOT WATER ISOMETRIC – AHU-1

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THE STATE OF TEXAS
GALVESTON COUNTY

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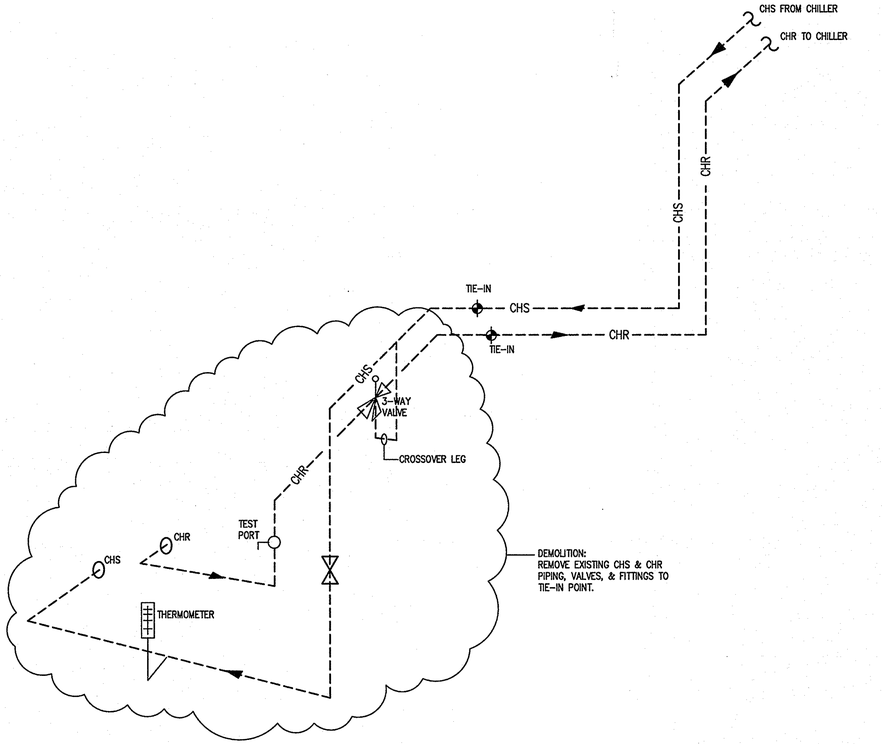
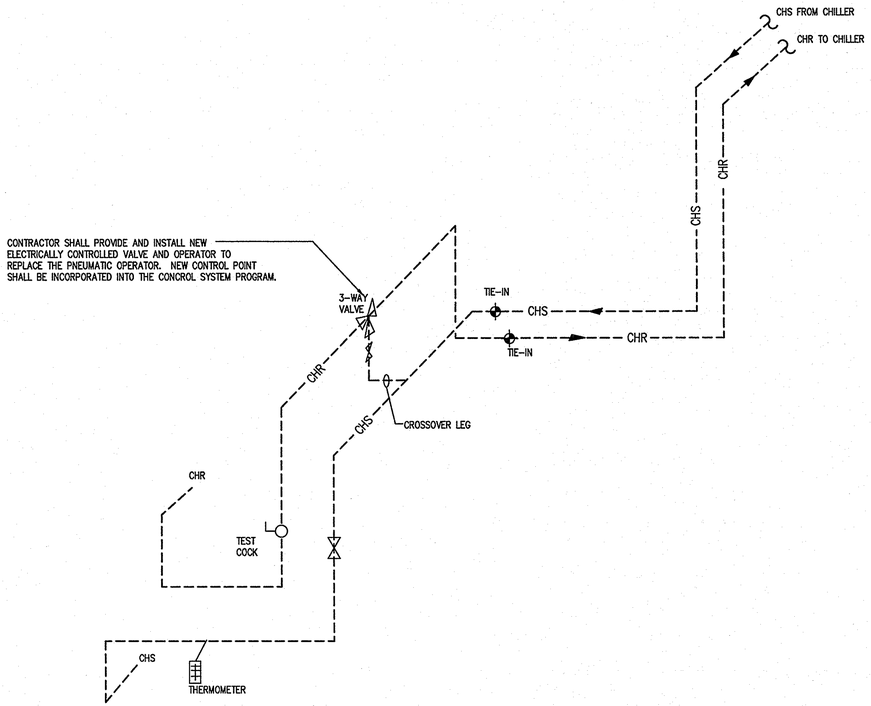
DATE 16 MAY, 2011
DESCRIPTION ISOMETRIC AHU-1
DRAWN BY CZQ
APPROVED BY NH

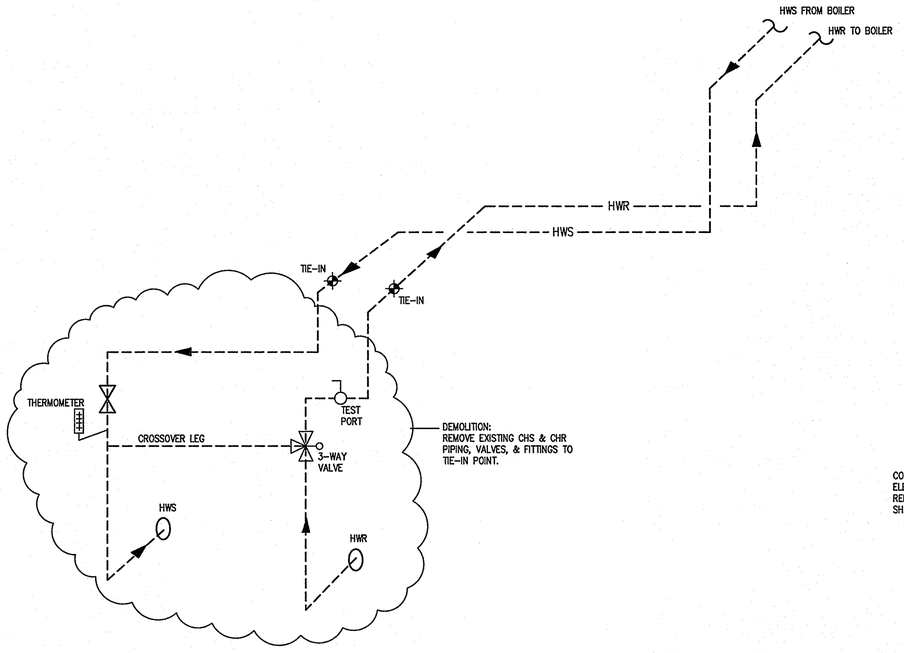
SHEET NO.
M-3.0



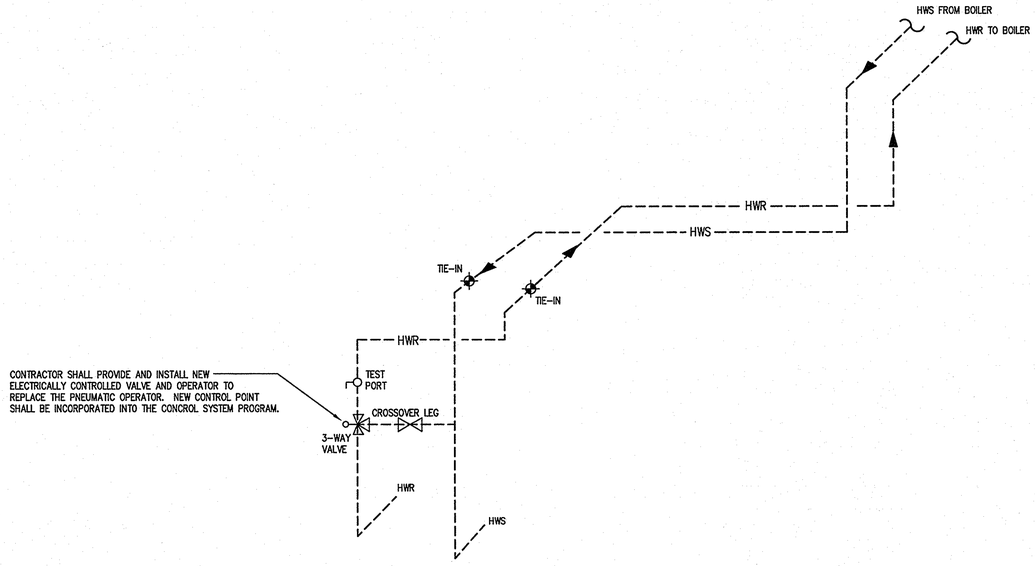
1 EXISTING CHILLED WATER ISOMETRIC – AHU-2



3 NEW CHILLED WATER ISOMETRIC – AHU-2



2 EXISTING HOT WATER ISOMETRIC – AHU-2



4 NEW HOT WATER ISOMETRIC – AHU-2

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THE STATE OF TEXAS COUNTY OF GALVESTON

REVISIONS

DATE
16 MAY, 2011
DESCRIPTION
ISOMETRIC AHU-2
DRAWN BY CZQ
APPROVED BY NH

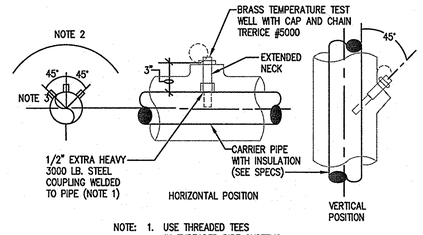
SHEET NO.
M-3.1

COOLING AND HEATING DATA

COOLING														HEATING						EXISTING UNIT MANUFACTURER	EXISTING UNIT UNIT	EXISTING UNIT SER. NO.
UNIT	LOCATION	TOTAL CFM	%OA	FAN HP	VOLT/PH	COIL AIRFLOW	EAT DB	EAT WB	LAT DB	LAT WB	EWT	GPM	TCAP	CFM	EAT	LAT	EWT	GPM	TCAP			
AHU-1	SOUTH	11,000	10.7	25	460/3PH	7,235	85.9	68.5	55	51.3	44	--	385 MBh	11,000	62.2	75.2	--	--	-159.2 MBh	TRANE WEATHERMAKER	39CD	39CD105311120
AHU-2	NORTH	11,000	10.7	25	460/3PH	7,235	85.9	68.5	55	51.3	44	--	385 MBh	11,000	62.2	75.2	--	--	-159.2 MBh	TRANE WEATHERMAKER	39CD	39CD10544r20---f

COOLING AND HEATING DATA NOTES:

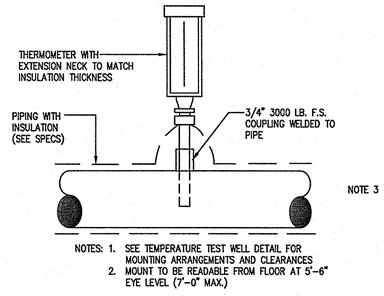
1. CONTRACTOR SHALL CONFIRM LOCATION OF AFFECTED CONTROL POINTS, COORDINATE WITH CONTROLS SYSTEM CONTRACTOR, AND REPORT TO ENGINEER PRIOR TO COMMENCING WORK.
2. CONTRACTOR SHALL CONFIRM CONTROL POINT SETTINGS WITHTHE CONTROLS SYSTEM CONTRACTOR, AND REPORT TO ENGINEER PRIOR TO COMMENCING WORK.
3. CONTRACTOR SHALL CONFIRM ALL DIMENSIONAL DATA AND DUCT CONFIGURATION AND REPORT TO ENGINEER PRIOR TO COMMENCING WORK OR PURCHASING EQUIPMENT.
4. CONTRACTOR SHALL CONFIRM EXISTING AIRFLOWS AND TEMPERATURES AND REPORT FINDINGS TO ENGINEER PRIOR TO PURCHASING EQUIPMENT.
5. CONTRACTOR SHALL CONFIRM EXISTING HOT AND COLD COIL SIZES AND REPORT FINDING TO ENGINEER PRIOR TO PURCHASING REPLACEMENT EQUIPMENT.
6. CONTRACTOR SHALL CONFIRM EXISTING HEATING AND COOLING WATER FLOW RATES AND TEMPERATURES AND REPORT TO ENGINEER PRIOR TO PURCHASING REPLACEMENT EQUIPMENT.
7. CONTRACTOR TO CONFIRM ALL DIMENSIONS, PIPING, DUCTING, AND COIL CAPACITIES ARE CAMPATABLE AT TIE-IN LOCATIONS.



NOTE: 1. USE THREADED TEES IN THREADED PIPE SYSTEMS
2. ALLOW CLEARANCE ABOVE FOR STEM THERMOMETER REMOVAL
3. DO NOT INSTALL BELOW POSITION SHOWN

TEMPERATURE TEST WELL INSTALLATION

SCALE: NONE

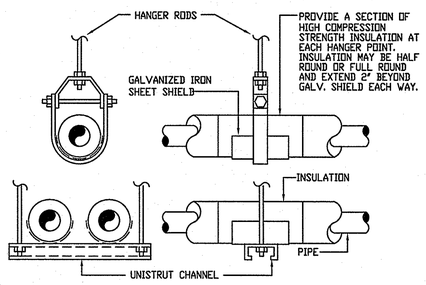


NOTES: 1. SEE TEMPERATURE TEST WELL DETAIL FOR MOUNTING ARRANGEMENTS AND CLEARANCES
2. MOUNT TO BE READABLE FROM FLOOR AT 5'-6" EYE LEVEL (7'-0" MAX.)

THERMOMETER INSTALLATION

SCALE: NONE

MINIMUM DIMENSIONS OF GALVANIZED SHEETMETAL PROTECTION SHIELDS AT PIPE HANGERS		
NOMINAL SIZE PIPE	SHIELD LENGTH (IN.)	GAUGE THICKNESS
1/2" & 3/4"	12	18
1" - 2-1/2"	12	18
3" - 4"	16	18
6"	18	16



HANGER FOR WATER PIPING

SCALE: NONE

GENERAL CONDITIONS

1. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE GOVERNING LOCAL, STATE, AND NATIONAL CODE AS THE MINIMUM REQUIREMENT WHETHER OR NOT SPECIFIED OR SHOWN ON DRAWINGS. DRAWINGS SHALL GOVERN WHERE A LARGER SIZE, QUANTITY, OR BETTER QUALITY IS SHOWN THAN IS REQUIRED BY CODE(S). AS USED IN THE FOLLOWING, "CONTRACTOR" SHALL MEAN THE CONTRACTOR INSTALLING WORK UNDER THIS DIVISION OF THE WORK.
2. DRAWINGS ARE DIAGRAMMATIC IN NATURE AND DO NOT SHOW EVERY REQUIRED MISCELLANEOUS DETAILS, SUPPORT, FITTINGS, ETC. FURNISH AND INSTALL ALL MATERIALS REQUIRED FOR A COMPLETE FUNCTIONING SYSTEM WHETHER OR NOT SHOWN ON THE DRAWINGS.
3. COORDINATE INSTALLATION WITH OTHER TRADES TO ASSURE INSTALLATION OF MATERIALS AND EQUIPMENT AS REQUIRED FOR THE PROPER SEQUENCE OF CONSTRUCTION. VERIFY AND INSTALL WITHIN INTENDED SPACE REQUIREMENTS WITH PROVISIONS FOR ACCESS FOR SERVICE AND REMOVAL.
4. CONTRACTOR SHALL INSPECT THE SITE AND BE INFORMED OF THE CONDITIONS AFFECTING THE WORK, NO ADDITIONAL ALLOWANCE WILL BE MADE BECAUSE OF FAILURE TO OBTAIN INFORMATION ON SITE CONDITIONS. COORDINATE THE WORK AS REQUIRED AND DIRECTED BY LOCAL UTILITY COMPANIES STANDARDS.
5. ALL WORK SHALL BE INSTALLED IN THE FIRST CLASS MANNER CONSISTENT WITH INDUSTRY STANDARDS. MATERIALS OR EQUIPMENT WHICH DO NOT PRESENT A REASONABLY NEAT OR WORKMANLIKE APPEARANCE MAY BE DIRECTED BY THE ENGINEER TO BE REMOVED AND REPLACED AT NO ADDITIONAL COST.
6. FURNISH 6 COPIES OR BROCHURES/SHOP DRAWINGS FOR APPROVAL PRIOR TO STARTING WORK. AT PROJECT CLOSEOUT, PROVIDE THREE COPIES OPERATING MANUALS, THREE COPIES OF "AS-BUILT" RECORD DRAWINGS, AND INSTRUCT OWNER IN THE OPERATION OF ALL EQUIPMENT.
7. ALL MISCELLANEOUS WORK SUCH AS EXCAVATION BACKFILL, CONCRETE, PADS, SLEEVES, ETC. REQUIRED TO PERFORM WORK UNDER THE DIVISION SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR OR THIS DIVISION OF WORK. OBTAIN AND PAY FOR ALL REQUIRED LICENSES, PERMITS, AND CERTIFICATES REQUIRED FOR WORK UNDER THIS SECTION.

GENERAL NOTES

1. REMOVE ALL EQUIPMENT, MATERIALS, CONTROL DEVICES, BOXES, WIRING, SAFETY SWITCHES, TUBING, ELECTRICAL CONDUIT, POWER WIRING, PIPING, CONTROL WIRING, SENSORS, AND EQUIPMENT, ELECTRICAL DISCONNECTS, EQUIPMENT/MATERIALS SUPPORTING DEVICES AND STRUCTURES, AND ALL RELATED AUXILIARY ITEMS ASSOCIATED EQUIPMENT AND MATERIALS WHICH WILL NO LONGER BE USED AFTER THIS PROJECT IS COMPLETE.
2. IT IS CONTRACTOR'S RESPONSIBILITY TO REMOVE AND DISPOSE OF ALL ITEMS INDICATED TO BE REMOVED. ONLY EXPRESSLY DESIGNATED ITEMS SHALL BE TURNED OVER TO OWNER.
3. FIELD-VERIFY EXISTING CONDITIONS, DIMENSIONS, DUCT ARRANGEMENTS, PIPING ARRANGEMENTS AND ELEVATIONS PRIOR TO COMMENCING ANY WORK.
4. COORDINATE ALL WORK WITH OTHER TRADES; COORDINATE SCHEDULE OF WORK WITH ALL SUB-CONTRACTORS TO ACHIEVE SMOOTH FLOW OF CONSTRUCTION.
5. TO GREATEST EXTENT POSSIBLE, KEEP WORK AREAS CLEAN AND FREE OF WASTE MATERIALS AND RUBBISH AT END OF EACH WORK DAY. LEAVE MANUFACTURER-RECOMMENDED AND CODE-REQUIRED CLEARANCES AROUND EQUIPMENT.
6. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND UNUSED, UNLESS EXPLICITLY NOTED OTHERWISE.

GENERAL NOTES - MECHANICAL

1. PERFORM ALL WORK PER 2009 VERSION OF THE INTERNATIONAL MECHANICAL CODE, AND APPLICABLE STATE AND COUNTY STANDARDS, UNLESS DRAWINGS OR SPECIFICATIONS HAVE MORE STRINGENT REQUIREMENTS.
2. CONTRACTOR IS RESPONSIBLE FOR ALL PERMITS AND FEES REQUIRED IN THE PERFORMANCE OF WORK OF THIS PROJECT.
3. DUE TO VARIATIONS IN EQUIPMENT CHARACTERISTICS BY DIFFERENT EQUIPMENT SUPPLIERS, MECHANICAL EQUIPMENT ULTIMATELY PROVIDED MAY DIFFER IN HORSEPOWER OR AMPERAGE REQUIREMENTS FROM THAT SPECIFIED IN THESE DRAWINGS. COORDINATE WITH GENERAL CONTRACTOR PRIOR TO BIDDING, AND PRIOR TO SUBMITTALS AND ORDERING EQUIPMENT, TO ENSURE THAT EQUIPMENT ELECTRICAL REQUIREMENTS ARE CONVEYED TO ELECTRICAL CONTRACTOR. IT IS SOLELY CONTRACTOR'S RESPONSIBILITY TO ENSURE COMPATIBILITY ISSUES ARE COORDINATED.
4. DUCT DIMENSIONS INDICATED ARE INSIDE CLEAR.

GENERAL NOTES - ELECTRICAL

1. PERFORM ALL WORK PER 2008 VERSION OF THE NATIONAL ELECTRIC CODE, AND APPLICABLE STATE AND COUNTY STANDARDS, UNLESS DRAWINGS OR SPECIFICATIONS HAVE MORE STRINGENT REQUIREMENTS.
2. SEE NOTES ON THE DRAWINGS FOR ADDITIONAL REQUIREMENTS.

GENERAL NOTES - CONTROLS

1. NEW AHUS ARE TO BE COMPATABLE WITH THE EXISTING CONTROL SYSTEM.
2. ALL EXISTING CONTROL POINTS ARE TO BE RETAINED, INSPECTED, AND REUSED. POINTS FOUND TO BE DEFECTIVE SHALL BE REPLACED. NEW AHU MAY REQUIRE ADDITIONAL CONTROL POINTS, THESE SHALL BE INCORPORATED INTO THE EXISTING CONTROLS SCHEME.
3. SEE NOTES ON THE DRAWINGS FOR ADDITIONAL CONTROL REQUIREMENTS.

PLUMBING LEGEND

SYMBOL	DESCRIPTION
SAN	SANITARY OR WASTE PIPING ABOVE GRADE (SAN)
SAN	SANITARY OR WASTE PIPING BELOW GRADE (SAN)
CW	COLD WATER PIPING (CW)
HW	HOT WATER PIPING (HW)
HWR	HOT WATER RETURN PIPING (HWR)
HWS	HOT WATER SUPPLY PIPING (HWS)
CHR	CHILLED WATER RETURN PIPING (CHR)
CHS	CHILLED WATER SUPPLY PIPING (CHS)
CON	CONDENSATION DRAIN PIPING (CON)
TW	TEMPERED WATER (TW)
TP	TRAP PRIMER LINE (TP)
FIRE	FIRE PROTECTION WATER PIPING (FIRE)
	FLOW DIRECTIONAL ARROW
	SHUT-OFF VALVE
BV	BALANCING VALVE (BV)
BV	BALL VALVE (BV)
	BUTTERFLY VALVE
	HORIZONTAL SWING CHECK
	UNION
	Y-STRAINER
	REDUCER OR INCREASER
	ECCENTRIC REDUCER
RPZ	REDUCED PRESSURE BACKFLOW PREVENTER (RPZ)
	PIPING DOWN
	RISE OR DROP PIPING
	PIPING UP -OR- PIPING UP & DOWN
	CAP ON END OF PIPE
CO	CLEANOUT (WALL OR CEILING) (CO)
FCO	FLOOR CLEANOUT (FCO)
ECO	EXTERIOR CLEANOUT WITH 18"x18"x4" CONCRETE PAD (ECO)
	TWO-WAY CLEANOUT (PROVIDE 18"x24"x4" CONCRETE PAD OUTSIDE)
PRV	PRESSURE REDUCING VALVE (PRV)
	BRANCH CONNECTION OUT OF TOP
	BRANCH CONNECTION OUT OF BOTTOM
	BRANCH CONNECTION OUT OF SIDE
	WYE & 1/8TH BEND BRANCH CONNECTION
	WYE BRANCH CONNECTION
HB	HOSE BIBB
	PRESSURE GAUGE WITH COCK
	THERMOMETER
	TEST COCK
	VALVE IN RISE
	ASME TEMPERATURE & PRESSURE RELIEF VALVE
	VACUUM RELIEF VALVE
#	REFER TO KEYED NOTE
FS	FLOOR SINK (FS)
FD	FLOOR DRAIN (FD)
FD	FLOOR DRAIN WITH P-TRAP (FD)
HD	HUB DRAIN (HD)
	ACCESS PANEL FOR TRAP PRIMER
AP	ACCESS PANEL LOCATION SYMBOL
A	SHOCK ABSORBER WITH ACCESS PANEL
	AIR CHAMBER
(E)	EXISTING
(N)	NEW
	CONNECT NEW TO EXISTING
IE=NNN.NN'	INVERT ELEVATION
1/4" PER FOOT	QUARTER OF AN INCH SLOPE
1/8" PER FOOT	1/8TH OF AN INCH SLOPE
1/16" PER FOOT	1/16TH OF AN INCH SLOPE
1	DELTA CHANGE SYMBOL
P 1 4" VTR	RISER FLAG

NOTE: NOT ALL SYMBOLS MAY APPLY TO THIS PROJECT.

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