

INVITATION TO BID

BID NO. 20-0027-5

**COOLING TOWERS REPLACEMENT AT THE CHATHAM COUNTY DETENTION
CENTER**

PRE-BID CONFERENCE: 2:00 P.M., JULY 16, 2020
MANDATORY ON-SITE

BID OPENING: 2:00 P.M., JULY 30, 2020

THE COMMISSIONERS OF CHATHAM COUNTY, GEORGIA

ALBERT J. SCOTT, CHAIRMAN

COMMISSIONER HELEN J. STONE

COMMISSIONER TABITHA ODELL

COMMISSIONER JAMES J. HOLMES

COMMISSIONER JAMES “JAY” JONES

COMMISSIONER BOBBY LOCKETT

COMMISSIONER DEAN KICKLIGHTER

COMMISSIONER PATRICK J. FARRELL

COMMISSIONER CHESTER A. ELLIS

R. JONATHAN HART, COUNTY ATTORNEY

CHATHAM COUNTY, GEORGIA
DOCUMENT CHECK LIST

The following documents, when marked, are contained in and made a part of this Bid Package or are required to be submitted with the bid. It is the responsibility of the bidder to read, complete and sign, where indicated, and return these documents with his/her bid. **FAILURE TO DO SO MAY BE CAUSE FOR DISQUALIFYING THE BID.**

 X GENERAL INFORMATION AND INSTRUCTIONS TO BID WITH ATTACHMENTS

 X SURETY REQUIREMENTS (a Bid Bond of 5% with this ITB)

 X PROPOSAL

 PLANS/DRAWINGS

 X BID SCHEDULE

 PERFORMANCE BOND – Required at the time of contract.

 PAYMENT BOND – Required at the time of contract.

 CONTRACT

 X LEGAL NOTICE

 X ATTACHMENTS: A. DRUG FREE WORKPLACE; B. NONDISCRIMINATION STATEMENT; C. DISCLOSURE OF RESPONSIBILITY STATEMENT; D. CONTRACTOR & SUBCONTRACTOR AFFIDAVIT AND AGREEMENT E. BIDDER'S CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION; F. M/WBE COMPLIANCE REPORT; G. SAVE AFFIDAVIT.

 X DOCUMENTATION OF ABILITY TO PERFORM BID REQUIREMENTS. THIS MAY BE REQUIRED OF BIDDERS AFTER SUBMISSION OF BIDS.

COUNTY TAX CERTIFICATE REQUIREMENT - Contractor must supply a copy of their Tax Certificate from their location in the State of Georgia, as proof of payment of the occupational tax where their office is located.

CURRENT TAX CERTIFICATE NUMBER
CITY _____
COUNTY _____
OTHER _____

The Chatham County Board of Commissioners has established goals to increase participation of minority and woman owned businesses. In order to accurately document participation, businesses submitting bids or proposals are encouraged to report ownership status. A minority or woman owned business is defined as a business with at least 51% ownership by one or more minority/female individuals and whose daily business operations are managed and directed by one (1) or more of the minority/woman owners. Please check ownership status as applicable:

African-American_____ Asian American_____ Hispanic_____

Native American or Alaskan Indian_____ Woman_____

In the award of Competitive Sealed Proposals, minority/woman participation may be one of several evaluation criteria used in the award process when specified as such in the Request for Proposal.

RECEIPT IS HEREBY ACKNOWLEDGED OF ADDENDA NUMBER(S)_____

The undersigned bidder certifies that he/she has received the above listed and marked documents and acknowledges that his/her failure to return each, completed and signed as required, may be cause for disqualifying his/her bid.

BY: _____
DATE

SIGNATURE

TITLE: _____

COMPANY: _____

CHATHAM COUNTY, GEORGIA
OFFICE OF THE PURCHASING DIRECTOR
1117 EISENHOWER DRIVE, SUITE C
SAVANNAH, GEORGIA 31406
(912) 790-1622

Date: June 24, 2020

BID NO. 20-0027-5

GENERAL INFORMATION FOR INVITATION FOR BID

This is an invitation to submit a bid to supply Chatham County with construction, equipment, supplies and/or services as indicated herein. Sealed bids will be received at the Office of the Purchasing Director, at **The Chatham County Citizens Service Center, 1117 Eisenhower Drive, Suite C, Savannah, Georgia 31406 up to 2:00PM on JULY 30, 2020** at which time they will be opened and publicly read. **The County reserves the right to reject all bids that are non-responsive or not responsible.**

A MANDATORY PRE-BID CONFERENCE will be held at 2:00 P.M., JULY 16, 2020, ON-SITE AT THE CHATHAM COUNTY DETENTION CENTER, 1050 CARL GRIFFIN DRIVE, SAVANNAH, GEORGIA.

Instructions for preparation and submission of a bid are contained in this Invitation For Bid package. Please note that specific forms for submission of a bid are required. Bids must be typed or printed in ink.

Any changes to the conditions and specifications must be in the form of a written addendum to be valid; therefore, the Purchasing Director will issue a written addendum to document each approved change. Generally when addenda are required, the bid opening date will be changed.

Chatham County has an equal opportunity purchasing policy. Chatham County seeks to ensure that all segments of the business community have access to supplying the goods and services needed by County programs. The County affirmatively works to encourage utilization of disadvantaged and minority business enterprises in our procurement activities. The County provides equal opportunity for all businesses and does not discriminate against any persons or businesses regardless of race, color, religion, age, sex, national origin or handicap. The terms "disadvantaged business," "minority business enterprise," and "minority person" are more specifically defined and explained in the Chatham County Purchasing Ordinance.

This project IS NOT a Special Purpose Local Option Sales Tax (SPLOST) Project. See paragraph 2.22 for M/WBE participation goals.

SECTION I INSTRUCTIONS TO BIDDERS

- 1.1 **Purpose:** The purpose of this document is to provide general and specific information for use in submitting a bid to supply Chatham County with equipment, supplies, and/or services as described herein. All bids are governed by the Code of Chatham County, Chapter 4, Article IV, and the laws of the State of Georgia.

1.2 **How to Prepare Bids: All bids shall be:**

- a. Prepared on the forms enclosed herewith, unless otherwise prescribed, and **all documents must be submitted.**
- b. Typewritten or completed with pen and ink, signed by the business owner or authorized representative, with all erasures or corrections initialed and dated by the official signing the bid. **ALL SIGNATURE SPACES MUST BE SIGNED.**

Bidders are encouraged to review carefully all provisions and attachments of this document prior to submission. Each bid constitutes an offer and may not be withdrawn except as provided herein.

1.3 **How to Submit Bids: All bids shall be:**

- a. **An original and duplicate copy must be submitted in a sealed opaque envelope, plainly marked with the bid number and title, date and time of bid opening, and company name.**
- b. Mailed or delivered as follows in sufficient time to ensure receipt by the Purchasing Director on or before the time and date specified above.

**Chatham County Purchasing and Contracting
Purchasing Director
1117 Eisenhower Drive
Suite C
Savannah, Georgia 31406.**

BIDS NOT RECEIVED BY THE TIME AND DATE SPECIFIED WILL NOT BE OPENED OR CONSIDERED.

- 1.4 **How to Submit an Objection:** Objections from bidders to this invitation to bid and/or these specifications should be brought to the attention of the County Purchasing Director in the following manner:

- a. When a pre-bid conference is scheduled, bidders shall either present their

oral objections at that time or submit their written objections at least two (2) days prior to the scheduled pre-bid conference.

- b. When a pre-bid conference is not scheduled, the bidder shall submit any objections he may have in writing not less than five (5) days prior to the opening of the bid.
- c. The objections contemplated may pertain to form and/or substance of the invitation to bid documents. Failure to object in accordance with the above procedure will constitute a waiver on the part of the business to protest this invitation to bid.

1.5 **Not Used.**

1.6 **Errors in Bids:** Bidders or their authorized representatives are expected to fully inform themselves as to the conditions, requirements, and specifications before submitting bids. Failure to do so will be at the bidder's own risk. In case of error in extension of prices in the bid, the unit price will govern.

1.7 **Standards for Acceptance of Bid for Contract Award:** The County reserves the right to reject any or all bids and to waive any irregularities or technicalities in bids received whenever such rejection or waiver is in the best interest of the County. The County reserves the right to reject the bid of a bidder who has previously failed to perform properly or complete on time contracts of a similar nature, or a bid from a bidder whom investigation shows is not in a position to perform the contract.

1.8 **Bid Tabulation:** Tabulations for all bids will be posted for thirty (30) days after the bid opening in the Office of Purchasing and Contracting, 1117 Eisenhower Drive, Suite C, Savannah, Georgia 31406 or can be reviewed on the Purchasing web site 24/48 hours after opening at <http://purchasing.chathamcounty.org>.

1.9 **Bidder:** Whenever the term "bidder" is used it shall encompass the "person," "business," "contractor," "supplier," "vendor," or other party submitting a bid or proposal to Chatham County in such capacity before a contract has been entered into between such party and the County.

1.10 **Responsible / Responsive Bidder:** *Responsible Bidder* means a person or entity that has the capability in all respects to perform fully and reliably the contract requirements. *Responsive Bidder* means a person or entity that has submitted a bid or proposal that conforms in all material respects to the requirements set forth in the invitation for bids or request for proposals.

1.11 **Compliance with Laws:** The bidder and/or contractor shall obtain and maintain all licenses, permits, liability insurance, workman's compensation insurance and comply with

any and all other standards or regulations required by federal, state or County statute, ordinances and rules during the performance of any contract between the contractor and the County. Any such requirement specifically set forth in any contract document between the contractor and the County shall be supplementary to this section and not in substitution thereof.

- 1.12 **Contractor:** Contractor or subcontractor means any person or business having a contract with Chatham County. The Contractor/Vendor of goods, material, equipment or services certifies that they will follow equal employment opportunity practices in connection with the awarded contract as more fully specified in the contract documents.

- 1.13 **Local Preference:** The local preference policy was amended January 2016 under the new purchasing ordinance. This Ordinance does not apply to construction contracts. However, contractors are encouraged to apply the same method when awarding bids to local and local M/WBE businesses whenever possible in order to promote growth in Chatham County's economy. **NOTE: Local Preference does not apply to Public Works Construction contracts.**

- 1.14 **Debarred Firms and Pending Litigation:** Any potential proposer/firm listed on the Federal or State of Georgia Excluded Parties Listing (Barred from doing business) **will not** be considered for contract award. Proposers **shall disclose** any record of pending criminal violations (Indictment) and/or convictions, pending lawsuits, etc., and any actions that may be a conflict of interest occurring within the past five (5) years. Any proposer/firm previously defaulting or terminating a contract with the County will not be considered.

**** All bidders or proposers are to read and complete the Disclosure of Responsibility Statement enclosed as an Attachment to be returned with response. Failure to do so may result in your solicitation response being rejected as non-responsive.**

Bidder acknowledges that in performing contract work for the Board, bidder shall not utilize any firms that have been a party to any of the above actions. If bidder has engaged any firm to work on this contract or project that is later debarred, Bidder shall sever its relationship with that firm with respect to the Board contract.

- 1.15 **Performance Evaluation:** On 11 April 2008, the Chatham County Board of Commissioners approved a change to the County Purchasing Ordinance requiring Contractor/Consultant Performance Evaluations, as a minimum, annually, prior to contract anniversary date.

Should Contractor/Consultant performance be unsatisfactory, the appointed County Project Manager for the contract may prepare a Contractor/Consultant Complaint Form or a Performance Evaluation to the County Purchasing Director.

- 1.16 **Payment of Taxes:** No contract shall be awarded unless all real and personal property taxes have been paid by the successful contractor and/or subcontractors as adopted by the

Board of Commissioners on 8 April 1994.

- 1.17 **State Licensing Board for General Contractors:** Pursuant to Georgia law, the following types of contractors must obtain a license from the State Licensing Board of Residential and General Contractors by 1 July 2008:

***Residential - Basic Contractor** (Contractor work relative to detached one-family and two-family residences and one-family townhouses not over three stories in height).

***Residential - Light Commercial Contractor** (Contractor work or activity related to multifamily and multiuse light commercial buildings and structures).

***General Contractor** (Contractor work or activity that is unlimited in scope regarding any residential or commercial projects).

- 1.18 **Immigration:** On 1 July 2008, the Georgia Security and Immigration Compliance Act (SB 529, Section 2) became effective. Contractors and subcontractors entering into a contract or performing work must sign an affidavit that he/she has used the E-Verify System. E-Verify is a no-cost federal employment verification system to insure employment eligibility. Affidavits are enclosed in this solicitation. You may download M-274 Handbook for Employers at <http://www.dol.state.ga.us/spotlight/employment/rules>. You may go to <http://www.uscis.gov> to find the E-Verify information.

Systematic Alien Verification for Entitlements (SAVE) Program: O.C.G.A. 50-36-1, required Georgia counties to comply with the federal **Systematic Alien Verification for Entitlements (SAVE) Program**. SAVE is a federal program used to verify that applicants for certain "public benefits are legally present in the United States. Contracts with the County are considered "public benefits. Therefore, the successful bidder will be required to provide the Affidavit Verifying Status for Chatham County Benefit Application prior to receiving any County contract. The affidavit is included as part of this bid package but is only required of the successful bidder.

Protection of Resident Workers: Chatham County Board of Commissioners actively supports the Immigration and Nationality Act (IN) which includes provisions addressing employment eligibility, employment verification, and nondiscrimination. Under the IN, employers may hire only persons who may legally work in the United States (i.e., citizens and nationals of the U.S.) and aliens authorized to work in the U.S. The employer must verify the identity and employment eligibility of anyone to be hired, which includes completing the Employment Eligibility Verification Form (I-9). The Contractor shall establish appropriate procedures and controls so no services or products under the Contract Documents will be performed or manufactured by any worker who is not legally eligible to perform such services or employment.

- 1.19 **Surcharge:** Unless otherwise stated in this bid, all prices quoted by the contractor/vendor must be F.O.B. Chatham County, Savannah, GA. with all delivery handling, surcharges,

and other charges included in the bid price. Failure to do so may cause rejection of the bid. The County will not pay additional surcharges. All shipments to be delivered inside facility at no additional cost

SECTION II GENERAL TERMS, CONDITIONS AND EXCEPTIONS

- 2.1 **Specifications:** Any obvious error or omission in specifications shall not inure to the benefit of the bidder but shall put the bidder on notice to inquire of or identify the same from the County. Whenever herein mentioned is made of any article, material or workmanship to be in accordance with laws, ordinances, building codes, underwriter's codes, ASTM regulations or similar expressions, the requirements of these laws, ordinances, etc., shall be construed to be the minimum requirements of these specifications.
- 2.2 **Multiple Bids:** No vendor will be allowed to submit more than one (1) bid. Any alternate proposals must be brought to the Purchasing Director's attention during the Pre-bid Conference or submitted in writing at least five (5) days preceding the bid opening date.
- 2.3 Not Used.
- 2.4 **Prices to be Firm:** Bidder warrants that bid prices, terms and conditions quoted in his bid will be firm for acceptance for a period of sixty (60) days from bid opening date, unless otherwise stated in the bid.
- 2.5 **Completeness:** All information required by Invitation for Bids/Proposals must be completed and submitted to constitute a proper bid or proposal.
- 2.6 **Quality:** All materials, or supplies used for the construction necessary to comply with this proposal shall be of the best quality, and of the highest standard of workmanship. Workmanship employed in any construction, repair, or installation required by this proposal shall be of the highest quality and meet recognized standards within the respective trades, crafts and of the skills employed.
- 2.7 **Guarantee:** Unless otherwise specified by the County, the bidder shall unconditionally guarantee the materials and workmanship on all material and/or services. If, within the guarantee period, any defects occur which are due to faulty material and or services, the contractor at his expense, shall repair or adjust the condition, or replace the material and/or services to the complete satisfaction of the County. These repairs, replacements or adjustments shall be made only at such time as will be designated by the County as being least detrimental to the operation of County business.
- 2.8 **Liability Provisions:** Where bidders are required to enter or go onto Chatham County property to take measurements or gather other information in order to prepare the bid or proposal as requested by the County, the bidder shall be liable for any injury, damage or loss occasioned by negligence of the bidder, his agent, or any person the bidder has

designated to prepare the bid and shall indemnify and hold harmless Chatham County from any liability arising therefrom. The contract document specifies the liability provisions required of the successful bidder in order to be awarded a contract with Chatham County.

- 2.9 **Cancellation of Contract:** The contract may be canceled or suspended by Chatham County in whole or in part by written notice of default to the Contractor upon non-performance or violation of contract terms. An award may be made to the next low bidder, for articles and/or services specified or they may be purchased on the open market and the defaulting Contractor (or his surety) shall be liable to Chatham County for costs to the County in excess of the defaulted contract prices. See the contract documents for complete requirements.
- 2.10 **Patent Indemnity:** Except as otherwise provided, the successful bidder agrees to indemnify Chatham County and its officers, agents and employees against liability, including costs and expenses for infringement upon any letters patent of the United States arising out of the performance of this Contract or out of the use or disposal for the account of the County of supplies furnished or construction work performed hereunder.
- 2.11 **Certification of Independent Price Determination:** By submission of this bid, the bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, that in connection with this procurement:
- (1) The prices in this bid have been arrived at independently, without consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
 - (2) Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly to any other bidder or to any competitor; and
 - (3) No attempt has been made or will be made by the bidder to induce any other person or firm to submit or not submit a bid for the purpose or restricting competition.
- 2.12 **Award of Contract:** The contract, if awarded, will be awarded to that responsible bidder whose bid/proposal will be most advantageous to Chatham County, price and other factors considered. The Board of Commissioners will make the determination as to which bid or proposal that serves as the best value to Chatham County.
- 2.13 **Procurement Protests:** Objections and protests to any portion of the procurement process or actions of the County staff may be filed with the Purchasing Director for review and resolution. The Chatham County Purchasing Ordinance, Part 9, Vendor Disputes shall govern the review and resolution of all protests.

- 2.14 **Qualification of Business (Responsible Bidder or Proposer):** A responsible bidder or proposer is defined as one who meets, or by the date of the bid acceptance can meet, certifications, all requirements for licensing, insurance, and registrations, or other documentation required by the Design Professional engaged to develop Scope of Work, specifications and plans. These documents will be listed in the Special Conditions further on in this solicitation. Chatham County has the right to require any or all bidders to submit documentation of the ability to perform, provide, or carry out the service or provide the product requested.

Chatham County has the right to disqualify the bid or proposal of any bidder or proposer as being unresponsive or irresponsible whenever such bidder/proposer cannot document the ability to deliver the requested product.

- 2.15 **Chatham County Tax Certificate Requirement:** A current Chatham County or municipal business license (within the State of Georgia) is required unless otherwise specified. A firm need not have a Chatham County Business License prior to submitting a proposal. However, a license must be obtained by the successful vendor prior to award of contract.

Please contact the Chatham County Department of Building Safety and Regulatory Services at (912) 201-4300 for additional information.

NOTE: No contract shall be awarded unless all real and personal property taxes have been paid by the successful contractor and/or subcontractors as adopted by the Board of Commissioners on 8 April 1994.

- 2.16 **Insurance Provisions, General:** The selected contractor shall be required to procure and maintain for the duration of the contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, his agents, representatives, employees or subcontractors. The cost of such insurance shall be included in the Bid.
It is every contractor's responsibility to provide the County Purchasing and Contracting Division current and up-to-date Certificates of Insurance for multiple year contracts before the end of each term. Failure to do so may be cause for termination of contract.

2.16.1 General Information that shall appear on a Certificate of Insurance:

Name of the Producer (Contractor's insurance Broker/Agent).

Companies affording coverage (there may be several).

Name and Address of the Insured (this should be the Company or Parent of the firm Chatham County is contracting with).

A Summary of all current insurance for the insured (includes effective dates of coverage).

A brief description of the operations to be performed, the specific job to be performed, or contract number.

Certificate Holder (This is to always include Chatham County).

Chatham County as an Additional Insured: Chatham County invokes the defense of sovereign immunity. In order not to jeopardize the use of this defense, the County **is not** to be included as an Additional Insured on insurance contracts.

2.16.2 **Minimum Limits of Insurance** to be maintained for the duration of the contract:

- a. **Commercial General Liability:** Provides protection against bodily injury and property damage claims arising from operations of a Contractor or Tenant. This policy coverage includes: premises and operations, use of independent contractors, products/completed operations, personal injury, contractual, broad form property damage, and underground, explosion and collapse hazards. Minimum limits: \$1,000,000 bodily injury and property damage per occurrence and annual aggregate.
- b. **Worker's Compensation and Employer's Liability:** Provides statutory protection against bodily injury, sickness or disease sustained by employees of the Contractor while performing within the scope of their duties. Employer's Liability coverage is usually included in Worker's Compensation policies, and insures common law claims of injured employees made in lieu of or in addition to a Worker's Compensation claim. Minimum limits: \$500,000 for each accident, disease policy limit, disease each employee and Statutory Worker's Compensation limit.
- c. **Business Automobile Liability:** Coverage insures against liability claims arising out of the Contractor's use of automobiles. Minimum limit: \$1,000,000 combined single limit per accident for bodily injury and property damage. Coverage should be written on an Any Auto basis.

2.16.3 Special Requirements:

- a. **Claims-Made Coverage:** The limits of liability shall remain the same as the occurrence basis, however, the Retroactive date shall be prior to the coincident with the date of any contract, and the Certificate of Insurance shall state the coverage is claims-made. The Retroactive date shall also be specifically stated on the Certificate of Insurance.
- b. **Extended Reporting Periods:** The Contractor shall provide the County with a notice of the election to initiate any Supplemental Extended Reporting Period and the reason(s) for invoking this option.
- c. **Reporting Provisions:** Any failure to comply with reporting provisions of the policies shall not affect coverage provided in relation to this request.

- d. **Cancellation:** Each insurance policy that applies to this request shall be endorsed to state that it shall not be suspended, voided, or canceled, except after thirty (30) days prior to written notice by certified mail, return receipt requested, has been given to the County.
- e. **Proof of Insurance:** Chatham County shall be furnished with certificates of insurance and with original endorsements affecting coverage required by this request. The certificates and endorsements are to be signed by a person authorized by the insurer to bind coverage on its behalf. All certificates of insurance are to be submitted prior to, and approved by, the County before services are rendered. The Contractor must ensure Certificate of Insurance is updated for the entire term of the Contract.
- f. **Insurer Acceptability:** Insurance is to be placed with an insurer having an A.M. Best's rating of A and a five (5) year average financial rating of not less than V. If an insurer does not qualify for averaging on a five year basis, the current total Best's rating will be used to evaluate insurer acceptability.
- g. **Lapse in Coverage:** A lapse in coverage shall constitute grounds for contract termination by the Chatham County Board of Commissioners.
- h. **Deductibles and Self-Insured Retention:** Any deductibles or self-insured retention must be declared to, and approved by, the County. At the option of the County, either: the insurer shall reduce or eliminate such deductibles or self-insured retention as related to the County, its officials, officers, employees, and volunteers; or the Contractor shall procure a bond guaranteeing payment of related suits, losses, claims, and related investigation, claim administration and defense expenses.

2.16.4 **Additional Coverage for Specific Procurement Projects:**

- a. **Professional Liability:** Insure errors or omission on behalf of architects, engineers, attorneys, medical professionals, and consultants.

Minimum Limits:

\$1 million per claim/occurrence

Coverage Requirement:

If claims-made, retroactive date must precede or coincide with the contract effective date or the date of the Notice to Proceed. The professional must state if tail coverage has been purchased and the duration of the coverage.

- b. **Builder's Risk: (For Construction or Installation Contracts)** Covers against insured perils while in the course of construction.
Minimum Limits: All-Risk coverage equal 100% of contract value
Coverage Requirements: Occupancy Clause - permits County to use the facility prior to issuance of Notice of Substantial Completion.
- 2.17 **Compliance with Specification - Terms and Conditions:** The Invitation to Bid, Legal Advertisement, General Conditions and Instructions to Bidders, Specifications, Special Conditions, Vendor's Bid, Addendum, and/or any other pertinent documents form a part of the bidders proposal or bid and by reference are made a part hereof.
- 2.18 **Signed Bid Considered Offer:** The signed bid shall be considered an offer on the part of the bidder, which offer shall be deemed accepted upon approval by the Chatham County Board of Commissioners, Purchasing Director or his designee. In case of a default on the part of the bidder after such acceptance, Chatham County may take such action as it deems appropriate, including legal action for damages or lack of required performance.
- 2.19 **Notice to Proceed:** The successful bidder or proposer shall not commence work under this Invitation to Bid until a written contract is awarded and a Notice to Proceed is issued by the Purchasing Director or his designee. If the successful bidder does commence any work or deliver items prior to receiving official notification, he does so at his own risk.
- 2.20 **Payment to Contractors:** Instructions for invoicing the County for products delivered to the County are specified in the contract document.
 - a. Questions regarding payment may be directed to the Finance Department at (912) 652-7900 or the County's Project Manager as specified in the contract documents.
 - b. Contractors will be paid the agreed upon compensation upon satisfactory delivery of the products or completion of the work as more fully described in the contract document.
 - c. Upon completion of the work or delivery of the products, the Contractor will provide the County with an affidavit certifying all suppliers, persons or businesses employed by the Contractor for the work performed for the County have been paid in full.
 - d. Chatham County is a tax exempt entity. Every contractor, vendor, business or person under contract with Chatham County is required by Georgia law to pay State sales or use taxes for products purchased in Georgia or transported into Georgia and sold to Chatham County by contract. Please consult the State of Georgia, Department of Revenue, Sales and Use Tax Unit in Atlanta (404) 656-4065 for additional information.

2.21 **Not Used**

2.22 The Chatham County Board of Commissioners has adopted an aggressive program that establishes goals for minority/woman, small and disadvantaged business participation in construction, professional services, and general procurement.

- a. The Chatham County Board of Commissioners under Georgia law may reject any bid as non-responsive if they feel a bidder did not exercise "Good Faith Effort in obtaining the goal established for M/WBE participation.
- b. The Chatham County Board of Commissioners adopted a policy establishing goals oriented to increase participation of minority and women owned businesses, through M/WBE certification and development. In order to accurately document participation, businesses submitting bids, quotes or proposals are encouraged to report ownership status. A bidder or vendor that is certified by any agency of the Federal Government or State of Georgia may submit a copy of their certification with their bid as proof of qualifications. Bidders that intend to engage in joint ventures or utilize subcontractors must submit to the County Contracts Administrator, a report on Minority/Women Business Enterprise participation.

Goals established for this project is 12% MBE/ 5% WBE.

- c. A Minority/Women Business Enterprise (M/WBE) is a business concern that is at least 51% owned by one or more minority/women individuals and whose daily business operations are managed and directed by one (1) or more of the minority/female owners.
- 2.23 Bidders or proposers are required to make a **Good Faith Effort**, where subcontracting is to be utilized in performing the contract, to subcontract with or purchase supplies from qualified M/WBE's. Bidders or proposers are required to state if they intend to subcontract any part of the work. Goals will be established for each contract at the onset. **Forms** requiring the signatures of bidders or proposers are enclosed as **Attachments** and must be completed and returned with your bid response. If forms are not completed and submitted, the bid may be considered nonresponsive.

Each bidder or proposer is required to maintain records of such efforts in detail adequate to permit a determination of compliance with these requirements. All contracts will reflect **Good Faith Efforts** and reporting requirements for the term of the contract. The County particularly urges general contractors to give emphasis to subcontracting with local area firms.

For information on the program or M/WBE contractors/vendors please contact Connell C. Heyward, Chatham County Minority and Women Business Coordinator, 124 Bull Street, Suite 310, Savannah, Georgia 31401, (912) 652-7926 phone, (912) 652-7849 fax.

- 2.24 **GEORGIA OPEN RECORDS ACT** - The responses will become part of the County's official files without any obligation on the County's part. Ownership of all data, materials and documentation prepared for and submitted to Chatham County in response to a solicitation, regardless of type, shall belong exclusively to Chatham County and will be considered a record prepared and maintained or received in the course of operations of a public office or agency and subject to public inspection in accordance with the Georgia Open Records Act, Official Code of Georgia Annotated, Section 50-18-70, et. Seq., unless otherwise provided by law.

Responses to RFP's shall be held confidential from all parties other than the County until after the contract is awarded by the Board of Commissioners.

The vendor and their bid price in response to the ITB will be read aloud at public bid openings. After Bid Tabulations, the ITB shall be available for public viewing.

Chatham County shall not be held accountable if material from responses is obtained without the written consent of the vendor by parties other than the County, at any time during the solicitation evaluation process.

- 2.25 **GEORGIA TRADE SECRET ACT of 1990** - In the event a Bidder/Proposer submits trade secret information to the County, the information must be clearly labeled as a Trade Secret. The County will maintain the confidentiality of such trade secrets to the extent provided by law.
- 2.26 **CONTRACTOR RECORDS** -The Georgia Open Records Act is applicable to the records of all contractors and subcontractors under contract with the County. This applies to those specific contracts currently in effect and those which have been completed or closed for up to three (3) years following completion. Again, this is contract specific to the County contracts only.
- 2.27 **EXCEPTIONS**-All proceedings, records, contracts and other public records relating to procurement transactions shall be open to the inspection of any citizen, or any interested person, firm or corporation, in accordance with the Georgia Open Records Act except as provided below:
- a. Cost estimates relating to a proposed procurement transaction prepared by or for a public body shall not be open to public inspection.
 - b. Any competitive sealed bidding bidder, upon request, shall be afforded the opportunity to inspect bid records within a reasonable time after the opening of all bids but prior to award, except in the event that the County decides not to accept any of the bids and to rebid the contract. Otherwise, bid records shall be open to public inspection only after award of the contract. Any competitive negotiation offer or, upon request, shall be afforded the opportunity to inspect proposal records

within a reasonable time after the evaluation and negotiations of proposals are completed but prior to award except in the event that the County decides not to accept any of the proposals and to reopen the contract. Otherwise, proposal records shall be open to the public inspection only after award of the contract except as provided in paragraph "c" below. Any inspection of procurement transaction records under this section shall be subject to reasonable restrictions to ensure the security and integrity of the records.

- c. Trade secrets or proprietary information submitted by a bidder, offer or contractor in connection with a procurement transaction shall not be subject to public disclosure under the Georgia Open Records Act; however, the bidder, offer or contractor must invoke the protections of this section prior to or upon submission of the data or other materials, and must identify the data or other materials to be protected and state the reasons why protection is necessary.
- d. Nothing contained in this section shall be construed to require the County, when procuring by "competitive negotiation" (Request for Proposal), to furnish a statement of the reasons why a particular proposal was not deemed to be the most advantageous to the County.

2.28 Not Used

SECTION III ADDITIONAL CONDITIONS

- 3.1 **METHOD OF COMPENSATION.** The compensation provided for herein shall include all claims by the CONTRACTOR for all costs incurred by the CONTRACTOR in the conduct of the Project as authorized by the approved Project Compensation Schedule and this amount shall be paid to the CONTRACTOR after receipt of the invoice and approval of the amount by the COUNTY. The COUNTY shall make payments to the CONTRACTOR within thirty (30) days from the date of receipt of the CONTRACTOR's acceptable statement on forms prepared by the CONTRACTOR and approved by the COUNTY.

- 3.2 **SURETY REQUIREMENTS and Bonds: (check where applicable)**

- ☒ **A. Such bidder shall post a bid bond, certified check or money order made payable to the Chatham County Finance Department in the amount of 5% of the bid price.**
- ☒ **B. Contractor(s) shall post a payment/performance bond, certified check or money order made payable to the Chatham County Finance Department in the amount of 100% of the bid price if awarded the purchase. Such bond(s) are due prior to contract execution as a guarantee that goods meet specifications and will be delivered per contract. Such bonds will also**

guarantee quality performance of services and timely payment of invoices to any subcontractors.

- X C. Whenever a bond is provided, it shall be executed by a surety authorized to do business in the State of Georgia and approved by Chatham County.
- X D. Bidder acknowledges Chatham County's right to require a Performance and Payment Bond of a specific kind and origin. Performance Bond means a bond with good and sufficient surety or sprites for the faithful performance of the contract and to indemnify the governmental entity for any damages occasioned by a failure to perform the same within the prescribed time. Such bond shall be payable to, in favor of, and for the protection of the governmental entity for which the work is to be done. Payment Bond means a bond with good and sufficient surety or sureties payable to the governmental entity for which the work is to be done and intended for the use and protection of all subcontractors and all persons supplying labor, materials, machinery, and equipment in the prosecution of the work provided for in the public works construction contract.
- X E. Forfeit the amount of the Bid Bond if he/she fails to enter into a contract with Chatham County to do and/or furnish everything necessary to provide service and/or accomplish the work stated and/or specified in this bid proposal for the bid amount, and;

3.3 AUDITS AND INSPECTIONS:

At any time during normal business hours and as often as the County may deem necessary, the Contractor and his subcontractors shall make available to the County and/or representatives of the Chatham County Department of Internal Audit for examination all of its records with respect to all matters covered by this Contract. It shall also permit the County and/or representatives of the Department of Internal Audit to audit, inspect, examine and make copies, excerpts or transcripts from such records of personnel, conditions of employment and other data relating to all matters covered by this Contract. All documents to be audited shall be available for inspection at all reasonable times in the main offices of the County or at the offices of the Contractor as requested by the County.

3.4 WARRANTY REQUIREMENTS:

- a. Provisions of item 2.7 apply.
 - b. Warranty required.
-
- X 1. Standard warranty shall be offered with bid.
 - 2. Extended warranty shall be offered with bid. The cost of the extended warranty will be listed separately on the bid sheet.

3.5 **TERMS OF CONTRACT:** (check where applicable):

- a. Annual Contract (With renewal options for four (4) additional one (1) year terms if all parties agree)
- X b. One-time Purchase
- c. Other

CONVERSATIONS OR CORRESPONDENCE REGARDING THIS SOLICITATION OR REPORT BETWEEN PROSPECTIVE OFFERORS AND PERSONS OUTSIDE THE CHATHAM COUNTY PURCHASING OFFICE WILL NOT BE CONSIDERED OFFICIAL OR BINDING UNLESS OTHERWISE SPECIFICALLY AUTHORIZED WITHIN THIS DOCUMENT.

The undersigned bidder or proposer certifies that he/she has carefully read the preceding list of instructions to bidders and all other data applicable hereto and made a part of this invitation; and, further certifies that the prices shown in his/her bid/proposal are in accordance with all documents contained in this Invitation for Bids/ Proposals package, and that any exception taken thereto may disqualify his/her bid/proposal.

This is to certify that I, the undersigned bidder, have read the instructions to bidder and agree to be bound by the provisions of the same.

This _____ day of _____ 20 ____.

BY _____
SIGNATURE

TITLE

COMPANY

Phone / Fax No.

CHATHAM COUNTY, GEORGIA
SURETY REQUIREMENTS

A Bid Bond for five percent (5%) of the amount of the bid is required to be submitted with each bid.

A Performance Bond for one hundred percent (100%) of the bid shall be required of the successful bidder.

The Bidder certifies that he/she has examined all documents contained in this bid package, and is familiar with all aspects of the proposal and understands fully all that is required of the successful bidder. The Bidder further certifies that his/her bid shall not be withdrawn for thirty (30) days from the date on which his bid is publicly opened and read.

The Bidder agrees, if awarded this bid, he/she will:

- A. Furnish, upon receipt of an authorized Chatham County Purchase Order, all items indicated thereon as specified in this bid proposal for the bid amount, or;
- B. Enter a contract with Chatham County to do and/or furnish everything necessary to provide the service and/or accomplish the work as stated and/or specified in this bid proposal for the bid amount, and;
- C. Furnish, if required, a Performance Bond, and acknowledges Chatham County's right to require a Performance Bond of a specific kind and origin, and;
- D. Forfeit the amount of the Bid Bond if he/she fails to enter a contract with Chatham County as stated in (B) above, within fifteen (15) days of the date on which he/she is awarded the bid, and/or;
- E. Forfeit the amount of the Performance Bond if he/she fails to execute and fulfill the terms of the contract entered. The amount of forfeiture shall be:
 - 1. The difference between his/her bid and the next lowest, responsible bid that has not expired or been withdrawn, or;
 - 2. The difference between his/her bid and the amount of the lowest, responsible bid received as a result of rebidding, including all costs related to rebidding.

COMPANY

DATE

SIGNATURE

TITLE

TELEPHONE NUMBER

COOLING TOWER REPLACEMENT AT THE CHATHAM COUNTY DETENTION CENTER

SPECIFICATIONS FOR:

BID NO. 20-0027-5

4.1 GENERAL SPECIFICATIONS:

The purpose of the bid is to solicit competitive bids from qualified contractors to provide a replacement of three (3) cooling towers and associated pumps and controls. An air compressor and associated equipment and controls for the Chatham County Detention Center. For additional information concerning these specifications, please contact **ONLY** Mr. Robert Marshall, Senior Procurement Specialist, at rmarshall@chathamcounty.org or (912) 790-1622. Bidders are **not** to contact any County Department directly. Detailed specifications are as follows:

4.2 SUPPLIES SPECIFICATIONS:

- 4.2.1 Current Equipment:
 - Two (2) Quicy Model# QT Series 80 gal.
 - One (1) Dayton Dryer Model SpeedAire
- 4.2.2 Currently the Chatham County Detention Center has two (2) piston style air compressors with one (1) line dryer connected to an auto switching control panel. Installation of two (2) new rotary screw style compressors of type Kaeser Airtower SC2 or equivalent. Any equivalent or substitute must meet all specification equal or greater than the Kaeser Airtower SC2 and be approved by the Chatham County Sheriff's Facility Engineering Staff. Include product specifications if bidding something equivalent.
- 4.2.3 This project consists of replacing the two (2) existing air compressors and must include the following features for the new compressors:
 - In line Air Dryers
 - Condensate drain kits with condensate treatment
 - Compressed air filters with blocking valves for service
 - Adjustable in line air regulators 0-200psi
 - Electronic switching controls with manual override capability
 - Full electrical hood up and start-up of system
 - Include operator and maintenance training
 - Note: Chatham County Sheriff's Office will provide electrical drop to the switching controls only and 4" concrete mounting pad for equipment. All other electrical and plumbing connections will be the responsibility of the winning bidder and/or installing company.
- 4.2.4 Work will be performed within the Chatham County Detention Centered Secured Area. All contractors, sub-contractors, employees and their representatives are

required to have a valid Georgia identification card or state issued drivers license which will be surrendered each day and exchanged for a visitors pass for entrance into the facility. A security escort will be on site for entrance and exit control. Limited entrance and exit will be enforced. All vehicles and personnel entering the secure area will be subject to search. No weapons or contraband will be allowed into the secure area. Smoking and tobacco products are not allowed in the secure area and a designated smoking area will be identified. All tools and equipment must be removed or secured at the end of the day with Chatham County Detention Staff approval. Work hours are Monday through Friday 7:30am until 3:30pm unless otherwise scheduled.

4.3 CONTRACT SPECIFICATIONS:

- 4.3.1 Bids shall be evaluated based on the requirements set forth in this solicitation, which includes bidder responsiveness, capability, past performance and other criteria to determine acceptability such as inspection, testing, quality workmanship, delivery and suitability for this purchase.
- 4.3.2 Vendor is required to provide a minimum of three (3) references related to the specifications proposed.
- 4.3.3 Manufacturer/specification data sheet for each item proposed should be submitted with bid.
- 4.3.4 10 days after receipt of "Notice to Proceed" equipment must be ordered and record of order provided to Chatham County Detention Center.

CHATHAM COUNTY, GEORGIA

BID

BID NO. 20-0027-5

**COOLING TOWER REPLACEMENT AT THE CHATHAM COUNTY DETENTION
CENTER**

Item No.	Description	QTY	Manufacturer and Item #	Unit Price	Total
1	Replacement of cooling tower and associated pumps and controls. Including shipping, installation and training.	1 Each			
			TOTAL BID		\$

ALL FIRMS REQUESTING TO DO BUSINESS WITH CHATHAM COUNTY MUST REGISTER ON-LINE AT
[HTTP://PURCHASING.CHATHAMCOUNTY.ORG](http://PURCHASING.CHATHAMCOUNTY.ORG)

NAME/TITLE

COMPANY NAME

ADDRESS

CITY/STATE/ZIP

PHONE/FAX NUMBER

LIST OF SUBCONTRACTORS

I do _____, do not _____, propose to subcontract some of the work on this project. I propose to subcontract work to the following subcontractors: **NOTE: M/WBE PARTICIPATION.**

[illegible]

SIGNED: _____ **CONTRACTOR**

Cooling Tower Replacement with associated pumps and controls

Request of Bid for replacement and /or upgrade below listed equipment located at:

Chatham County Sheriff's Office Detention Center located at 1050 Carl Griffin Dr. Savannah, Ga.

Scope of work:

Replacement of three Evapco style cooling towers (One is dual sided) with 2ea. Tower Tech TTXL Cooling Towers.

Bid as Alternate Option: Replacement of three water circulation pump and motor assembly with Variable Frequency Drive capable motors and Variable Frequency Drives including Siemens Controls.

Replacement and upgrade of Building Automated System for control of Cooling Tower's and water circulation pump motors assembly, with addition of equipment to control and monitor entire Cooling Tower and pump loop. Integrate new control system into the currently in use Siemens Building Automation System.

Existing Equipment and Control

1. Cooling Towers (Main Central Plant)

A. Equipment

	Mfg.	Model	Location
1ea.	Evapco	AT8-66B	Central Plant Main
1ea.	Evapco	AT112-512	Central Plant Main
1ea.	Evapco	Unknown no data plate	Central Plant Main

2. Water Circulation pumps

B. Equipment

	Mfg.	Model	Location
2ea.	Marathon	20 HP Cond.	Central Plant Main
1ea.	Marathon	15 HP Cond	Central Plant Main

3. Cooling Tower Control and Motor Control systems. (Building Automation Control)

C. Equipment

	Mfg.	Model	Location
1ea.	Siemens	APOGEE	Central Plant Main

General Information:

Currently the Chatham County Detention Center has 3 ea. Evapco Cooling Towers (One is a dual sided) being fed from 3ea. Trane Chillers 2ea. 387 ton and 1ea. 307 ton.

This project consist of replacing the 3 ea. Evapco Cooling Towers with 2 ea. Tower Tech Cooling Towers to include all plumbing and electrical modifications to complete the install and add VFD Tower Controls to existing Siemens BAS control system. As alternate bid to include replacement of 3 ea. Circulation pumps and Variable Frequency Drive capable motors and controls is part of this bid package. This project will include purchase and installation of Siemens Building and Automation Controls components for control and monitoring of Cooling Towers, Circulation Pumps (even if not chosen as alternate) and Condenser water loop. All testing (TAB Report) must be completed before turning over final equipment to Chatham County Detention Staff.

All work is to be performed according to the plan and specifications prepared by listed Project Engineer. Any discrepancies or inaccuracies must be brought to the attention in writing to the Project Manager and reviewed by Project Engineer prior to any modification or change order of contract.

Removal and disposal of all old equipment shall be included in the bid price.

1ea. 387 ton cooling tower and chiller must remain in use during entire project

No complete shutdown will be approved due to temperatures being a major factor for scope of project.

Work will be performed within the Chatham County Detention Center Secured Area. All Contractor, Sub-Contractors, employees and their representatives are required to have a valid Georgia identification card or state issued driver license which will be surrender each day and exchanged for a visitors pass for entrance to Secure Area. A Security Escort will be on site for entrance and exit control. Limited entrance and exit will be enforced. All vehicles and personnel entering the Secure Area will be subject to search and no weapons or contraband will be allowed into the Secure Area. Smoking and tobacco products are not allowed in the Secure Area and a designated smoking area will be identified. Restrooms are not available in area of work a portable toilet will be provided by the contractor and will be required. All tools and equipment must be removed or secured at the end of the day to Chatham County Detention Center Staff approval.

Work hours are Monday through Friday 7:30am until 4:00pm unless otherwise scheduled.

Pre bid conference attendance is required.

10 days after receipt of "Notice to proceed" equipment must be ordered and record of order provided to Chatham County Detention Center. Equipment must be available on site or in local storage no later than December 7th 2020 so work may begin December 8th 2020 and be completed no later than March 1st 2021

NOTE: This is a CIP funded project.

SECTION 23 0110 – MECHANICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.
- B. It is recognized that separate sub-contracts may be instituted by THIS CONTRACT'S GENERAL CONTRACTOR with others. It is the responsibility of THIS CONTRACT'S GENERAL CONTRACTOR to completely inform, coordinate and advise those sub-contractors as to all of the requirements, conditions and information associated with providing and installing their portion of the total job.

1.2 IMPOSED REGULATIONS:

- A. Applicable provisions of the State and Local Codes and of the following codes and standards in addition to those listed elsewhere in the specifications are hereby imposed on a general basis for mechanical work. In each case, the prevailing edition shall be the current adopted edition of the state where the project is located.
 - 1. *International Mechanical Code.*
 - 2. *International Gas Code.*
 - 3. *International Energy Conservation Code.*
 - 4. *International Fire Code.*

1.3 SCOPE OF WORK:

- A. Provide all labor, materials, equipment and supervision to construct complete and operable mechanical systems as indicated on the drawings and specified herein. All materials and equipment used shall be new, undamaged and free from any defects.

1.4 EXISTING SERVICES AND FACILITIES:

- A. **Damage to Existing Services:** Existing services and facilities damaged by the Contractor through negligence or through use of faulty materials or workmanship shall be promptly repaired, replaced, or otherwise restored to previous conditions by the Contractor without additional cost to the Owner.
- B. **Interruption of Services:** Interruptions of services necessary for connection to or modification of existing systems or facilities shall occur only at prearranged times approved by the Owner. Interruptions shall only occur after the provision of all temporary work and the availability of adequate labor and materials will assure that the duration of the interruption will not exceed the time agreed upon.
- C. **Removed Materials:** Existing materials made unnecessary by the new installation shall be removed, shall remain the property of the Owner and shall be stored at a location and in a manner as directed, or, if classified by the Owner's authorized representative as unsuitable for

further use, shall become the property of the Contractor and shall be removed from the site.

1.5 WARRANTIES:

- A. Provide manufacturer's standard printed commitment in reference to a specific product and normal application, stating that certain acts of restitution will be performed for the Purchaser or Owner by the manufacturer, when and if the product fails within certain operational conditions and time limits. Where the warranty requirements of a specific specification section exceed the manufacturer's standard warranty, the more stringent requirements will apply and modified manufacturer's warranty shall be provided. The Contractor shall provide a (2) year warranty on all parts and labor. The warranty shall begin at the Material Completion date.

1.6 PRODUCT SUBSTITUTIONS:

- A. General: Materials specified by manufacturer's name shall be used unless prior approval of an alternate is given by addenda. Requests for substitutions must be received in the office of the Architect at least 10 days prior to opening of bids.

PART 2 - PRODUCTS

2.1 GENERAL MECHANICAL PRODUCT REQUIREMENTS:

- A. Standard Products: Provide not less (quality) than manufacturer's standard products, as specified by their published product data. In addition to the indication that a particular product/model number is acceptable, comply with the specified requirements. Do not assume that the available off-the-shelf condition of a product complies with the requirements; as an example, a specific finish or color may be required.
- B. Uniformity: Where multiple units of a general product are required for the mechanical work, provide identical products by the same manufacturer, without variations except for sizes and similar variations as indicated.
- C. Product Compatibility, Options: Where more than one product selection is specified, either generically or proprietarily, selection is Purchaser's or Installer's option. Provide mechanical adaptations as needed for interfacing of selected products in the work.
- D. Equipment Nameplates: Provide a permanent operational data nameplate on each item of power operated mechanical equipment, indicating the manufacturer, product name, model number, serial number, speed, capacity, power characteristics, labels of tested compliance, and similar essential operating data.
- E. Locate nameplates in easy-to-read locations. When product is visually exposed in an occupied area of the building, locate nameplate in a concealed position (where possible) which is accessible for reading by service personnel.

PART 3 - EXECUTION

3.1 PRODUCT INSTALLATION, GENERAL:

- A. Except where more stringent requirements are indicated, comply with the product manufacturer's installation instructions and recommendations, including handling, anchorage, assembly, connections, cleaning and testing, charging, lubrication, startup, test operation and shut-down of operating equipment. Consult with manufacturer's technical experts, for specific instructions on unique product conditions and unforeseen problems.
- B. Protection and Identification: Deliver products to project properly identified with names, model numbers, types, grades, compliance labels and similar information needed for distinct identifications; adequately packaged or protected to prevent deterioration during shipment, storage and handling. Store in a dry, well ventilated, indoor space, except where prepared and protected by the manufacturer specifically for exterior storage.
- C. Permits and Tests: Provide labor, material and equipment to perform all tests required by the governing agencies and submit a record of all tests to the Owner or his representative. Notify the Architect five days in advance of any testing.

END OF SECTION 23 0110

SECTION 23 0210 - MECHANICAL COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 QUALITY ASSURANCE:

- A. Mechanical Coordination Affidavit: Prior to ordering materials, provide the Coordination Affidavit required by Section 23 0220.

PART 2 - PRODUCTS

2.1 MECHANICAL PRODUCT COORDINATION:

- A. Power Characteristics: Refer to the electrical sections of the specifications and the electrical drawings for the power characteristics available for the operation of each power driven item of equipment. The electrical design was based on the typical power requirements of the equipment manufacturers scheduled or specified. Any modifications to the electrical system which are required due to the use of an approved equivalent manufacturer shall be made at no additional cost to the owner. All changes must be clearly documented and submitted for review by the Architect/Engineer prior to purchasing equipment. Coordinate purchases to ensure uniform interface with electrical work. The mechanical contractor shall furnish a detailed list of equipment electrical characteristics to the electrical contractor for the purpose of preparing the coordination affidavit required by Division 26.
- B. Coordination of Options and Substitutions: Where the contract documents permit the selection from several product options, and where it becomes necessary to authorize a substitution, do not proceed with purchasing until coordination of interface of equipment has been checked and satisfactorily established.
- C. Firestopping: Refer to architectural drawings for the locations of all fire rated ceilings, floors and walls. The contractor shall furnish detailed shop drawings of all firestopping details to be used for both piping and ductwork. All firestopping details shall be U.L. listed and subject to approval by the State Fire Marshal.

PART 3 - EXECUTION

3.1 INSPECTION AND PREPARATION:

- A. Substrate Examination: The Installer of each element of the mechanical work must examine the condition of the substrate to receive the work, and the conditions under which the work will be performed, and must notify the Contractor in writing of conditions detrimental to the

proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

- B. Do not proceed with the installation of sleeves, anchors, hangers, roof penetrations and similar work until mechanical coordination drawings have been processed and released for construction. Where work must be installed prior to that time in order to avoid a project delay, review proposed installation in a project coordination meeting including all parties involved with the interfacing of the work.

3.2 CUTTING AND PATCHING:

- A. Structural Limitations: Do not cut structural framing, walls, floors, decks and other members intended to withstand stress, except with the Architect's or Engineer's written authorization.
- B. Where authorized, cut opening through concrete (for pipe penetrations and similar services) by core drilling or sawing. Do not cut by hammer-driven chisel or drill.
- C. Other work: Do not endanger or damage other work through the procedures and processes of cutting to accommodate mechanical work. Review the proposed cutting with the Installer of the work to be cut, and comply with his recommendations to minimize damage. Where necessary, engage the original Installer or other specialists to execute the cutting in the recommended manner.
- D. Where patching is required to restore other work, because of either cutting or other damage inflicted during the installation of mechanical work, execute the patching in the manner recommended by the original Installer. Restore the other work in every respect, including the elimination of visual defects in exposed finishes, as judged by the Architect. Engage the original Installer to complete patching of the following categories of work:
 - 1. Exposed concrete finishes and exposed masonry.
 - 2. Waterproofing and vapor barriers.
 - 3. Roofing, flashing and accessories.
 - 4. Interior exposed finishes and casework, where judged by the Architect to be difficult to achieve an acceptable match by other means.

3.3 COORDINATION OF MECHANICAL INSTALLATION:

- A. General: Sequence, coordinate and integrate the various elements of mechanical work so that the mechanical plant will perform as indicated and be in harmony with the other work of the building. The Architect/Engineer will not supervise the coordination, which is the exclusive responsibility of the Contractor. Comply with the following requirements:
 - 1. Install piping, ductwork and similar services straight and true, aligned with other work and with overhead structures and allowing for insulation. Conceal where possible.
 - 2. Arrange work to facilitate ease of maintenance and repair or replacement of equipment and filters. Locate items requiring more maintenance such as valves, etc. in front of items requiring less maintenance. Connect equipment for ease of disconnecting, with minimum of interference with other work.
 - 3. Equipment located above ceilings shall be installed in a position and elevation which allows complete and adequate maintenance access through the ceiling grid or access panel while standing safely on a ladder. If this is not possible, a suitable maintenance

platform must be provided per IMC.

4. Give the right-of way to piping systems required to slope for drainage (over other service lines). Piping shall be located to avoid interference with ductwork and light fixtures.
 5. Store materials off the ground and protected from standing water and weather.
- B. Drawings: Conform with the arrangement indicated by the contract documents to the greatest extent possible, recognizing that portions of the work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, comply with the Architect's decision on resolution of the conflict.
- C. Electrical Work: Coordinate the mechanical work with electrical work, and properly interface with the electrical service. In general, and except as otherwise indicated, install mechanical equipment ready for electrical connection. Refer to electrical sections of the specifications for electrical connection of mechanical equipment.
- D. Utility Connections: Coordinate the connection of mechanical systems with exterior underground utilities and services. Comply with the requirements of governing regulations, franchised service companies and controlling agencies. Provide a single connection for each service except where multiple connections are indicated.

3.4 COORDINATION OF MECHANICAL START-UP:

- A. Seasonal Requirements: Adjust and coordinate the timing of mechanical system start-ups with seasonal variations, so that demonstration and testing of specified performance can be observed and recorded. Exercise proper care in off-season start-ups to ensure that systems and equipment will not be damaged by the operation.

END OF SECTION 23 0210

SECTION 23 0220 - MECHANICAL SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUBMITTAL FORMS AND PROCEDURES:

- A. The purpose of submittals is to demonstrate to the Architect/Engineer that the Contractor understands the design concept. The Architect/Engineer's review of such drawings, schedules, or cuts shall not relieve the Contractor from responsibility for deviation from drawings or specifications unless he has, in writing, called the Architect/Engineer's attention to such deviations at the time of submission, and has received from the Architect/Engineer, in writing, permission for such deviations. All submittals must be completely checked by the Contractor prior to submission for review.
- B. Hard Copy Submittals: Submittal data shall be placed in one or more hard-back 3-ring binders, arranged and labeled according to specification section. Each binder shall contain a title page and table of contents. Provide separator tabs, and label by specification section. Make note in the table of contents, any drawings that accompany the submittal. Title page shall contain Project Name, Contractor's Name, Division 23 Superintendent's name, Suppliers and point of contact for each, and date. Except as otherwise indicated in other sections, submit 5 complete copies. Quantity indicated does not include copies required for regulatory agencies.
- C. Electronic Submittals: If the Architect agrees to allow electronic submittals via an on-line information management product such as "Submittal Exchange," etc., all electronic submittal files shall be organized to match the bid documents for specification section and name. Each submittal file shall be complete for each specification section. Multiple partial submittals per specification section will be rejected. Make note in the table of contents, any drawings that accompany the submittal. Title page shall contain Project Name, Contractor's Name, Division 23 Superintendent's name, Suppliers and point of contact for each, and date.
- D. Submittals shall be made for all items contained in the Mechanical Submittal List in PART 3 - EXECUTION.
- E. Response to Submittals: A Mechanical Submittal Review Report shall be issued by the Engineer with the following classifications for each item:
 - 1. **"No Exceptions Taken"**: No corrections, no marks. Contractor shall submit copies for distribution.
 - 2. **"Make Corrections Noted"**: A few minor corrections. Items may be ordered as marked up without further resubmission. Submit copies for distribution.
 - 3. **"Revise and Resubmit"**: Minor corrections. Item may be ordered at the Contractor's option. Contractor shall resubmit drawings with corrections noted.
 - 4. **"Rejected"**: Major corrections or not in accordance with the contract documents. No items shall be ordered. Contractor shall correct and resubmit drawings.

PART 2 - PRODUCTS

2.1 SUBMITTAL REQUIREMENTS:

- A. General: Each specification section shall list the required submittal items. All submittal items shall conform to the requirements listed below. For each major section of submittal data, include a summary page which lists items and model numbers for each piece of equipment.
- B. Shop Drawings: Prepare mechanical shop drawings to accurate scale except where diagrammatic representations are specifically indicated. Show clearance dimensions of critical locations, and show dimensions of spaces required for operation and maintenance of equipment. Show piping connections and other service connections, and show interface with other work including structural support. Indicate by note, the portions of mechanical work shown on the shop drawings which deviated from the indication of work in the contract documents, and explain the reasons for the deviations. Show how such deviations coordinate with interfacing deviations on shop drawings for other portions of the work, currently or previously submitted.
- C. Manufacturer's Data: Where pre-printed data is submitted for more than one distinct product, size, type, material, trim, accessory group or other variation, mark submitted copy with black pen to indicate which of the variations is to be provided. Delete or mark-out significant portions of preprinted data which are not applicable. Where operating ranges are shown, mark data to show portion of range required for project application. Expansion or elaboration of standard data to describe a non-standard product must be processed as a shop drawing submittal. For each product include the manufacturer's production specifications, installation or fabrication instructions, nearest source of supply (including telephone number), sizes, weights, speeds, operating capacities, piping and service line connection sizes and locations, statements of compliance with required standards and governing regulation (include manufacturer's signed statements if not covered in printed data), performance data (where applicable) and similar information needed to confirm compliance with the requirements.
- D. ATTACHMENT NO. 1 (Mechanical Coordination Affidavit):
 1. The intent of Attachment Number 1 is to ensure that the electrical requirements for mechanical equipment have been reviewed and coordinated by the Contractor. No mechanical equipment shall be ordered, nor shall rough-in begin, before this coordination has taken place. This document shall be returned appropriately marked whether or not any changes are deemed to be necessary by the contractor.

PART 3 - EXECUTION

3.1 MECHANICAL SUBMITTAL LIST:

23 0210 – Mechanical Coordination:

Mechanical Coordination Affidavit (see Attachment No. 1 below)

23 0230 – Mechanical Identification:

- Pipe Markers.
- Pipe Tape.
- Engraved Nameplates.
- Valve Tags.
- Valve Charts.

23 0240 – Mechanical Work Closeout:

- Record Plans.
- Maintenance Manuals.
- Mechanical TAB Report.
- Owner Training Videos.

23 0310 – Mechanical Pipe, Tube, and Fittings:

- Black Steel Pipe, Schedule 40.
- Black Steel Pipe, Schedule 10.
- Galvanized Steel Pipe, Schedule 40.
- Galvanized Steel Pipe, Schedule 10.
- Copper Tube.
- PVC Pipe.
- Cast Iron Threaded Fittings.
- Welded Fittings.
- Cast Iron Flanged Fittings.
- Gasket for Flanged Joints.
- Soldering Materials.
- Mechanical Couplings.
- PVC Cement.
- Pipe Sleeves.
- Fire Caulk.
- Latex Paint for PVC Pipe.

23 0320 – Mechanical Hangers and Supports:

- Condenser Water Pipe Hangers (Clevis Type).
- Pipe Supports, Guides, Shields, and Saddles.

23 1110 – Mechanical Water Piping System:

- Shutoff Valves.
- Check Valves.
- Drain Valves.
- Triple Duty Valves.
- Pressure Reducing Valves.
- Pressure Relief Valves.
- Backflow Preventers.
- Wye Strainers.
- Basket Strainers.
- Suction Diffusers.

Thermometers.
Pressure Gauges.
Heat Trace Tape.
Painting.

23 1210 – Mechanical Piping and Equipment Insulation:

Cellular Glass Insulation and Fittings.
Armaflex Insulation and Fittings.
Polystyrene Insulation and Fittings.
Aluminum Jackets.

23 1310 – Pumps:

All equipment in PUMP SCHEDULE and/or plans and/or specifications.

23 1410 – Water Treatment:

Condenser Water System.

23 4210 – Cooling Towers:

All equipment in COOLING TOWER SCHEDULE and/or plans and/or specifications.

END OF SECTION 23 0220

ATTACHMENT NO. 1

SHOP DRAWING COORDINATION AFFIDAVIT

I, the Division 23 Superintendent, certify that I have reviewed the mechanical shop drawings for electrically driven equipment and that the accompanying mechanical shop drawings reflect the requirements of the actual equipment to be furnished for use on this project. In addition, the electrical requirements of said equipment have been coordinated with the Division 26 contractor.

NOTE: If no deviations are required please indicate by circling the appropriate answer above your signature.

PROJECT: _____ DEVIATIONS: Yes / No

COMPANY: _____

TITLE: _____ SIGNATURE: _____

TELEPHONE: _____ DATE: _____

FAILURE TO PERFORM THE WORK REQUIRED BY THIS AFFIDAVIT, PRIOR TO ORDERING MATERIALS OR ROUGHING-IN, MAY RESULT IN IMPROPER CONNECTIONS BEING PROVIDED. THE EXPENSE OF CORRECTIVE MEASURES, IF REQUIRED, SHALL BE BORNE BY THE CONTRACTOR.

SECTION 23 0230 - MECHANICAL IDENTIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 QUALITY ASSURANCE:

- A. Manufacturers: Firms regularly engaged in the manufacture of identification systems required for this product.
- B. Submittals: Submit manufacturer's data on materials and submit a sample of each type required.

PART 2 - PRODUCTS

2.1 MECHANICAL IDENTIFICATION MATERIALS:

A. Pipe Markers:

1. General: Product manufacturer's standard pre-printed, flexible or semi-rigid, permanent, color-coded, plastic-sheet pipe markers, complying with ANSI A13.1.
2. Small Pipe: For external diameters less than 6 inches (including insulation, if any), provide full band pipe markers, extending 360 degrees around pipe at each location, fastened by one of the 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 wide; full circle at both ends of pipe marker, tape lapped 1-1/2 inch.
3. Large Pipes: For external diameters of 6 inches and larger (including insulation, if any), provide either full-band or strip-type pipe markers, but not narrower than 3 x letter height (and of required length), fastened by one of the following methods:
 - a. Laminated or bonded application of pipe marker to pipe (insulation).
 - b. Taped to pipe (or insulation) with color-coded plastic adhesive tape, not less than 1-1/2 inches wide: full circle at both ends of pipe marker, tape lapped 3 inches.
4. Lettering: Comply with piping system names as specified, scheduled or shown, and abbreviate only as necessary for each application length.
5. Arrows: Print each pipe marker with arrow indicating direction of flow, either integrally with piping system service lettering or as separate unit of plastic (to accommodate both directions).
6. Install pipe markers on the following systems:

Condenser Water Supply and Return Piping
Drain Piping

B. Pipe Tape: Manufacturer's standard color-coded pressure-sensitive (self-adhesive) vinyl tape, not less than 3 mils thick.

1. Width: Provide 1-1/2 inches wide tape markers on pipes with outside diameters including insulation of less than 6 inches, 2-1/2 inches wide tape on larger pipes.
2. Color: Comply with ANSI A13.1.

C. Engraved Plastic-Laminate Labels:

1. General: Provide engraving stock melamine plastic laminated, complying with FS L-P-387, in the sizes and thicknesses indicated, engraved with engraver's standard letter style of the sizes and wording indicated, black with white core, letter color, except as otherwise indicated, punched for mechanical fastening except where adhesive mounting is necessary because of substrate.
2. Thickness: 1/16 inch, except as otherwise indicated.
3. Fasteners: Self-tapping stainless steel screws, except contact type permanent adhesive where screws cannot or should not penetrate the substrate.
4. Install engraved equipment labels on all mechanical equipment. Match equipment names as scheduled.
5. Install "Permanent Label of Equivalent Length" in each laundry area near the clothes dryer. Label shall match the example shown in 2012 IMC, Section 504. The contractor shall fill in the actual equivalent length for each dryer exhaust duct.

D. Valve Tags:

1. Valve tags shall be 18 gauge (minimum) brass with 1-1/4" (minimum) height and width. Identification letters and numbers shall be stamped in tag and shall be filled with black paint
2. Valve tags shall be attached to valve using cable ties. Cable ties shall be self-locking nylon ties.
3. Valve tags shall be installed at all shut-off, balancing, metering, and drain valves. Valve tag shape and designations shall be as follows:

Identification System	Shape	Numbers
Condenser Water	Oval	C-1, 2, 3, ...

2.2 LETTERING AND GRAPHICS:

A. General: Coordinate names, abbreviations and other designations used in the mechanical identification work, with the corresponding designations shown, specified or scheduled. Provide numbers, lettering recommended by manufacturers or as required for proper identifications and operation/maintenance of the mechanical systems and equipment.

PART 3 - EXECUTION

3.1 APPLICATION AND INSTALLATION:

A. Coordination: Where identification is to be applied to surfaces which require insulation, painting and other covering or finish, including valve tags in finished mechanical spaces,

install identification after completion of covering or painting.

- B. All equipment, dampers, filters, valves, etc. located above ceiling grids shall be located with an engraved marker permanently attached to the ceiling grid. The marker shall describe the item located above the ceiling.
- C. Piping System Identification:
 - a. General: Install pipe markers on each system indicated to receive identification, and include arrows to show normal direction of flow.
- D. Locate pipe markers as follows wherever piping is exposed to view in mechanical rooms, accessible maintenance spaces (including accessible areas above ceilings) and exterior non-concealed locations:
 - a. Near each valve and control device.
 - b. Near each branch, excluding short take-offs for fixtures. Mark each pipe at branch, where there could be a question of flow pattern.
 - c. Near locations where pipes pass through walls or ceilings, or enter non-accessible enclosures.
 - d. Near major equipment items and other points of origination and termination.
 - e. Spaced intermediately at maximum spacing of 50 feet along each piping run, except reduce spacing to 25 feet in congested areas of piping and equipment.
- E. Do not mark piping exposed in finished occupied spaces.
- F. Mechanical Equipment Identification: Install an engraved plastic laminate label on or near each major item of mechanical equipment and each operational device, as specified herein if not otherwise specified for each item or device. Each label shall include the equipment name, room number and electrical panel name. Confirm installed final room numbers and electrical panel names prior to ordering labels.
- G. Valve tags shall be attached to the valve handwheel with cable ties.

END OF SECTION 23 0230

SECTION 23 0240 - MECHANICAL WORK CLOSEOUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DOCUMENTATION PROCEDURES:

- A. Signed Commitments: Do not proceed with transfer of mechanical plant to the Owner for operation until warranties, performance certifications and similar commitments to be signed by Contractor and other entities have been executed and transmitted to Architect (for Owner's records).

PART 2 - PRODUCTS

2.1 RECORD PLANS:

- A. Explanation: Except where otherwise indicated, mechanical plans (contract plans) prepared by Engineer are diagrammatic in nature and may not show locations accurately for various components of mechanical systems. Shop drawings, including coordination plans, prepared by Contractor shall show certain portions of work more accurately to scale and location, and in greater detail.
- B. General Recording Procedure: Maintain a white-print set, blue-line or black-line, of mechanical contract plans and shop drawings in clean, undamaged condition, for mark-up of actual installations which vary substantially from the work as shown. Mark-up whatever plans are most capable of showing the installed conditions accurately; however, where shop drawings are marked, record a reference note on appropriate contract drawing. Mark with erasable pencil and use multiple colors to aid in the distinction between work of separate mechanical systems. In general, record every substantive installation of mechanical work which previously is either not shown or shown inaccurately, but in any case record the following:
 - 1. Underground and aboveground piping, both exterior and interior, drawn to scale and fully dimensioned.
 - 2. "*Mechanical Project Record*" shall be maintained as part of the "*Project Record*" specified in Division 1.

2.2 MAINTENANCE MANUALS:

- A. Organize each copy of the required system maintenance manuals to include an index followed by thumb-tab marked sections for each of the following:
 - 1. Operating Instructions: Submit manufacturer's operating instructions for each item of

- mechanical equipment and supplement with additional project application instructions where necessary. Prepare and submit specific operating instructions for charging, start-up, control or sequencing of operation, phase or seasonal variations, shut-down, safety and similar operational instructions. Prepare in typewritten form in completely explained and easily understood English language
2. Emergency instructions including addresses and telephone numbers of service sources.
 3. Regular system maintenance procedures including lubrication.
 4. List of all filters required for each unit.
 5. Spare parts listing and stocking recommendations.
 6. Inspection, adjusting, rebalancing, cleaning, parts replacement, and similar maintenance instructions and recommendations, including the proper use of tools and accessories.
 7. Valve schedule and control diagram for each system.
 8. Manufacturer's data and test reports for each operating item in each system.
 9. Manufacturer's product warranties and guarantees relating to the system and equipment items in the system.
 10. Corrected or approved issues of submittal items relating to the system.
- B. Bind each maintenance manual in one or more vinyl-covered, 2", 3-ring binder, plus pocket-folder type binders for folded drawings, and mark the back spine of each binder with system identification and volume number.
- C. Certifications: Where specifically indicated, submit with notarized execution.
- D. Test Reports: Submit test reports which have been signed and dated by the firm performing the test and prepared in the manner specified in the standard or regulation governing the test procedures as indicated.
- E. Manufacturer's Product Warranties: Where pre-printed and published warranty includes substantial deviation from required warranty (as judged by the Architect or Engineer), product is automatically disqualified from use on the project, except where manufacturer prepares and issues a specific product warranty on the product, stating that it is in lieu of the published warranty, and is executed by an authorized officer, and complies with the requirements. Warranties shall comply with the requirements of individual specification section where those requirements exceed the manufacturer's standard warranty.
- F. Guarantees: Where indicated as "Certified", provide guarantee which, in addition to execution by an authorized officer of each guarantor, is attested to by the Secretary of each guarantor and bears the corporate seal

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES:

- A. General Coordination: Sequence closeout procedures properly, so that work will not be endangered or damaged, and so that every required performance will be fully tested and demonstrated.
- B. System Performance Test Run: At the time of mechanical work closeout, check each item in each system to determine that it is set for proper operation. With Owner's representative and Architect/Engineer present, operate each system in a test run of appropriate duration to demonstrate compliance with performance requirements. During or following test runs, make

final corrections or adjustments of system to refine and improve performances wherever possible, including noise and vibration reductions, elimination of hazards, better response of controls, signals and alarms, and similar system performance improvements. Provide testing or inspection devices as may be requested for Architect's/Engineer's observation of actual system performances. Demonstrate that controls and items requiring service or maintenance are accessible. Test run shall be scheduled to coincide with Engineer's final inspection of the mechanical work.

- C. **Cleaning and Lubrication:** After final performance test run of each mechanical system, clean system both externally and internally. Clean dirt and debris from air handling systems and install new filters. Flush piping system by operating drains and similar means, and clean strainers and traps. Lubricate both power and hand operated equipment and remove excess lubrication. Touch-up minor damage to factory painted finishes and other painting specified as mechanical work; refinish work where damage is extensive.
- D. **General Operating Instructions:** In addition to specified training of Owner's operating personnel specified in individual mechanical sections, and in addition to preparation of written operating instructions and compiled maintenance manuals specified, provide general operating instructions for the total mechanical plant. Conduct a walk-through explanation and demonstration for orientation and education of Owner's personnel to be involved in continued operation of building and its mechanical plant.
 - 1. Describe each basic mechanical system and how its control system functions, including flow adjustments, temperature control and similar operations.
 - 2. Explain and point out identification system, displayed diagrams, signals, alarms and similar provisions of the work.
 - 3. Describe basic sequencing requirements and interlock provisions for system start-up, phasing, coast-down, shut-down and seasonal operations.
 - 4. Emphasize emergency procedures and safety provisions for protection of equipment and safety of occupants during equipment malfunction, disasters, power failures and similar unusual circumstances, and describe system limitations and precautions including weather adjustments.
 - 5. Outline basic maintenance procedures.
- E. Demonstrate what adjustments have been made and can continue to be made to reduce noise and vibration, improve system output, decrease energy consumption and similar performance improvements.
- F. Point out operational security provisions, safety, unavoidable hazards and similar operator limitations. Display and conduct a "thumb-through" explanation of maintenance manuals, record drawings, meter readings and similar service items.
- G. All training sessions shall be digitally recorded (audio/video) and submitted to the Owner.
- H. **Construction Equipment:** After completion of performance testing and Owner's operating instructions and demonstrations, remove installers tools, test facilities, construction equipment and similar devices and materials used in execution of the work but not incorporated in the work.

3.2 CONTINUED SYSTEM OPERATIONS:

- A. **Final Acceptance:** At time of substantial completion of mechanical work, Owner's operating

Chatham County Sherriff Cooling Tower Replacement

personnel will take over operation of mechanical systems. However, until time of final acceptance, respond promptly with consultation and services on whatever operation or maintenance problems may remain or arise in continued operation of mechanical plant.

END OF SECTION 23 0240

SECTION 23 0310 – MECHANICAL PIPE, TUBE AND FITTINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 QUALITY ASSURANCE:

A. Industry Standards:

1. Qualify welding procedures, welders and operators in accordance with ASME B31.1 for shop and project site welding of piping work.
2. Certify welding of piping work using the *Standard Procedure Specifications* by, and welders tested under supervision of, the *National Certified Pipe Welding Bureau*.
3. Where plastic piping is indicated to transport potable water, provide pipe and fittings bearing approval label by the *National Sanitation Foundation* (NSF).

B. SUBMITTALS:

1. Submit manufacturer's data, welding certifications, test reports, and product warranties as applicable for all piping materials.
2. Grooved joint couplings and fittings shall be shown on drawings and product submittals, and be specifically identified with the applicable style number.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS:

- A. General: Provide pipe and tube of the type, joint type, grade, size and weight (wall thickness or Class) indicated for each service. Where type, grade or class is not indicated, provide proper selection as determined by Installer for installation requirements and comply with governing regulations and industry standards.
- B. Black Steel Pipe: ASTM A 53, Schedule 40.
- C. Galvanized Steel Pipe: ASTM A 53, Schedule 40.
- D. Stainless Steel Pipe: ASTM A 312, Schedule 10S, full finish annealed pipe, certified for use with mechanical fittings.
- E. Copper Tube: ASTM B88-89 Type (wall thickness) as indicated for each service; hard drawn temper, except as otherwise indicated. Solder for use on domestic water piping shall be lead free type.

2.2 PIPE/TUBE FITTINGS:

- A. General: Provide factory-fabricated fittings of the type, materials, grade, class and pressure rating indicated for each service and pipe size. Provide sizes and types matching pipe, tube valve or equipment connections in each case. Where not otherwise indicated, comply with governing regulations and industry standards for selections, and with pipe manufacturer's recommendations where applicable.
- B. Cast-Iron Threaded Fittings for Steel Pipe: ASTM A 126-84 Class 125, plain or galvanized to match pipe.
- C. Welded Fittings for Steel Pipe: ASTM A234.
- D. Cast-Iron Flanged Fittings for Steel Pipe: ASME B16.1, including bolting. Class 125, plain or galvanized to match pipe.
- E. Gaskets for Flanged Joints: ASME B16.21; full-faced for cast-iron flanges.
- F. Soldering Materials: Except as otherwise indicated, provide soldering materials as determined by the Installer to comply with installation requirements.
 - 1. Tin-Antimony Solder: ASTM B 32, Grade 95TA.
- G. Mechanical Couplings for IPS Pipe: Coupling housings shall be ductile iron (ASTM A536). Bolts and nuts shall be carbon steel track-type (ASTM A183), minimum tensile 110,000 psi. Gaskets shall be Grade "E" EPDM, for water services from -30° to +230°F. At joints allowing controlled movement, expansion, contraction of deflection, flexible couplings with shall be used. At all joints not requiring flexibility, a rigid coupling shall be used. Fittings for pipe 2 inches and smaller shall be the mechanical compression type. Mechanical couplings shall be by *Victaulic, Anvil* or *Grinnell*.
 - 1. Rigid Type: Coupling housings cast with offsetting, angle-pattern bolt pads shall be used to provide system rigidity and support and hanging in accordance with ANSI B31.1 and B31.9.
 - 2. Flexible Type: Use in locations where vibration attenuation and stress relief are required.
 - 3. Flange Adapter: Flat face, for direct connection to ANSI Class 125 or 150 flanged components.
- H. Grooved End Fittings for Steel Pipe: Fittings shall be ductile iron (ASTM A536) forged steel (ASTM A234); or fabricated from carbon steel pipe (ASTM A53); with pre-grooved ends for use with mechanical couplings of the same manufacturer.
- I. Mechanical Couplings for Hard Copper Tube: Coupling housings shall be ductile iron (ASTM A536), coated with copper colored alkyd enamel and cast with angle-pattern bolt pads for system rigidity. Bolts and nuts shall be carbon steel track-type (ASTM A183), minimum tensile 110,000 psi. Gaskets shall be Grade "E" EPDM FlushSeal® type, for water services from -30 to +230°F. Mechanical couplings shall be by *Victaulic, Anvil* or *Grinnell*.
- J. Mechanical Couplings for Copper Pipe: Fittings 2"-4" size shall be wrought copper (ASTM B75 C12200 or ASTM B152 C11000 and ANSI B 16.22). Fittings .5" - 8" size shall be bronze sand casting (ASTM B584-87) or copper alloy CDA844 (81-3-7-9) (ANSI B 16.18). Fittings shall have pre-grooved ends for use with mechanical couplings of the same

manufacturer. Fittings shall be manufactured to copper tubing sizes. (Flaring of tube and fitting ends to IPS dimensions is not allowed.)

K. Pipe Sleeves:

1. Iron Pipe Sleeves: Fabricate from Schedule 40 galvanized steel pipe; remove burrs.
2. Sheet Metal Pipe Sleeves: Fabricate from galvanized sheet metal closed with lock-seam joints. For following pipe sizes provide gauge indicated: 3 inch pipe and smaller, 20 gauge; 4 to 6 inch pipe, 16 gauge; over 6 inch pipe, 14 gauge.
3. Pipe Sleeve Caulking: *3M Fire Barrier Caulk, STI or Grabber.*

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. General: Install pipe, tube and fittings in accordance with recognized industry practices which will achieve permanently-leakproof piping systems, capable of performing each indicated service without piping failure. Install each run with a minimum of joints and couplings, but with adequate and accessible unions for disassembly and maintenance/replacement of valves and equipment. Reduce sizes (where indicated) by use of reducing fittings. Align piping accurately at connections, within 1/16" misalignment tolerance.
1. Comply with ASME B31.1 Code for Pressure Piping.
 2. Comply with ASME B31.9 Code for Building Services Piping.
- B. Locate piping runs as indicated on the drawings. Route vertically and horizontally (pitched to drain) and avoid diagonal runs wherever possible. Orient horizontal runs parallel with walls and column lines. Locate runs as shown, or described by diagrams, details and notations or, if not otherwise indicated, run piping in the shortest route which does not obstruct usable space or block access for servicing the building and its equipment. Where possible, locate insulated piping for 1.0" clearance outside insulation. Changes in direction shall be made with fittings.
- C. Piping System Joints: Provide joints of the type indicated in each piping system.
- D. Threaded Joints: Thread pipe in accordance with ANSI B2.12; cut threads full and clean using sharp dies. Ream threaded ends to remove burrs and restore full inside diameter. Apply pipe joint compound, or pipe joint tape (Teflon) where recommended by pipe/fitting manufacturer, on male threads at each joint and tighten joint to leave not more than 3 threads exposed.
- E. Welded Joints: Weld pipe joints in accordance with recognized industry practice and as follows: Weld pipe joints only when ambient temperature is above 0 degrees F. where possible. Bevel pipe ends at a 37.5 degree angle where possible, smooth rough cuts and clean to remove slag, metal particles and dirt. Install welding rings for butt welded joints. Use pipe clamps or tack-weld joints with 1.0" long welds; 4 welds for pipe sizes to 10". Build up welds with a stringer-bead pass, followed by a hot pass, followed by a cover or filler pass. Eliminate valleys at center and edges of each weld. Weld by procedures which will ensure elimination of unsound or unfused metal, cracks, oxidation, blow holes and non-metallic inclusions. Do not weld-out piping system imperfections by tack-welding procedures; refabricate to comply with requirements. Install forged branch-connection fittings wherever

branch pipe is indicated, or install regular "T" fitting (at Contractor's option).

- F. Flanged Joints: Match flanges within piping system, and at connections with valves and equipment. Clean flange faces and install gaskets. Tighten bolts to provide uniform compression of gaskets.
- G. Mechanical Coupling Joints: Square cut pipe ends and deburr. Roll-groove pipe ends to manufacturer's specifications. Lubricate gaskets completely on interior and exterior using a non-petroleum based lubricant. Slide gasket over pipe ends between grooves. Engage coupling housing into grooves and tighten until housing bolt pads are in full contact on each side of joint. For pipes 2 inches and smaller, no groove is required. Mark pipe ends for proper insertion into couplings and fittings. Engage piping into fitting to full depth, indicated by marked pipe ends. Align pipe ends, position compression tool and press trigger until assembly cycle is complete. All grooved couplings, fittings, valves and specialties shall be the products of a single manufacturer. Grooving tools shall be of the same manufacturer as the grooved components. The gasket style and elastomeric material (grade) shall be verified as suitable for the intended service as specified. Gaskets shall be molded and produced by the grooved coupling manufacturer. Grooved ends shall be clean and free from indentations, projections, and roll marks in the area from pipe end to groove. Grooved coupling manufacturer's factory trained field representative shall provide on-site training for contractor's field personnel in the proper use of grooving tools, application of groove and installation of grooved piping products. Factory trained representative shall periodically inspect the product installation. Contractor shall remove and replace any improperly installed products.
- H. Soldered Joints: Solder copper tube and fitting joints where required, in accordance with recognized industry practice. Cut tube ends squarely; ream to full inside diameter, and clean outside of tube ends and inside of fittings with steel wool. Apply solder flux to joint areas of both tubes and fittings. Insert tube full depth into fitting and solder in manner which will draw solder full depth and circumference of joint. Wipe excess solder from joint before it hardens. Use a non-corrosive paste flux and wire solder composed of 95 percent tin and 5 percent antimony.
- I. Insulating (Dielectric) Nipples: Comply with manufacturer's instructions for installing nipples in a manner which will prevent galvanic action and stop corrosion where the joining of ferrous and non-ferrous piping occurs.
- J. Pipe Sleeves: Install pipe sleeves of the types specified wherever piping passes through the walls, floors or structural members of the work. Provide sleeves of adequate size, accurately centered in pipe runs. Size sleeves so that piping and insulation will have free movement in the sleeve, including allowance for thermal expansion. Where insulation includes a vapor barrier covering provide sleeve with sufficient clearance for installation of vapor barrier. Install length of sleeve equal to thickness of construction penetrated, except extend floor sleeves 0.25 inches above floor finish. Provide temporary support of sleeves during placement of concrete and other work around sleeves and provide temporary closure to prevent concrete and other materials from entering pipe sleeves.
 - 1. Sleeve Type: At interior partitions and ceilings, install sheet metal sleeves.
 - 2. Sleeve Type: At exterior penetrations both above and below grade, install iron pipe sleeves.
 - 3. Sleeve Type: Except as otherwise specified, install steel pipe sleeves.
 - 4. Caulk pipe sleeves at exterior penetrations and at other locations where indicated. Provide sufficient quantities of oakum and lead to make permanent weather-tight closure

between sleeve and piping, slightly recessed at exposed surface.

3.2 CLEANING, FLUSHING AND INSPECTING:

- A. General: Clean exterior surfaces of installed piping systems of superfluous materials and prepare for application of specified coatings.
- B. Flush out piping system with clean water before proceeding with required tests. Inspect each run of each system for completion of joints, supports and accessory items.

3.3 PIPING TESTS:

- A. General: Provide temporary equipment for testing, including pump and gages. Test piping systems before insulation is installed wherever feasible, and remove control devices before testing. Test each natural section of each piping system independently, but do not use piping system valves to isolate sections where test pressure exceeds valve pressure rating.
 - 1. Required test period is 2 hours.
- B. Unless otherwise specified for specific systems, hydraulically test each pressurized piping system at 150% of operating pressure indicated, but not less than 100 psig test pressure.
- C. Observe each test section for leakage at end of test period. Test fails if leakage is observed or if pressure drop exceeds 5% of test pressure.
- D. Repair piping systems sections which fail the required piping test, by disassembly and re-installation, using new materials to the extent required to overcome leakage. Do not use chemicals, stop-leak compound, mastics, or other temporary repair methods. Drain test water from piping systems after repair work and retesting has been completed.

END OF SECTION 23 0310

SECTION 23 0320 – MECHANICAL HANGERS AND SUPPORTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUBMITTALS:

- A. Provide manufacturer's data, test reports, and product warranties on all items.

PART 2 - PRODUCTS

2.1 HANGERS AND SUPPORTS:

- A. General: Except as otherwise indicated, provide factory-fabricated piping hangers and supports of the type specified complete with bolts and washers. Comply with the manufacturer's published product information. Size hangers and supports properly for piping and weight of the medium being transported. Provide insulation shields for all insulated piping.
- B. Hangers for condenser water piping and drain piping shall be the standard clevis type *B-Line* Fig. B3100 or equivalent by *Anvil*, *Erico Caddy*, *PHD Manufacturing* or *Hubbard Enterprises/Holdrite*.

PART 3 - EXECUTION

3.1 HORIZONTAL PIPING SUPPORT:

- A. Minimum spacing of hangers and supports for above-ground horizontal pipe and tubing shall be as follows:

- 1. Steel Pipe:

Nominal Pipe Size (inches)	Support Spacing (feet)
1-1/4 and smaller	7
1-1/2	9
2	10
2-1/2	11
3 & larger	12

- 2. Copper Tubing:

Tubing Size	Support Spacing
-------------	-----------------

(inches)	(feet)
3/4 and smaller	5
1 to 2-1/2	6
3	10
4 and larger	12

- B. Prevent electrolysis in the support of copper tubing by the use of hangers and supports which are copper plated, or by other recognized industry methods.
- C. Branch piping located in walls, partitions or pipe chases shall be rigidly supported inside the wall or chase.

3.2 VERTICAL PIPING SUPPORT:

- A. Copper Tubing: Support at riser tops and 5 feet maximum on center for pipe 1-1/2" and larger and 4 feet on center for pipe 1-1/4" and smaller. Use copper plated pipe clamps.
- B. Steel Pipe: Supports at top and bottom of riser and on 10 feet maximum centers.

3.3 ADJUSTMENT OF HANGERS AND SUPPORTS:

- A. Adjust hangers and supports to bring piping to proper level, elevations and slopes.

END OF SECTION 23 0320

SECTION 23 1110 - MECHANICAL WATER PIPING SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

- A. The extent of mechanical water piping work is indicated by the drawings and by the requirements of this section and includes the following:
 - 1. Condenser Water Supply (CWS); Condenser Water Return (CWR)
 - 2. Drain Piping (D)
 - 3. Makeup Water Piping

1.3 SUBMITTALS:

- A. Submit manufacturer's data, test reports, and product warranties as applicable for all items.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS:

- A. General: Comply with Section 230310 for product requirements of piping materials. For each service, provide the piping materials indicated including pipe, fittings, hangers, supports, anchors, valves and accessories. Where more than one type is indicated, selection of one type is Installer's option. Where type is not otherwise indicated, provide materials in accordance with industry standards or governing regulations.

2.2 CONDENSER WATER PIPING:

- A. Above Ground Pipe: All pipe sizes shall be schedule 40 steel. Pipe sizes 2 inches and smaller shall be schedule 40 steel or hard drawn Type L seamless copper.
- B. Fittings: Wrought steel welding type, cast iron flanged type, cast iron threaded type, mechanical groove joint couplings, mechanical compression joints, or sweat connections as applicable.

2.3 DRAIN PIPING:

- A. All Pipe Sizes: Hard drawn Type L seamless copper tubing.
- B. Fittings: Hard drawn wrought copper with sweat connections.

2.4 MAKEUP WATER PIPING:

- A. All Pipe Sizes: Harddrawn Type L seamless copper tubing.
- B. Fittings: Hard drawn wrought copper with sweat connections.

2.5 ACCESSORIES:

- A. General: Provide factory-fabricated piping accessories recommended by the manufacturer for use in the service indicated. Provide products of the type and pressure-rating specified for each service or, if not specified, provide proper selection as determined by the piping system Installer to comply with installation requirements. Provide sizes and connections matching pipe, tube, valve, and equipment connections. For piping systems requiring up to 2" of insulation, provide an extended valve handle that offers a vapor seal, adjustable memory stop and valve packing maintenance without disturbing the insulation.
- B. Shutoff Valves: Valves 2 inches and smaller shall be ball valves. Valves shall have two-piece bronze or brass body, meeting MSS-SP110, full or standard port, blowout-proof stem and adjustable packing nut independent of handle. Valves shall be rated for 150 SWP, 600 CWP. Valves shall be by *Apollo, Hays, Milwaukee, Nibco, Victaulic or Watts*.
- C. Shutoff Valves: Valves 2.5 inches and larger shall be lug or grooved-end type butterfly valves with ten-position handles. Valves shall have minimum pressure rating of 150 WOG with cast iron, ductile iron or bronze body; bronze alloy, offset electroless nickel-plated ductile iron or elastomer encapsulated ductile iron disc, stainless steel stem, and replaceable EPDM seat and shall have a two-inch extended neck. The valve liner design shall be such that it shall serve as a flange seal and no separate gasket shall be required. Valves shall be installed with grooved joint couplings or between ASA 150 steel slip-on flanges. Valves shall be by *Hays, Milwaukee, Nibco, Victaulic or Watts*.
- D. Check Valves: Valves 2 inches and smaller shall be all bronze with threaded connections, swing check type, TFE disc, Class 150, meeting MSS-SP80. Valves shall be by *Milwaukee, Nibco or Watts*.
- E. Check Valves: Valves 2.5 inches and larger shall be iron body with flanged connections, swing check type, Class 125, meeting MSS-SP71. Valves shall be by *Milwaukee, Nibco or Watts*.
- F. Drain Valves: Valves shall be bronze construction ball type with TFE seats, angle body, hose end connection with cap and chain. Valves shall be by *Apollo, Hays, Nibco, Victaulic or Watts*.
- G. Triple Duty Valves: Provide a triple duty valve in the discharge piping of each base mounted pump. Valve shall consist of a non-slam check valve with a spring-loaded weighted contoured disc and a calibrated adjustment feature permitting regulation of pump discharge flow and shut-off. Valves shall be designed to permit repacking under full pressure. Valve body shall be cast iron construction suitable for maximum working pressure of 175 psig and maximum operating temperature of 300 degrees F. Triple duty valves shall be as manufactured by *Bell & Gossett, Patterson, Peerless, Taco, Wheatley or Victaulic*.

- H. Pressure Reducing Valves: Valves shall be bronze body construction with renewable seats and integral check valve and strainer. Pressure reducing valves shall be by *Armstrong, Bell & Gossett, Taco* or *Watts*.
- I. Pressure Relief Valves: Valves shall be bronze construction engineered in accordance with the requirements of Section IV of the *ASME Boiler and Pressure Vessel Code for Heating Boilers*. Capacities shall be certified by the *National Board of Boiler and Pressure Vessel Inspectors*. Valves shall be by *Armstrong, Bell & Gossett, Taco* or *Watts*.
- J. Back Flow Preventer: Units shall be the reduced pressure principle type. Units shall consist of two spring-loaded check valves with an automatic pressure differential relief valve located between the two check valves. The units shall include shut off valves located at each end and properly located test cocks. Maximum allowable pressure drop through the assembly is 8 psig. Back Flow Preventer shall be by *Febco, Watts* or *Wilkins*.
- K. Wye Strainers: Provide self cleaning type wye strainers where indicated. Strainers shall be the iron body type rated for 175 psig W.O.G. Screen shall be monel mesh or perforated metal as recommended by the manufacturer. Provide connections as required. Blowoff outlets shall be equipped with a shut-off valve. Strainers shall be by *Hays, Mueller, Nibco, Watts, Wheatley* or *Victaulic*.
- L. Basket Strainers: Provide self-cleaning type basket strainers where indicated. Strainers shall be the iron body type rated for 200 psig W.O.G. Screen shall be 304 stainless steel with 0.125" openings. Provide a flanged, bolted cover with compressed fiber gasket. Bottom blowoff outlet shall be equipped with a shut-off valve. Strainers shall be by *Hays, Mueller, Nibco, Watts, Wheatley* or *Victaulic*.
- M. Suction Diffusers: Units shall consist of an angle type body with inlet vanes and combination diffuser-strainer with 3/16 inch diameter perforations. Unit shall be equipped with a disposable fine mesh start up strainer which shall be removed after system start up. the cast iron body shall fit the pump and connecting pipe size and shall be suitable for maximum working pressure of 175 psig and maximum operating temperature of 250 degrees F. The units shall be equipped with an adjustable support foot to carry piping weight. Suction Diffusers shall be as manufactured by *Armstrong, Bell & Gossett, Patterson, Peerless, Taco, Wheatley, Wood* or *Victaulic*.
- N. Flexible Pump Connectors: Provide flexible connectors at pump connections where indicated. Flexible connectors shall be of bronze construction with corrugated inner tubing, braided outer shield, and forged flanged ends suitable for water service at 40 degrees F to 240 degrees F temperature range, 125 psig working pressure, and 200 psig test pressure. Connectors shall be as manufactured by *Metraflex, Patterson, Southeastern Hose* or *Wheatley*. Flexible mechanical couplings may be substituted for flexible connectors.
- O. Flow Metering Stations: Stations shall be a pitot tube probe with double-tube construction and double-averaging operation. The probe shall have 304 stainless steel tube with brass block and valves. Maximum temperature shall be 250 degrees F and maximum pressure shall be 200 psig. Provide a matching differential pressure gauge and conversion chart. Flow metering station shall be by *J.W. Sweet, Patterson, Preso*, or *Taco*.
- P. Thermometers: Piping system thermometers shall be the bi-metal type with silicon liquid fill, 5 inch dial, and adjustable angle. The case shall be stainless steel, hermetically sealed, with stainless steel ring. The window shall be double strength glass. The dial shall be white finished aluminum with black and blue markings in degrees F and degrees C. The pointer

shall be balanced aluminum with a black finish. Provide an external recalibrator, 1% accuracy of full scale, stainless steel ½ inch NPT connection and stainless steel stem. The scale range for each gauge shall be selected so that the normal operating point for each application falls in the approximate midpoint of the gauge range. Thermometers shall be by *Trerice, Weiss* or *Wika*.

- Q. Pressure Gauges: Gauges shall be connected to the piping system with threaded chrome-plated brass pipe and fittings. Gauges shall be the flangeless liquid-filled type and shall have 4-1/2 inch dials, cast aluminum cases, stainless steel heavy duty rotary gear movements, phosphor bronze bourdon tubes, forged brass rod sockets and tips, 1/2% accuracy of scale range, plexiglass dial covers, and 1/4 inch lower connections. Each gauge shall be provided with chrome plated brass lever handle cock and a stainless steel pulsation dampener. Provide compound gauges for locations which are under negative pressure. Range for pressure gauges shall be selected so that the normal operating point for each application falls in the approximate midpoint of the gauge range. Gauges shall be by *Trerice, Weiss* or *Wika*.
- R. Heat Trace Tape for Freeze Protection: Freeze protection tape shall be provided for all above ground water piping outside the building and selected to match pipe size, insulation thickness, and 0 degree F ambient temperature in accordance with the manufacturer's instructions. Tape shall maintain 40 degrees F minimum water temperature and shall be self regulating type. Tape shall be by *Chromalox, Raychem* or *Watts*.

PART 3 - EXECUTION

3.1 INSTALLATION OF PIPING:

- A. General: Comply with requirements of Section 230310 for installation of basic piping materials.
- B. Take-Offs: Branch take-offs from the supply mains shall be made from the top of the main.
- C. Drains: Install drain connections at the bottom of risers as necessary to permit complete system drainage. Piping slopes shall be as indicated on the drawings.
- D. Painting: Surface preparation and painting shall be in accordance with the Painting Section of the specifications. Apply a minimum of two coats of paint. All steel piping not insulated shall be painted.

3.2 INSTALLATION OF ACCESSORIES:

- A. Install premanufactured accessories in accordance with the manufacturer's instructions and recommendations.

3.3 INSPECTION:

- A. Each length of pipe shall be inspected prior to installation. Ends of open pipe shall be temporarily capped to prevent entry of foreign material prior to connections to other piping or equipment.

3.4 TESTING:

A. Comply with requirements of Section 230310.

3.5 FLUSHING:

A. Comply with requirements of Section 231410.

END OF SECTION 23 1110

SECTION 23 1210 – MECHANICAL PIPING AND EQUIPMENT INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SCOPE:

- A. Piping and equipment to be insulated include:

1. Condenser Water Piping Outdoors
2. Make Up Water Piping

1.3 QUALITY ASSURANCE:

- A. Manufacturers: Provide insulation products produced by one of the following for each type and temperature range of insulation.

1. *Certainteed*
2. *Knauf*
3. *Manville*
4. *Owens-Corning*
5. *Pittsburgh Corning*
6. *Armacell*
7. *Aeroflex USA*
8. *K-Flex USA*

- B. Flame/Smoke Ratings: Provide composite piping insulation (insulation, jackets, covering, sealers, mastics and adhesives) with flame-spread rating not exceeding 25 and smoke developed rating not exceeding 50, as tested by ASTM E 84 (NFPA 255) method and UL 723.

1.4 SUBMITTALS:

- A. Provide manufacturer's data, test reports, and product warranties for all items.

PART 2 - PRODUCTS

2.1 PIPE INSULATION:

- A. Fiberglass Insulation: Insulation shall be preformed, two-piece, heavy density fiberglass with self sealing ASJ jacket conforming to ASTM C 547. Insulation on valves, elbows and fittings shall be pre-formed fiberglass with PVC covers and same material thickness as adjacent pipe. Insulation thickness shall be as follows:

1. Condenser Water Piping Outdoors: 1 inch thick for all sizes.
 2. Make Up Water Piping: 1 inch thick for all sizes.
- B. Cellular Glass Insulation: Cellular glass insulation shall comply with ASTM C 552, Type II. Jacketing for indoor applications shall be all purpose type of *Kraft* paper/aluminum foil/vinyl coating construction. Jacketing for outdoor applications shall be .016 inch aluminum. Insulation on valves, elbows and fittings shall be pre-formed cellular glass with PVC covers and same material thickness as adjacent pipe.
- C. Closed Cell Elastomeric Insulation: Closed cell elastomeric glass insulation shall comply with ASTM C 534, Type I, Tube Grade 1. Jacketing for outdoor applications shall be .016 inch aluminum. Insulation on valves, elbows and fittings shall be pre-formed closed cell elastomeric with same material thickness as adjacent pipe. Insulation thickness shall be as follows:
- D. Aluminum Jacket: Corrugated, embossed or smooth sheet, .016 inch nominal thickness, ASTM B 209, temper H14, type 3003, 5005 or 5010.

2.2 EQUIPMENT INSULATION:

- A. Insulation for all equipment shall be cellular glass complying with ASTM C 552, Type II. Insulation thickness shall be 2 inches. Secure with stainless steel bands. Finish with mastic reinforced with white open weave membrane with maximum mesh opening of 10x10 per inch. Optionally, insulation for all equipment shall be closed cell elastomeric insulation complying with ASTM C 534, Type II, Sheet Grade 1. Insulation thickness shall be 2 inches. Jacketing for outdoor applications shall be .016 inch aluminum.

PART 3 - EXECUTION

3.1 INSTALLATION OF PIPING INSULATION:

- A. General: Install insulation products in accordance with the manufacturer's written instructions, and in accordance with recognized industry practices to ensure that the insulation serves its intended purpose. Do not use cut pieces or scraps abutting each other.
- B. Insulation shall be applied on clean dry surfaces. All insulation shall be continuous through wall and ceiling openings and sleeves. Insulation on all cold surfaces, where vapor barrier jackets are used, will be applied with continuous unbroken vapor seal. Seal off ends of insulation on cold piping systems with white vapor barrier coating at valves, flanges, supports and exposed ends. Supports that are secured to cold surfaces shall be insulated and vapor sealed to prevent condensation.
- C. Pipe covering protection shields shall be provided around exterior of pipe insulation at pipe hangers which fit around pipe insulation. Shields shall be 12 inches long by 180 degrees and shall be 18 gauge galvanized steel sheet. High density isolation inserts shall be provided at pipe saddles.
- D. Unions shall not be insulated except for unions in chilled water lines which shall be insulated.

- E. Cover valves, flanges, fittings and similar items in each piping system.
- F. Extreme care shall be taken to insure a neat, uniform exterior surface on insulation applied to exposed pipes. Insulation in finished areas shall be painted in accordance with the paint specifications.
- G. Heat tracing of piping shall be as specified in Section 23 1110. Insulation shall be oversized one pipe size to allow installation over heat trace tape.
- H. Aluminum jackets shall be provided on exterior insulated pipes where noted on the plans.

3.2 INSTALLATION OF EQUIPMENT INSULATION:

- A. General: Apply equipment insulation suitable for temperature and service in rigid board to fit as closely as possible to equipment. Groove or score insulation where necessary to fit the contours of equipment. Stagger end joints where possible. Bevel the edges of the insulation for cylindrical surfaces to provide tight joints. Fill joints with insulating cement conforming to ASTM C 195. Bevel insulation around name plates, ASME Stamp, and access plates. For insulation on equipment that must be opened periodically for inspection, without damage. Protect exposed insulation corners with corner angles under wires and bands.

3.3 PROTECTION AND REPLACEMENT:

- A. Replace damaged insulation which cannot be repaired satisfactorily, including units with vapor barrier damage and moisture saturated units.
- B. Protection: The Installer of the insulation shall advise the Contractor of required protection for the insulation work during the remainder of the construction period, to avoid damage and deterioration.

END OF SECTION 23 1210

SECTION 23 1310 - PUMPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

- A. The applications of general-use centrifugal pumps required for the project include the following:
 - 1. Condenser Water Pumps

1.3 QUALITY ASSURANCE:

- A. *Bell and Gossett* is the Basis of Design manufacturer. Equivalent name brand equipment manufactured by *Armstrong, Aurora, Grundfos, Patterson, Peerless, Taco* and *Thrush* that meets performance, capacity, space and other requirements of the design documents shall be acceptable.
- B. Industry Standards: Provide electric motors and products which have been listed and labeled by *Underwriters Laboratories* and comply with NEMA Standards. Pumps shall be tested and rated in accordance with ANSI/HI 1.6-1994.

1.4 SUBMITTALS:

- A. Submit manufacturer's data, test reports, and product warranties on all items.

PART 2 - PRODUCTS

2.1 GENERAL:

- A. Except as otherwise indicated, provide pumps with manufacturer's standard materials and components in sizes, capacities and ratings indicated, complying with manufacturer's published product information and designed and constructed by manufacturer for applications indicated.

2.2 FLEXIBLY-COUPLED END SUCTION PUMPS:

- A. Pumps shall be flexibly-coupled, base mounted, single stage, end suction design with a frame mounted volute to allow servicing of the impeller and bearing assembly without disturbing piping connections. Pump volute shall be Class 30 cast iron with integrally cast pedestal support feet. The impeller shall be cast bronze enclosed type, dynamically balanced, keyed to

the shaft and secured by a locking capscrew. The liquid cavity shall be sealed off at the pump shaft by an internally-flushed mechanical seal with ceramic seal seat and carbon seal ring, suitable for continuous operation at 225 degrees F. A replaceable bronze shaft sleeve shall completely cover the wetted area under the seal. Pump shall be rated for minimum of 175 psig working pressure. Volute shall have gauge tappings at the suction and discharge nozzles and vent and drain tappings at the top and bottom. Baseplate shall be of structural steel or fabricated steel channel with fully enclosed sides and ends, and securely welded cross members. Grouting area shall be fully opened. A flexible type, center dropout design coupler, capable of absorbing torsional vibration, shall be employed between the pump and motor. Coupler shall be shielded by a coupler guard securely fastened to the base. Pump and motor shall be factory aligned, and shall be realigned by contractor after installation. The pump shall be thoroughly cleaned and painted with at least one coat of high grade machinery enamel prior to shipment.

- B. Motors shall meet NEMA specifications and shall be of the size, voltage and enclosure called for on the plans. Motors connected to variable frequency drives with 460v/3ph power shall be rated for 1600 peak volts.

PART 3 - EXECUTION

3.1 INSPECTION:

- A. Installer must examine areas and conditions under which pumps are to be installed and notify the Contractor in writing of those conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.2 INSTALLATION OF PUMPS:

- A. Install pumps where shown, in accordance with manufacturer's written instructions, and with recognized industry practices, to ensure that pumps comply with requirements and serve intended purposes. Comply with NEMA standards and requirements of NEC.

3.3 ELECTRICAL CONNECTIONS:

- A. Ensure that pump units are wired properly, with rotation in direction indicated and intended for proper pump performance. Provide positive electrical pump and motor grounding.

3.4 FIELD QUALITY CONTROL:

- A. Upon completion of installation of pumps and after motors have been energized with normal power source, bleed air from pump casings and test pumps to demonstrate compliance with requirements. Where possible, field correct malfunctioning units, then retest to demonstrate compliance. Replace units which cannot be satisfactorily corrected.

END OF SECTION 23 1310

SECTION 23 4210 - COOLING TOWERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 QUALITY ASSURANCE:

- A. *Tower Tech TTXR* is the Basis of Design.
- B. Industry Standards: Provide cooling towers which have been listed and labeled by *Underwriter's Laboratories*.
- C. Cooling Technology Institute (CTI): CTI STD-201 - Certification Standard for Commercial Water-cooling Towers' Thermal Performance.

1.3 WARRANTY

- A. Warranty: Provide cooling tower manufacturer's standard material and labor warranty, in accordance with conditions specified within written warranty. Towers not covered by a warranty of this scope will not be accepted.
 - 1. External Shell: Fifteen years from date of shipment from factory. Excludes normal wear and tear and cosmetic and superficial damage.
 - 2. Cold Water Basin and Tower Casing: Fifteen years from date of shipment from factory.
 - 3. Internal Components: Five years from date of shipment from factory.
 - 4. Fill Media and Drift Eliminators: Five years from date of shipment from factory.
 - 5. Distribution Nozzles: Two years from date of shipment from factory.
 - 6. Motors, Sump, Water Collection Devices, Fans: Five years from date of shipment from factory.
 - 7. Labor: One year from date of shipment from factory.

1.4 SUBMITTALS:

- A. Provide manufacturer's data, test reports, and product warranties.

PART 2 - PRODUCTS

2.2 FORCED DRAFT, COUNTERFLOW, PROPELLER FAN TYPE:

- A. General: The cooling towers shall be the factory assembled, forced draft, propeller fan type with bottom air entry and top discharge. The tower shall be non-combustible. All steel components shall be stainless steel. The cold water basin and the tower casing shall be constructed of pultruded Fiberglass Reinforced Polyester (FRP) with UV inhibitors.
- B. Fans, Motors and Drive System: Fans shall be of an axial, airfoil design positioned within an aerodynamically streamlined fiberglass shroud and installed with a minimum tip clearance for maximum efficiency. Fan blades shall be manufactured of Fiberglass-Reinforced

Polypropylene and be pitch-adjustable. Fan hubs shall be manufactured of high strength, low weight aluminum alloy to minimize stress and wear on motor bearings. Fans shall have an air inlet cylinder. Fan motor shall be the totally enclosed inverter duty type suitable for cooling tower service. Motors shall be factory pre-wired using oil resistant, VFD compatible, quantum-shielded cable connected to a NEMA-4X junction box which allow service to be performed on an offline fan/motor while the remaining fans continue to operate. Motors in each cooling tower module shall be connected to and operated by a single variable-frequency drive (VFD), housed in a NEMA-4 enclosure. Provide wire mesh screens over the air inlets and outlets.

- C. Distribution System: Water shall enter the tower through a single inlet comprised of an enclosed, low pressure, non-corrosive Polyvinyl Chloride (PVC) Schedule 40 piping system. Water will be distributed further using 4-inch Schedule 40 PVC laterals. Water shall be evenly sprayed over the fill media by evenly spaced and sized High Density Polyethylene (HDPE) spray nozzles. The nozzles shall have a 2 inch NPT connection and rotating turbine for atomized water, producing a square pattern, and shall be installed not more than 3 inches (762 mm) above the fill media.
- D. Fill and Drift Eliminators: The fill and drift eliminators shall be integral construction consisting of formed sheets of PVC, impervious to rot, decay, fungus, or biological attack with a flame spread index of 5 according to ASTM E 84 and a maximum operating temperature of 130 degrees F. Drift losses shall not exceed 0.0004 percent of the design circulating flow rate at full fan speed.
- E. Water Collection Systems: The tower shall utilize a water collection system positioned beneath the fill media and above the air inlet. The water collection system shall collect cold water as it falls from the fill media and channel the water into the tower's elevated perimeter basin permitting the mechanical equipment to be mounted in the dry entering air stream beneath the tower. The water collectors shall be made of extruded flame retardant acrylonitrile butadiene styrene copolymer (ABS) material. Provide electric immersion sump heaters for freeze protection. Heaters shall have a NEMA 3 control box, thermostats, and safety float switch.
- F. Control Panel: The control panel shall consist of the following:
 - 1. Segmented cooling tower fan control panel shall consist of UL 508 type 4 enclosure, 200A main circuit disconnect, individual motor starters with thermal overload protection, individual motor circuit disconnects with pad lockable handles; door-mounted OI LCD view screen with individual icons for HOV selection/status that also indicates motor run/tripped status; door-mounted H-A selector switch used for Automatic or Bypass control; temperature controller (PLC) capable of reading an analog 4-20ma signal from an RTD temperature input with an analog 4-20ma converter communicating via analog communication cable to the temperature controller; temperature controller to communicate with the single operator interface through Ethernet communication cable; a separate 120VAC supply control power circuit is controlled through auxiliary contacts of the main disconnect to a circuit breaker then to the PLC. This control panel shall be mounted and wired, and shall control the cooling tower fans, per this specification.
 - 2. Enclosure:
 - a. Enclosure shall be rated UL 508 Type 3R, 4, and 12.

- b. Enclosure shall be manufactured of formed 14- or 16- gauge steel.
 - c. Enclosure doors shall be removable.
 - d. Enclosure must have collar studs for interior panel mounting.
 - e. Enclosure shall be finished with re-coatable powder coating.
3. Cover Control:
- a. Cover control shall consist of a touch screen LCD that contains the Hand-Off-Auto selector switch for each fan motor, a visual indication of running/tripped status for each fan motor. Each of these icons shall be labeled on the screen indicating each operation or annunciation. There shall be a Bypass-Auto selector switch on the cover for selection of Bypass or Auto mode for the PLC/LCD screen. Bypass operation to engage all fan motors.
 - b. The main circuit disconnect shall clearly indicate ON and OFF and shall be lockable.
 - c. The operator interface (OI) shall be rated UL508 4X and shall be in the door and connected to the temperature controller via a communication cable. The OI shall access set point, stages, VFD control, remote set point, remote enable, and cooling time variable in the temperature controller without opening the enclosure door.
4. Temperature Controller: The temperature controller (TC) shall have the ability to communicate with the OI and other remote devices not described herein via Ethernet, analog 4-20ma, and other protocols by additional interface modules. The TC shall also have the ability to expand to 64 I/O. The TC shall have 120VAC or 24VAC supply power ratings and shall have the ability to use analog (4-20ma), and digital input along with both analog (4-20ma +/- 10VDC) and digital outputs.
5. Motor Control and Protection: Each fan motor shall have a contactor suitable for both the HP and voltage specified. Each fan motor shall have thermal overload protection suitable for the FLA (including service factor) and voltage specified. Each fan motor shall have an individual magnetic circuit protector suitable for the HP, FLA and voltage specified. The motor circuit protector shall have lockout protection and a NO and NC auxiliary contact.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Install cooling towers in accordance with manufacturer's written instructions and recognized industry standards. Coordinate with other work, including electrical conduits, water and drain piping as necessary to interface installation properly with other work.

3.2 TESTING:

- A. Test operate installed cooling tower to demonstrate compliance with the requirements.

END OF SECTION 23 4210

SECTION 26 0100 - GENERAL PROVISIONS - ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 IMPOSED REGULATIONS:

- A. Applicable provisions of the State and Local Codes and of the following codes and standards are hereby imposed on a general basis for electrical work:
 - 1. NEC, National Electrical Code (NFPA No. 70), with Georgia Amendments.
 - 2. The Life Safety Code (NFPA No. 101), with Georgia Amendments.
 - 3. State of Georgia ADA Accessibility Guidelines for Building and Facilities.
 - 4. The Standard Building Code, with Georgia Amendments.
 - 5. The National Electrical Safety Code (ANSI C2.)
 - 6. U.L. Fire Resistance Directory.
 - 7. U.L. Electrical Construction Materials Directory.
 - 8. U.L. Electrical Appliance and Utilization Equipment Directory.

1.3 SCOPE OF WORK:

- A. Provide all labor, materials, equipment and supervision to construct complete and operable electrical systems as indicated on the drawings and specified herein. All materials and equipment used shall be new, undamaged and free from any defects.

1.4 COORDINATION:

- A. Coordinate work provided under this division of the specifications with work provided under other divisions of the specifications and work provided by owner, where applicable.

1.5 PROJECT STAFFING:

- A. Superintendent:
 - 1. Provide a superintendent to plan, layout, supervise and coordinate the work provided by all organizations providing work under Division 26. The superintendent shall be at the job site at any time work is being performed.

2. The superintendent shall have a minimum of 5 years of experience in projects of similar size and scope. The superintendent shall have a State of Georgia unrestricted electrical contractor's license.

B. Organizations Furnishing and Installing Electrical Systems:

1. Traditional electrical systems work shall be furnished and installed by organizations who have successfully completed work of similar size and scope, and who have been in business for at least 3 years.
2. Electricians, 600V and below:
 - a. Electricians assigned to the project shall have proof of having completed a formal training program which certifies that they are qualified to perform electrical work of the type encountered on this project and are familiar with the building codes which apply to this project. For the purposes of this project, workers not possessing these qualifications shall be considered helpers and shall not be allowed to perform electrical work.

- C. Submit resumes for review and approval by the Engineer prior to proceeding with any work on the project. Fill out Attachment 2, Section 260120 for each firm providing work under Division 26.

1.6 UTILITY CONNECTIONS:

- A. The utility connections are existing to remain.

1.7 PERMITS AND TEST; ELECTRICAL WORK:

- A. Submit a record copy (for Owner's records) of electrical work notices, permits, licenses, inspection or test reports, and similar items obtained in response to governing and imposed codes, regulations and standards.

1.8 ELECTRICAL DRAWINGS:

- A. Do not scale the electrical drawings. Obtain all dimensions from the Engineer's dimensioned drawings, field measurements and shop drawings.
- B. Electrical contract drawings are diagrammatic and indicate the general arrangement and connection of equipment and devices. Review product data sheets, wiring diagrams, manufacturer's installation instructions, etc. and provide the connections required to place equipment into service. Do not rely solely on the conductor counts shown on the drawings.
- C. Discrepancies shown on different drawings, between drawings and specifications or between documents and field conditions shall be brought to the attention of the Engineer. **The specifications do not override the drawings or vice-versa.**

1.9 EQUIPMENT REQUIRING ELECTRICAL SERVICE:

- A. Provide connections for all electrically driven equipment, in accordance with the electrical drawings and the Division of the specifications in which the equipment is specified.

1. Connection shall include circuit breaker, wiring, control and disconnecting means (where applicable) and final connection.
2. Prior to ordering materials, review approved shop drawings of equipment that will be ordered and verify the connections shown. Fill out and submit the Coordination Affidavit required by Section 260120.
3. Where connection is required by other Divisions, but no connection is shown on the electrical drawings, provide connection to nearest panel of same voltage and phase based on the characteristics shown on other drawings. All added connections shall be brought to the attention of the Engineer.
4. Provide 120 volt, 1 phase, 20 ampere power connection for all Division 23 control panels, whether indicated on the project drawings or not. Circuit from nearest 120/208 volt, 3 phase, 4 wire panelboard from available 20 amp, single-pole spares. Revise panelboard schedules accordingly. Document and coordinate control panel requirements and locations during preparation of the Coordination Affidavit, Attachment No. 1.

1.10 SYSTEMS REQUIRING ROUGH-IN:

- A. Rough-in shall consist of all outlet boxes and covers/raceway systems/supports and sleeves required for the installation of cables/devices specified by other Divisions and by the Using Agency.
- B. Review shop drawings to determine rough-in requirements; do not rely solely on the information shown on the drawings. Keep a copy of these shop drawings at the project site throughout the course of construction.
- C. Systems requiring rough-in shall include, but not be limited to the following:
 1. Mechanical equipment as shown in Divisions 22 and 23
 2. Building equipment as shown
 3. Equipment furnished by the Using Agency as shown on plans
- D. Rough-in requirements are further defined in Section 261010. Prior to performing any rough-in, meet with the designated representative of the trade involved to confirm device locations, mounting heights, trim ring type and orientation.

1.11 RECORD DOCUMENTS:

- A. The electrical superintendent shall maintain a white set (blue-line or black-line) of contract documents in clean, undamaged condition, for mark-up of actual installations which vary substantially from the work as shown. Mark-up whatever drawings are most capable of showing installed conditions accurately. These documents shall be used for no other purpose. As a minimum, record the following:
 1. Post all addenda prior to beginning work.
 2. Post all changes in the work.
 3. Document actual feeder conduit routes, both interior and exterior. For lines run below grade or slab, dimension lines off of fixed surfaces.
 4. Scope of each change order (C.O.), noting C.O. number.
 5. Mark up all branch circuit connections.

1.12 RECORD MANUALS: (CLOSEOUT REQUIREMENTS)

Record manuals shall include the following:

- A. Manufacturer's operation and maintenance manuals for:
 - 1. Motor Starters
 - 2. Motor Control Centers (Include manufacturer's fabrication drawings)
- B. Shop drawings, revised to reflect all review comments, *supplemented with the installation instructions shipped with equipment.*
- C. One copy of all panelboard directories plus CD/RW with electronic spreadsheets containing directories.
- D. All test results listed by specification section.
- E. All required keys, tools, and spare parts.

Submit record manuals in quantities and in the format prescribed in the Division specifications, plus one copy for the Engineer.

1.13 TRAINING OF OWNERS FORCES:

- A. Train Owner's personnel on the operation and maintenance of the following systems :
 - 1. Tour of Facility - 4 hours
- B. The "tour of facility" shall consist of the walk-thru of at least one space of each type. The Division 26 Superintendent shall demonstrate operation of all lighting controls, emergency shut off controls, use of receptacles, etc. The tour shall be conducted jointly with Division 27.
- C. Training shall not be conducted until system has been tested by the Contractor and is 100% operational. Training shall be conducted at the project site.
- D. As a minimum, the following materials shall be reviewed during the training session:
 - 1. Owner's operation and maintenance manual.
 - 2. Corrected shop drawings and as-built system drawings.
 - 3. Hands-on demonstration of system features and operation.
- E. Schedule the training at least two weeks in advance. At that time, provide a detailed outline of the training session.
- F. The contractor shall make a video (DVD format) of all training sessions and deliver to the Owner.

1.14 REVIEW OF THE WORK BY THE ENGINEER:

- A. During the course of the project, the work will be reviewed by a representative of the

Engineer. Upon each visit, the Contractor shall also demonstrate that the record documents and shop drawing files are being kept current. The Division 26 Superintendent shall accompany the Engineer on all reviews and shall provide all personnel, tools, ladders, etc. necessary to conduct the review.

- B. Prior to reviewing of work in progress, or at the final inspection, the Contractor shall submit a letter describing the specific work to be reviewed, along with a punch-list of items that are incomplete or which require correction, based on observations made by the supervisor of the given trade. Reviews will not be scheduled until this information is submitted. The Contractor shall bear the burden of any resulting delays.
- C. Construction review reports will be issued by the Engineer for every review trip. Within five working days from the date of review, the Contractor shall submit a letter which addresses when corrections will be made for each deficiency in the report. Prior to subsequent review of the work, the Contractor shall submit a letter confirming that the work required by all comments on the report has been completed.

PART 2 - PRODUCTS

2.1 GENERAL:

- A. Refer to the drawings and individual specification sections for requirements.
- B. All equipment shall be suitable for the environment in which it is installed. Such considerations shall include, but not be limited to characteristics of this specific project such as wet/damp/dry locations, ambient temperature / humidity, spaces used as air plenums and hazardous locations. It shall be the responsibility of the contractor to review the contract documents and order equipment based on intended use.

2.2 MATERIALS:

- A. All materials and equipment used shall be new, undamaged and free from any defects.
- B. Provide materials and equipment that are U.L. listed, unless listing is unavailable.
- C. All equipment of the same type or of the same product category shall be the product of a single manufacturer.
- D. It is the responsibility of the Contractor to determine the shipping splits for large equipment.
- E. Where product is specified by catalog number, such specification is intended only to convey general characteristics. Actual product selection shall be based on catalog number, other references on the drawings / specifications and intended use. Products not listed in these specifications or shown on drawings shall not be used.

2.3 ACCEPTABLE MANUFACTURERS:

- A. Provide equipment and materials which are products of the manufacturers listed on the drawings and in the specifications. Requests for substitution of other manufacturers shall

comply with Division 1 and the paragraph "B" below.

- B. Requests for prior approval (i.e. before the bid opening) must contain all information listed for the specific item in Section 260120, including any applicable dimensioned layout drawings. Requests must be sent by mail or express delivery such that they are received in the Engineer's office no later than ten working days prior to the opening of bids. **Requests that are incomplete or are sent by facsimile will not be reviewed.**

PART 3 - EXECUTION

3.1 ROLE OF THE SUPERINTENDENT:

- A. The Division 26 Superintendent's duties shall include, but not be limited to the following:
 - 1. Preparation of submittals.
 - 2. Planning and layout of the work.
 - 3. Coordination with other trades and the local utility company.
 - 4. Posting addenda and changes in the work to maintain the Record Documents and to ensure that Division 26 personnel are working from up-to-date drawings and specifications.
 - 5. Supervision of all Division 26 personnel.
 - 6. Ongoing review of work in place to ensure compliance with the Contract Documents.
 - 7. Administrative duties as required to fulfill the requirements of the General Conditions, Special Conditions and Division 1 specifications.
 - 8. Training of the Owner's personnel.

3.2 PROTECTION OF THE WORK:

- A. Protect the work during the course of construction. Do not install any equipment or materials until the proper environmental conditions have been established.
- B. Store materials in the manner recommended by the manufacturer until materials are installed. Materials rated for indoor use shall not be stored outdoors regardless of the packaging in which the materials are shipped.
- C. Prior to the building being "dried-in", protect incomplete conduit runs, outlet boxes, equipment enclosures, etc. from the entry of water or construction debris, by installing and maintaining temporary protective covers.
- D. Do not install wiring devices, equipment or panel interiors until the building is dried-in. For the purposes of this specification "dried in" shall mean the roof has been installed, all exterior openings are covered and the interior of the building is dry.
- E. Maintain temporary protective covers over equipment enclosures, outlet boxes and similar items after interiors, conductors, devices, etc. are installed, to prevent the entry of construction debris and to protect the installation during finish work performed by others. Do not install device plates, equipment covers or trims until finish work is complete.
- F. Install temporary protective covers over equipment mounted on the building exterior to prevent corrosion damage during cleaning of the building exterior, by others.

- G. Clean all equipment, inside and out, upon completion of the work. Scratched or marred surfaces shall be touched-up with touch-up paint furnished by the equipment manufacturer.
- H. Equipment or materials that are improperly stored or are installed before the proper environmental conditions are achieved will be removed and replaced with new, at no cost to the Owner. The Contractor shall bear all consequences from any resulting delays.
- I. All equipment and materials that become damaged will be removed and replaced with new, at no additional cost to the Owner.

3.3 CUTTING AND PATCHING:

- A. Structural Limitations: Do not cut structural framing, walls, floors, decks, and other members intended to withstand stress, except with the Engineer's written authorization. Authorization will be granted only when there is no other reasonable method for completing the electrical work, and where the proposed cutting clearly does not materially weaken the structure.
- B. Cutting Concrete: Where authorized, cut openings through concrete (for conduit penetrations and similar services) by core drilling or sawing. Do not cut by hammer-driven chisel or drill.
- C. Other Work: Do not endanger or damage other work through the procedures and process of cutting to accommodate electrical work. Review the proposed cutting with the Installer of the work to be cut, and comply with his recommendations to minimize damage. Where necessary, engage the original Installer or other specialists to execute the cutting in the recommended manner.
- D. Patching: Where patching is required to restore other work, because of cutting or other damage inflicted during the installation of electrical work, execute the patching in the manner recommended by the original Installer. Restore the other work in every respect, including the elimination of visual defects in exposed finished, as judged by the Engineer. Engage the original Installer to complete patching of various categories of work including: concrete and masonry finishing, waterproofing and roofing, exposed wall finishes, etc.

3.4 INTERFACE OF ELECTRICAL WORK WITH OTHER TRADES:

- A. Where electrical work must connect to or be incorporated into work installed by other trades, engage the services of the other trade to interface the work. Under no circumstances shall the installer performing work under this Division of the specifications modify or alter work installed by others. Such work includes, but is not limited to:
 - 1. Roof Penetrations.
 - 2. Any attachments to roofing system.
 - 3. Penetrations in Vapor Barriers.
 - 4. Exterior Insulation and Finish Systems (EIFS).

END OF SECTION 26 0100

SECTION 26 0120 - ELECTRICAL SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 GENERAL:

- A. Submit for review by the Architect a schedule with engineering data of materials and equipment to be incorporated in the work.
 - 1. Submittals shall be supported by descriptive materials, i.e., catalog sheets, product data sheets, diagrams, performance curves and charts published by the manufacturer, to show conformance to Specifications and Plan requirements; model numbers alone shall not be acceptable.
 - 2. Data submitted for review shall contain all information to indicate compliance with Contract Documents. Complete electrical characteristics shall be provided for all equipment.
 - 3. Submittals for lighting fixtures shall include Photometric Data.
 - 4. The Architect reserves the rights to require samples of any equipment to be submitted for review.
- B. Prepare submittals, including the necessary inter-division planning and coordination in accordance with the approved project schedule. Note that certain Division 26 submittals cannot be prepared until approved submittals are available from other Divisions of the work.
- C. Submittal material shall be assembled and checked by the Division 26 superintendent.
- D. All layout drawings shall be prepared under the supervision of, and checked by the Division 26 superintendent.
- E. Hard Copy Submittals: Submittal data shall be placed in one or more hard-back 3-ring binders arranged and labeled according to specification section. Each binder shall contain a title page and table of contents. Provide separator tabs, and label by specification section. Make note in the table of contents, any drawings that accompany the submittal. Title page shall contain Project Name, Contractor's Name, Division 26 Superintendent's name, Suppliers and point of contact for each, and date. Except as otherwise indicated in other sections, submit 5 complete copies. Quantity indicated does not include copies required for regulatory agencies.
- F. Electronic Submittals: If the Architect agrees to allow electronic submittals via an on-line information management product such as "Submittal Exchange, etc., all electronic submittal files shall be organized to match the bid documents for specification section and name. Each submittal file shall be complete for each specification section. Multiple partial submittals per specification section will be rejected. Make note in the table of contents, any drawings that accompany the submittal. Title page shall contain Project Name, Contractor's Name, Division 26 Superintendent's name, Suppliers and point of contact for each, and date.

1.3 RESPONSE TO SUBMITTALS:

- A. The contractor shall review all submittals prior to submitting to ensure compliance with the contract documents. Comments made by the Design Professional do not relieve the contractor from complying with the contract documents (drawings, specifications, and addenda). The Design Professional does not approve any submittals. The Design Professional only reviews and makes observations regarding the submittals.
- B. The purpose of the submittals is to demonstrate to the Design Professional that the contractor understands the design concept and that he demonstrates his understanding by indicating which equipment and materials he intends to furnish and install. Any deviation from the contract documents shall be clearly stated on the submittal data. If not clearly stated, the submittal shall be marked "Revise and Resubmit". Failure of the contractor to provide submittals during the submittal process shall make the contractor totally responsible for any and all changes to achieve compliance with the contract documents.
- C. Shop drawings shall be evaluated by the Architect in accordance with the following classifications:
 - 1. **"No Exceptions Taken"**: No corrections, no marks. Items may be ordered.
 - 2. **"Make Corrections Noted"**: A few minor corrections. Items may be ordered as marked up without further resubmission.
 - 3. **"Revise and Resubmit"**: Minor correction. Item may be ordered at the Contractor's option. Contractor shall resubmit drawings with corrections noted.
 - 4. **"Rejected"**: Major corrections or not in accordance with the contract documents. No items shall be ordered. Contractor shall correct and resubmit drawings.
- D. Whether resubmittals are required or not, all shop drawings shall be corrected for the record manuals specified in Section 26 0100.

1.4 SUBMITTAL GROUPING:

- A. Submittals shall be made in no more than 1 group.
- B. All submittals for a given system shall be submitted at the same time. For example, wiring diagrams and other detailed layout information must be submitted with equipment data sheets.
- C. Submittals that do not comply with these requirements or that are deemed by the Architect to be incorrect shall be returned without review. The Contractor shall bear the burden of any resulting delays.

1.5 EQUIPMENT AND MATERIALS REQUIRING SUBMITTALS:

- A. Section 26 0100 - General Provisions
 - 1. Superintendent's resume
 - 2. Electricians' qualifications

B. Section 26 0120 - Electrical Submittals

1. Attachment 1

C. Section 26 1010 - Raceway Systems

1. Raceways and Fittings
2. Wall Boxes and Covers
3. Pull Boxes
4. Troughs
5. Firestopping Materials and Installation Drawings
6. Corrosion Protection

D. Section 26 2010 - Wires and Cables

1. Conductors
2. Connectors
3. Splices

E. Section 26 2021 - Safety and Disconnect Switches

1. Safety Switches
2. Motor Rated Switches
3. Equipment List
4. Arc Flash Warning Labels
5. Nameplates

F. Section 26 2080 - Electrical Grounding, 600V and Below

1. Conductors
2. Connectors
3. Bonding Bushings

PART 2 - PRODUCTS

2.1 NOT APPLICABLE:

PART 3 - EXECUTION

3.1 MANUFACTURER'S DATA:

- A. Include the manufacturer's comprehensive product data sheet and installation instructions.
- B. Where operating ranges are shown, mark data to show portion of range required for project application.
- C. Where pre-printed data sheet covers more than one distinct product-size, type, material, trim, accessory group or other variations, delete or mark-out portions of the pre-printed data which are not applicable.

3.2 EQUIPMENT LIST:

- A. Where more than one type of a product is being used (i.e. starters, disconnects, breakers, etc.) provide a list with each submittal correlating the type and size of product to the load served.

3.3 TEST REPORTS:

- A. Submit test reports which have been signed and dated by the firm performing the tests, and prepare in the manner specified in the standard or regulation governing the tests procedure as indicated.

3.4 ELECTRICAL LAYOUT AND COORDINATION DRAWINGS:

- A. Electrical Rooms: Provide layouts of all electrical rooms, using the dimensions of equipment actually furnished. Locate all ducts and piping entering or crossing these spaces.
- B. Mechanical Rooms and Mechanical Equipment Yards: Provide layouts showing all mechanical equipment based on dimensions of the actual equipment provided. Show the location of all motor controls, disconnect switches, control power junction boxes and conduit stub-ups at equipment. Location of stub-ups shall be based on manufacturer's installation drawings.
- C. Panel and Equipment Feeders, 60A or more: The routing of feeders is not shown on the drawings. Actual routing shall be determined by the contractor in accordance with the specifications and shall be coordinated with work by other trades. For feeders of 60A or higher rating, provide layout drawings showing proposed routes.
- D. System specific drawings - Include the following:
 - 1. Floor plans:
 - a. Show all system equipment, devices and interconnecting cabling. Provide a legend to define all devices and cable runs.
 - 2. Details:
 - a. Show the rough-in requirements and mounting height for every component Include all requirements such as outlet box size/trim/alignment and raceway requirements.
 - b. Prepare in sufficient detail such that these drawings can be used to provide the required rough-in.
 - 3. Point-to-point installation wiring diagrams of the entire system:
 - a. Provide terminal diagram for every control panel.
 - b. Provide wiring diagram for every device. Key these diagrams to the system diagrams.
 - c. Provide wiring diagram depicting all interlocks of specific systems with other systems.
 - d. Spare and unused terminals shall be marked as such. Indicate the size, type and color code of all conductors.
 - e. The use of generic wiring diagrams is not acceptable. Wiring diagrams shall be prepared for this specific project.
 - 4. Elevations:
 - a. Provide an elevation drawing of the headend equipment / control panel / backboard, showing the location of all components.

- b. Indicate enclosure sizes and space available for future expansion.

E. Drawing Format:

1. Drawings shall be prepared at the following scales:
 - a. Floor plans: $1/8" = 1'-0"$.
 - b. Electrical Rooms: $1/4" = 1'-0"$.
 - c. Mechanical Rooms / Equipment Yards: $1/4" = 1'-0"$.
 - d. Feeder routes: $1/16" = 1'-0"$.
2. The scales defined above are for plan views. Device assembly drawings, wiring diagrams, etc. may be prepared "not to scale".
3. Drawings shall be titled to define Project Name, Drawing subject, date prepared and designer's name and seal. All revisions shall be marked and dated.
4. Drawings shall include all room names and numbers.
5. Submit only one copy of each drawing, in reproducible format. The Architect will mark review comments on the reproducible drawing so that the contractor can make as many copies as may be required.

3.5 ATTACHMENT NO. 1:

- A. The intent of Attachment Number 1 is to ensure that the electrical requirements for equipment have been reviewed and coordinated by the Contractor. No electrical equipment shall be ordered, nor shall rough-in begin, before this coordination has taken place. This document shall be returned appropriately marked whether or not any changes are deemed to be necessary by the contractor.

ATTACHMENT NO. 1

SHOP DRAWING COORDINATION AFFIDAVIT

I, the Division 26 Superintendent, certify that I have reviewed the equipment shop drawings for electrically driven equipment and that the accompanying electrical shop drawings reflect the requirements of the actual equipment to be furnished for use on this project. The following deviations from design drawings were required to serve the furnished equipment:

ITEM	CKT. DESIG.	BKR.SIZE		CONDUIT/WIRE		DISC.SIZE		STARTER	
		New	Old	New	Old	New	Old	New	Old

NOTE: If no deviations are required please indicate by circling the appropriate answer above your signature.

PROJECT: _____ DEVIATIONS: Yes / No

COMPANY: _____

TITLE: _____ SIGNATURE: _____

TELEPHONE: _____ DATE: _____

FAILURE TO PERFORM THE WORK REQUIRED BY THIS AFFIDAVIT, PRIOR TO ORDERING MATERIALS OR ROUGHING-IN, MAY RESULT IN IMPROPER CONNECTIONS BEING PROVIDED. THE EXPENSE OF CORRECTIVE MEASURES, IF REQUIRED, SHALL BE BORNE BY THE CONTRACTOR.

END OF SECTION 26 0120

SECTION 26 1010 - RACEWAY SYSTEMS AND SUPPORTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SCOPE OF WORK:

- A. The requirements of this section apply to all electrical raceway systems and supporting devices, installed under this contract, except for concrete encased duct banks. Electrical raceway system is defined to include, but not be limited to, all electrical raceways, boxes, fittings and similar components necessary for a continuous pathway for the installation of cables or conductors. Supports are any devices or components used to support raceways or electrical equipment.
- B. Concrete encased duct banks are specified under Section 261011.
- C. Cable Trays for low voltage systems are specified in Section 261020.

1.3 QUALITY ASSURANCE:

- A. Submittals: Refer to Section 260120 for requirements.

PART 2 - PRODUCTS

2.1 ELECTRICAL METALLIC TUBING (EMT):

- A. Uses permitted:
 - 1. Indoors concealed in walls or ceiling.
 - 2. Concealed in slabs above grade.
 - 3. Exposed horizontal runs installed at least 7' above finished floor.

2.2 INTERMEDIATE METAL CONDUIT (IMC) OR RIGID GALVANIZED STEEL CONDUIT (RGS):

- A. Uses permitted:
 - 1. Indoors concealed or exposed.
 - 2. Transition from below grade nonmetallic raceway system to above grade metallic raceway system.
 - 3. Refrigerated spaces.
 - 4. Vertical drops serving equipment.

2.3 RIGID NON-METALLIC CONDUIT (SCHEDULE 40 PVC):

A. Uses permitted:

1. Below grade installations.
2. Grounding electrode conductor raceway.
3. Lightning protection system down conductor raceway.

2.4 FLEXIBLE METAL CONDUIT:

A. Uses permitted:

1. Final connection to lighting fixtures.
2. Final connection to other than Division 23 equipment located in indoor, dry locations.

2.5 LIQUID-TIGHT FLEXIBLE METAL CONDUIT:

A. Uses permitted:

1. Final connection to equipment in indoor or outdoor locations.

2.6 CABLE RUNWAY:

A. Installed where shown to support cables specified under Division 27, limited to use at backboards and above equipment cabinets. This product is not the same as the Cable Trays specified in Section 261020.

B. Material: ASTM A36 steel bar:

- | | |
|------------------|---|
| 1. Stringers: | 3/8" x 2" |
| 2. Rungs: | 1/2" x 1" steel channel welded, @ 9" on centers |
| 3. Runway width: | 12" |

C. Finish: Baked polyester powder coat, telephone gray.

D. Provide hanger kits, corner kits and other accessory fittings needed to install in the configurations specified.

E. Cable runways and accessories shall be the product of B-Line, Kindorf or Cope.

2.7 INNERDUCTS:

A. Innerducts shall be used where specifically indicated.

B. Innerducts shall be solid wall (ribbed) suitable for the use intended.

C. Provide metered tape and pull cord in all innerducts.

- D. When installed within conduits, terminate conduit runs with non-metallic, corrosion-proof, water/air/gas tight triplex or quadruplex duct plugs, for the number of innerducts installed. Additionally, provide duct plugs of the same type in all runs in which conductors are not installed.

2.8 SLEEVES:

- A. Conduit sleeves shall be RGS unless otherwise required by the through penetration firestop system selected.
- B. Sleeves shall be minimum 1" and maximum 4" diameter, provided in quantities necessary to install cable systems specified in Divisions 23 and 27.
- C. The contractor shall take special note that sleeve fill will be limited by the specific through penetration firestop system used. *In no case shall the fill exceed 40%.*

2.9 CONNECTORS/COUPLINGS:

- A. Connectors/couplings for use with EMT conduit shall be steel compression type, except that steel, set screw type will be acceptable for EMT conduits sizes 2-1/2" and larger.
- B. Connectors/couplings for use with IMC and RGS conduit shall be threaded type.
- C. All connectors shall be insulated throat type.
- D. Locknuts shall be of the same material as connectors.
- E. All fittings shall be raintight. Fittings encased in concrete shall be concrete-tight.

2.10 CONDUIT BODIES:

- A. Provide galvanized steel or cast metal conduit bodies constructed with threaded conduit ends, removable cover, and corrosion resistant screws.

2.11 CEILING OUTLET BOXES:

- A. Provide 4" octagon, galvanized steel interior outlet boxes constructed with stamped knockouts in back and sides and with threaded holes with screws for securing box covers or wiring devices.
- B. Boxes used to support ceiling paddle fans shall be listed for the purpose.

2.12 WALL OUTLET BOXES:

- A. Recessed:

1. Boxes shall be galvanized steel constructed with stamped knockouts in back and sides and with threaded holes with screws for securing box covers or wiring devices.
2. Minimum box size shall be 4" square by 1-1/2" deep.
3. Boxes for GFCI outlets, Division 22, Division 23, and Division 27 devices and other locations deemed necessary, shall be 4-11/16" square by 2 1/8" deep.
4. Boxes shall have square edge tile type covers.
5. Where devices are ganged, use gang-type boxes with gang box covers.
6. The use of gangable type outlet or switchboxes is not acceptable unless required by specific device manufacturer.
7. Use masonry type boxes of equal or greater volume to those specified above, in masonry walls.

B. Surface:

1. Use cast aluminum box with threaded hubs in conjunction with metallic conduit systems.

C. Special Conditions:

1. Where box type specified herein conflicts with requirements of equipment to be installed, equipment manufacturer's requirements shall govern.

2.13 INTERIOR PULL BOXES:

- A. Provide galvanized sheet steel boxes without knockouts. Provide surface boxes with screw-held covers in unfinished areas. In finished areas, including storage rooms, provide recessed boxes with screw-held cover, finished to match panelboards.

2.14 WIRING TROUGHS:

- A. Troughs shall be made of code gauge galvanized steel, without knock-outs, and shall be suitable for surface mounting. Provide screw-held, removable front cover. Trough and cover shall be finished the same as panelboards. Dimensions shall be as indicated on the drawings. Provide knock-outs as required.

2.15 SUPPORTS:

- A. Supporting devices shall be the products of manufacturers' specifically intended for supporting electrical raceways, devices and equipment. Makeshift supports are not acceptable. Where channel type supports are used, select complete assemblies based on the weight of the raceway(s) or equipment being supported.
- B. The use of tie wire or tie wraps as a means of support for electrical raceways, devices and equipment is not permitted.
- C. Plywood backboards shown in Communications Rooms or otherwise for the support of low-voltage cabling systems and/or mounting of equipment shall be fire resistant, Type AC rated. The plywood shall be painted with gray, fire resistant coating. Ensure that the plywood rating seal is left exposed after painting.

2.16 FIRESTOPPING:

- A. A through-penetration firestop system shall be used to seal penetrations of electrical conduits and cables through fire-rated partitions per NEC 300-21 and NEC 800-3. The firestop system shall be qualified by formal performance testing in accordance with ASTM E-814, or UL 1479.
- B. The firestop system shall consist of a fire-rated caulk type substance and a high temperature fiber insulation. It shall be permanently flexible, water-proof, non-toxic, smoke and gas tight and have a high adhesion to all solids so damming is not required. Only metal conduit shall be used in conjunction with this system to penetrate fire rated partitions. Install in strict compliance with manufacturer's recommendations. 3M, Metacaulk or Nelson.
- C. **Submit installation drawings for conduit penetration, cable in metal sleeve penetration and blank metal sleeve penetration for each type of wall/floor construction encountered.**
- D. Schedule a representative of the manufacturer to conduct a product demonstration / training session for each through-penetration firestop system to be used on this project. The session shall be held at the project site. Submit a letter to the Architect stating when the demonstration will be conducted.

PART 3 - EXECUTION

3.1 RACEWAY INSTALLATION - GENERAL:

- A. Wherever possible, install horizontal raceway runs above water and drain piping. Give the right-of-way in confined spaces to piping which must slope for drainage and to larger HVAC duct work and similar services which are less conformable than electrical services. *However, ensure that all junction boxes and other points of access in raceway systems are located such that they are not rendered inaccessible.*
- B. Complete the installation of electrical raceways before starting installation of cables within raceways.
- C. All above grade conduits shall be routed parallel or perpendicular to the building structure.
- D. **Raceways shall not be installed exposed in finished spaces or on the exterior of the building.** Install concealed in walls, ceilings, below slab-on-grade or embedded in slabs above grade. *Where raceway system serves surface mounted equipment (i.e. safety switch), mount equipment over recessed outlet box.*
- E. All exposed raceway systems shall be painted to match the surface to which it is attached. All components of the raceway system shall be painted, i.e. conduits, boxes, supports, etc. Painting is specified under other divisions of the work.
- F. Provide 200 lb. nylon pull cord in all conduits installed for cable systems specified under Division 23 and Division 27; and where conduits will be left empty for future use. Cap open ends and mark location of opposite end with black indelible marker pen.
- G. Seal the inside of all conduits entering the building from outside, whether they connect to enclosures or not.

- H. Do not run raceways atop the roof deck, through stairwells or elevator shafts.

3.2 BELOW SLAB AND IN-SLAB INSTALLATIONS: (within the building footprint)

- A. *Do not install conduits in slabs on-grade.* Raceways shall be routed under the first floor building slab. Conduits shall be routed such that the top of the conduit is a minimum of six inches below the slab.
- B. All 90 degree elbows and all stub-ups through the floor slab for all size conduits shall be corrosion protected RGS or corrosion protected IMC.
- C. Raceways in slabs above grade shall be totally embedded in the slab. They shall be placed above the lower reinforcing and below the upper reinforcing. The outer edge in no case shall be less than 1" from the surface of the slab. The corners of raceways at turnups into walls shall not be exposed at the wall/floor junction.

3.3 BELOW GRADE INSTALLATIONS: (outside the building footprint)

- A. Perform all excavating, trenching and backfilling to install work of this project in accordance with applicable sections of Division 2 of the specifications and ANSI C2. Bottom of trenches shall be smooth and level to provide uniform bearing for conduits.
- B. Secure conduits in trench to eliminate unnecessary curvature and to prevent movement of conduits while backfilling.
- C. Maintain 6" vertical separation between conduits installed one above the other. Backfill and compact each layer separately. The minimum cover requirements specified herein shall be referenced to the uppermost layer of conduits.
- D. Maintain minimum 12" horizontal and 6" vertical separation between conduits of different systems and between other underground utilities.
- E. Do not backfill until installed electrical work has been tested and accepted, wherever testing is indicated.
- F. Condition backfill material by either drying or adding water uniformly, to whatever extent may be necessary to facilitate compaction to the required densities. Do not backfill with frozen soil materials.
- G. Backfill simultaneously on opposite sides of electrical work, and compact simultaneously; do not dislocate the work from installed positions.
- H. Backfill excavations in 8" high courses of backfill material, uniformly compacted to the following densities (percent of maximum density, ASTM Standard Proctor), using power-driven hand-operated compaction equipment.

- | | |
|-------------------------------------|-----|
| 1. Lawn/Landscaped Areas: | 90% |
| 2. Roadways: | 95% |
| 3. Paved Area, Other than Roadways: | 95% |

- I. Backfill to elevations matching adjacent grades, at the time of backfilling excavations for mechanical work.
- J. Where compaction tests indicate lower densities of backfill than specified, continue compaction (and re-excavation and backfilling where necessary) and provide additional testing as directed by the Architect/Engineer.
- K. Minimum cover requirements:
 - 1. Service entrance and feeder conduits, 600V and below: 24".
- L. Secondary service entrance conduits:
 - 2. Install conduits using base, intermediate and top spacers specifically intended for non-concrete encasement. Install spacers every 5'.
 - 3. Backfill to top of conduits with river sand to ensure that compaction around spacers is achieved.

3.4 GRADE LEVEL PULL BOXES:

- A. Top of boxes shall be set flush with finished grade and shall be aligned parallel or perpendicular to predominant site features (i.e. sidewalks, etc.)
- B. The exact location of boxes shall be field determined based on existing conditions and coordination with other underground utilities.
- C. Conduits shall enter boxes through field-made openings in the sides of box. Conduits shall not enter the bottom of box. Make and seal all openings in accordance with the box manufacturer's recommendations.
- D. Provide a 6" layer of crushed rocks beneath open-bottom type boxes.

3.5 MOISTURE PROTECTION:

- A. Conduits entering refrigerated spaces - Provide sealing fitting at accessible location outside the refrigerated space. Seal raceway to prevent the entry of moisture.
- B. Where conduits pass from a conditioned space to a non-conditioned space, apply insulating electrical putty inside conduit, at an accessible location, to prevent the entry of moisture.
- C. Conduits and boxes installed in exterior walls shall not penetrate the vapor barrier.
- D. Boxes installed on the building exterior shall have gasketed covers. All conduits entering box shall be sealed with insulating electrical putty.

3.6 CORROSION PROTECTION:

- A. Corrosion protection for conduits passing through concrete slabs shall be by one of the following means:

1. Field-wrap conduits with tape, using with a 50 percent overlay. Tape shall be premium 7-mil, flame retardant, weather resistant tape. Resists temperature and moisture for splicing. Meets requirements of UL 510, HHI-595, and CSA 22.2.
 2. Conduits shall have a factory-applied polyvinyl chloride, plastic resin, or epoxy coating.
- B. All supporting materials installed exposed on the building exterior shall be hot-dipped galvanized after fabrication or provide an equivalent level of corrosion protection. Protect exterior raceway systems from damage while the building exterior is cleaned. Replace any portions of the system showing signs of rust at the time of final inspection.

3.7 GROUNDING:

- A. Metallic raceway systems shall be made electrically continuous to provide a low impedance path to ground for faults, as required by the NEC.

3.8 RACEWAY BENDS:

- A. Bend radius shall comply with the NEC and the requirements of the specific cabling system installed. For television and telephone service entrance conduits, consult with the local utility.
- B. All field bends shall be made with a tool specifically intended for the purpose.
- C. Tools using open flames are not acceptable for bending PVC conduit. Any section of conduit discolored or deformed in any way shall be cut out and replaced.

3.9 FLEXIBLE CONNECTIONS:

- A. Final connections to light fixtures may be made using 3/8" diameter flexible metal conduit not exceeding 6 feet in length.
- B. 1/2" diameter flexible metallic conduit may be used to fish existing walls, within the limits of NFPA 70.
- C. Final connections to motors and to other electrical equipment subject to movement and vibration shall be made using Liquid-tight flexible metal conduit not more than 24" long.

3.10 SLEEVES:

- A. Provide sleeves of the size and quantity required to install cabling systems specified under Division 23 and Division 27. Where multiple sleeves are required, install in a rectangular array.
- B. Make and seal all penetrations to maintain fire rating of member penetrated. Pay particular attention to the annular space required around the inside and outside of the penetrating item. Sealing compounds shall be re-enterable type.
- C. Coordinate the exact placement of sleeves with other trades to ensure they are readily accessible and are not obstructed by pipes, ductwork, etc.

- D. Sleeves shall be flush with both sides of the member penetrated unless otherwise required by the through penetration firestop system selected.

3.11 RACEWAY LAYOUT:

- A. Unless noted otherwise, the layout of all raceway systems is the responsibility of the Contractor.
- B. Provide pull points as required by the NEC and ensure that all such points are readily accessible and not blocked by ducts, pipes, etc.

3.12 WALL OUTLET LAYOUT:

- A. The location of devices shown on the drawings is schematic. Prior to roughing-in, review the Architectural interior elevations and millwork shop drawings, to ensure that outlets will not be installed behind cabinets or otherwise inaccessible. Ensure that there is sufficient space from door jamb, cabinets, etc. to install without trimming device cover.
- B. Outlets installed below countertops shall be centered in the kneespace.
- C. All outlets shall be installed vertically except where space above counter back splash and other features does not permit, and when installed in baseboards. In such cases, outlets shall be installed horizontally.
- D. Maintain uniform spacing of outlets shown to be side-by-side on the plans. Spacing shall not exceed 2" in framed walls. For masonry walls, install outlets in adjacent cells.
- E. Gang mount switches shown in the same location, unless noted otherwise. Provide metal barrier in boxes between switches, when switches are connected to opposite phases of systems exceeding 150V to ground.
- F. Mark the branch circuit identification on the cover of all outlet boxes.
- G. Provide separate outlet boxes and flexible final connections for fixtures provided with both normal and emergency power connections.

3.13 SUPPORTS:

- A. Raceways:
 - 1. Support all components of the electrical raceway system using wood screws to wood; by toggle bolts on hollow masonry units; by concrete inserts or expansion bolts on concrete or brick; by machine screws, welded threaded studs, or spring-tension clamps on steel work.
 - 2. Support individual raceways with conduit straps or clips. Support multiple runs using trapeze-type hangers. Trapeze hangers shall consist of 1-1/2" x 1-1/2" gage steel channels, 1/2" diameter threaded steel rods and conduit clamps. Attach rods to the building structure or to 1-1/2" x 1-1/2" gage steel channels span between adjacent structural members.
 - 3. Support conduits at distances required by the National Electrical Code. *Additional*

supports shall be provided at the points of tangency of all bends.

4. Joints in conduit systems shall coincide with point of support.
5. Provide expansion joints in all raceway systems in either of the following conditions:
 - a. In accordance with manufacturer's literature, based on length of run and temperature differential that will be encountered.
 - b. When raceways cross expansion joints.

B. Outlet Boxes:

1. Ceiling outlet boxes shall be supported by lightweight channel attached to structure with (2)-1/4" threaded rods and braced to prevent lateral movement. Boxes used to support ceiling paddle fans shall be listed for the purpose.
2. Masonry walls:
 - a. Install outlet boxes in sawcut openings.
 - b. Outlet boxes shall be grouted in place, back and sides. There shall no reveals around the perimeter of the box.
3. Framed walls:
 - a. Non-rated walls - Outlet boxes shall be attached to intermediate horizontal supports between vertical framing members. *Do not attach boxes to vertical members.*
 - b. Framed walls rated 1-hr or 2-hr, boxes 16 square inches or less - Compartmentalize each outlet box (top, bottom and sides) using same material as wall framing. All penetrations in framing members shall be sealed. Where penetrations exceed 100 square inches per 100 square feet of wall space, install in accordance with subparagraph "c" below.
 - c. Framed walls rated 1-hr or 2-hr, boxes exceeding 16 square inches - Compartmentalize boxes as specified above. Additionally, Boxes shall be covered back, top, bottom and all sides with drywall such that the rating is carried around the box. All penetrations in this envelope shall be sealed.
4. Boxes shall not be installed in walls rated more than 2-hr.
5. Do not install outlets back-to-back. Maintain 24" offset in rated walls and with no overlap in non-rated walls. Where groups of outlets are shown back-to-back, each group of outlets shall be shifted to accommodate the installation. *Exceptions: (1- Outlet boxes in non-rated masonry walls, may be installed back-to-back. Do not break webbing or connect boxes back-to-back. The use of thru-wall outlet boxes is not permitted. 2- The 24" offset may be eliminated in 1-hr and 2-hr walls when U.L. listed moldable putty is installed around box, in accordance with the U.L. Fire Resistance Directory.)*
6. Outlet boxes mounted in STC rated walls shall be sealed in accordance with Gypsum Association Document GA-600 "Fire Resistance Design Manual, Sound Control".
7. Cover of outlets installed flush mounted in walls shall be set back no more than 1/8" from face of wall.

3.14 ROUGH-IN FOR DIVISION 23 CONTROL WIRING:

- A. Provide outlet box and 3/4" conduit stubbed up to above accessible ceiling from each wall mounted device. Rough-in details shall be similar to that shown for Division 27 devices. Cabling support system above accessible ceilings for division 23 control wiring shall be supplied and installed by Division 23 contractor. In areas with exposed ceilings, such as mechanical rooms, provide complete conduit pathway to the associated control equipment.

3.15 ROUGH-IN FOR DIVISION 22 PLUMBING FIXTURE SENSORS:

- A. Provide outlet boxes for sensors and transformers furnished with the plumbing fixtures. Provide ½" conduit from each sensor location to a point within 6" of transformer outlet box, and terminate with insulated throat bushing.
- B. Provide wiring as described in the mechanical equipment connection schedule.

3.16 FIRESTOPPING:

- A. Do not proceed with firestopping until the field demonstration has been conducted.
- B. Seal all penetrations based on rating / element being penetrated. Penetrations in non-rated walls shall be rated 1-hour.

END OF SECTION 26 1010

SECTION 26 2010 - WIRES AND CABLES, 600V AND BELOW

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SCOPE OF WORK:

- A. The requirements of this section apply to the wire and cable work installed under this contract.

1.3 QUALITY ASSURANCE:

- A. Acceptable Manufacturers: Provide wires and cables from manufacturers who have been in business for a minimum of five years.
- B. Submittals: Refer to Section 260120 for requirements.

PART 2 - PRODUCTS

2.1 GENERAL:

- A. Wires and cables manufactured more than 12 months prior to date of delivery to the site shall not be used.

- B. Color Coding

- 1. Color shall be **green** for grounding conductors and **green with yellow stripe** for isolated grounding conductors.
- 2. The color of the circuit conductors shall be as follows:

120/208 volt, 3-phase	Phase A - Black Phase B -Red Phase C - Blue Neutrals – White (with stripes as specified below)
-----------------------	--

277/480 volt, 3-phase:	Phase A - Brown Phase B - Orange Phase C - Yellow Neutrals – Gray (with stripes as specified below)
------------------------	---

- C. All conductors shall be 600V copper, with 75 degrees C, THWN/THHN insulation. Minimum size shall be No. 12 AWG. Conductors within three inches of fixture ballasts shall be rated 90 degrees C. Sizes up to No. 10 AWG may be stranded; sizes No. 8 AWG and larger shall be concentric-lay-stranded. All control conductors shall be concentric-lay-stranded.
- D. Conductors used in flexible metal conduit and liquid-tight flexible metal conduit used for final connection to equipment shall be stranded.

PART 3 - EXECUTION

3.1 INSTALLATION GENERAL:

- A. No more than three phase conductors, each of opposite phases for a three phase WYE system, shall be combined in a single raceway without written permission from the Architect.
- B. For each ungrounded conductor, provide a dedicated neutral conductor, with stripe color to match ungrounded conductor insulation color.
- C. For each electrical connection/termination, provide a complete assembly of materials, including but not necessarily limited to, pressure connectors, terminals (lugs), electrical insulating tape, heat-shrinkable insulating tubing, cable ties, solderless wire nuts, and other materials necessary to complete splices and terminations. Torque all connections according to installation instructions.
- D. Motor connections shall be made with compression connectors forming a bolted in-line or stub-type connection. Connections shall be insulated with Raychem MCK motor connection kit.
- E. Splicing of feeder conductors shall not be acceptable, unless specifically indicated on the drawing. Where splicing of feeder conductors is indicated, splices shall be made using Raychem RVS splice kit and compression type butt splice.
- F. Numbers 10 and 12 AWG stranded conductors shall not be directly terminated to screw-type terminals. The use of Stacon type compression connectors is required.
- G. All conductors shall be installed in raceways.
- H. Make connections to wiring devices using "pigtails" within outlet boxes. *Direct connection (loop) to devices is not acceptable.*

3.2 DISTANCE LIMITATIONS FOR 20A BRANCH CIRCUITS:

- A. All 120 volt, 20 amp branch circuits exceeding 90 feet in length shall consist of No. 10 AWG circuit conductors. Increase conduit size accordingly.
- B. All 277 volt, 20 amp branch circuits exceeding 150 feet in length shall consist of No. 10 AWG circuit conductors. Increase conduit size accordingly.

END OF SECTION 26 2010

1.1 RELATED DOCUMENTS:

- ## 1.2 SCOPE OF WORK:

- ### 1.3 QUALITY ASSURANCE:

1. General Electric Company
2. Square D Company
3. Cutler Hammer
4. Siemens

- ## PART 2 - PRODUCTS

2.1 SAFETY AND DISCONNECT SWITCHES:

- Example – (not actual disconnect on project): HP-1
35.5A, 1ph, 208V
Fed from HA-2

- C. Nameplates shall be screwed and glued to the enclosure.**

- D. Enclosures: NEMA 1 general purpose enclosures indoors, NEMA 3R enclosures where noted or shown on drawings or exposed to weather.

2.2 MOTOR RATED SWITCHES:

- A. Switches shall be toggle-type, without overload protection, rated for the applied voltage and motor load.
- B. Label same as specified for disconnect switches, except install label on wall adjacent to switch.

2.3 ARC FLASH WARNING LABELS:

- A. All safety and disconnect switches shall have arc flash warning labels field affixed to their enclosures that comply with the requirements of NFPA 70 and NFPA 70E.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Coordinate safety and disconnect switch installation with surrounding equipment to provide clearance and workspace based on the voltage encountered, and to insure that the switch is within sight of the controller or driven equipment.
- B. Group and lace conductors within enclosure with nylon tie straps.
- C. **Location of safety switches shall be coordinated with the equipment installer.** Do not proceed with rough-in until location has been established.
- D. All switches associated with outdoor equipment shall be located as close to the equipment as possible (when equipment is in a service yard, switches shall also be in the service yard) and mounted such that the top of the switch is no more than 3'-0" above grade. All switches associated with equipment mounted above a lay-in ceiling shall also be located above the lay-in ceiling.

END OF SECTION 26 2021

SECTION 26 2080 - ELECTRICAL GROUNDING, 600V AND BELOW

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

- A. Provide grounding and bonding of systems and equipment as shown on the drawings, specified herein and as required by Article 250 of the NEC.
- B. The grounding electrode system is existing to remain.
- C. The following items shall be bonded to the grounding system:
 - 1. Equipment enclosures.
 - 2. Device terminals.
 - 3. Equipment grounding conductors.

1.3 RELATED WORK:

- A. Grounding and bonding for Lightning Protection Systems is specified in Section 265000.

1.4 QUALITY ASSURANCE:

- A. Acceptable Manufacturers: Use products of manufacturer's regularly engaged in the production of grounding systems products.
- B. Standards: IEEE Green Book - Grounding.
- C. Compliance / Labels: All materials shall be U.L. listed for grounding and bonding systems.
- D. Submittals: Refer to Section 260120 for requirements.

PART 2 - PRODUCTS

2.1 GENERAL:

- A. Where more than one type meets indicated requirements, selection is Installer's option. Where material or component is not otherwise indicated, provide products complying with U.L., NEC, and established industry standards.

2.2 CONDUCTORS:

- A. Equipment Grounding conductors: Insulated, stranded copper electrical grounding conductors complying with Section 262010, sized as shown. When no size is shown, select from Table 250-122 of the NEC.

2.3 CONNECTORS:

- A. Connections to items specified to be bonded to the grounding system may be by any U.L. listed product suitable for the application.

PART 3 - EXECUTION

3.1 GENERAL:

- A. Ensure that metal-to-metal contact is made between grounding connectors and painted or coated surfaces of equipment enclosures, piping systems, etc.
- B. Metallic raceway systems shall be made electrically continuous to provide a low impedance path to ground for faults, as required by the NEC.

3.2 EQUIPMENT GROUNDING CONDUCTORS:

- A. Install an equipment grounding conductor in all branch circuit and feeder raceways, sized in accordance with Article 250 of NFPA 70.
- B. Branch circuits serving isolated ground receptacles shall be provided with an isolated equipment grounding conductor in addition to the equipment grounding conductor.

3.3 BONDING:

- A. Bond interior metal piping systems to the service equipment ground bus. The connections shall be accessible.
- B. Bond metallic equipment enclosures to a lug installed within the enclosure, which is connected to an equipment grounding conductor.
- C. Bond standard device grounding terminals to metallic outlet box and to equipment grounding conductor.
- D. Bond equipment grounding conductor to metallic boxes where splices are made.

3.4 BONDING BUSHINGS AND LOCKNUTS:

A. Bushings and locknuts shall be required:

1. When required by the NEC for voltages in excess of 250V. Bonding conductor shall be sized per the NEC.
2. When terminating conduits in concentric or eccentric knockouts. Bonding conductor shall be sized per the NEC.
3. For all connectors that are **not** U.L. listed as suitable for grounding.

B. Bushings shall be connected to the respective enclosure by an equipment grounding conductor sized in accordance with Article 250 of the NEC.

3.5 TESTING:

- A. Upon completion of installation of electrical grounding system, test resistance of each ground rod installation using the "Fall of Potential" method. Ground resistance shall be measured in normally dry conditions not less than 48 hours after rainfall. Where tests show resistance to ground is over 25 ohms, take appropriate action to reduce resistance to 25 ohms or less by driving additional sections of ground rods and/or by chemically treating soil encircling ground rod; then retest to demonstrate compliance. Provide forms to record the data as the tests are conducted. Forms shall be signed by the person conducting the test.

END OF SECTION 26 2080

LEGEND:

ELECTRICAL EQUIPMENT:

VERIFY LOAD AND LOCATION WITH EQUIPMENT OUT-SHETS AND INSTALLER.



ABBREVIATIONS:

A AMPERES	K.E. KITCHEN	MS MAIN BREAKER
AFV ABOVE FINISHED FLOOR	C CONDUIT	MCA MINIMUM CIRCUIT AMP
AFS ABOVE FINISHED GRADE	DA DIMMER	MS MINIMUM
AI AIR HANDLER	ECB ENCLOSED CIRCUIT BREAKER	MOCP MAXIMUM OVERCURRENT PROTECTION
AC AMPERE INTERRUPTING CAPACITY	FAP FIRE ALARM PANEL	MTS MOUNTED
ATU AIR TERMINAL UNIT	FACP FIRE ALARM CONTROL PANEL	NAL NUMBER
AV AUDIO/VIDEO	G GROUND	NEC NATIONAL ELECTRICAL CODE
AWG AMERICAN WIRE GAUGE	GFI GROUND-FAULT INTERRUPTER	NTS NOT TO SCALE
BFG BELOW FINISHED GRADE	HP HORSE POWER	PIV PIVOT INDICATOR VALVE
	KWH KILOWATT HOUR	RSS RUST GALVANIZED STEEL

GENERAL PROJECT NOTE:

CONTRACTOR SHALL VISIT THE SITE AND CAREFULLY EXAMINE THOSE PORTIONS OF THE SITE AFFECTED BY THIS WORK BEFORE SUBMITTING PROPOSALS. GOALS TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT EXECUTION OF WORK. SUBMITTAL OF A PROPOSAL WILL BE CONSIDERED AN AWARD THAT SUCH EXAMINATION HAS BEEN MADE AND LATES CLAIMS FOR UNLAWFUL EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES DISCOVERED SHALL NOT BE ALLOWED.

MCC-N

BLANK
BLANK
EXISTING CT-3 FAN MOTOR
EXISTING CHILLER #3

MCC-1

(NOTE 16) EXISTING CT-1 HEATER	(NOTE 13) EXISTING CT-2 FAN MOTOR	(NOTE 9) EXISTING CT-3 HEATER
	(NOTE 14) EXISTING CT-1 FAN MOTOR	(NOTE 10) EXISTING CWP-3 PUMP MOTOR
EXISTING CHILLER #2	(NOTE 14) EXISTING CT-1 FAN MOTOR	(NOTE 11) EXISTING CWP-2 PUMP MOTOR
	(NOTE 15) EXISTING CT-2 HEATER	(NOTE 12) EXISTING CWP-1 PUMP MOTOR
EXISTING CHILLER #1	EXISTING EP-2	BLANK

EXISTING MOTOR CONTROL CENTERS -

DEMOLITION WORK

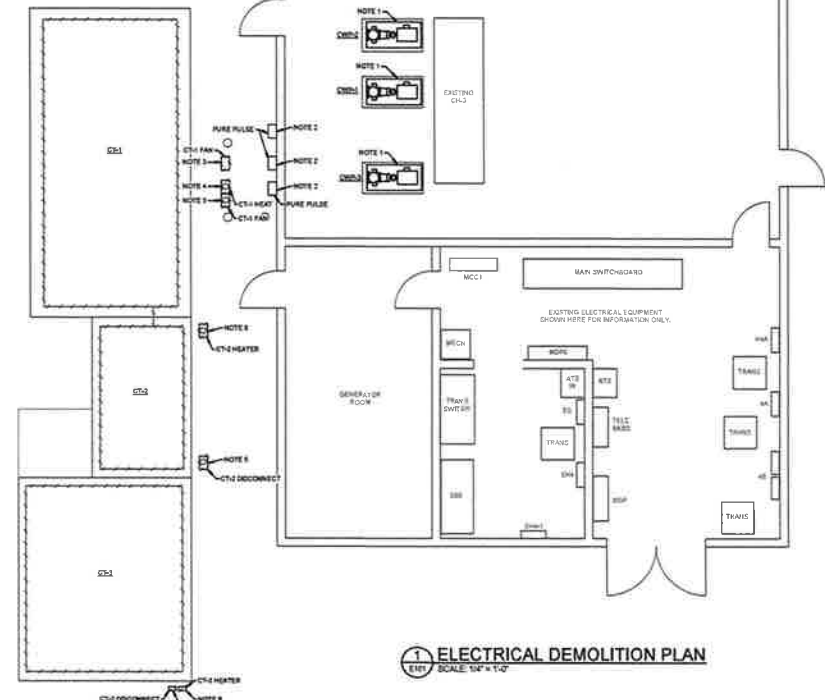
SCALE: 1/4" = 1'-0"

DEMOLITION GENERAL NOTES:

- THIS PLAN HAS BEEN PROVIDED AS A GENERAL SCOPE OF DEMOLITION. THE CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS AND REMOVE ITEMS INDICATED IN THESE DEMOLITION NOTES ON THIS SHEET. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DEMOLITION OF ALL ITEMS NOT SHOWN ON THIS SHEET.
- THERE IS NO ELECTRICAL DEMOLITION EXCEPT AS SPECIFICALLY NOTED OR SHOWN.
- REMOVE ELECTRICAL CONNECTIONS (WIRING) TO MECHANICAL EQUIPMENT BEING REMOVED ONLY. DO NOT REMOVE OTHERS. COORDINATE WITH MECHANICAL PLANS.
- ALL EXISTING EQUIPMENT REMOVED FROM SERVICE AND NOT ATTACHED FOR REUSE SHALL REMAIN THE PROPERTY OF OWNER AND SHALL BE REMOVED OR RE-INSTALLED AS DIRECTED BY THE OWNER, OR AS REQUESTED ON PLANS.
- MAINTAIN SERVICE TO ALL EXISTING CIRCUITS THAT ARE NOT SCHEDULED FOR REMOVAL. REMOVE ONLY A PORTION OF A CIRCUIT LONG AS SCHEDULED TO BE REMOVED. REMOVE ONLY THAT PORTION ASSOCIATED WITH THE DEMOLITION OBJECT TO A POINT BEFORE THE REMAINING LONG AS ACTIVE AND MAINTAIN IN A GOOD OPERATING CONDITION.
- EXISTING EQUIPMENT NOT SCHEDULED FOR DEMOLITION OR MECHANICAL OR ELECTRICAL DEMOLITION SHALL HAVE SERVICE MAINTAINED OR DISCONNECTED TO EXISTING OR NEW PANELBOARDS AS NECESSARY.
- COORDINATE ELECTRICAL DEMOLITION WITH MECHANICAL DEMOLITION. PROVIDE FITTING, UNIFORM NOTING AND ACCESSORIES TO MEET CONDITIONS. COORDINATE NOTING OF ALL NEW FEEDERS WITH EXISTING SITE ELEMENTS. ALL FEEDERS SHALL BE CONCEALED WHERE POSSIBLE.
- FIELD VERIFY EXACT LOCATIONS OF ALL EXISTING DEVICES AND EQUIPMENT NOTED OR SHOWN.
- EXISTING INFORMATION INDICATED ON THE DRAWING IS NOT TO BE CONSIDERED FULLY COMPLETE AND ACCURATE WITH REGARD TO EXACT QUANTITY AND LOCATIONS OF ALL SYSTEM COMPONENTS. INFORMATION CONTAINED HEREIN SHALL BE USED BY THE CONTRACTOR AS A GUIDE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DEMOLITION OF ALL EXISTING COMPONENTS PRIOR TO BEGINNING DEMOLITION WORK.
- THROUGHOUT DEMOLITION AREAS ABANDONED CABLE SHALL BE REMOVED IN ACCORDANCE WITH ALL APPLICABLE RULES.
- CONTRACTOR SHALL REMOVE ANY UNLAWFUL WHERE EXPOSED.
- CONTRACTOR SHALL VISIT THE SITE AND INSPECT EXISTING CONDITIONS. EQUIPMENT, CIRCUIT BREAKERS, CONDUIT, AND CONDUITS PRIOR TO PLACING THE CONTRACTOR SHALL INCLUDE IN HIS PRICE ANY REMOVAL OF EXISTING EQUIPMENT OR MATERIALS REQUIRED IN ORDER TO ACCOMMODATE COMPLETE SCOPE OF WORK. COORDINATE WITH THE COMPLETE SET OF MECHANICAL DRAWINGS AND SPECIFICATIONS.
- REFER TO MECHANICAL DRAWINGS AND SPECIFICATIONS FOR PROJECT PHASING OF DEMOLITION AND CONSTRUCTION OPERATIONS.

NOTES:

- EXISTING CWP-1, CWP-2, AND CWP-3 ARE TO BE REPLACED, IF POSSIBLE, REUSE EXISTING CONDUIT AND CONDUITS, OTHERWISE PROVIDE (FOR EACH UNIT) 2" AND 1" IN 1" EXISTING CONDUIT.
- PURE PULSE UNIT TO BE DEMOLISHED, REMOVE CONDUIT AND CONDUITS BACK TO PANELBOARD. REFER TO SHEET E201 FOR REUSE OF EXISTING CONDUIT FOR TOWER SENSOR AND CONTROLS.
- EXISTING CT-1 MOTOR DISCONNECT TO BE REMOVED, REMOVE ASSOCIATED CONDUITS BACK TO PANELBOARD.
- EXISTING CT-1 HEATER DISCONNECT SWITCH TO BE REMOVED, REMOVE ASSOCIATED CONDUITS BACK TO PANELBOARD.
- EXISTING CT-2 MOTOR DISCONNECT SWITCH TO BE REMOVED, REMOVE ASSOCIATED CONDUITS BACK TO PANELBOARD.
- EXISTING CT-2 HEATER DISCONNECT SWITCH TO BE REMOVED, REMOVE ASSOCIATED CONDUITS AND CONDUIT BACK TO PANELBOARD.
- EXISTING CT-3 MOTOR DISCONNECT SWITCH TO BE REMOVED, REMOVE ASSOCIATED CONDUITS BACK TO PANELBOARD. IF POSSIBLE, REUSE EXISTING ASSOCIATED CONDUIT.
- CT-3 HEATER DISCONNECT SWITCH TO BE REMOVED, REMOVE ASSOCIATED CONDUITS BACK TO PANELBOARD. IF POSSIBLE, REUSE EXISTING ASSOCIATED CONDUIT.
- REMOVE EXISTING CT-3 HEATER MOTOR CONTROL ASSEMBLY. REMOVE ASSOCIATED CONDUITS BACK TO PANELBOARD. IF POSSIBLE, REUSE EXISTING ASSOCIATED CONDUIT.
- EXISTING CWP-3 TOWER PUMP MCC BUCKET AND INTERNAL COMPONENTS TO REMAIN AS IS.
- EXISTING CWP-2 TOWER PUMP MCC BUCKET AND INTERNAL COMPONENTS TO REMAIN AS IS.
- EXISTING CWP-1 TOWER PUMP MCC BUCKET AND INTERNAL COMPONENTS TO REMAIN AS IS.
- EXISTING CT-2 FAN MCC ASSEMBLY SHALL BE REMOVED, REMOVE ASSOCIATED CONDUITS BACK TO PANELBOARD. IF POSSIBLE, REUSE EXISTING ASSOCIATED CONDUIT.
- EXISTING CT-1 FAN MCC ASSEMBLY SHALL BE REMOVED, REMOVE ASSOCIATED CONDUITS BACK TO PANELBOARD. IF POSSIBLE, REUSE EXISTING ASSOCIATED CONDUIT.
- EXISTING CT-1 HEATER MCC ASSEMBLY SHALL BE REMOVED, REMOVE ASSOCIATED CONDUITS BACK TO PANELBOARD. IF POSSIBLE, REUSE EXISTING ASSOCIATED CONDUIT.
- EXISTING CT-3 HEATER MCC ASSEMBLY SHALL BE REMOVED, REMOVE ASSOCIATED CONDUITS BACK TO PANELBOARD. IF POSSIBLE, REUSE EXISTING ASSOCIATED CONDUIT.



1 ELECTRICAL DEMOLITION PLAN

SCALE: 1/4" = 1'-0"

CHATHAM COUNTY SHERIFF COOLING TOWER REPLACEMENT

1050 CARL GRIFFIN DRIVE

SAVANNAH, GA 31405

ELECTRICAL DEMOLITION PLAN

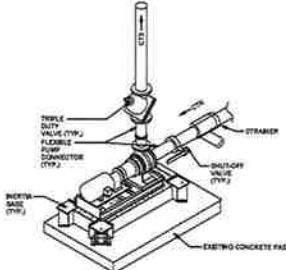
DATE	2/1/2019
BY	ELIOT 2019
CHKD	MEC
APPV	WOW

SHEET NUMBER:
E101

DULOHERY WEEKS
ELECTRICAL ENGINEERS
1202 HUNTERMAN DRIVE, SUITE 100
SAVANNAH, GA 31405
PHONE 912.344.4444

PUMP SCHEDULE						
ITEM	SERVICE	GPM	HEAD FT.	MOTOR HP	TYPE	REMARKS
CHW-1	COOLING TOWER	875	45	30	LEFT/RIGHT END RETURN	TACO PM11B
CHW-2	COOLING TOWER	875	45	30	CENTER/END RETURN	TACO PM11B
CHW-3	COOLING TOWER	875	45	30	CENTER/END RETURN	TACO PM11B

1. REFER TO ELECTRICAL PLANS FOR POWER CONNECTIONS. REFER TO SPEC SECTION 2310 FOR FURTHER INFORMATION.



- INSTALL PRESSURE GAUGES ON Suction OF PUMP INLET, Suction OF PUMP OUTLET AND PUMP DISCHARGE.
- INLET/OUTLET ISOLATION PUMP GROUP SHALL CONSIST OF FLOW CONTROL, VIBRATION-CONTROLLING FLEXIBLE COUPLINGS, ACCESS PORTS FOR GAUGES AND THERMOWELLS, STRAINER AND AN INTERNAL FLANGED PUMP CONNECTION.
- OUTLET/ISOLATION PUMP GROUP SHALL CONSIST OF FLOW CONTROL, VIBRATION-CONTROLLING FLEXIBLE COUPLINGS, ACCESS PORTS FOR GAUGES AND THERMOWELLS, CHECK VALVE AND AN INTERNAL FLANGED PUMP CONNECTION.
- ALL PUMPS AND MOTORS SHALL BE LAID/ASSEMBLED AFTER COMPLETE PUMP ASSEMBLY HAS BEEN LEVELLED.

3 BASE MOUNTED PUMP DETAIL
SCALE: NOT TO SCALE

ADD ALTERNATE #1

MECHANICAL CONTROLS:

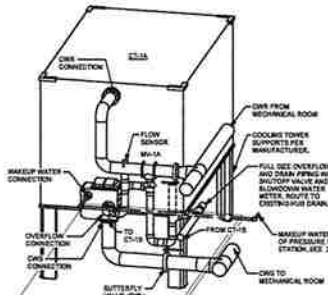
- COOLING TOWER CONTROL PANEL SHALL MODULATE TOWER FANS AS NEEDED TO MAINTAIN BASIN WATER TEMPERATURE.
- BASIN HEATERS SHALL BE ENERGIZED AS NEEDED TO PREVENT ICE IN TOWER COLD WATER BASIN.
- EXISTING BUILDING MANAGEMENT SYSTEM SHALL MONITOR COOLING TOWER PANEL AND SET REQUIRED COLD WATER BASIN TEMPERATURE.
- THE BUILDING MANAGEMENT SYSTEM SHALL MODULATE MOTORIZED VALVES MV-1A AND MV-1B AS NEEDED TO ALLOW EQUAL FLOW TO EACH COOLING TOWER.
- FLOW SENSOR SHALL BE INSTALLED IN COMPLIANCE WITH SPEC SECTION 2311.0. COORDINATE EXACT LOCATION IN PIPE WITH MANUFACTURER'S RECOMMENDATIONS. OUTPUT SHALL TIE INTO EXISTING BUILDING MANAGEMENT SYSTEM BY SIEMENS FOR CONTROL OF MV-1A AND MV-1B BY THE BUILDING MANAGEMENT SYSTEM.

SCOPE OF WORK:

- REMOVE CT-1 AND CT-2.
- INSTALL NEW CT-1A AND CT-1B.
- REMOVE CT-3 AFTER CT-1A IS OPERATIONAL.
- REMOVE OLD PULSE PUMP SYSTEMS.
- REMOVE WATER METERS.
- EXTEND CONDENSER PIPING FROM CH-3 TO MAIN PIPE.
- ONE CHILLER HAS TO BE OPERATIONAL AT ALL TIMES.
- ADD ALTERNATE #1 IS TO REPLACE (3) CONDENSER WATER PUMPS (CWP's).
- NO PIPING CHANGES INSIDE EXCEPT FOR PUMP CHANGE OUT.
- ALL PIPING TO BE OUTSIDE.

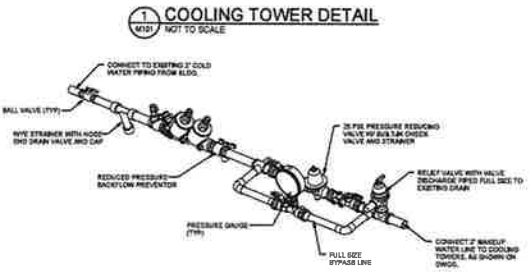
COOLING TOWER SCHEDULE						
ITEM	SERVICE	CONDENSER WATER GPM	DESIGN WET BULB °F	MAX. MOTOR HP	BASIN HEATER KW	REMARKS
CT-1A	CONDENSER WATER	1,251	80.0	30	70	2 FANS @ 1/2 HP EACH
CT-1B	CONDENSER WATER	1,251	80.0	30	70	2 FANS @ 1/2 HP EACH

NOTES:
1. REFER TO ELECTRICAL PLANS FOR POWER CONNECTIONS. REFER TO SPEC SECTION 2341.0 FOR FURTHER INFORMATION.
2. (2) BASIN HEATING ELEMENTS PER MODULE AT 480V.



1 COOLING TOWER DETAIL
SCALE: NOT TO SCALE

- CONDENSER AND CHW PIPES ABOVE GROUND SHALL BE WRAPPED WITH HEAT TAPE, INSULATION AND METAL JACKETS.
- ROUTE CHW PIPING TOWARD DRAIN BELOW TOWER. PROVIDE 2" AIR GAP BETWEEN DRAIN PIPING AND RUS DRAIN.
- REMOVE SHUT-OFF VALVE ON CHW PIPING.
- INSTALL AN ELECTRICAL SUPPLY WATER TIE AND ASSOCIATED CONTROL WIRING.
- MINIMUM HEIGHT OF THE BOTTOM OF COOLING TOWER SHALL BE 4" ABOVE CONCRETE HOUSEKEEPING FLOOR.
- CONCRETE FLOOR FINISHES AND DESIGN SHALL BE DETERMINED BY A STRUCTURAL ENGINEER AS PART OF CONTRACTOR RESPONSIBILITY AND COST.



2 PRESSURE REDUCING STATION DETAIL
SCALE: NOT TO SCALE

MECHANICAL LEGEND		
ABBREVIATION	SYMBOL	DESCRIPTION
CD	—C—	COLD WATER PIPING
WR	—W—	WASTE PIPING
NG	—NG—	NATURAL GAS PIPING
CHW	—CHW—	CHILLED WATER SUPPLY PIPING
CHWR	—CHWR—	CHILLED WATER RETURN PIPING
CW	—CW—	CONDENSER WATER SUPPLY PIPING
CWR	—CWR—	CONDENSER WATER RETURN PIPING
HWR	—HWR—	HOT WATER SUPPLY PIPING
HWR	—HWR—	HOT WATER RETURN PIPING
GV	—GV—	GATE VALVE (SHUT-OFF VALVE)
SV	—SV—	SHUTTER VALVE
WV	—WV—	WATER VALVE
CON	—CON—	CONNECT TO EXISTING
AD	—AD—	ACCESS DOOR
W	—W—	WITH
AT	—AT—	ABOVE FRESH FLOOR
FG	—FG—	ABOVE FRESH GRADE
AD	—AD—	ABOVE CEILING
FL	—FL—	BELOW FLOOR
GN	—GN—	GALLONS PER MINUTE
PS	—PS—	POUNDS PER SQUARE INCH
UG	—UG—	UNDERGROUND
TY	—TY—	TYPICAL
CH	—CH—	CHILLER
CT	—CT—	COOLING TOWER
R	—R—	ROOF
CWP	—CWP—	CONDENSER WATER PUMP
HWP	—HWP—	HOT WATER PUMP
AS	—AS—	AIR SEPARATOR
ET	—ET—	EXPANSION TANK
NG	—NG—	NATURAL GAS
PRV	—PRV—	PRESSURE RELIEF VALVE
CD	—CD—	COLD
SPH	—SPH—	GALLONS PER HOUR
CON	—CON—	CONNECTION
ARCH	—ARCH—	ARCHITECTURAL
PR	—PR—	PRESSURE
WC	—WC—	WATER COLUMN
BRG	—BRG—	BRASS
CFM	—CFM—	CUBIC FEET PER HOUR

GENERAL NOTES:

- THE DRAWINGS SHOW THE GENERAL ARRANGEMENT AND LOCATION OF THE MECHANICAL AND PLUMBING WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF SAVANNAH, GEORGIA.
- PIPING SHOWN ON THE PLANS IS SIZED AND ROUTED BASED ON INFORMATION AVAILABLE DURING DESIGN PHASE FOR EXISTING CONDITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE SIZES AND ROUTES OF ALL PIPING AND EQUIPMENT SHOWN HEREIN BEFORE BEGINNING WORK.
- ALL SITE UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS ONLY. VERIFY EXACT LOCATION AND INVERT ELEVATION IN FIELD BEFORE BEGINNING WORK.
- ALL EXISTING PIPING SHALL BE SUPPORTED FROM FLOOR AND/OR STRUCTURAL MEMBERS IS, IN NO CASE SHALL PIPING BE SUPPORTED FROM FLOOR OR CEILING LESS THAN 4" FROM CONCRETE.
- PIPE STOP ALL PENETRATIONS OF FIRE RATED ASSEMBLIES.
- PROVIDE PLUMB TRAP SEALS ON ALL FLOOR DRAINS NOT PROVIDED WITH TRAP PRIMERS.
- PROVIDE DRAIN VALVES AT ALL LOW POINTS IN ALL WATER PIPING SYSTEMS.
- ALL WATER, VENT, AND OVERFLOW PIPING SHALL BE INSTALLED ABOVE GROUND UNLESS NOTED OTHERWISE.
- AUTOMATIC AIR VENTS ON TOP OF AIR SEPARATORS SHALL BE PIPED FULL SIZE TO NEAREST FLOOR DRAIN.

DEMOLITION NOTES

- THE DRAWINGS SHOW THE GENERAL ARRANGEMENT AND LOCATION OF EXISTING MECHANICAL AND PLUMBING WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF SAVANNAH, GEORGIA.
- HATCHING INDICATES ITEMS TO BE DEMOLISHED UNLESS NOTED OTHERWISE. DEMOLITION SHALL BE COMPLETED BY THE CONTRACTOR. DEMOLITION OF ANY ITEM SHALL INCLUDE REMOVAL OF SUPPORTS, BRACKETS, PIPING, CONDUIT, WIRING, CONTROL, ETC. UNLESS NOTED OTHERWISE, DEMOLITION SHALL BE COMPLETED BY THE CONTRACTOR. DEMOLITION SHALL BE COMPLETED BY THE CONTRACTOR. DEMOLITION SHALL BE COMPLETED BY THE CONTRACTOR.
- AT LOCATIONS WHERE MECHANICAL AND PLUMBING DEMOLITION RESULTS IN WALL CHANGES, ALL SUCH CHANGES SHALL BE CLOSURE OFF WITH WALL, PARTITION, AND FINISHES TO MATCH EXISTING. IF ANY SUCH WALLS ARE FINISHED, THE FINISHES MUST BE MAINTAINED. ENSURE THAT EXISTING WALLS, PARTITIONS, AND FINISHES ARE NOT DAMAGED BY DEMOLITION. IF DEMOLITION IS REQUIRED, IT SHALL BE COMPLETED BY THE CONTRACTOR. DEMOLITION SHALL BE COMPLETED BY THE CONTRACTOR.
- COORDINATE THE DEMOLITION OF EQUIPMENT AND ALL ASSOCIATED ITEMS WITH FINISHES AS DIRECTED BY THE OWNER. IF THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT DEMOLITION OF AN ITEM DOES NOT AFFECT THE FINISHES OR THE FINISHES ARE DAMAGED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING THE FINISHES TO MATCH EXISTING.
- THE WORK SHALL BE PHASED SO THAT AT LEAST ONE COOLING TOWER IS ALWAYS OPERATIONAL.
- ALL WORK SHALL BE COORDINATED THROUGH THE SHERIFF'S FACILITY DEPARTMENT STAFF.

CHATHAM COUNTY SHERIFF COOLING TOWER REPLACEMENT

1050 CARL GRIFFIN DRIVE
SAVANNAH, GA 31405

MECHANICAL LEGEND & SCHEDULES



**DULOHERY
WEEKS**
ENGINEERING
1050 CARL GRIFFIN DRIVE
SAVANNAH, GA 31405
PHONE: (912) 434-4444
FAX: (912) 434-4444

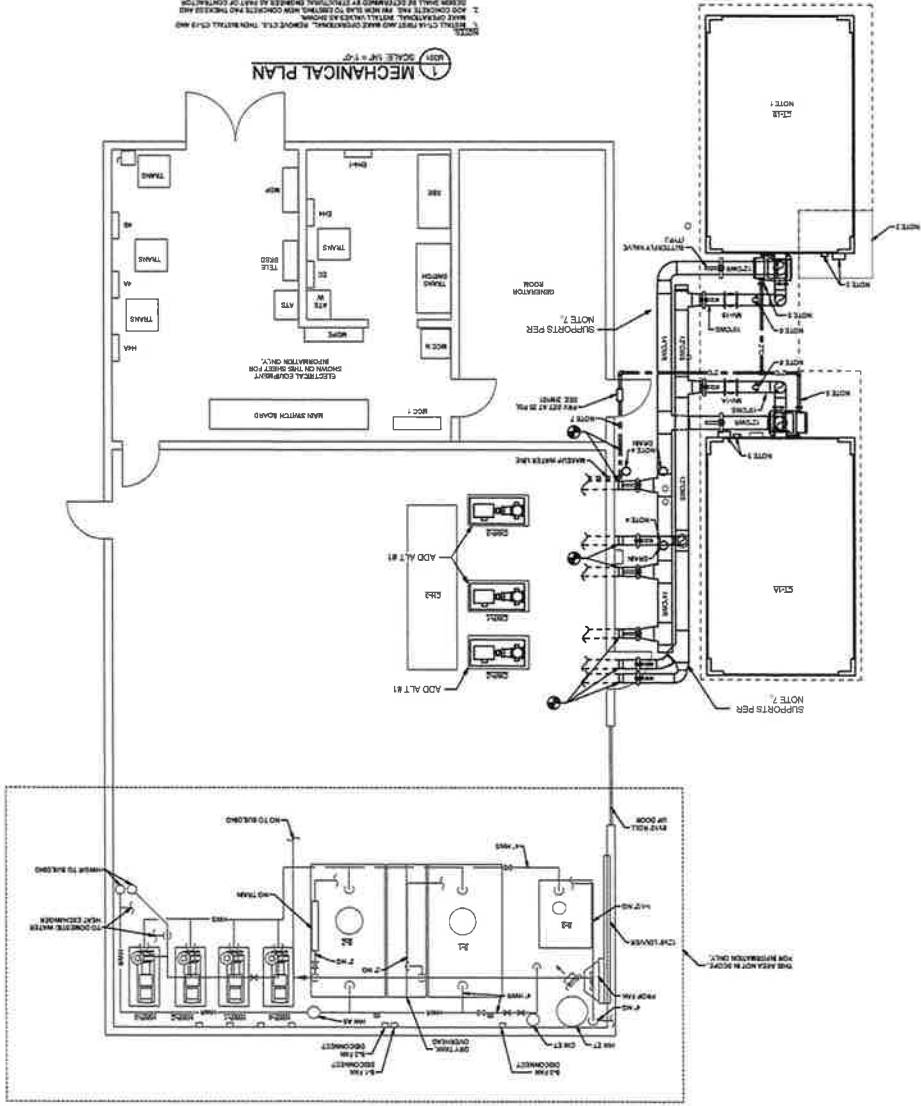
PROJECT	1050
DATE	10/01/2019
BY	RSW
DATE	10/11/2019
BY	RSW

SHEET
NUMBER:
M101



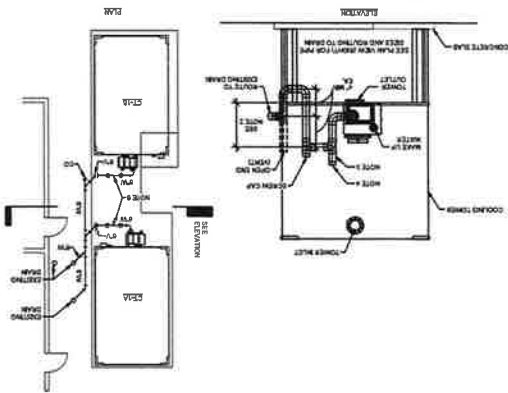
- NOTES:
1. ALL COOLING TOWER PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.
 2. COOLING TOWER PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.
 3. COOLING TOWER PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.
 4. COOLING TOWER PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.
 5. COOLING TOWER PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.
 6. COOLING TOWER PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.
 7. COOLING TOWER PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.
 8. COOLING TOWER PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.
 9. COOLING TOWER PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.
 10. COOLING TOWER PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.

MECHANICAL PLAN
SCALE: 1/4" = 1'-0"



COOLING TOWER OVERFLOW PIPING
SCALE: 1/4" = 1'-0"

- NOTES:
1. COOLING TOWER OVERFLOW PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.
 2. COOLING TOWER OVERFLOW PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.
 3. COOLING TOWER OVERFLOW PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.
 4. COOLING TOWER OVERFLOW PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.
 5. COOLING TOWER OVERFLOW PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.
 6. COOLING TOWER OVERFLOW PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.
 7. COOLING TOWER OVERFLOW PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.
 8. COOLING TOWER OVERFLOW PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.
 9. COOLING TOWER OVERFLOW PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.
 10. COOLING TOWER OVERFLOW PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING NOTES.



ATTACHMENT A

DRUG - FREE WORKPLACE CERTIFICATION

THE UNDERSIGNED CERTIFIES THAT THE PROVISIONS OF CODE SECTIONS 50-24-1 THROUGH 50-24-6 OF THE OFFICIAL CODE TO GEORGIA ANNOTATED, RELATED TO THE ****DRUG-FREE WORKPLACE****, HAVE BEEN COMPLIED WITH IN FULL. THE UNDERSIGNED FURTHER CERTIFIES THAT:

1. A Drug-Free Workplace will be provided for the employees during the performance of the contract; and
2. Each sub-contractor under the direction of the Contractor shall secure the following written certification:

_____ (CONTRACTOR) certifies to Chatham County that a Drug-Free Workplace will be provided for the employees during the performance of this contract known as **COOLING TOWER REPLACEMENT AT THE CHATHAM COUNTY DETENTION CENTER** (PROJECT) pursuant to paragraph (7) of subsection (B) of Code Section 50-24-3. Also, the undersigned further certifies that he/she will not engage in the unlawful manufacture, sale, distribution, possession, or use of a controlled substance or marijuana during the performance of the contract.

CONTRACTOR

DATE

NOTARY

DATE

ATTACHMENT B

PROMISE OF NON-DISCRIMINATION STATEMENT

Know All Men By These Presence, that I (We), _____
Name

Title Bidder Name of

(herein after Company) in consideration of the privilege to bid/or propose on the following
Chatham County project procurement **COOLING TOWER REPLACEMENT AT THE
CHATHAM COUNTY DETENTION CENTER** hereby consent, covenant and agree as
follows:

- (1) No person shall be excluded from participation in, denied the benefit of or otherwise discriminated against on the basis of race, color, national origin or gender in connection with the bid submitted to Chatham County or the performance of the contract resulting therefrom;
- (2) That it is and shall be the policy of this Company to provide equal opportunity to all business persons seeking to contract or otherwise interested with the Company, including those companies owned and controlled by racial minorities, and women;
- (3) In connection herewith, I (We) acknowledge and warrant that this Company has been made aware of, understands and agrees to take affirmative action to provide minority and women owned companies with the maximum practicable opportunities to do business with this Company on this contract;
- (4) That the promises of non-discrimination as made and set forth herein shall be continuing throughout the duration of this contract with Chatham County;
- (5) That the promises of non-discrimination as made and set forth herein shall be and are hereby deemed to be made a part of and incorporated by reference in the contract which this Company may be awarded;
- (6) That the failure of this Company to satisfactorily discharge any of the promises of non-discrimination as made and set forth above may constitute a material breach of contract entitling the County to declare the contract in default and to exercise appropriate remedies including but not limited to termination of the contract.

Signature

Date

ATTACHMENT C
DISCLOSURE OF RESPONSIBILITY STATEMENT

Failure to complete and return this information will result in your bid/offer/proposal being disqualified from further competition as non-responsive.

1. List any convictions of any person, subsidiary, or affiliate of the company, arising out of obtaining, or attempting to obtain a public or private contract or subcontract, or in the performance of such contract or subcontract.

2. List any indictments or convictions of any person, subsidiary, or affiliate of this company for offenses such as embezzlement, theft, fraudulent schemes, etc. or any other offenses indicating a lack of business integrity or business honesty which affects the responsibility of the contractor.

3. List any convictions or civil judgments under states or federal antitrust statutes.

4. List any violations of contract provisions such as knowingly (without good cause) to perform, or unsatisfactory performance, in accordance with the specifications of a contract.

5. List any prior suspensions or debarments by any governmental agency.

6. List any contracts not completed on time.

7. List any penalties imposed for time delays and/or quality of materials and workmanship.

8. List any documented violations of federal or any state labor laws, regulations, or standards, occupational safety and health rules.

I, _____, as _____
Name of individual Title & Authority

of _____, declare under oath that

Company Name _____

the above statements, including any supplemental responses attached hereto, are true.

Signature

State of _____

County of _____

Subscribed and sworn to before me on this _____ day of _____

20__ by _____ representing him/herself to be

_____ of the company named herein.

Notary Public

My Commission expires:

Resident State: _____

DPC Form #45

ATTACHMENT D

CONTRACTOR AFFIDAVIT under O.C.G.A. § 13-10-91(b)(1)

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services on behalf of CHATHAM COUNTY has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned contractor will continue to use the federal work authorization program throughout the contract period and the undersigned contractor will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present an affidavit to the contractor with the information required by O.C.G.A. § 13-10-91(b). Contractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Federal Work Authorization User Identification Number

Date of Authorization

Name of Contractor

Name of Project

Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on _____, ____, 201__ in _____(city), _____(state).

Signature of Authorized Officer or Agent

Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME
ON THIS THE _____ DAY OF _____, 201__.

NOTARY PUBLIC

My Commission Expires:

SUBCONTRACTOR AFFIDAVIT under O.C.G.A. § 13-10-91(b)(3)

By executing this affidavit, the undersigned subcontractor verifies its compliance with O.C.G.A. 13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services under a contract with _____ (name of contractor) on behalf of CHATHAM COUNTY has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned subcontractor will continue to use the federal work authorization program throughout the contract period and the undersigned subcontractor will contract for the physical performance of services in satisfaction of such contract only with sub-subcontractors who present an affidavit to the subcontractor with the information required by O.C.G.A. § 13-10-91 (b). Additionally, the undersigned subcontractor will forward notice of the receipt of an affidavit from a sub-subcontractor to the contractor within five (5) business days of receipt. If the undersigned subcontractor receives notice of receipt of an affidavit from any sub-subcontractor that has contracted with a sub-subcontractor to forward, within five (5) business days of receipt, a copy of such notice to the contractor. Subcontractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Federal Work Authorization User Identification Number

Date of Authorization

Name of Subcontractor

Name of Project

Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on _____, ___, 201__ in _____ (city), _____ (state).

Signature of Authorized Officer or Agent

Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME
ON THIS THE _____ DAY OF _____, 201__.

NOTARY PUBLIC
My Commission Expires:

ATTACHMENT E

BIDDER'S CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

The undersigned certifies, by submission of this proposal or acceptance of this contract, that neither Contractor nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency, State of Georgia, City of Savannah, Board of Education of local municipality. Bidder agrees that by submitting this proposal that Bidder will include this clause without modification in all lower tier transactions, solicitations, proposals, contracts, and subcontracts. Where the Bidder or any lower tier participant is unable to certify to this statement, that participant shall attach an explanation to this document.

Certification - the above information is true and complete to the best of my knowledge and belief.

(Printed or typed Name of Signatory)

(Signature)

(Date)

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001

END OF DOCUMENT Mod. CC P & C 6/2005

ATTACHMENT F

**Chatham County
Minority and Women Business Enterprise Program
M/WBE Participation Report**

Name of Bidder: _____

Name of Project: _____

Bid No: _____

M/WBE Firm	Type of Work	Contact Person/ Phone #	City, State	%	MBE or WBE

MBE Total _____

WBE Total _____%

M/WBE Combined _____%

The undersigned should enter into a formal agreement with M/WBE Contractor identified herein for work listed in this schedule conditioned upon execution of contract with the Chatham County Board of Commissioners.

Signature _____ Print _____

Phone () _____

Fax () _____

ATTACHMENT G

Systematic Alien Verification for Entitlements (SAVE) Affidavit Verifying Status for Chatham County Benefit Application

By executing this affidavit under oath, as an applicant for a Chatham County, Georgia Business License or Occupation Tax Certificate, Alcohol License, Taxi Permit, Contract or other public benefit as reference in O.C.G.A. Section 50-36-1, I am stating the following with respect to my bid for a Chatham County contract for _____. [Name of natural person applying on behalf of individual, business, corporation, partnership, or other private entity]

1.) _____ I am a citizen of the United States.

OR

2.) _____ I am a legal permanent resident 18 years of age or older.

OR

3.) _____ I am an otherwise qualified alien (8 § USC 1641) or non-immigrant under the Federal Immigration and Nationality Act (8 USC 1101 et seq.) 18 years of age or older and lawfully present in the United States.*

In making the above representation under oath, I understand that any person who knowingly and willfully makes a false, fictitious, or fraudulent statement or representation in an affidavit shall be guilty of a violation of Code Section 16-10-20 of the Official Code of Georgia.

Signature of Applicant:

Date

Printed Name:

SUBSCRIBED AND SWORN
BEFORE ME ON THIS THE
____ DAY OF _____, 20____

* _____
Alien Registration number for non-citizens.

Notary Public
My Commission Expires:

REFERENCE FORM

REFERENCES - \$499,999 or more: On July 25, 2003 the Board of Commissioners directed that all construction projects with a bid of \$499,999 or less, for bidders to be responsive each must provide information on the most recent three (3) projects with similar scope of work as well as other information to determine experience and qualifications as follows. If the contractor has performed any work for the Chatham County Board of Commissioners within the last five (5) years, at least one (1) of the three (3) owner references must be from the appropriate party within the Chatham County Government

- a. Project Name: _____
Location: _____
Owner: _____
Address: _____
City and State: _____
Contact: _____
Phone & Fax: _____
*Architect or Engineer: _____
Contact: _____
Phone & Fax: _____
Email: _____
- b. The awarded bid amount and project start date. _____
- c. Final cost of project and completion date. _____
- d. Number of change orders. _____
- e. Contracted project completion in days. _____
- f. Project completed on time. Yes___ No___ Days exceeded_____.
- g. List previous contracts your company performed for Chatham County by Project Title, date and awarded/final cost. _____
- h. Has contractor ever failed to complete a project?___ If so, provide explanation. _____
- i. Have any projects ever performed by contractor been the subject of a claim or lawsuit by or against the contractor? _____ If yes, please identify the nature of such claim or lawsuit, the court in which the case was filed and the details of its resolution. _____

REFERENCE FORM

REFERENCES - \$499,999 or more: On July 25, 2003 the Board of Commissioners directed that all construction projects with a bid of \$499,999 or less, for bidders to be responsive each must provide information on the most recent three (3) projects with similar scope of work as well as other information to determine experience and qualifications as follows. If the contractor has performed any work for the Chatham County Board of Commissioners within the last five (5) years, at least one (1) of the three (3) owner references must be from the appropriate party within the Chatham County Government

- a. Project Name: _____
 Location: _____
 Owner: _____
 Address: _____
 City and State: _____
 Contact: _____
 Phone & Fax: _____
 *Architect or Engineer: _____
 Contact: _____
 Phone & Fax: _____
 Email: _____
- b. The awarded bid amount and project start date. _____
- c. Final cost of project and completion date. _____
- d. Number of change orders. _____
- e. Contracted project completion in days. _____
- f. Project completed on time. Yes___ No___ Days exceeded_____.
- g. List previous contracts your company performed for Chatham County by Project Title, date and awarded/final cost. _____
- h. Has contractor ever failed to complete a project?___ If so, provide explanation. _____
- i. Have any projects ever performed by contractor been the subject of a claim or lawsuit by or against the contractor? _____ If yes, please identify the nature of such claim or lawsuit, the court in which the case was filed and the details of its resolution. _____

REFERENCE FORM

REFERENCES - \$499,999 or more: On July 25, 2003 the Board of Commissioners directed that all construction projects with a bid of \$499,999 or less, for bidders to be responsive each must provide information on the most recent three (3) projects with similar scope of work as well as other information to determine experience and qualifications as follows. If the contractor has performed any work for the Chatham County Board of Commissioners within the last five (5) years, at least one (1) of the three (3) owner references must be from the appropriate party within the Chatham County Government

- a. Project Name: _____
 Location: _____
 Owner: _____
 Address: _____
 City and State: _____
 Contact: _____
 Phone & Fax: _____
 *Architect or Engineer: _____
 Contact: _____
 Phone & Fax: _____
 Email: _____
- b. The awarded bid amount and project start date. _____
- c. Final cost of project and completion date. _____
- d. Number of change orders. _____
- e. Contracted project completion in days. _____
- f. Project completed on time. Yes ___ No ___ Days exceeded _____.
- g. List previous contracts your company performed for Chatham County by Project Title, date and awarded/final cost. _____
- h. Has contractor ever failed to complete a project? ___ If so, provide explanation. _____
- i. Have any projects ever performed by contractor been the subject of a claim or lawsuit by or against the contractor? ___ If yes, please identify the nature of such claim or lawsuit, the court in which the case was filed and the details of its resolution. _____

CHECKLIST FOR SUBMITTING BID

Sign below and submit this sheet with Bid

NOTE: All of the following items must be submitted with your Bid to be considered "responsive."

1. ACKNOWLEDGMENT OF ANY/ALL **ADDENDUMS** (Page 3 of ITB).
2. **ORIGINAL SURETY BOND (5% OF BID) ALONG WITH SURETY REQUIREMENTS SHEET FILLED OUT (BID BOND IS NOT REQUIRED FOR THIS PROJECT)**
3. BID SHEET COMPLETELY FILLED OUT AND SIGNED.
4. **LIST OF SUBCONTRACTORS SHEET FILLED OUT WITH ALL SUBCONTRACTORS AND SUPPLIERS.**
5. **% TO MBE SUBCONTRACTORS/SUPPLIERS SHEET COMPLETELY FILLED OUT SHOWING \$ AMOUNT AS WELL AS % OF PROJECT THAT IS PROJECTED TO GO TO MBE/WBE SUBCONTRACTORS/SUPPLIERS.**
6. **REFERENCES:** Supply ALL the information that is requested for each Reference. NOTE: *Forms for Reference Information are attached to this Bid Package.*
7. **ALL FIRMS REQUESTING TO DO BUSINESS WITH CHATHAM COUNTY MUST REGISTER ON-LINE AT [HTTP://PURCHASING.CHATHAMCOUNTY.ORG](http://PURCHASING.CHATHAMCOUNTY.ORG).**
8. **COMPLETE AND SUBMIT ALL ATTACHMENTS TO THE ITB (Attachments A thru G).**
9. **SUBMIT A COPY OF YOUR BUSINESS TAX CERTIFICATE.**

NAME/TITLE

COMPANY NAME

ADDRESS

CITY/STATE/ZIP

PHONE NUMBER

FAX NUMBER

LEGAL NOTICE

CC NO. 167871

Invitation to Bid

Sealed Bids will be received until **2:00 PM** on **JULY 30, 2020** and publicly opened in **Chatham County Purchasing & Contracting Department, at The Chatham County Citizens Service Center, 1117 Eisenhower Drive, Suite C, Savannah, Georgia 31406**, for: **BID NO : 20-0027-5- COOLING TOWER REPLACEMENT AT THE CHATHAM COUNTY DETENTION CENTER.**

A MANDATORY PRE-BID CONFERENCE will be held at **2:00 P.M. JULY 16, 2020, ON-SITE AT THE CHATHAM COUNTY DETENTION CENTER, 1050 CARL GRIFFIN DRIVE, SAVANNAH, GEORGIA.**

The Bid Package can be downloaded and printed from the County Purchasing and Contracting website <http://purchasing.chathamcounty.org>.

All firms requesting to do business with Chatham County must also register on-line at <http://purchasing.chathamcounty.org>. For additional information concerning specifications, please contact Jean Fleming at (912) 790-1619.

CHATHAM COUNTY HAS THE AUTHORITY TO REJECT ALL BIDS AND WAIVE MINOR FORMALITIES.

"CHATHAM COUNTY IS AN EQUAL OPPORTUNITY EMPLOYER, M/F/H, ALL BIDDERS ARE TO BE EQUAL OPPORTUNITY EMPLOYERS"



MARGARET H. JOYNER, PURCHASING DIRECTOR

SAVANNAH NEWS/PRESS INSERT: JULY 1, 2020