Project Manual

Lively Technical Center

Chiller Plant Upgrades

LCS Project No. 33017

Construction Documents

June 3, 2015

Prepared for

The School Board of Leon County

Division of Facilities

*Set No.*_____

To the best of my knowledge these drawings and the project manual are complete, and comply with the State Requirements for Education Facilities.

_____

Peter McGinniss, PE

McGinniss & Fleming
Engineering, Inc.

Mechanical · Electrical · Fire Protection · Plumbing

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ADVERTISEMENT
SCHOOL BOARD OF LEON COUNTY, FLORIDA
Lively Technical Center Central Chiller Plant Upgrades Project

Leon County School Board, Tallahassee, Florida will receive bids ONLY from Leon County School Board Pre-Qualified Contractors at the Leon County Schools, Purchasing Department located at 3397 West Tharpe Street, Tallahassee, Florida 32303. In accordance with the Contract Documents, all bids must be a lump sum basis; segregated bids will not be accepted. Each Bid shall be addressed to:

PROJECT:	Lively Technical Center Central Chiller Plant Upgrades Project
BID NO:	5330-2016
BID DATE/TIME:	July 23, 2015 at 2:00 pm local time
PLACE:	3397 W. Tharpe Street, Tallahassee, FL 32303

Drawings and Specifications may be obtained at the offices of McGinniss & Fleming Engineering, 1401 Miccosukee Road, Suite 200, Tallahassee, FL 32308 850-681-6424 in accordance with the Instructions to bidders upon receipt of $200.00 refundable deposit per set. All materials furnished and all work performed shall be in accordance with Drawings and Specifications.

Bid security in the amount of five (5) percent of the Bid must accompany each Bid in accordance with the Instruction to Bidders. In the event the Contract is awarded to the Bidder, Bidder shall, within eight (8) Owner business days after the award by the Owner of the Contract, furnish the required Performance and Payment Bonds; failing to do such, Bidder shall forfeit their bid guarantee as liquidated damages.

The Performance and Payment Bonds shall be secured from any agency of a surety or insurance company, which agency shall have an established place of business in the State of Florida and be duly licensed to conduct business there.

The Owner reserves the right to waive irregularities and/or informalities in any Bid and to reject any or all Bids in whole or part, with or without cause, and/or accept the Bid that in its judgment will be for the best interest of the School Board of Leon County, Florida.

A Pre-Bid Conference will be held on July 16, 2015 at 9:00 am at Lively Technical Center, Central Energy Plant, Building 11 located at 500 Appleyard Drive, Tallahassee, FL 32304. All bidders or their representatives are encouraged to be in attendance.

THE SCHOOL BOARD OF LEON COUNTY, FLORIDA

BY: Maggie B. Lewis-Butler,
Chairperson

Jackie Pons,
Superintendent of Schools

June Kail,
Director of Purchasing

Publication: June 30, July 7 and 14, 2015

SECTION B

INSTRUCTION TO BIDDERS

PROCUREMENT OF BID DOCUMENTS

Contractors bidding the project may secure Bidding Documents at:
McGinniss & Fleming Engineering, 1401 Miccosukee Road, Suite 200, Tallahassee, FL 32308, 850/681-6424

1. DEFINITIONS:

1.01 All definitions set forth in the General Conditions of the Contract for Construction, The School Board of Leon County, Florida, are applicable to these Instructions to Bidders.

1.02 Bidding Documents include the Advertisement to Bid, Notice to Prospective Bidders, Instructions to Bidders, Policies of the School Board, Contract, General Conditions, Supplementary General Conditions, Special Conditions, Bid Bond, Performance and Payment Bond, Proposal Form, and the proposed Contract Documents including any Addenda issued prior to receipt of bids.

1.03 Addenda are written or graphic instruments issued prior to the execution of the Contract which modify or interpret the bidding documents, clarifications or corrections. Addenda will become part of the Contract Documents when the Construction Contract is executed.

2. BIDDER'S REPRESENTATION:

2.01 Each bidder, by making his bid, represents that he has read and understands the bidding documents.

2.02 Each bidder, by making his bid, represents that he has visited the site and familiarized himself with the local conditions under which the Work is to be performed.

2.03.1 CRIMINAL BACKGROUND CHECKS (Updated Dec. 8, 2008; May 13, 2009; Sept. 1, 2009 below) The Legislature passed a law effective September 1, 2005 called the Jessica Lunsford Act. This law requires any employee, contractor, vendor who will (1) Be at a school when students are present; or (2) Have direct contact with students; or (3) Have access to or control of school funds; meet Level II Background screening requirements. Level II screening includes fingerprinting, statewide criminal and juvenile justice records checks through the Florida Department of Law Enforcement and federal criminal records checks through the Federal Bureau of Investigation. Level II screening may also include local criminal records checks through the local law enforcement agencies.

Leon County School Board Policy 2.021 also requires a background check of all vendors that meet the above requirements. In addition, all vendors will have a Sexual Predator Check completed if they meet the requirements as listed below.

LCSB Policy 2.021 is subject to review and change. As a provision of this contract, if awarded, any changes made to this policy will automatically become a part of and be incorporated in this contract. It is the responsibility of the awardee(s) to be aware of any changes that may occur.

a. **Sexual Predator Check** – All vendors who provide services under this contract will have a Sexual Predator Check completed by Purchasing Department personnel through the Florida Department of Law Enforcement prior to approval of any contract. This check will be performed at the FDLE website listed here: http://www3.fdle.state.fl.us/sexual_predators/

Level II Background Check – **(Updated 12-08-08)** Any vendor providing services under this contract who will (1) Be at a school when students are present; or (2) Have direct contact with students; or (3) Have access to or control of school funds, that person shall have a Level II background check submitted through the Leon County School Board. The Leon County School Board shall submit vendor fingerprints and information to the Florida Department of Law Enforcement and the Federal Bureau of Investigations.

The LCSB will inform the contractor of the approval/disapproval of the check within approximately one week. If any person does not meet the Board's requirements, as described in Policy 2.021, that individual shall not be allowed to perform services for Leon County Schools. The contractor shall be required to pay for all costs of the background reports. If it is discovered, during the period of the contract that the successful contractor substituted an unapproved worker for an approved worker, the vendor's contract may be cancel led immediately at the discretion of the Leon County School Board.

Work construction sites that are completely segregated by a chain link fence (minimum height of six foot) and with no students present, may work with a Sexual Offender/Predator check, when under the constant supervision of a Level II screened authorized individual.

All Level II cleared contractors must display a Leon County Schools Vendor badge when on school district property.

In the event that an approved contractor/vendor is arrested for any reason subsequent to the background clearance performed by Leon County School Board, Safety, Security & Emergency Management Dept., they are required to immediately notify his or her supervisor who will then notify the Safety, Security & Emergency Management within 48 hours of the arrest, at which time a determination will be made as to whether the approval of that individual will be rescinded from accessing Leon County School Board properties.

2.03.2 **Reciprocity of Florida School I.D. Badges**: If a contractor has registered with another Florida school district, they may be able to obtain a Leon County School I.D.; the contractor should contact the Safety and Security Department at 850-487-7293 for additional information regarding the process and any associated cost. Once the individual has been cleared, he/she will need to report to Fingerprint Services to pick up a picture id badge.

3. BIDDING PROCEDURES:

3.01 All bids must be prepared using the forms contained in these specifications and submitted in accordance with the Instruction to Bidders.

3.02 A bid is invalid if it has not been deposited at the designated location prior to the time and date for receipt of bids indicated in the advertisement or invitation to bid, or prior to any extension thereof issued to the bidders.

3.03 Unless otherwise provided in any supplement to these Instructions to Bidders, no bidder shall modify, withdraw or cancel his bid or any part thereof for 60 days after the time designated for the receipt of bids in the advertisement or invitation to bid.

3.04 Prior to the receipt of bids, Addenda will be mailed or delivered to each qualified General Contractor recorded by the Architect as having received the bidding documents, and will be available for inspection wherever the bidding documents are kept available for this purpose.

(a) The Prospective Bidder (General Contractor or Construction Manager) must submit a Small Business Participation Plan that shall identify the Small Business Enterprises (SBE) to be utilized, their percentage of utilization, and the commercial services they are providing, consistent with the commodities or services for which they are certified and/or qualified to provide.

The term "Small Business Enterprise" (SBE) is defined as Small Business Enterprise and firms certified by Leon County School Board, which is provided at the current link: http://sharepoint.leon.k12.fl.us/sbd/Important%20Documents/Program%20Overview.aspx . For more information please contact **Dexter Martin, Director of Small Business Enterprise, Leon County Schools, Tallahassee, Florida. Telephone: 850-617-1821.**

(b) **SBE Targets**: All prime bidders (general contractor or construction manager) including SBE's shall either meet the Aspirational Target(s) and if applicable, demonstrate in their bid that a good faith effort was made to meet the Aspirational Target(s). All prime bidders will make Contact with the Leon County School SBE Division for a listing of available SBEs who provide the services needed for the bid or proposal.

(c) **Good Faith Effort** The following are examples of good faith efforts that prime bidders can use if they are not meeting the Aspirational Target:

1. Advertising for participation by SBEs in local publications within the Market Area, including a copy of the advertisement and proof of date(s) it appeared; or by sending correspondence, no less than ten (10) days prior to the submission deadline, to all SBEs referred to the Bidder by the SBE Division for the goods and services to be subcontracted and/or supplied.
2. Documentation indicating that the bidding Prime Contractor provided ample time for potential SBE Subcontractors to respond to bid opportunities, including a chart outlining the schedule/time frame used to obtain bids from SBE Vendors as applicable to the Aspirational Target.
3. Contacting SBE Vendors who provide the services needed for the bid or proposal. Include a list of all SBEs that were contacted and the method of contact.
4. Document follow-up telephone calls with potential SBE Subcontractors encouraging their participation.
5. Allowing potential SBE Subcontractors to review bid specifications, blueprints and all other bid/RFP related items at no charge to the SBEs.
6. Contacting the SBE Division, no less than five (5) business days prior to the Bid/RFP deadline, regarding problems they are having in reaching the Aspirational Targets.
7. Other documentation indicating their Good Faith Efforts to meet the Aspirational Targets.

3.05 Preparation and Submission of Bid Proposal Form:

(a) Each bidder shall copy the Proposal Form on Bidder's own letterhead and indicate their bid prices thereon in the proper spaces for the entire work and for the alternates on which they bid. Any erasures or other corrections in the bid must be explained or noted over the signature of the Bidder. Bids containing any conditions or irregularities of any kind may be rejected by the Owner.

(b) Each Bid shall specify a unit price written in ink in both words and figures, for each of the separate items, as called for, except when the bid is called for on a lump sum basis. Lump sum bids shall be shown in both words and figures; where there is a variation between the written amount and figures, the low one will be taken as the bid price.

(c) Each bid must give the full business address of the bidder, and state whether he is an individual, corporation or partnership. Proposals by a corporation must be signed with the legal name and seal of the corporation followed by the name of the state of its incorporation and by the manual signature and designation of an officer, agent, or other person, authorized to bind the corporation. Proposals by partnerships shall show the names of all partners and must be signed in the

partnership name by one of the partners or by an authorized representative. In either case, the partnership signature shall be followed by the manual signature and designation of the person signing.

In every case, the name of the person signing, and his designation, shall be typed or printed below his signature. A bid by a person who affixes to his signature the word "President," "Secretary," "Agent," or other designation without disclosing his principal may be held to be the bid of the individual so signing. Satisfactory evidence of the authority of an officer, agent, attorney, or other person signing for a corporation and for an agent, attorney, etc., signing for a partnership or an individual shall be furnished.

(d) The Owner reserves the right to waive informality in any bid, to reject any and all bids in whole or in part, with or without cause, and/or to accept the bid that in its judgment will be in the best interest of the Leon County School Board. **June Kail,** Director of Purchasing, Leon County Schools, Tallahassee, Florida (850)488-1206.

(**e**) **Section D** - List of Major Subcontractors shall be enclosed with Bid Documents (see 6.02).

3.06 BASIS OF BID: The Bidder shall include with their Bid all unit cost items, quantity estimates and alternates indicated on the Bid Form. Failure to comply may be cause for rejection. If the Owner wishes to learn the relative or additional construction cost of alternate use of material, or an increase or decrease in scope of the project, these items will be defined as alternates and will be specifically described by the Drawings and/or the Specifications. Alternates will be listed in the Bid Form in such a manner that the Bidder shall be able to clearly indicate what sums will add to (or deduct from) their Base Bid. The Owner reserves the right to accept or reject any or all bids or combinations there-of as deemed in the best interest of the Owner.

No segregated Bids or assignments shall be considered.

3.06.1 Each Bidder shall, if so requested by the Owner, present further evidence of Bidder's experience, qualifications and ability to carry out the terms of the Contract, including a financial statement.

3.07 Modification of Bids: Bid Modifications will be accepted from Bidders if addressed to the Owner at the place where Bids are to be received (marked "Modification of Bid") and if received prior to the opening of the Bids. Modifications may be in written or telegraphic form. Modifications will be acknowledged by the Owner or the Architect before opening of formal Bids. Bid modifications written on the outside of the sealed Proposal envelope are acceptable when such notations are made and signed and dated by the Bidder prior to submittal for the bid. No notations may be made and signed by the Bidder after submittal of the bid. Modifications will be read by the Owner prior to opening of formal bids. It is the full responsibility of the Bidder to bring any Bid Modification to the attention of the person opening the bids at the time of opening of the affected bid.

3.08 Withdrawal of Bids: Bids may be withdrawn on written request received from bidders prior to the time fixed for opening. Such request shall be properly signed in accordance with the requirements pertaining to signatures contained on Page B-3, Paragraph 3.05(c). Negligence on the part of the bidder in preparing the bid confers no right for withdrawal of the bid after it has been opened.

3.09 Bid Guarantee - 5% (Total Bid - Base Bid Plus All Alternates) Bids shall be accompanied by a bid guarantee which shall be a Bid Bond (Signed or countersigned by a Florida Resident Insurance Agent); Cashier's Check; Certified Check (Certified Checks offered as Bid Guarantees must have Florida Documentary Stamps attached); or bank Draft; made payable to the SCHOOL BOARD OF LEON COUNTY, FLORIDA**.** Such check or bond shall be submitted with the understanding that it shall guarantee that the Bidder will not withdraw their bid for a period of 60 consecutive calendar days after the scheduled closing time for the receipt of Bids. That, if this Bid is accepted, the Bidder will enter into a formal contract with the Owner in accordance with the form of agreement included

as part of the Contract Documents and that the required Performance Bond and Payment Bond will be given. In the event of the withdrawal of Bid within said period, or failure to enter into said Contract and give said bond within eight (8) owner business days after Bidder has received notice of acceptance of their Bid; the Bidder shall be liable to the Owner for the full amount of the Bid guarantee as representing the damage to the Owner on account of the default of the Bidder in any particular thereof.

The Bid Bonds and checks shall be returned by mail to all except the three (3) lowest Bidders within fifteen (15) days after the formal opening of the Bids. The Owner reserves the right to hold the Bid Guarantee of the lowest three Bidders until after they have executed the Contract with the accepted Bidder and the Performance Bond and Payment and Material Bonds have been approved by the Owner.

If required Contract and Bonds have not been executed within sixty 60 consecutive calendar days after the date of the opening of the bids, then the Bid Bond or check of any Bidder will be returned upon his request, provided Bidder has not been notified of the acceptance of their bid prior to the date of such request.

4. EXAMINATION OF DOCUMENTS AND SITE:

4.01 Each Bidder shall examine the Bidding Documents carefully; and, fourteen (14) days prior to the date for receipt of bids, Bidders shall make a written request to the Architect for interpretation or correction of any ambiguity, inconsistency or error which may be discovered. Any interpretations or corrections will be issued as addenda. The Architect and/or Owner shall not be responsible for oral clarifications. No addendum shall be issued after seven (7) calendar days prior to Bid.

4.02 Bidders shall carefully examine the Bidding Documents and the construction site to obtain first-hand knowledge of the existing conditions. Contractors shall not be given extra payment for conditions which can be determined by examining the site and Bidding Documents.

4.03 The submission of a bid by a Bidder shall be an acknowledgment that Bidder has thoroughly examined the Contract, site, specifications, and drawings and completely understands their obligations and those of the Owner under the documents. Failure to mention any work, materials, appurtenances, or safety methods in these specifications or plans which are required for the satisfactory and safe completion of an efficient, safe, complete, and working system as implied by these specifications and drawings shall not relieve the Contractor of any responsibility to provide such for the completion of such a system.

4.04 The Owner assumes no responsibility for any understanding or representations made by any of its officers or agents during or prior to the execution of the Contract, unless (1) such understanding or representation are expressly stated in the contract and (2) the Contract expressly provides that the responsibility therefore is assumed by the Owner.

5. SUBSTITUTIONS:

5.01 Each Bidder represents that his bid is based upon the materials and equipment described in Bidding Documents.

5.02 No substitutions for other material and equipment will be considered unless a written request has been submitted to the Architect for approval at least fourteen 14 days prior to the date for receipt of bids. Each such request shall include a complete description of the proposed substitute, the name of the material or equipment for which it is to be substituted, drawings, cuts, performance and test data and any other data or information necessary for a complete evaluation.

5.03 If the Architect approves any proposed substitution, such approval will be set forth in an addendum.

5.04 If any bidder is unable to procure written approval of any substitution from the Architect prior to the opening of bids, then he shall base his bid on the exact items specified.

5.05 Substitutions which have not been approved in writing by the Architect prior to the opening of bids, may be listed on the Bid Proposal form along with the amount the bidder will add to or deduct from the Base Bid if such substitution is approved. Substitutions so submitted shall include any and all adjustments of that work or any other affected thereby. Substitutions listed on the Bid Proposal Form which are approved will be incorporated into the contract with the successful bidder.

5.06 Requests for any substitutions not submitted in accordance with the above instructions will be denied by the Architect.

5.07 Requests for any substitution(s) of subcontractors will need to be in compliance with FS 255.0515:

> FS 255.0515: Bid for state contracts; substitution of subcontractors. With respect to state contracts let pursuant to competitive bidding, whether under Chapter **1013**, relating to educational facilities, or this chapter, relating to public buildings, the contractor shall not remove or replace subcontractors listed in the bid subsequent to the lists being made public at the bid opening, except upon good cause shown.
>
> History. -s. 1, ch. 78-389.

6. LIST OF SUBCONTRACTORS AND MATERIALS SUPPLIERS:

6.01 The Contractor shall within twenty-four (24) hours after the Bid is opened, submit to the Owner (at 3420 West Tharpe Street, Suite 100, Tallahassee, FL 32303) a list of subcontractors and materials suppliers. This list, if requested, shall include each company name, the character of its work or the materials it supplies, the address and telephone number and the name of the person with whom the Contractor is dealing. Submit in accordance with Section P.

6.02 When the Contractor submits his bid, he shall include his listing of Major Subcontractors. Submit in accordance with Section D.

7. REJECTION OF BIDS:

7.01 The Bidder acknowledges the right of the Owner to reject any or all bids and to waive any informality or irregularity in any bid received. In addition, the bidder recognizes the right of the Owner to reject a bid if the bidder failed to furnish any required bid security, or to submit the data required by the bidding documents, or if the bid is in any way incomplete or irregular; to reject the bid of a bidder who is not in a position to perform the contract; and to re-advertise for other or further bid proposals.

7.02 The Owner reserves the right to reject any or all bids when such rejection is in the interest of the Owner, and to reject the Bid of a Bidder who is not in a position to perform the Contract, or whose List of Subcontractors is improperly prepared, or not included in the Bid proposal.

8. SUBMISSION OF POST-BID INFORMATION:

8.01 The selected bidder shall within eight (8) Owner Business days after Notification of Board Award submit the following:

> 1. Executed Performance Bond and Payment Bond with local agent's name, address, and phone number. In accordance with FS 255.05 . . . . Performance and Payment Bonds are to be recorded prior to the date of commencement of project. The address is: Leon County Clerk of Circuit Court, **313 South Calhoun Street**, Tallahassee, Florida 32301, (850) **577-4030**. Please request a copy of the recorded document to be submitted along with other Post Bid documentation to the Contract

Administrator. You'll also receive a receipt from the clerk for your records.

2. **Criminal Background Checks** **Refer to 2.03.1 above Updated Dec. 8, 2008; Sept. 1, 2009.** The Legislature passed a new law this year effective September 1, 2005 called the Jessica Lunsford Act.

Any questions regarding the Background Checks, please call Safety and Security Office at 850-487-7117 or go to the website www.leon.k12.fl.us go to District Departments, go to Safety and Security Link.

The notice to proceed will be held until the LCS Construction Department receives an acceptance on the background checks provided by the General Contractor.

3. A progress schedule and all data as required under Article 3.10.4 Supplementary General Conditions.

4. Evidence of Insurance as required under Article 11 Supplementary General Conditions in the Contract Documents with a "Hold Harmless Rider," and a statement of the School Board of Leon County, Florida being listed as "primary additional insured."

5. A letter certifying twenty percent (20%) of work performed by contractor as required under Article 3.4.1 Supplementary General Conditions.

6. Photocopies of General Contractor's registration and either State registrations or Leon County certificate of competency of all subcontractors.

7. Resume of General Contractor's construction superintendent.

8. List of Toxic Substances per Florida Statute FS 442.102.

9.01 The successful bidder shall be required to furnish a Performance Bond and Payment Bond in the amount of one-hundred percent (100%) of the contract amount.

9.02 All required premiums shall be paid for by the successful bidder and the amount of the premium shall be included in his bid proposal.

10. AWARD OF CONTRACT:

10.01 The Contract, if awarded by the Owner, will be awarded within sixty (60) calendar days of receipt of the bids to the lowest responsible Bidder, provided Bidder's bid is reasonable and it is in the best interest of the Owner to accept. The Owner reserves the right to waive any informality in bids received when such waiver is in the best interest of the Owner.

10.02 The method of determining the lowest responsible bid from bidders shall be the Base Bid Price plus or minus Alternate Prices listed on the Bid Proposal Form which are accepted by the Owner. Alternates will be considered for acceptance by the Owner as set forth in the Alternate section of the specifications, SECTION B, 15.1 Alternates and SECTION C - Bid Form.

11. BID PROTEST PROCEDURES - (See Board Policy 6.09 inserted at the end of Section B for more information).

11.01 The agency shall provide notice of its decision or intended decision concerning a bid solicitation or a contract award as follows:

11.01.1 For a bid solicitation, notice of a decision or intended decision shall be given by United States mail or by hand delivery.

11.01.2 For any other agency decision, notice of a decision or intended decision shall be given either by posting the bid tabulation at the location where the bids were opened or by certified United States mail, return receipt requested.

The notice required by this paragraph shall contain the following statement: "Failure to file a protest within the time prescribed in s. 120.53(5), Florida Statutes, shall constitute a waiver of proceedings under Chapter 120, Florida Statutes."

11.02 Any person who is affected adversely by the agency decision or intended decision shall file with the agency a notice of protest in writing within seventy-two (72) hours after the posting of the bid tabulation or after receipt of the notice of the agency decision or intended decision and SHALL FILE A FORMAL WRITTEN PROTEST WITHIN TEN (10) DAYS AFTER THE DATE HE FILED THE NOTICE OF PROTEST. Failure to file a notice of protest or failure to file a formal written protest shall constitute a waiver of proceedings under Chapter 120.

11.03 Upon receipt of a notice of protest which has been timely filed, the agency shall stop the bid solicitation process or the contract award process until the subject of the protest is resolved by final agency action. Unless the agency head sets forth in writing particular facts and circumstances which require the continuance of the bid solicitation process, or the contract award process without delay in order to avoid an immediate and serious danger to the public health, safety, or welfare.

11.04 The agency, on its own initiative or upon the request of a protestor, shall provide an opportunity to resolve the protest by mutual agreement between the parties within fourteen (14) days of receipt of a formal written protest.

11.04.1 If the subject of a protest is not resolved by mutual agreement within fourteen (14) days of receipt of the formal written protest and if there is no disputed issue of material fact, and informal proceeding shall be conducted pursuant to s. 120.57(2). If the hearing is not requested in the Notice of Bid Protest, it shall be waived. The informal hearing shall be conducted in the presence of the Contract Administrator, as the Superintendent's designee, the legal staff, and any other witnesses deemed appropriate. The protesting party may be present with assistance of counsel and any witnesses he deems appropriate, however, failure to have counsel or witnesses present, shall not invalidate the hearing.

12. FAMILIARITY WITH LAWS:

12.01 The Bidder shall be familiar with and shall perform work in accordance with all Federal, State and local laws, ordinances, rules and regulations affecting the work. Special attention is called to, but not limited to, the Local Environmental Ordinances.

Ignorance of them on the part of the bidder shall in no way relieve Bidder from responsibility of compliance with all said laws, ordinances, rules and regulations.

1013.371 Conformity to Codes. – (1) CONFORMITY TO FLORIDA BUILDING CODE AND FIRE PREVENTION CODE REQUIRED FOR APPROVAL. –

(a) Except as otherwise provided in paragraph (b), all public educational and ancillary plants constructed by a board must conform to the Florida Building Code and the Florida Fire Prevention Code, and the plants are exempt from all other state building codes; county, municipal, or other local amendments to the Florida Building Code and local amendments to the Florida Fire Prevention Code; building permits, and assessments of fees for building permits, except as provided in s.553.80; ordinances; road closures; and impact fees or service availability fees. Any inspection by local or state government must be based on the Florida Building Code and the Florida Fire Prevention Code. Each board shall provide for periodic

inspection of the proposed educational plant during each phase of construction to determine compliance with the state requirements for educational facilities.

12.02 **LCS District Building Permit:** Upon acknowledgement of award of contract, the General contractor will receive a Leon County School District – Permit Application Packet along with his/her contracts. This Permit Application is to be completed and submitted with **three (3)** complete sets of 100% Construction Plans, signed and sealed by the Architect /Engineer; and, **three (3)** sets of Construction Specifications.

12.03 Chapter 1013.45 F.S. states that "The services of a registered architect are not required for minor renovation project for which the construction cost is less than $50,000.00, or for the placement or hookup of relocatable educational facilities that conform to the standards adopted under Chapter 1013, , F.S."

For minor projects meeting the requirements of Chapter 1013.45(4) Educational facilities contracting and construction techniques -- plans will be required. However an architect seal will not be required. For projects with a construction cost exceeding $200,000.00, plan review will be done by the Department of Education. The School Board Inspection Department will issue **ALL** permits and Certificates of Occupancy, regardless of the project costs.

(4) Except as otherwise provided in this section and s. 481.229, the services of a registered architect must be used for the development of plans for the erection, enlargement, or alteration of any educational facility. The services of a registered architect are not required for a minor renovation project for which the construction cost is less than $50,000 or for the placement or hookup of relocatable educational facilities that conform with standards adopted under s. 1013.37. However, boards must provide compliance with building code requirements and ensure that these structures are adequately anchored for wind resistance as required by law. Boards are encouraged to consider the reuse of existing construction documents or design criteria packages where such reuse is feasible and practical. Notwithstanding s. 287.055, a board may purchase the architectural services for the design of educational or ancillary facilities under an existing contract agreement for professional services held by a district school board in the State of Florida, provided that the purchase is to the economic advantage of the purchasing board, the services conform to the standards prescribed by rules of the State Board of Education, and such reuse is not without notice to, and permission from, the architect of record whose plans or design criteria are being reused. Plans shall be reviewed for compliance with the state requirements for educational facilities. Rules adopted under this section must establish uniform prequalification, selection, bidding, and negotiation procedures applicable to construction management contracts and the design-build process. This section does not supersede any small, woman-owned or minority-owned business enterprise preference program adopted by a board. Except as otherwise provided in this section, the negotiation procedures applicable to construction management contracts and the design-build process must conform to the requirements of s. 287.055. A board may not modify any rules regarding construction management contracts or the design-build process. **History.**--s. 844, ch. 2002-387.

Procedures for Application for a Building Permit are available through Leon County School District's Facilities/Construction Department by Roderick McQueen, (850)617-1837 or (850)617-1838.

13. ASSESSMENTS AND TAXES:

13.01 Although the Owner is not subject to the Florida Sales Tax, any contractor who purchases materials which will be used in the construction of a public works facility **will not** be exempt from the sales tax on those materials, The Owner is exempt from all Federal excise taxes on materials, appliances, etc., which are incorporated into and become a part of the finished improvements. The Owner is not required to pay for any municipal building permit. The Bidder shall take this information into consideration in preparing their proposal.

14. FLORIDA PRODUCTS AND LABOR

14.01 The Bidder's attention is called to Section 255.40, Florida Statutes, which requires that on public building contracts, Florida products and labor shall be used whenever price and quality are equal.

14.02 ADD (August 3, 2011) **LCSB Purchasing Policies – Local Preference Part III**
It shall be the policy of the Leon County School Board to afford local preference to the lowest responsive Leon County vendors and Florida vendors in accordance with the terms set forth in Board Policy 6.07, Part III.

15. ALTERNATES:

15.1 Alternates may be included in the specifications, and where included, the Bidder shall indicate the sum Bidder will deduct from, or add to, their Base Bid. Such Alternates may or may not be accepted.

16. BIDDER'S QUALIFICATIONS: The Bidder and all Subcontractors for this project shall be fully qualified by experience to perform the work and install the type of equipment and systems which are included in this project. The Contractor and each major Subcontractor, including particularly mechanical, electrical and plumbing shall each have successfully completed a minimum of three projects of equal or larger scope and size.

If the price of the mechanical part of the project exceeds $200,000.00, a full time mechanical foreman shall be assigned. The person assigned shall have a minimum of five (5) years' experience installing equipment and systems similar to those to be installed on this project. The mechanical foremen shall be on the site at all times when any mechanical work is being done, and shall be available to the Engineer and Owner's representative to examine work in progress and answer questions about schedule and installations.

17. LICENSE:

17.1 The Contractor and his subcontractors shall meet all requirements of the State of Florida, county and city license regulations. The Bidder shall complete the portion of the Bid Form dealing with licenses; should Bidder fail to complete the license information, the bid may be rejected.

18. DISQUALIFICATION OF BIDDER:

18.1 More than one Bid from an individual, firm, partnership, corporation or association under the same or different names will not be considered. Reasonable grounds for believing that a Bidder is interested in more than one Bid for the same work will cause the rejection of all bids in which such Bidder is believed to be interested. Bids will be rejected if there is reason to believe that collusion exists between Bidders. Bids in which the prices obviously are unbalanced may be rejected.

19. HAZARDOUS MATERIALS AND WASTE:

19.01 Toxic Substances: Each Contractor and their designated subcontractor shall submit a written list of all toxic substances, pursuant to Chapter 1013.49(4) Educational Facilities, to be used on said project. Said list must be sent to the Director of Construction (if it is a construction project) or the Director of Maintenance (if it is a maintenance project) of the School Board of Leon County at least five (5) days prior to the commencement of construction.

Said notification shall contain the following:

A. The name of the substance to be used;
B. Where the substance is to be used; and
C. When the substance will be used.

The Contractor must also attach to the notification a copy of a Material Safety Data Sheet for each toxic

substance to be used. A copy of this list is to be kept at the site during duration of construction project.

19.02. Hazardous Waste: Each Contractor and his designated Subcontractor is responsible for the proper storage, handling, and disposal of hazardous wastes generated at a school site during construction or maintenance activities.

Contractors must notify the Industrial Hygienist, **Carl Green** at (850-**617-1777**) of their intent to generate, store, and remove hazardous waste from a site. Any costs including, but not limited to, fines, disposal, and clean up incurred by the School District to comply with the proper storage and disposal of hazardous waste shall be withheld from Final Payment to the Contractor.

19.03 Asbestos: Any maintenance, construction, renovation, demolition, or other alteration of an educational facility must be cleared by the Industrial Hygienist to preclude disturbance of asbestos containing materials. Failure to obtain proper clearance will subject the Contractor to all expenses incurred in decontaminating the facility.

Architect should denote in plans any known hazardous materials on site, and if it (hazardous materials) impacts construction in any way, then it should be included in scope of work of contractor.

Neither Contractors nor their designated Subcontractors shall use or substitute building materials which contain asbestos for any component of an educational facility. Contractors will be held liable for the cost of removing any asbestos containing building materials (A.C.B.M.) and re-installation of non-asbestos building materials should subsequent sampling of materials reveal the presence of more than 1% asbestos.

No asbestos containing building materials are to be specified or substituted for specified materials.

Educational Facilities. The *State Requirements for Educational Facilities* (SREF) is applicable to all public educational facilities and plants: pre-kindergarten (pre-K) through grade twelve (12), including conversion charter schools; area vocational educational schools; area vocational/technical centers; adult education; community colleges and universities; the Florida School for the Deaf and the Blind (FSDB), where referenced; ancillary plants; relocatables; factory-built structures, reconstructable facilities, modular buildings, and manufactured buildings; lease and lease-purchase; and new construction, remodeling, renovation, improvements, and site development projects. It shall be the responsibility of each school board, each community college board of trustees, and each university board of trustees to ensure that all facilities constructed from any fund source meet the standards set forth in SREF where applicable.

(1) **Authority.** The Office of Educational Facilities (hereinafter referred to as the "Office") shall review, update, and revise SREF and make recommendations for any modification to the State Board of Education (SBE). SREF shall not be changed, amended, interpreted, or modified by any other individual, agency, or entity.

(2) **Capital Outlay Funds.** Financial criteria for capital outlay funds, including Public Education Capital Outlay (PECO) and Capital Outlay and Debt Service (CO&DS) funds, are administered under SREF.

(3) **Scope of SREF requirements.** SREF establishes the requirements for public educational facilities under the Florida School Code and Chapter 1013, Florida Statutes, in particular.

(4) **Rules.** Public educational facilities shall comply with the following rules, as applicable:

(a) **DOT-AASHTO.** For on-site transportation improvements including roads, sidewalks, bridges, and drainage structures, districts shall comply with the American Association of State Highway and Transportation Officials, "AASHTO LRFD Bridge Design Specifications (2006)" as modified by the Florida Department of Transportation (DOT) in "Structures Design Manual," January 2007 Revision, and DOT "Drainage Manual" Chapter 4, as required by the structure type and as incorporated by reference in Rule 14-15.002(2), FAC, which is hereby incorporated by reference.

(b) **OSHA.** Occupational Safety and Health Administration, U.S. Department of Labor, 29 CRF as revised July 1, 2005, for district employees.

(5) **Exception.** Facilities projects for universities are administered under Chapter 6C-14, FAC, and facilities projects for the FSDB are administered under Chapter 13D-17, FAC, except where specifically required in the *State Requirements for Educational Facilities*.

See Rule 6A-2.0010, Florida Administrative Code, and Sections 120.542, 1013.02, 1013.12, 1013.32, 1013.37, 1013.40, 1013.45, Florida Statutes.

6A-2.0010 Educational Facilities. State Board of Education requirements adopted pursuant to Chapter 120, Florida Statutes, to implement the State Uniform Building Code for Public Educational Facilities Construction in Chapter 1013, Florida Statutes, are contained in Section 423 of the Florida Building Code and the Department of Education publication "State Requirements for Educational Facilities 2007," which is hereby incorporated by reference and made a part of this rule to become effective with the effective date of the amended rule. All educational and ancillary facilities constructed by a school board or community college board shall comply with "State Requirements for Educational Facilities 2007."

(1) Copies of the publication "State Requirements for Educational Facilities, 2007," are available from the Office of Educational Facilities, Florida Department of Education, Room 1054, 325 West Gaines Street, Tallahassee, Florida 32399-0400, at a cost to be determined by the Commissioner, but which shall not exceed actual cost, or from the Department of Education's website at: **http://www.fldoe.org/edfacil** in PDF format.

Specific Authority Section 1(a) Article IX, State Constitution, Sections 1001.02(1), 1013.02(2), 1013.37, F.S. Law Implemented: Section 1(a) Article IX, State Constitution, 1001.02, 1001.42(9), 1001.453, 1011.09, 1011.74, 1031.01, 1013.03, 1013.31, 1013.35, 1013.37, 1013.371, 1013.60, 1013.61, 1013.64, 1013.735, 1013.736, 1013.737, F.S. History – New 10-30-94, Amended 4-28-97, Formerly 6A-2.0111, Amended 1-5-00, Formerly 6-2.001, Amended 8-22-05, 7-2-06.

THE SCHOOL BOARD OF LEON COUNTY, FLORIDA
BOARD POLICY 6.09
BID PROTESTS

6.09 Bid Protests.

(1) **Purpose and Scope.** These rules provide for the speedy resolution of protests arising from the contract bidding and award process. Contracts not subject to competitive bidding or any contract awarded pursuant to an emergency or sole source declaration are not subject to these rules.

2) **Notice of Bid Solicitation.** The Purchasing Department shall provide notice of bid solicitations:

(a) By advertising in a newspaper having a general circulation in the county, or

(b) By U.S. mail or by hand delivery to all qualified contractors who have requested notice of bid solicitation.

(3) **Notice of Intended Decision.** Unless otherwise specified herein all notices referred to in this policy shall be issued by the Purchasing Department.

(a) Notice of intent to award a contract shall be shall be given to all bidders by posting the bid tabulations reflecting the lowest responsible bidder on the date specified in the bid proposal. Such posting will remain on display for no less than three work days. The bid tabulations shall be posted at the Purchasing Department Office located at 3397 W. Tharpe Street in Tallahassee, Florida 3230**3**.

(b) If because of unforeseen circumstances the bid tabulations cannot be posted on the date specified in the bid proposal, all bidders shall be notified by certified mail, return receipt. The notification letter shall also advise all bidders of the new date on which the bid tabulations will be posted, which date shall be at least three days subsequent to the date the notification letter is mailed. Thereafter, notice of intent toward the contract shall be provided by posting the bid tabulations on the date specified in the notification letter. If because of unforeseen circumstances the bid tabulations cannot be posted on the date specified in the notification letter, all bidders shall be so notified by certified mail, return receipt. thereafter, notice of intent to award the contract shall be provided to all bidders by certified mail, return receipt.

(c) If all bids are to be rejected, all bidders shall be so notified by certified mail, return receipt.

(d) All notices of intent to award a bid or to reject all bids shall contain the following statement: "Failure to file a protest within the time prescribed in Section 120.57(3), F.S., shall constitute a waiver of proceedings under Chapter 120, F.S."

(4) **Action Differing from Notice.**

(a) Each action on bids taken by the Board is preceded by a recommendation from the Superintendent. If the Superintendent's recommendation differs from the notice of intended decision as set forth in section (3) of this policy all bidders must be notified by certified mail, return receipt requested, or by hand delivery, at least four (4) days prior to the intended date of Board action.

(b) In the event the Board takes action toward a bid in a manner which differs from the notice of intended decision (or last notice of intended decision if more than one was provided) such award does not become final until seven calendar days after Board action. Within one work day of such Board action all bidders shall be notified of the action by certified mail, return receipt requested, or by hand delivery. A written protest filed by a bidder within seventy-two (72) hours after receipt of this letter shall void the Board award and invoke the procedures of section (5) of this policy.

(5) **Protest.**

(a) Any person adversely affected by project plans / specifications or the decision to solicit bids or the intended decision to award a contract shall file a notice of protest, in writing, within 72 hours after receipt of project plans / specifications or the notice of bid solicitation or the notice of intent to award or to reject all bids. In addition, such persons shall file a formal written protest, in petition form, specifically stating the grounds for the protest and identifying all disputed issues of material fact. The formal written protest shall be filed within ten days of the notice of protest. All protests shall be filed with the Purchasing Department at 3397 W. Tharpe Street in Tallahassee, Florida 3230**3**.

Any person who files an action protesting an intended award shall post with the Purchasing Department, at the time of filing the formal written protest, a bond payable to the Leon County School Board in an amount equal to: (1) Twenty-five thousand dollars or two percent (2%) of the lowest accepted bid, whichever is greater, for projects valued over $500,000; and (2) five percent (5%) of the lowest accepted bid for all other projects, which bond shall be conditioned upon the payment of all costs which may be adjudged against him in the administrative hearing in which the action is brought and any subsequent appellate court proceeding. If after completion of the administrative hearing process and any appellate court proceedings, the department prevails, it shall recover all costs and charges which shall be included in the final order or judgment, excluding attorney's fees. Upon payment of such costs and charges by the person protesting the award, the bond shall be returned to him. If the person protesting the award prevails, he shall recover from the department all costs and charges which shall be included in the final order or judgment, excluding attorney's fees.

(b) A protest is filed when it is delivered to and received at the Purchasing Department. Accordingly, protest is not timely filed unless it is received by the Department within the times specified in subsection (a).

(c) A written notice of protest filed by 4:30 p.m. on the day on which the seventy-two (72) hours runs shall be timely.

(d) In computing the time in which to file a notice of protest or formal protest, the day of the event from which the designated period of time begins to run shall not be included. The last day of the period so computed shall be included unless it is a Saturday, Sunday, or a holiday when the Purchasing Department office is closed, in which event the period shall run until the end of the next day that is neither a Saturday, Sunday, nor holiday.

6) **Suspension of Bidding Process.**

(a) Upon receipt of a timely written notice of protest, the bid solicitation or contract award process shall be stayed until the subject of the protest is resolved by final agency action School
unless the Superintendent sets forth, in writing, particular facts and circumstances which require the continuance of the bid solicitation or contract award process without delay to avoid an immediate and serious danger to the public health, safety, or welfare.

(b) Notice that a protest of a bid solicitation has been filed shall be given by U.S. mail or hand delivery to all bidders to whom bid proposals have been supplied and to all other timely protestants. Notice that a protest of the intent to award a contract has been filed shall be given by U.S. mail or hand delivery to all companies which submitted a bid. Notice that a protest of the intent to reject all bids has been filed shall be give by U.S. mail or hand delivery to all bidders.

(7) **Resolution of Protests.**

(a) The Purchasing Department, on its own initiative, or upon the request of the protestor, shall provide an opportunity to meet with the Superintendent or his designee to resolve the protest by mutual agreement between the parties within fourteen (14) days of receipt of a formal written protest.

(b) If the subject of a protest is not resolved by mutual agreement within fourteen (14) days of receipt of the formal written protest, and if there is a disputed issue of material fact, the protest shall be referred to the Division of Administrative Hearings for proceedings under Section 120.57(1), Florida Statutes.

(c) This Board is not obligated to accept a recommendation placed before it nor is it bound by a notice of intended decision. At its sole discretion it may decide to reject all bids submitted. Such action terminates all procedures invoked or evocable under this policy.

Statutory authority: 230.22(2) F.S.
Law implemented: 120.57(3) F.S., SBER 6A 7.42(2) (f).

Date adopted: July, 1982.

Date amended: March 13, 1984; April 13, 1993; April 7, 1998

END OF SECTION B

SECTION C

BID FORM

SUBMIT IN DUPLICATE ON CONTRACTOR'S LETTERHEAD

SCHOOL BOARD OF LEON COUNTY, FLORIDA — DATE:

DIVISION OF FACILITIES — TIME:

3420 W. THARPE STREET, Suite 100
TALLAHASSEE, FLORIDA 32303 — OWNER'S BID NO.

REFERENCE:

I (We), the undersigned, hereby declare that the only persons, firm or corporation interested in this Proposal or the Contract to be entered into, as principals, are named herein, and that this Proposal is made without collusion with any person, firm or corporation, and that it is in all respects fair and in good faith.

The undersigned, hereinafter called "Bidder", having visited the site of the proposed project and become familiar with the local conditions, nature and extent of the work, and having examined carefully the drawings, specifications, the Form of Agreement, and other Contract Documents, with the bond requirements therein, proposes to furnish all labor, materials, equipment and other items, facilities, and services for the proposed execution and completion of the **Lively Technical Center Chiller Plant Upgrades** in full accordance with the drawings and specifications prepared by **McGinniss & Fleming Engineering, 1401 Miccosukee Road, Suite 200, Tallahassee, Florida**, in full accordance with the Advertisement for Bids, Instruction to Bidders, Agreement and all other Contract Documents; and if awarded the Contract, I (We) will contract with the SCHOOL BOARD OF LEON COUNTY, FLORIDA to furnish all necessary labor, equipment, materials, and incidental costs, and that I (We) will substantially complete all necessary work in accordance with the Specifications and Drawings, and the requirements under them within 210 consecutive calendar days after receipt of Notice-to-Proceed for the following Bid price:

BASE BID _____ Dollars($_____).

With the foregoing as a Base Bid, the following Alternate Prices are submitted in accordance with the Drawings and Specifications.

Alternate No. 1: _____ Dollars ($_____).

The undersigned further agree(s) to bear the full cost of maintaining all work until the final acceptance, as provided in the Contract Documents.

The above amount, if accepted by the Owner shall form a Contract to be entered into. The undersigned agree(s) to furnish a sufficient and satisfactory bond in the sum of not less than 100 percent (100%) of the Contract Price of the work awarded.

It is further agreed that in the case of failure on the part of the undersigned to execute said Contract and Bond under the conditions of this Proposal within eight (8) "Owner Business Days" after the award of the Contract, the accompanying Proposal Guaranty, made payable to the SCHOOL BOARD OF LEON COUNTY, FLORIDA of not less than five percent (5%) of the total actual bid (Base Bid plus all Alternates), shall be forfeited as liquidated damages; otherwise, said Guaranty is to be returned to the undersigned upon the delivery of the executed Contract, a satisfactory bond and other specified documents.

Name of Bonding Company: _____
Local Agent's Address: _____ _____ Phone No. _____

Attached hereto, is the said Proposal Guaranty in the form of a Bid Bond, Certified Check, Cashier's Check in the amount of _____ Dollars ($ _____), according to the provisions contained herein and to the conditions and provisions of the Contract Documents.

Section D: Major Subcontractors is to be completed and included with this bid form package.

I (We) hereby acknowledge receipt of the following Addendum, if any, issued during the bidding period:
(List Addendum No. and Date)

It is understood by the Bidder that the Owner shall post its intent to award or reject this Bid. The intent shall remain posted for a period of three (3) working days. Failure to file a protest within the time prescribed in Section 120.57(3), Florida Statutes, shall constitute a waiver of proceedings under Chapter 120, Florida Statutes.

I (We), the undersigned, hereby certify that I (We) have carefully examined the foregoing Proposal after the same was completed and have verified each item placed thereon; and I (We) agree to indemnify, defend and save harmless, the SCHOOL BOARD OF LEON COUNTY, FLORIDA and their agents, against any cost, damage or expense which it may incur or be caused by an error in my (our) preparation of same.

In witness whereof, the Bidder has hereunto set his signature and affixed his seal this ___ day of _____, A.D., 20__.

_____(SEAL)

By:
Title:
The following license is current and the Bidder agrees to maintain it in effect throughout the project duration:
Florida Construction Industries Licensing Board Certification (State Certified of County Registered).

_____
(Name of Holder)

END OF SECTION C

SECTION D

LISTING OF MAJOR SUBCONTRACTORS
(To be submitted in a separate envelope marked, "LISTING OF MAJOR SUBCONTRACTORS," along with Bidder's Bid Form)

TO: School Board of Leon County, Florida
3420 West Tharpe Street, Suite 100
Tallahassee, FL 32303

ATTENTION: Director of Construction

NOTE: To be executed as part of the Bidders Proposal. If, due to Alternate bids, more than one subcontractor must be considered, Contractor shall list each and state which is to be considered for Base Bid work and which is to be considered for alternate work if a specific alternate is to be taken.

Bidder agrees that, if they are apparent low bidder or if so requested by the Owner, they will submit to the Owner a full list of subcontractors and suppliers within 24 hours of bid opening (contained in Section P) to the Contract Administrator for the School Board of Leon County, Florida, 3420 West Tharpe Street, Suite 100, Tallahassee, FL 32303.

All subcontractors and suppliers are subject to approval of the Owner. The following are the subcontractors and suppliers proposed to be used if the undersigned is awarded the contract for **Lively Technical Center Chiller Plant Upgrades.**

DIVISION OF WORK	CORPORATE NAME AND ADDRESS	PRINCIPAL OR OFFICER'S NAME

The undersigned declares that they have fully investigated each subcontractor listed and have determined to their own complete satisfaction that such contractor maintains a fully-equipped organization capable technically and financially of performing the pertinent work, and has made similar installations in a satisfactory manner.

Name of Firm: _____

Signed By: _____

Title: _____

Address/Zip: _____

Telephone No._____ Contractor's Certificate No. _____

END OF SECTION D

SECTION E

BID BOND

GENERAL:

A. I. A. BID BOND:

The "Bid Bond" American Institute of Architects Form A-310, Latest Edition, is referenced herein and shall be used on this project.

Forms shall be obtained by the Contractor from the Florida Association of the American Institute of Architects, located at 104 East Jefferson Street, Tallahassee, Florida 32301, (850) 222-7590

END OF SECTION E

SECTION F

ACCEPTABLE SURETY COMPANIES **Updated February 24, 2012**.

GENERAL:

To be acceptable as Surety on the Performance Bond and Materials and Payment Bond, a surety company shall comply with the following provisions:

The Surety Company must be admitted to do business in the State of Florida.

The Surety Company shall have been in business and have a record of successful and continuous operations for at least five (5) years.

Provide bonds as stipulated herein and in Section 1013.47, Florida Statutes.

The Surety Company shall have at least the following minimum ratings:

CONTRACT AMOUNT	REQUIRED FINANCIAL RATING 1*
$1 to 1,000,000	A & A-
$1,000,000 OR MORE	A+

*Best's Financial Rating.

The Surety Company shall not expose itself to any loss of any one risk in an amount exceeding ten percent (10%) of its surplus to policy holders, provided:

Any risk or portion of any risk which shall have reinsured (in which case these minimum requirements contained herein also apply to the reinsuring carrier) in an assuming insurer authorized or approved by the insurance commissioner to do such business in this State shall be deducted in determining the limitation of risk prescribed in this Division.

In the case of a surety insurance company, there shall be deducted, in addition to the deduction for reinsurance, the amount assumed by any co-surety, the value of any surety deposited, pledged or held subject to the consent of the surety and for the protection of the surety.

END OF SECTION F

SECTION G

CONTRACT BONDS

GENERAL:

PERFORMANCE BOND and PAYMENT BONDS:

The Performance and Payment Bonds, American Institute of Architect's Form A-312, Latest Edition, shall be used on this project.

Forms shall be obtained by the Contractor from the Florida Association of the American Institute of Architects, located at 104 East Jefferson Street, Tallahassee, Florida 32301, (850) 222-7590

SECTION H

CONTRACT AGREEMENT

GENERAL:

The "Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment Is a Stipulated Sum", American Institute of Architects, Document A-101, Latest Edition shall be used on this project.

FORMS SHALL be obtained by the Contractor from the Florida Association of the American Institute of Architects located at 104 Jefferson Street, Tallahassee, Florida 32301, (850) 222-7590.

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The following information is Supplementary Conditions to the Contract to be amended where indicated.

Article 2

PROJECT: **Lively Technical Center, Chiller Plant Upgrades**

PROJECT NO: **33017**

Article 3

3.1 The Date of Commencement will be defined in a Notice-to-Proceed.

3.2 Substantial Completion shall be within [210] consecutive calendar days following Notice-to-Proceed; Final Completion shall be within **30** consecutive calendar days following Substantial Completion.

Liquidated damages shall be in accordance with Section K, 8.4.1 Supplementary General Conditions of the Contract Documents. Liquidated Damages: **$500.00** per day.

Article 4

4.2 List Base Bid, and all alternates accepted (if any) for the project. Total Base Bid plus alternates.

Article 5

5.2 See Attached Article 5, Progress Payments, made as Exhibit 'B' to the contract documents as if repeated herein.

ARTICLE 5
PROGRESS PAYMENTS

Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect and approved by the Owner, the Owner shall make progress payments against the account of the Contract Sum to the Contractor in accordance with the following:

~~**NOTE:** If this project is federally funded through School Construction Bonds (i.e. Qualified School Construction Bonds [QSCB], or Qualified Zone Academy Bonds (QZAB) then the Department of Labor Standards and Provisions for Federally Assisted Projects and the Prevailing Wage Rates for Construction: Heavy, Highway, and Building for Leon County, Florida must comply with the Davis Bacon Act (DBA). This includes the General Contractor or Construction Manager at Risk Services, and all trades/subcontractors/subs on the site doing work~~.

(1) The Construction Manager or if applicable, the General Contractor's fees only, will be held and distributed in the following manner:

Fifty percent (50%) of the Construction Manager or if applicable, the General Contractor's fees will be divided in equal payment on the Application for Payment for the duration of the project until Substantial Completion. The remaining fifty percent (50%) is to be held (Schedule of Values breakdown sheet under the title *"Total Completed & Stored to Date"* area) until FINAL COMPLETION.

(2) Within thirty (30) Owner business days after the Owner's receipt of a Certificate of Payment issued by the Architect, the Owner shall pay ninety percent (90%) of the Contract Sum properly allocable to labor, materials and equipment incorporated in the Work and ninety percent (90%) of the portion of the Contract Sum allocable to materials and equipment suitably stored at the site or at some other location agreed upon in writing, for the period covered by the Application for Payment, less the aggregate of previous payments made by the Owner; and upon Substantial Completion of the entire Work, a sum sufficient to increase the total payments to ninety percent (90%) of the Contract Sum, less such amounts as the Architect and Owner shall determine for all incomplete Work and unsettled claims as provided in the Contract Documents.

The unpaid balance of the Contract Sum will be held until the project is accepted by the School Board. At the time of acceptance by the School Board, three (3) times the value as determined by the Architect of any remaining items will be withheld until the specific items have been completed. If three (3) times the estimated cost of completing remaining items exceeds the unpaid balance of the Contract Sum, the Architect will issue a Change Order for the difference to be payable to the Owner by the Contractor.

Notwithstanding the contractor's compliance with the claim or dispute resolution terms of this contract, the contractor shall not be entitled to any interest on payments which may be due and unpaid by the owner, nor shall the contractor be entitled to any prejudgments interest on any damages awarded to the contractor in any civil action or on any arbitration award, even if the owner is found to have breached the contract.

5.6.1 Ten percent (10%).
5.6.2 Ten percent (10%).
5.7.1 Ninety percent (90).
5.8 Retainage will only be released upon recommendation of the Architect and by action by the Board of Education with all documents properly forwarded to the Office of Educational Facilities (D.O.E.).

Article 7
7.2 N/A

7.3 Other Provisions:
7.3.1 For the sum of one hundred dollars ($100.00) and other good and valuable consideration, receipt of which is hereby acknowledged by the contractor, said Contractor does agree to indemnify the Owner and Architect in accordance with Paragraph 3.18 of Contract Document A-201 which was previously entered into by the parties.

7.4 Prior to beginning the Work, the Contractor shall obtain and furnish the Owner the Bonds and Insurance policies required by the Contract Documents, which shall be procured from agents authorized to do business in the State of Florida and in such form and amounts acceptable to the Owner. If at any time the Owner shall deem the surety, or sureties to be unsatisfactory of a Bond, and is deemed inadequate by the Owner, they shall be required to furnish an additional Bond or Bonds in such form and amount and with a surety acceptable to the Owner. The failure of the contractor to furnish such Bonds and Insurance policies in a timely manner shall not delay the commencement of the Contract time nor shall be a cause for an extension of the Contract time.

IN WITNESS WHEREOF, this Contract has been fully executed on behalf of the parties hereto by its duly authorized representatives as of the date first written above.

THE SCHOOL BOARD OF LEON COUNTY, FLORIDA

BY: _____
Chairperson

(SEAL)

ATTEST: _____
Board Secretary

_____
Name of Firm

BY: _____
Title

(SEAL)

ATTEST: _____
Secretary of Corporation

Approved as to Form: _____
Attorney to the Board

END OF SECTION H

SECTION J

GENERAL CONDITIONS

GENERAL:

The "General Conditions of the Contract for Construction", American Institute of Architects, Document A-201- **2007**, Latest Editions shall be used on this project.

FORMS SHALL be obtained by the Contractor from the Florida Association of the American Institute of Architects located at 104 Jefferson Street, Tallahassee, Florida 32301, (850) 222-7590.

End of Section J

SECTION K

Revised December 4, 2008

SUPPLEMENTARY GENERAL CONDITIONS
INDEX

Revised December 4, 2008

SUPPLEMENTARY GENERAL CONDITIONS—to AIA Document A201- **2007**

ARTICLE 2 - OWNER

OWNER'S RIGHT TO CARRY OUT THE WORK

2.4 ADD the following:

2.4.1 If the Contractor defaults or neglects to carry out the work in accordance with the Contract Documents and fails within **three (3) business days period** after written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may after such **three (3) business days period**, without further notice and without prejudice to other remedies the owner may have, correct such deficiencies. In such case an appropriate change order shall be issued deducting from payments then or thereafter due the contractor thee cost of correcting such deficiencies, including compensation for the Architect's additional services and expenses made necessary by such default, neglect, or failure. Such action by the Owner and the amount charged to the Contractor are NOT subject to approval of the Architect. If payments then or thereafter are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

2.4.1.1 Failure to meet timelines defined in the Critical Path schedule submitted by the Contractor to the Owner under **Article 3.10** of these Supplementary General Conditions and as described in Section 01340 ("Construction Schedule") of the technical specifications shall be evidence of negligence when it appears by examination of the Critical Path Schedule that such failure will result in failure to meet the contracted substantial completion date. Nothing in this paragraph shall prevent the Owner from action against default or neglect for other reasons.

2.4.2 In the event that the Contractor's default, neglect, or failure to carry out the Work in accordance with the Contract Documents will jeopardize the health or safety of the present or future occupants of buildings or structures which are part of the Project, and which constitute a violation of any regulation or Code involving health or safety, the Owner's period of required notice to the Contractor shall be reduced from seventy-two (72) hours to twenty-four (24) hours, and all other provisions of paragraph 2.4.1 shall apply.

2.4.3 If after the lapse of seventy-two (72) hours (or twenty-four (24) hours if applicable), the Owner begins mobilization and procurement as required to correct the Work, and if after that time the Contractor commences and continues correction of the Work diligently and expeditiously, the Contractor shall reimburse the Owner for all expense of mobilization, procurement, labor, and materials incurred between the time that the written notice expired and the time that the Contractor had clearly and unambiguously commenced corrective work, with adequate work force to meet all applicable time lines.

SCHOOL BOARD PROJECT REPRESENTATIVE

2.5 ADD the following: The Owner will designate its School Board Project Coordinator and Inspector who will act as its on-site field representatives and fulfill duties enumerated in the Rules of the Department of Education, State Board of Education, State Requirements for Educational Facilities, Section 4.4(1), **February 12, 2007**.

DECLARATION OF DEFAULT

2.6 ADD the following: The failure of the Contractor to supply enough properly skilled workmen or materials or to make prompt payment to Subcontractors or for materials or labor, or to obey laws, ordinances, rules,

regulations or orders of public agencies having jurisdiction, or to comply with the Contract Documents, shall be sufficient grounds for the Architect to find the Contractor in substantial default and to certify to the Owner that sufficient cause exists to terminate the Contract and to withhold payment or any part thereof until the cause or causes giving rise to the finding of default has been eliminated by the Contractor and approved by the Architect and Owner. If a finding of default is made, the Contractor shall remain responsible for performance of the requirements of the Contract Documents unless and until the Owner terminates the Contract. Upon finding of default, the Architect shall set a reasonable time within which the Contractor shall eliminate the cause or causes of default. When the basis for a finding of default no longer exists, the Architect shall notify the Contractor and Owner in writing that the default has been corrected and that the Contractor is no longer in default. If the Contractor fails to correct the default within the time allowed, the Owner upon certification by the Architect that sufficient cause exists to justify such action, may terminate the Contract and the employment of the Contractor pursuant to **Article 14.2** of General Conditions.

Article 3 - CONTRACTOR

CONTRACTOR VERIFICATION OF SURVEY:

3.2.2.1 ADD the following:

Prior to commencing any excavation or grading, the Contractor shall satisfy himself as to the accuracy of all survey data as indicated in these Drawings and Specifications and/or as provided by Owner. Should the contractor discover any inaccuracies, errors, or omissions in the survey data, the Contractor shall immediately notify the Architect in order that proper adjustments can be anticipated and ordered. Commencement by the Contractor of any excavation or grading shall be held as an acceptance of the survey data by the Contractor, after which time the Contractor has no claim against the Owner resulting from alleged errors, omissions or inaccuracies of the said survey data.

NUMBER OF DOCUMENTS

3.2.2.2 ADD the following: The Contractor will be furnished, free of charge, ten (10) copies of the Drawings and Specifications and may purchase from the Architect as many additional copies as the Contractor may require at (Architect/Engineer's set price for project) per set.

CONSTRUCTION PROCEDURE:
LABOR AND MATERIALS:

3.4.1.1 ADD the following: The Contractor shall provide, in addition to supervision and layout, not less than twenty percent (20%) of the Contract Sum which shall include two (2) or more of the following: all carpentry work, all form work, all reinforcing steel work, all structural steel work, or all concrete work. Prior to the Contract being awarded, the Contractor shall provide to the Owner for approval a written statement setting forth the portion of Work he shall provide. Once approved, no changes shall be made to this written statement without prior written approval of the Owner.

TAX EXEMPTIONS:

3.6.1 ADD the following: Although the Owner is not subject to the Florida Sales and Use Tax, any Contractor who purchases materials which will be used in the construction of a public-owned building ***will not be exempt*** from the sales tax on these materials as evidences by the following excerpt from the Florida Statutes:

"The State, any county, municipality or political subdivision of this state is exempt from the sales tax, except this exemption shall not include sales of tangible personal property made to contractors employed either directly or as agents of such government or political subdivision thereof when such tangible personal property going into or becomes a part of public works owned by such government or political subdivision thereof."

PERMITS:
3.7.1.1 ADD the following:

The Owner is not subject to cost of the Municipal Building Permits.

3.7.1.2 ADD the following:

Chapter 235.211(4), F.S. states that "The services of a registered architect are not required for minor renovation project for which the construction cost is less than $50,000.00, or for the placement, or hookup of relocatable educational facilities that conform to the standards adopted under Chapter 235.26(2), F.S."

For minor projects meeting the requirements of Chapter 235.211(4), plans will be required. However an architect seal will not be required. For projects with a construction cost exceeding $200,000.00, plan review will be done by the Department of Education. The School Board Inspection Department will issue **ALL** permits and Certificates of Occupancy, regardless of the project costs.

Procedures for Application for a Building Permit are available through Leon County School District's Facilities/Construction Department by Roderick McQueen, **(850) 617-5900**.

3.7.1.3 Add the following: "All construction shall be in accordance with the editions of codes currently adopted by Leon County Schools. See Leon County School Building Code Requirements."

SUPERINTENDENT:
3.9 ADD the following:

3.9.1.1: The Contractor shall employ and keep at the site of the work during its progress a competent and thoroughly experienced superintendent capable of handling all phases of the project. The Superintendent shall have any necessary assistants, foremen and timekeepers required by the scope of this project, and shall be acceptable to the Architect, and shall not be changed or transferred unless approved by the Architect, or ceases to be in the employ of the Contractor. If the Contractor must replace the Superintendent for any reason between "Notice-to-Proceed" and final Architect's certification of completion of the work, then the Contractor shall: Notify Architect that the existing Superintendent will be leaving the job on (date) and that all job work shall cease after said date until a satisfactory replacement Superintendent is found, approved by Architect, and physically present on the site properly authorized and briefed by Contractor.

3.9.2.1: The Superintendent shall represent the Contractor in the Contractor's absence and all directions given to the Superintendent shall be as binding as if given to the Contractor. Major and important directions shall be confirmed in writing to the Contractor. Other directions shall be so confirmed on written request in each case.

SUPERINTENDENT'S NAME:

3.9.2.2 The Contractor shall submit to the Architect the name and resume of the proposed superintendent for the Contractor at the pre-construction conference to allow investigation by Architect.

SUPERVISION:

3.9.4: The Contractor shall give efficient supervision to the work, using the best skill and attention. The Contractor shall carefully study and compare all Drawings, Specifications and other instructions and shall report at once to the Architect any error, inconsistency or omission which is discovered but shall not be held responsible for their existence or discovery. The Superintendent shall be in attendance on the job a minimum of six (6) hours per working day from "Notice-to-Proceed" continuously through final approval of the work by the Architect. No work shall be allowed to transpire on the site unless the Superintendent is in attendance at the site.

PRECONSTRUCTION CONFERENCE:

3.9.5: Before beginning work at the site, the Contractor shall attend a pre-construction conference scheduled by the Architect and he shall bring the superintendent employed for this project. At this time, all parties concerned will discuss the project under Contract and prepare a program of procedures in keeping with requirements of the Contract Documents. The superintendent shall henceforth make every effort to expeditiously coordinate all phases of the work, including the required reporting procedure, to obtain the end result within the full purpose and intent of the Contract Documents for the project.

PROGRESS SCHEDULE:
3.10 ADD the following:

3.10.4: The contractor shall furnish, not later than fifteen (15) days after receipt of "Notice-to-Proceed", a CPM schedule showing the expected times of completion of the various stages of work on this project. The schedule shall be a C.P.M. (Critical Path Method) chart. The work headings therein shall correspond generally with the headings listed in the Contractor's Schedule of Values. Refer to Division 1 - General Requirements. Final times of completion in the schedule shall not exceed the completion date required by the contract Documents. During progress of the work the Contractor shall enter on the schedule that Actual progress at the end of each month, and shall deliver two (2) copies to the Architect along with the Contractor's pay request. Contractor's pay request will not be processed until receipt and review of monthly updated CPM Chart.

WORK FORCE:
3.10.5: The Contractor shall furnish sufficient forces, construction plans and equipment, and shall work such hours, including night shifts and overtime operation, as may be necessary to insure the execution of the Work in accordance with the approved progress schedule. If the Contractor falls behind the progress schedule, the Contractor shall take such steps as may be necessary to improve the progress by increasing the number of shifts, overtime operations, days of work and the amount of construction plans, all without additional cost to the Owner.

3.10.6: Failure of the contractor to comply with the requirements under this provision shall be grounds for determination by the Architect that the Contractor is not executing the Work with such diligence as will insure completion within the time specified and such failure constitutes a substantial violation of the conditions of the Agreement.

3.10.7: Upon such determination, the Owner may terminate the Contractor's right to proceed with the Work, or any separable part thereof, in accordance with Article 14 of the General Conditions, or may withhold further payments as indicated in Article 9.5.1.

DOCUMENTS AND SAMPLES AT THE SITE

3.11.2 ADD the following: A copy of Toxic Substance List submitted by both the Contractor and Subcontractors to the Owner, must be kept at the site during the duration of construction.

SHOP DRAWINGS; Product Data and Samples:

3.12 ADD the following new subparagraphs:

3.12.11: Shop Drawings and samples shall be dated and contain: name of project; project No.; description or names of equipment, materials and items; and complete identification of locations at which materials or equipment are to be installed. If the shop drawings do not conform completely with the requirements of the Contract Documents, such nonconformance shall be specifically noted on the face of the drawings.

3.12.12: Submission of Shop Drawings and samples shall be accompanied by transmittal letter, containing project name, Contractor's name, number of drawings and samples, titles and other pertinent data.

3.12.13: Unless otherwise specified, the number of Shop Drawings and the number of samples which the Contractor shall submit and, if necessary, resubmit, is the number that the Contractor requires to be retained for the Contractor's use plus 2 which will be retained by the Architect/Engineer.

CLEAN UP:
3.15.3 ADD the following:
Keep interior of the building free of stored or unattended combustible materials.

ACCESS TO WORK:
3.16.2 ADD the following:
The authorized representatives and agents of the Architect, the Owner and such other persons as the Owner may designate, shall have access to and be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials and other relevant data and records wherever they are in preparation and progress. The contractor shall provide proper facilities for such access, inspection and, when required, exact duplicate copies of the aforementioned data shall be furnished.

CHANGE ORDERS

7.2.the following:

7.2.2 In subparagraphs **7.2.1.1** and **7.2.1.3** the allowance for overhead and profit combined, included in the total cost to the Owner shall be based upon the following schedule:

(a) For the Contractor, for any work performed by his own forces, 10% of the cost:

(b) For each subcontractor, for any work performed by his own forces, 10% of the cost:

(c) For the Contractor, for work performed by his subcontractor, 5% of the amount due the subcontractor.

(d) Cost shall be limited to the following: Bond premiums, cost of materials, including sales tax (in effect at time of change order) and cost of delivery, cost of labor and fringe benefits, including Social Security, Old Age and Unemployment Insurance (labor cost may include a pro rate share of foreman's time only in case an extension of Contract Time is granted on account of the change); Workmen's Compensation Insurance; rental value of power tools and equipment.

(e) Overhead shall include the following: Supervision, superintendence, wage of time keepers, watchmen and clerks, small tools incidentals, general office expense and all other expenses not included in "cost".

7.3.7 ADD the following:

In the 6th and 7th lines change the words " ... a reasonable allowance for overhead and profit in accordance with the schedule set forth above in **Section 7.2.2**".

LIQUIDATED DAMAGES
8.4.1 is amended to read as follows:

Failure to complete the Project within the time fixed in this Agreement will result in substantial injury to the Owner, and as damages arising from such failure cannot be calculated with any degree of certainty, according to the definition of "Substantial Completion" in Subparagraph **9.8.1** of the General Conditions, within the time fixed or within such further time, if any, as may be authorized in accordance with the Contract Documents, the Contractor shall pay to the Owner as Liquidated Damages for such delay, and not as a penalty, **Five hundred dollars ($500.00)** for each and every calendar day elapsing between the date fixed

for Substantial Completion and the date such Substantial Completion shall have been fully accomplished. It is also hereby agreed that if after thirty **(30)** Calendar Days after Substantial Completion this Project is not fully and finally completed in accordance with the requirements of the Contract Documents, the Contractor shall pay to the Owner as Liquidated Damages, and not as a penalty, for such delay, one-forth (1/4) of the rate previously indicated. These Liquidated Damages shall be payable in addition to any expenses or costs payable by the Contractor to the Owner under the provisions of the Contract Documents and shall not exclude the recovery of damages of the Owner under the Contract Documents. This provision of Liquidated Damages for delay shall in no manner affect the Owner's right to terminate the Contract. The Owner's exercise of the right to terminate shall not release the Contractor from his obligation to pay Liquidated Damages. It is further agreed that the Owner may deduct from the balance of the Contract Sum held by the Owner the Liquidated Damages stipulated herein, or such portions as said balance will cover.

SCHEDULE OF VALUES:

9.1.1 Add the following: The Construction Manager or if applicable, the General Contractor's fees only, will be held and distributed in the following manner:

Fifty (50%) percent of the Construction Manager or if applicable, the General Contractor's fees will be divided in equal payment on the Application for Payment for the duration of the project until Substantial Completion. The remaining fifty (50%) percent is to be held (Schedule of Values breakdown sheet under the title *"Total Completed & Stored to Date"* area) until FINAL COMPLETION.

9.2.1 ADD the following: The Contractor shall submit to the Architect the Schedule of Values within fifteen (15)f days after receipt of Notice-to-Proceed in accordance with the schedule shown at the end of this Section. The General Contractor's overhead and profit for each item and sub-contract shall be included in each item. Refer to Division 1 - General Requirements. This schedule will be re-submitted for approval by the Architect. No pay requests will be approved until contractor has submitted an **acceptable** schedule of values.

9.8 SEMI-FINAL PRELIMINARY INSPECTION:

9.8.2.1: Prior to a formal inspection by the Architect, i.e., semi-final inspection, the superintendent or Contractor shall conduct a preliminary inspection, noting on a punch list those items requiring correction. This list shall then be distributed to all project inspectors and subcontractors. All items so noted shall be corrected prior to a formal inspection by the Architect and the check-off list shall be submitted to the Architect with the contractor's request for Substantial Completion inspection.

PLUMBING, HVAC & ELECTRICAL CERTIFICATE:

9.8.2.**2** ADD the following: The contractor shall submit at substantial completion a certificate from each manufacturer's technical representatives that all Plumbing, HVAC and Electrical equipment and material have been installed properly and that all warranties and guarantees will be valid. Submit in triplicate.

FINAL PAYMENT:

9.10.3.1 ADD the following: Notwithstanding any other provisions of the Contract Documents, no final payment or release of the retainage will be due the Contractor until final acceptance of the work by Owner, Architect and final acceptance inspection and approval of the Department of Education. Final Payment shall be made after this date.

ADD 9.11 WRITTEN GUARANTEE

9.11.1 is amended to read as follows: The Contractor shall and does hereby guarantee the Work and shall remedy any defects due to faulty materials or workmanship which appear within one (1) year, unless a longer period is specified in the Contract Documents, from the date specified in Subparagraph 8.1.3.

Neither the final payment nor any provision in the Contract Documents shall relieve the Contractor of the responsibility for negligence, defects of manufacturer, faulty materials, or workmanship to the extent within the period provided by law; and upon written notice that they shall remedy any defects due thereto and pay all expenses for any damages to other work resulting therefrom.

9.12 DATA FURNISHED BY THE CONTRACTOR

9.12.1 ADD the following: During the Work and prior to receiving Final Payment, the Contractor shall furnish to the Architect for transfer onto the record drawings one (1) complete set of "record" drawings acceptable to the Architect and Owner, indicating construction changes and actual locations which are at variance with the original drawings.

9.12.2 ADD the following: At the completion of the Work and prior to receiving Final Payment, the Contractor shall furnish to the Architect for delivery to the Owner all bonds, warranties, guarantees, manuals and operating instructions and a complete list of equipment installed in the Project showing manufacturer and model numbers and cost.

9.12.3 ADD the following: At the completion of the Work and prior to receiving final payment, the Contractor shall furnish to the Architect a Schedule of Maintenance, stating frequency and type of service for each piece of equipment.

9.12.4 ADD the following: At the completion of the Work and prior to receiving final payment, the Contractor and Subcontractor shall instruct the Owner how to use all equipment and systems in the Project and supply appropriate instruction manuals.

SAFETY PRECAUTIONS AND PROGRAMS

2.03.1 CRIMINAL BACKGROUND CHECKS (Updated Dec. 8, 2008; May 13, 2009; Sept. 1, 2009 below) The Legislature passed a law effective September 1, 2005 called the Jessica Lunsford Act. This law requires any employee, contractor, vendor who will (1) Be at a school when students are present; or (2) Have direct contact with students; or (3) Have access to or control of school funds; meet Level II Background screening requirements. Level II screening includes fingerprinting, statewide criminal and juvenile justice records checks through the Florida Department of Law Enforcement and federal criminal records checks through the Federal Bureau of Investigation. Level II screening may also include local criminal records checks through the local law enforcement agencies.

Leon County School Board Policy 2.021 also requires a background check of all vendors that meet the above requirements. In addition, all vendors will have a Sexual Predator Check completed if they meet the requirements as listed below.

LCSB Policy 2.021 is subject to review and change. As a provision of this contract, if awarded, any changes made to this policy will automatically become a part of and be incorporated in this contract. It is the responsibility of the awardee(s) to be aware of any changes that may occur.

a. **Sexual Predator Check** – All vendors who provide services under this contract will have a Sexual Predator Check completed by Purchasing Department personnel through the Florida Department of Law Enforcement prior to approval of any contract. This check will be performed at the FDLE website listed here: http://www3.fdle.state.fl.us/sexual_predators/

   Level II Background Check – **(Updated 12-08-08)** Any vendor providing services under this contract who will (1) Be at a school when students are present; or (2) Have direct contact with students; or (3) Have access to or control of school funds, that person shall have a Level II background check submitted through the Leon County School Board. The

Leon County School Board shall submit vendor fingerprints and information to the Florida Department of Law Enforcement and the Federal Bureau of Investigations.

The LCSB will inform the contractor of the approval/disapproval of the check within approximately one week. If any person does not meet the Board's requirements, as described in Policy 2.021, that individual shall not be allowed to perform services for Leon County Schools. The contractor shall be required to pay for all costs of the background reports. If it is discovered, during the period of the contract that the successful contractor substituted an unapproved worker for an approved worker, the vendor's contract may be cancel led immediately at the discretion of the Leon County School Board.

Work construction sites that are completely segregated by a chain link fence (minimum height of six foot) and with no students present, may work with a Sexual Offender/Predator check, when under the constant supervision of a Level II screened authorized individual.

All Level II cleared contractors must display a Leon County Schools Vendor badge when on school district property.

In the event that an approved contractor/vendor is arrested for any reason subsequent to the background clearance performed by Leon County School Board, Safety, Security & Emergency Management Dept., they are required to immediately notify his or her supervisor who will then notify the Safety, Security & Emergency Management within 48 hours of the arrest, at which time a determination will be made as to whether the approval of that individual will be rescinded from accessing Leon County School Board properties.

2.03.2 **Updated May 13, 2009**– reciprocity if a contractor already is registered with another school district?: **Reciprocity of Florida School I.D. Badges**: If a contractor has registered with another Florida school district, they may be able to obtain a Leon County School I.D.; the contractor should contact the Safety and Security Department at 850-487-7293 for additional information regarding the process and any associated cost. Once the individual has been cleared, he/she will need to report to Fingerprint Services to pick up a picture id badge.

10.2. SAFETY OF PERSONS AND PROPERTY

10.2.2.1 ADD the following: The contractor shall comply with all applicable provisions of the Workmen's Compensation Law, specifically, Chapter 440.56, Safety Rules and Provisions and the various safety codes or regulations adopted by the Florida Department of Commerce and the State of Florida. The Contractor shall be familiar with each of these documents and designate a safety officer to be responsible for compliance with these safety provisions.

Hazardous Materials ADD the following:

10.3.1.1 : The National Emission Standards For Hazardous Air Pollutants (NESHAPS), 40 CFR Part 61, Subpart M and other guidance materials relating to asbestos regulations and as follows shall be the responsibility of the Contractor.

10.3.1.2: Subsections 61.145, 61.146, 61.147, 61.152, 61.154, and 61.156, apply to DEMOLITION AND RENOVATION PROJECTS. In accordance with asbestos regulations, Subpart M, a notification must be sent to the Department of Environmental Regulation before the project starts. A notice must be sent for a DEMOLITION project even if NO asbestos containing material is present in the facility.

10.3.1.3: Ten (10) days before the start of an asbestos renovation or demolition project the notification must be postmarked or delivered to:

Florida Department of Environmental Protection
Northwest District Branch Office
Attn: Mr. Tracy White
470 Harrison Avenue
Panama City, Florida 32401

The project notifications may also be emailed to: tracy.white@dep.state.fl.us and linda.s.hamilton@dep.state.fl.us

The Notice shall include the following information:

1. The name, address and phone number of the facility Owner.
2. The name, address and phone number of the demolition or renovation contractor.
3. A description of the structure being demolished or renovated, including the size, age, and prior use.
4. The approximate amount in square feet or linear feet of friable asbestos material present in the facility.
5. The address or location of the structure (including county) to be demolished or renovated.
6. The scheduled starting and completion dates of the demolition or renovation project.
7. The nature of the planned demolition or renovation project and the methods to be used. (saying the regulations will be acceptable.)
8. The procedure to be used to prevent asbestos emissions to the outside air (see Subsection 61.147).
9. The name and location of the waste disposal site where the friable asbestos waste material will be deposited.

Any questions concerning the asbestos regulations can be addressed to DEP.

Article 11 - INSURANCE AND BONDS **–(Revised 6/11/07)**

CONSTRUCTION LIABILITY INSURANCE:

11.1.1 ADD the following:

In the second line following the word "located" insert the words "and in a company or companies to which the Owner has no reasonable objection."

In the third line following the word "contractor" insert the words "and the Owner as additional insured".

11.1.2 ADD the following:

11.1.2.1: The insurance required by subparagraph 11.1.1 shall be written for not less than any limits of liability required by law or by those set forth below, whichever is greater, and shall include contractual liability insurance as applicable to the Contractor's obligations under Paragraph 3.18. All of the following monetary insurance requirements are minimum amounts:

11.1.2.2 ADD the following:

11.1.2.2: Worker's Compensation shall be in compliance with Chapter 440, Florida Statutes.

11.1.2.3: Public Liability: Per occurrence:

(1)	Each Accident	$1,000,000
(2)	Disease-Policy Limit	$1,000,000
(3)	Disease-Each Employee	$1,000,000

11.1.2.4: Automobile Liability: Per Occurrence:

(1) Bodily and Personal Injury $1,000,000
(2) Property Damage $1,000,000

11.1.2.5: The Contractor's liability policy shall provide "XCU" (Explosion, Collapse, Underground Damage) coverage for those classifications in which they are excluded.

INSURANCE CERTIFICATE:

11.1.3 ADD the following:

11.1.3.1: Furnish a certificate herein called for and specifically set forth evidence of all coverage required by 11.1.1 and 11.1.2 and 11.1.3; and the Contractor shall furnish to the Architect copies of any endorsements that are subsequently issued amending coverage or limits.

OWNER'S LIABILITY INSURANCE:

11.2.1 ADD the following:

The Contractor shall procure and furnish an Owner's Protective Liability Insurance Policy (the Owner shall be **named insured**) with the following limits:

Bodily Injury Liability:
$1,000,000.00 per occurrence
Property Damage Liability:
$1,000,000.00 per occurrence
Personal Injury Liability:
$1,000,000.00 per occurrence

PROPERTY INSURANCE:

11.3.1 ADD the following:

11.3.1.2 add Subparagraph "**11.3.1.2.1** Contractor shall also carry comprehensive general liability insurance".

11.3.1.6: The Contractor shall purchase and maintain property insurance upon the entire Work at the site of the full insurable value thereof. This insurance shall include the interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Work and shall insure against the perils of fire and extended coverage and shall include **"all risk"** insurance for physical loss or damage including, without duplication of coverage, theft, vandalism, and malicious mischief. If not covered under the all risk insurance or otherwise provided in the Contract Documents, the Contractor shall effect and maintain similar property insurance on portions of the Work stored off the site or in transit when such portions of the Work are to be included in an Application for Payment under Subparagraph 9.3.2.

INSURED LOSS:

11.4 PERFORMANCE BOND AND PAYMENT BOND

11.4.3 ADD the following: Furnish in duplicate a Performance Bond and Payment Bond, each in the amount of 100% of the Contract Sum, written by a surety licensed to do business in the state, FLORIDA**,** where the project is located. The prescribed form of the Performance Bond and Payment Bond is A.I.A. Document A-312, latest addition.

Article 13 - Miscellaneous Provisions:

13.5.3 ADD the following:

13.5.1.1: Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

13.5.1.2: Owner to notify Contractor of selected testing company. All tests, except those preformed exclusively for the Contractor's convenience, shall be paid by the Owner; however, the Contractor must notify and/or coordinate with the testing firms with proper notification to the Owner. Any retests made necessary by the Contractor's failure to perform to the specs in the specifications, these costs shall be paid by the Contractor.

INTEREST

13.6.1 ADD the following new subparagraph to read as follows:

Notwithstanding the contractor's compliance with the claim or dispute resolution terms of this contract, the contractor shall not be entitled to any interest on payments which may be due and unpaid by the owner; nor shall the contractor be entitled to any prejudgments interest on any damages awarded to the contractor in any civil action or on any arbitration award, even if the owner is found to have breached the contract.

Article 13 ADD the following new paragraph 13.8.1 to read as follows:

> Except as provided in Article 3.18.1, the contractor shall not be entitled to recovery of any attorney's fees from the owner, and the owner shall not be liable for payment of attorney's fees to the contractor for any reason whatsoever. The contractor hereby waives any right to recovery of attorney's fees from the owner under the payment or performance bond, or the contract between the owner and the contractor, or any other cause of action (except as provided in Article 3.18.1), notwithstanding any provision in Section 57.105, Florida Statutes to the contrary.

ADD THE FOLLOWING ARTICLE:

ARTICLE 15 – Claims and Disputes

15.1.4 CLAIMS FOR ADDITIONAL COST
15.1.4.1 ADD the following: If the Contractor wishes to make a claim for an increase in the Contract Sum, he shall give the Architect written notice thereof within twenty (20) days after the beginning of the occurrence of the event giving rise to such claims. This notice shall be given by the Contractor before proceeding to execute the Work, except in an emergency endangering life or property in which case the Contractor shall proceed in accordance with **Section 10.4**.

No such claim shall be valid unless so made. Any change in the Contract Sum resulting from such a claim shall be authorized by a Change Order. Claims not made within the time allowed shall be waived.

If the Contractor claims that additional cost is involved because of, but limited to, (1) any written interpretation pursuant to Subparagraph **15.1.4.2** ; (2) any order by the Owner to stop the Work pursuant to **Section** 2.3 where the Contractor was not at fault, (3) any written order for a minor change in the Work issued pursuant to **Section 3.4.2 or 7.3** , or (4) failure of payment by the Owner pursuant to **Section 9.7**, the Contractor shall make such claims as provided in Subparagraph **3.7.4**.

TIME EXTENSIONS:
15.1.5.3 ADD the following:

Weather, which hinders or prevents work, is not a basis for a time extension unless it surpasses in severity

the weather reasonably to be expected in the locality at the particular time of the year. If the contractor files timely notice that he was delayed by weather sufficiently severe as to entitle Contractor to additional time, Contractor should furnish promptly, a statement of the portion of the work affected, an explanation as to the reasons work was prevented or hindered by the weather if not readily apparent, the dates on which such portions of work were affected, the total number of days the job in its entirety was delayed, and other information such as official weather bureau climatological data for a ten year period, local weather bureau data, job daily records, etc. Time extensions due to adverse weather shall not be allowed after the Contract Substantial Completion date. Construction time is based on Local Average weather conditions. Requests for time extensions due to adverse weather, shall be considered only for and equal to the number of "rain days" in excess of the ten year mean average number of days for any given time period as shown on the U.S. Department of Commerce (closest location to the project location). The mean number of "rain days" for a month is as shown on the "U.S. Department of Commerce's Summary Report" under the heading "Number of days -- Precipitation .01 inch or more". If current rainfall is less than average, contract time will not be shortened.

15.1.5.4 ADD the following:

Extension of time requests due to adverse weather shall be submitted within twenty (20) days after adverse weather. The Contractor shall submit the referenced climatological summary data immediately upon its availability and shall show how the time extension request corresponds with the climatological data.

LOSS SETTLEMENT:

15.3.1 ADD the following: Delete in the 3rd through 6th lines the words, ... , "if such objection be made, **mediators** shall be chosen as provided in **Section 15.3.2** The Owner as fiduciary shall, in that case, make settlement with insurers in accordance with directions of such **mediators**. If distribution of insurance proceeds by **mediation** is required, the **mediators** will direct such distribution".

ARBITRATION:
15.4 is deleted in its entirety.

CLAIMS FOR CONSQUENTIAL DAMAGES:
15.1.6.1 ADD the following : The Contractor agrees to make no claim for damages for delay in the performance of the contract occasioned by any act or omission of the Owner or any of its agents or representatives, or because of any injunction which may be brought against the Owner and agrees that any such claim shall be fully compensated for by an extension of time to complete performance of the Work as provided herein.

15.1.6 add Subparagraph "**15.1.6.1** Claims for damages arising from Products and Completed Operations Liability".

ADD THE FOLLOWING ARTICLE:
Article 16 - Equal Employment Opportunity:

16.1 CONTRACTOR'S EMPLOYMENT POLICY
16.1.1 The Contractor and all subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin or age. The Contractor shall take affirmative actions to insure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex national origin or age. Such action shall include, but not be limited to the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertisement; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

16.1.2 The Contractor and all subcontractors shall, in all solicitations or advertisements for employees

placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex, national origin or age.

END OF SECTION K Supplementary General Conditions

SECTION L

INSURANCE CERTIFICATIONS **– Revised 6/11/07**
GENERAL:

CONTRACTORS INSURANCE CERTIFICATIONS:

Certifications are required for compliance with Supplementary General Conditions for Contractor's Liability, and they shall include the following information:

Insurance Certificates documenting the requirements of the Supplementary General Conditions shall be dated, addressed to the Owner, and shall contain the name of the insured Contractor, the specific job by name and the name of the insurer.

All contractors shall maintain Contractor's Public Liability which shall include comprehensive general liability, contractual liability, and products and completed operations liability. (The board is to be the named insured under this coverage). A minimum of $1,000,000.00 per occurrence up to the limits of contractor's coverage in force, whichever is greater:

(1) Bodily Injury limits of liability shall be at least $1,000,000.00 per occurrence. Higher limits may be required.

(2) Property Damage limits of liability shall be at least $1,000,000.00 per occurrence. Higher limits may be required.

(3) Personal Injury liability limits shall be specified in amounts of at least $1,000,000.00 per occurrence. Higher limits may be required. Separate coverage from Bodily Injury shall be required.

(4) The Contractor's liability policy shall provide "XCU" (Explosion, Collapse, Underground Damage) coverage for those classifications in which they are excluded.

(5) The School Board of Leon County, Florida shall be named as an additional insured on the contractor's policy.

(6) Indemnification Rider: The Contractor's Liability Policy should include Contractual Liability Coverage designed to protect the Contractor for contractual liabilities assumed by the Contractor in the performance of this Contract.

All Contractor's shall provide commercial Automobile Liability insurance coverage to include owned, non-owned, and hired autos with limits of at least:

(1) Bodily Injury: $1,000,000.00 per occurrence
(2) Property Damage: $1,000,000.00 per occurrence

OWNER'S PROTECTIVE LIABILITY INSURANCE:
The Contractor shall procure and furnish an Owner's Protective Liability Insurance Policy (the Owner shall be named as insured). A Minimum of $1,000,000.00 per occurrence up to the limits of contractor's coverage in force, whichever is greater:

Bodily Injury Liability:	$1,000,000.00 minimum/per occurrence
Property Damage Liability:	$1,000,000.00 minimum/per occurrence
Personal Injury Liability:	$1,000,000.00 minimum/per occurrence

PROPERTY INSURANCE:

The Contractor shall purchase and maintain property insurance upon the entire Work at the site of the full insurable **replacement** value thereof. This insurance shall include the interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Work and shall insure against the perils of fire and extended coverage and shall include **"all risk"** insurance for physical loss or damage including, without duplication of coverage, theft, vandalism, and malicious mischief. If not covered under the all risk insurance or otherwise provided in the Contract Documents, the Contractor shall effect and maintain similar property insurance on portions of the Work stored off the site or in transit when such portions of the Work are to be included in an Application for Payment under Subparagraph 9.3.2. Certificates evidencing that all or the above insurance is in force shall be furnished to the board before commencement of any work.

Furnish a certificate and specifically set forth evidence of all coverage required by 11.1.1 and 11.1.2 and 11.1.3; and the Contractor shall furnish to the Architect copies of any endorsements that are subsequently issued amending coverage or limits.

All insurance Certificates are to provide the following information:

a) A statement of the maximum amount of insurance against injuries, including death resulting from accident to one person, the maximum for each accident against injuries, including death resulting from accident to two or more persons; and,

b) A statement of the maximum amount of insurance against damage to property of other resulting from any one accident; and,

c) A statement that should any of the described policies be cancelled before the expiration date, the School Board of Leon County, Florida shall be notified at least thirty (30) days prior to the cancellation of policies by return-receipt, certified mail and that no other form of notification will otherwise relieve the insurance company, its agents, or its representatives of responsibility; and,

d) A statement that the Worker's Compensation shall be in compliance with Chapter 440, Florida Statutes.

e) Signature in the name of the insurer by its authorized resident agent, their address, phone number, and email.

f) Certificates shall be on either an ACORD Form or the Form provided on the following pages.

CERTIFICATE OF INSURANCE Date: _____

This Certificate is issued at the request of:

THE SCHOOL BOARD OF LEON COUNTY, FLORIDA
Division of Facilities/Department of Construction

The following insurance policies of this company have been issued to:
INSURED:
on the construction job designated below:
Name **Location** **Project No.**

Effective/ Insurance In Force		Minimum Limits in Thousands	Limits in Force in Thousands	Name of Insurance Carrier	Expiration Dates
Worker's Compensation and Employer Liability in compliance with Chapter 440, Florida Statutes Policy No._____		STATUTORY			
Contractor's Comprehensive General Liability and Property Damage Including Contractual Liability, Products and Completed Operations Liability and Personal Injury Policy No._____					
1.	Bodily Injury Liability		1000 per occurrence		
2.	Personal Injury		1000 per occurrence		
3.	Property Damage Liability		1000 per occurrence		
Automobile Liability Policy No._____					
1.	Bodily Injury Liability		1000 per occurrence		
2.	Property Damage Liability		1000 per occurrence		
Owner's and Contractor's Protective Liability Insurance Policy No._____					
1.	Bodily Injury Liability		1000 per occurrence		
2.	Property Damage Liability		1000 per occurrence		
Builder's Risk			Contract Amount		

Note: All blanks on this form must be completely filled in. If the same policy number is indicated for the "Contractor's Comprehensive General Liability and Property Damage Policy" and the "Owner's and Contractor's Protective Liability Policy," then the School Board of Leon County, Florida must be added as an additional named insured on that policy. Indicate that the School Board of Leon County, Florida is a **primary** additional named insured on that policy by checking YES_____ here.

OTHER REQUIRED COVERAGES:

1. "XCU (EXPLOSION, COLLAPSE, UNDERGROUND DAMAGE): The Contractor's Liability Policy shall provide "XCU" coverage for those classifications in which they are applicable.

2. CONTRACTUAL LIABILITY-WORK CONTRACTS: The Contractor's Liability Policy should include Contractual Liability Coverage designed to protect the Contractor for contractual liabilities assumed by the Contractor in the performance of this Contract.

3. INDEMNIFICATION RIDER: The Contractor's Liability Policy provides a "Hold Harmless" rider to cover the provisions of Article 3.18 of the referenced A.I.A. General Conditions and is so noted on the Contractor's Certificate of Insurance.

4. BROAD FORM PROPERTY DAMAGE COVERAGE & COMPLETED OPERATIONS: The Contractor's Liability Coverage shall include Broad Form Property Damage Coverage and Completed Operations.

5. BUILDER'S RISK COVERAGE: The Contractor shall secure and maintain during the life of this contract a "Builder's Risk Policy," All Risk Form and issued on a completed valued basis. Installation Floaters and other inland Marine Forms may be utilized where applicable and are in the best interest of the State of Florida.
   Policy No. _____
   Effective Date _____
   Expiration Date _____

6. BINDERS: When binders are issued as interim coverage, it shall be the sole responsibility of the insured to renew such binders as deemed necessary until such a time that the appropriate policy/policies are issued and copies of said policies delivered to the School Board of Leon County, Florida, Division of Facilities/Department of Construction, 3420 West Tharpe Street, Suite 100 Tallahassee, Florida 32303.

7. It is hereby certified that the above listed required policies and other required coverage are in force and that the above listed policies protect the Owner and Contractor performing work under the contract for the construction job designated above, against all claims for damages for **bodily injury and** personal injury, including death, resulting from accidents and for damage to property, which may arise from operations under the contract whether such operations be by the Contractor or anyone directly employed by him in connection with the performance of the contract, but only to those limits of liability specified in pages one (1) and two (2) of this certificate.

   In addition, it is also hereby certified that the designated insurer will give notice by return-receipt, certified mail to the School Board of Leon County, Florida, Division of Facilities, Department of Construction at least thirty (30) days prior to any material change in the provisions of or the cancellation of the above listed policies of insurance, and that no other form of notification will otherwise relieve the insurance company, its agents, or its representatives of responsibility.

INSURER: **FLORIDA AUTHORIZED LICENSED RESIDENT AGENT**

BY:_____ **Social Security No.**_____

Address:_____ **Area Code** ____ **Phone**_____

END OF SECTION L Page 2 of 2

SECTION M

CONTRACT DOCUMENTS
COMPONENT PARTS:
The Contract Documents shall consist of the following component parts.

Bidding requirements:
- Advertisement to Bid.
- Instructions to Bidders.
- Contractor's Bid as accepted by the Owner.
- Bid Bond.

Contract Forms:
- Acceptable Surety Companies.
- Payment Bond.
- Performance Bond.
- Contract Agreement.
- Addenda.
- Amendments to Contract Agreements.

General Conditions:
- General Conditions.
- Supplementary General Conditions.
- Insurance Certificates.

Technical Specifications:

Construction Drawings:

INTENT:
The Contract Documents shall be complementary to each other and what is called for by one shall be as binding as if called for by all.

The Specifications are divided into headings for the convenience of the Contractor. The Contractor, however, shall be held to the furnishing of a complete building, facility, etc., according to the meaning and intent of the Contract Documents, whether all of the items involved under any trade are mentioned in one or several places or can be reasonably inferred.

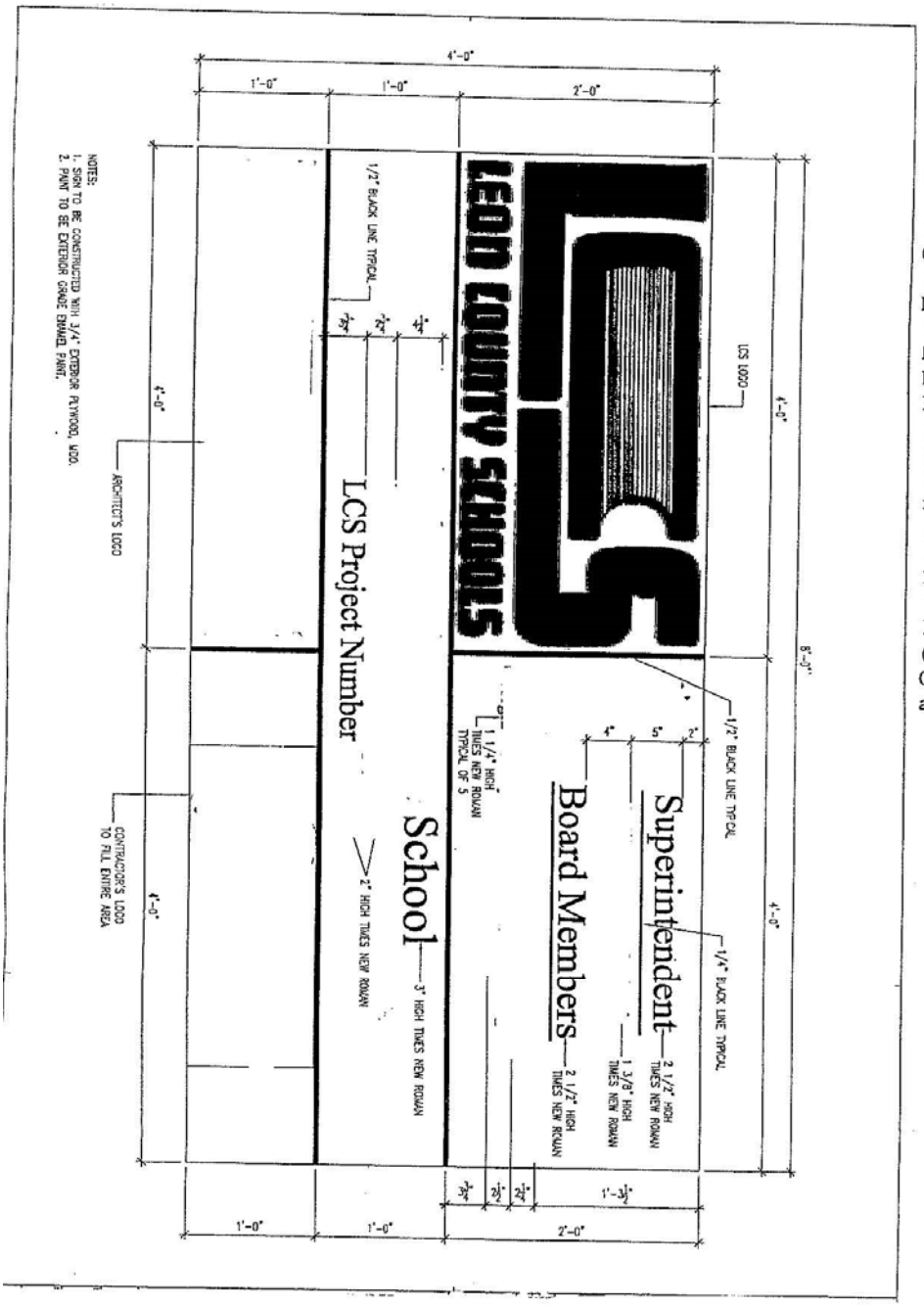
PRECEDENCE:
In the event that any provisions of the component parts of the Contract Documents conflicts with any provision of any other component part, the provisions of the Contract Agreement shall govern; the Supplementary General Conditions shall take precedence over the General Conditions.
Should the Drawings and Specifications conflict on any point the work shall be done according to the Specification; should the details and schedules shown on the Drawings conflict on any point, the details and schedules shall prevail over the small scale plans and elevations. Should the Structural and Architectural Drawings conflict, the work shall be done in accordance with the Structural Drawings.

Copies of forms of the American Institute of Architects are on file in the office of the Architect and may be examined on request.

END OF SECTION M

Section N: SMALL BUSINESS DEVELOPMENT PROGRAM (Omitted December 4, 2008) For information go to the Leon County School Board Website at www.leonschools.net

SECTION O: PROJECT SIGN



INSERT THE FOLLOWING INFORMATION INTO APPROPRIATE AREAS ON SIGN:

(1) Superintendent: Jackie Pons, Supt
(2) Chairperson: Georgia "Joy" Bowen
(3) Vice Chairperson: Maggie B. Lewis-Butler
(4) Board Members:
Dee Crumpler
DeeDee Rasmussen
Forrest Van Camp
(5)School Name
(6)Type of Construction (i.e. Renovation,remodeling; or addition)
(7)LCSB Project Number
(8)Prime Consultant's logo & information
(9) Prime GC or CM logo & information
(10) Paint colors - Check with both LCSB and Prime Consultant

NOT USED

SECTION P

LIST OF SUBCONTRACTORS AND SUPPLIERS

NOTE: To be executed within 24 hours of Bid Opening by apparent low bidder or if requested by Owner. If, due to Alternate Bids, more than one subcontractor or supplier must be considered, Contractor shall list each and state which is to be considered for Base Bid work and which is to be considered if a specific alternate is to be accepted.

All Subcontractors and suppliers are subject to approval by the Owner. The following are the subcontractors and suppliers proposed to be used if the undersigned is awarded the contract for: the General Construction of Chiller Plant Upgrades, Lively Technical Center, Leon County, Florida.

TYPE OF WORK	CORPORATE NAME AND ADDRESS	PRINCIPAL OR OFFICER'S NAME
LANDSCAPE WORK	_____	_____
CONCRETE WALKS	_____	_____
CONCRETE WORK	_____	_____
UNIT MASONRY	_____	_____
MISCELLANEOUS METALS	_____	_____
HANDRAILS AND RAILINGS	_____	_____
LAMINATE CLAD CASEWORK	_____	_____
BITUMINOUS DAMPPROOFING	_____	_____
INSULATION	_____	_____
JOINT SEALERS	_____	_____
STEEL DOORS AND FRAMES	_____	_____
WOOD DOORS	_____	_____
FINISH HARDWARE	_____	_____
GYPSUM DRYWALL	_____	_____
ACOUSTICAL CEILINGS	_____	_____
CARPETING	_____	_____
PAINTING	_____	_____
PIPE AND PIPE FITTING	_____	_____
HANGERS AND SUPPORTS	_____	_____

EQUIPMENT SUPPORTS, ENCLOSURES AND ACCESS PANELS	_____	_____
PIPE INSULATION	_____	_____
AIR CONDITIONING AND HEAT PUMPS	_____	_____
DEHUMIDIFYING UNITS	_____	_____
AIR DISTRIBUTION	_____	_____
RACEWAYS	_____	_____
BOXES	_____	_____
WIRING DEVICES	_____	_____
PANELBOARDS	_____	_____
DISCONNECT SWITCHES	_____	_____
GROUNDING	_____	_____
LIGHTING	_____	_____
CONTROLS	_____	_____
COMMUNICATION SYSTEMS	_____	_____

The undersigned declares that they have fully investigated each subcontractor listed and has determined to their own complete satisfaction that such contractor maintains a fully-equipped organization capable technically and financially of performing the pertinent work, and has made similar installations in a satisfactory manner.

Name of Firm: _____

Signed By: _____

Title: _____

Address/Zip: _____

_____

Contractor's Certificate No: _____

Telephone No: _____

END OF SECTION P

SECTION 01010 - SUMMARY OF WORK

PART 1 - GENERAL:

0. PROJECT PROCUREMENT & IMPLEMENTATION

   A. This project will be bid and contracted by Leon County Schools in accordance with the project information and contract.

1. WORK COVERED BY CONTRACT DOCUMENTS

   A. The work of this Contract comprises the construction of **Lively Technical Center, Chiller Plan Upgrades, Tallahassee, Florida**

   B. Work to be performed shall be in accordance with drawings and specifications prepared by **McGinniss & Fleming Engineering.**

   C. The Contractor shall lay out the work with appropriately qualified personnel from the information shown on the drawings.

2. RELATED REQUIREMENTS

   A. I. Bidding Conditions

   B. II. Contractual Conditions

3. CONTRACT WORK

   The **Lively Technical Center, Chiller Plan Upgrades** Construction base bid shall generally include, but not be limited to the following work:

   A. Furnish, Install and put into proper service three (3) Air-Cooled Water Chillers
   B. Furnish, Install and put into service two (2) new chilled water loop pumps and accessories
   C. Furnish, Install and put into service three (3) new chilled water primary pumps and accessories
   D. Construct a new equipment yard.
   E. Install piping, valves, insulation, electrical, and all required and desirable components and accessories.
   F. Perform all demolition and disposal, and sitework restoration required by Owner

4. CONTRACT TIME

   All work for the building and site work shall be substantially complete and the requirements under them **within 210 days after Notice to Proceed.**

5. WORK BY OTHERS

A. Work on the project which will be executed prior to the start of work on this contract, and which is excluded from this contract, as follows:

1. None identified at this time.

6. CONTRACTOR'S USE OF PREMISES

A. Coordinate use of premises under direction of Architect/Engineer. Locate construction staging area as shown on the site plan or as indicated.

B. Assume full responsibility for the protection and safekeeping of Products under this Contract, stored on site.

C. Move any stored Products, under Contractor's control, which interfere with operation of the Owner or any separate Contractor.

D. Protect all existing site vegetation and improvements not specifically noted to be demolished.

7. OWNER OCCUPANCY

A. Contractor shall at all times conduct his operations as to insure the safety of and least inconvenience to the students and staff of the facility.

B. Owner may take beneficial occupancy of any portion of the work so agreed and arranged between Owner, Contractor and Architect/Engineer.

8. OWNER - FURNISHED EQUIPMENT PRODUCTS

Owner furnished equipment or products are planned for installation as a part of this contract and shall be provided to the Contractor upon 60 days written notice. Owner furnished items are as indicated on the drawings.

9. RIGHT OF ACCESS

The Contractor agrees that representatives of the Owner and Architect/Engineer will have access to the work wherever it is in preparation or progress and that the Contractor will provide facilities for such access.

10. SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION

The Contractor shall be solely responsible for all applicable obligations prescribed as employer obligations under any and all governmental regulations.

11. PROTECTION OF EXISTING GROUNDS

A. Turfs, irrigation systems, shrubbery, etc. shall be protected from any and all damage by construction vehicles or work activities. The Contractor shall be responsible for restoring same to equal or better conditions.

B. Trees are a valuable natural resource and shall be protected to at least their drip lines with wood fencing acceptable to the Architect/Engineer. Construction vehicles and activities shall in no case, except as specifically shown on the Contract Documents, violate the drip lines of existing trees.

C. The Contractor's fenced staging and construction areas may or may not include existing trees and shrubs; these shall receive protection. The entire staging and construction area shall be re-sodded as required.

D. In an effort to document existing grounds conditions, the Contractor shall provide a convenient to access digital video recording prior to his commencing any on site Construction Activities. Such video shall be delivered to the Architect/Engineer for review with the Owner at the project completion in order to evaluate and direct the Contractor as to restoration required.

E. Coordinate with Section 01760.

12. GROWTH MANAGEMENT REQUIREMENTS - ENVIRONMENTAL

A. The Contractor shall comply with all requirements of the City of Tallahassee or Leon County Environmental Management Ordinance, as specifically set forth in the Owner's Environmental Management Permit.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION 01010.

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SECTION 01027 - APPLICATION FOR PAYMENT

PART 1 - GENERAL:

1. REQUIREMENTS INCLUDED

   Procedures for preparation and submittal of Application for Payment.

2. RELATED REQUIREMENTS
   A. I. Bidding Conditions

   B. II. Contractual Conditions

   C. Section 01340 - Submittals: Submission Requirements

   D. Section 01370 - Schedule of Values

   E. Section 01700 - Contract Closeout: Final Application for Payment

3. FORMAT
   Application for Payment Form - AIA Standard G702.

4. PREPARATION OF APPLICATIONS

   A. Submit applications for payment to Architect/Engineer in accordance with the schedule established by conditions of the Contract and agreement between Owner and Contractor.

      1. Type required information, or use media-driven printout.

      2. Execute certification by signature of authorized officer.

   B. Submit Schedule of Values for review and acceptance by the Architect/Engineer and Owner per Section 01370. Schedule of Values shall be broken down for each Work item and shall indicated both materials and labor.

   C. Use data on accepted Schedule of Values. Provide dollar value in each column for each line item for portion of Work performed.

   D. Initial progress payment shall not be made until Contractor has established a Contractor's site office, with telephone service, and a temporary field office for the Project Representative.

   E. Prepare Application for Final Payment as specified in Section 01700.

F. Submit Application for Payment in rough format (percentages complete) for Owner and Architect/Engineer review five (5) days prior to submittal of Application.

5. SUBMITTAL PROCEDURES

A. Submit seven (7) copies of each Application for payment at times stipulated.

B. Contractor shall submit to Architect/Engineer not later than the first working day of each month an application for payment completed and signed by the Contractor.

6. SUBSTANTIATING DATA

A. When Architect/Engineer requires substantiating information, submit data justifying line item amounts in question.

B. Submit suitable information for each copy of application with a cover letter identifying:

1. Project
2. Application number and date
3. Detailed list of enclosures

C. Submit one copy of data and cover letter for each copy of application.

D. Submit with each copy of application continuation sheet providing the following:

1. Fill in total list of all schedule component items of work, with item number and scheduled dollar values for each item.

2. Fill in dollar value in each column for each schedule line item when work has been performed or materials stored.

3. List each change order executed prior to date of submission, at the end of the continuation sheets.

E. Submit data and applicable insurance as required by Owner to establish Owner's title to material and equipment suitably stored at the site.

The Contractor shall be responsible for all expenses of the Architect/Engineer to verify the quantity of stored materials off of the site.

PART 2 - PRODUCTS:

Not used.

PART 3 - EXECUTION:

Not used.

END OF SECTION 01027.

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SECTION 01030 - ALTERNATES

PART 1 - GENERAL:

1A DESCRIPTION OF REQUIREMENTS

"Alternates" are defined as alternate products, materials, equipment, systems, methods, units of work or major elements of the construction which may, at Owner's option and under terms established by Instructions to Bidder, the Contract or Agreement, be selected for the work in lieu of corresponding requirements of Contract Documents. Selection may occur prior to Contract Date or may, be deferred for possible selection at a subsequent date. Alternates may or may not change scope and general character of the work substantially. Requirements of this section may be related to but must not be confused with requirements of contract documents related to "allowances", "unit prices", "change orders", "substitutions" and similar provisions.

Refer to the Contract or "Owner-Contractor Agreement" and subsequent modifications thereof (if any) for determination if the scheduled "alternate" herein has been accepted and therefore is in full force and effect as though included originally in the contract documents for the base bid.

Immediately following the award of Contract, prepare and distribute to each entity to be involved in performance of the work, a notification of the status of each alternate scheduled herein. Indicate which alternates have been: 1) Accepted, 2) Rejected, and 3) Deferred for consideration at a later date as indicated. Include full description of negotiated modifications to alternates, if any.

1B GENERAL ALTERNATE REQUIREMENTS

The description herein for each alternate is recognized to be incomplete and abbreviated but implies that each change must be complete for the scope of work affected. Refer to applicable specification section (Division 2 through 16) and to applicable drawings for specific requirements of the work. Coordinate related work and modify surrounding work as required to properly integrate with the work of each alternate. It is recognized that descriptions of alternates are primarily scope definitions and do not necessarily detail full range of materials and processes needed to complete the work as required.

ALTERNATE 1: Remove and replace secondary chilled water pumps and pump motors.

PART 2 - PRODUCTS:
Not used.

PART 3 - EXECUTION:
Not used.

END OF SECTION 01030.

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SECTION 01040 - COORDINATION

PART 1 - GENERAL:

1. WORK INCLUDED

   A. Contractor shall supervise and direct the work competently and efficiently, devoting such attention thereto and applying such skills as may be necessary to perform the work in accordance with the Contract Documents.

   B. Contractor shall be solely responsible for all means, methods, techniques, sequences and procedures of construction, and for providing adequate safety precautions and coordinating all portions of the work under the Contract Documents.

   C. Contractor shall be responsible to see that the finished work complies accurately with the Contract Documents.

   D. Contractor shall be responsible for all project coordination.

2. RELATED REQUIREMENTS

   A. Section 01010 - Summary of Work
   B. I. Bidding Conditions
   C. II. Contractual Requirements
   D. Section 01200 - Project Meetings
   E. Section 01410 - Special Testing/Inspection Requirements
   F. Section 01700 - Contract Closeout

3. DESCRIPTION

   A. Coordinate scheduling, submittals, and work of the various sections of specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items to be installed later.

      1. Maintain reports and records at job site:

         a. Daily log of progress of work and other pertinent data. Maintain log accessible to Owner, Architect/Engineer and his representative.
         b. Assemble documentation for handling of any claims or disputes which may arise.

      2. Inspections and Testing:

         a. Inspect the work to assure that it is performed in accordance with the requirements of the Contract Documents.

b. Arrange with the Architect/Engineer and owner as applicable for special inspections or testing required by Section 01410 or other specification sections.
c. Reject work which does not conform to requirements of the Contract Documents.

B. Coordinate sequence of work to insure proposed completion dates are met.

1. Construction Schedule:
a. Prepare detailed schedule of Contractor's operations and for all subcontractors on the project.

b. Monitor schedules as work progresses.

1. Identify potential variances between scheduled and probable completion date.

2. Recommend to Architect/Engineer any adjustments in schedule to meet required completion date.

3. Provide monthly summary reports of each monitoring.

c. Observe work to monitor compliance with schedule.

1. Verify that labor and equipment are adequate to meet and maintain the schedule for the work.

2. Verify that product deliveries are adequate to meet and maintain the schedule for the work.

3. Report any non-compliance to Architect/Engineer, with recommendations for remedy.

4. Verify that adequate services are provided to comply with requirements for work and climatic conditions.

5. Verify proper maintenance and operation of temporary facilities.

6. Administer traffic and parking controls for construction workers. Construction traffic shall not interfere with surrounding traffic movement.

2. Coordination of Subcontractors:

a. Coordinate work of all subcontractors and relationship between them.

b. Establish on-site lines of authority and communication. Schedule and conduct progress meetings among Owner and Architect/Engineer representatives and subcontractors.

c. Ensure that specified cleaning is done during progress of the work and at completion of contract.

4. MEETINGS

In addition to progress meeting specified in Section 01200, hold coordination meetings and pre-installation conferences with personnel and subcontractors to assure coordination of work.

5. COORDINATION OF SUBMITTALS

A. Schedule and coordinate submittals specified in Section 01340.

Administer processing of shop drawings, product data, and samples.

B. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

1. Coordinate Testing Laboratory Services:

a. Notify laboratory of test schedule.

b. Verify that required personnel are present.

c. Verify that specified tests are made as scheduled.

d. Verify compliance of the test results with specified criteria. Determine need for retesting and submit recommendations to Architect/Engineer. Administer and pay for required retesting.

2. Coordinate with Sub-contractors as required:

a. Provide temporary utilities (electric, water) required by the Subcontractors in the performance of their work.

b. Provide designated location where the Subcontractors may place

construction debris for removal by the Contractor.

C. Coordinate requests for changes to assure compatibility of space, of operating elements, and effect on work of other sections.

1. Recommend necessary of desirable changes to Architect/Engineer.

2. Review subcontractor's requests for changes and substitutions. Submit recommendations to Architect/Engineer.

3. Process Change Orders in accord with General Conditions and Change Order Procedures.

6. COORDINATION OF SPACE

A. Coordinate use of Project space and sequence of installation of subcontractor work which is indicated diagrammatically on Drawings. Follow routings shown for pipes, ducts, and conduits as closely as practicable, with due allowance for available physical space; make runs parallel with lines of building. Utilize space efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

B. In finished areas, except as otherwise shown, conceal pipes, ducts, and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.

7. INTERPRETATION OF CONTRACT DOCUMENTS

A. Consult with Architect/Engineer to obtain interpretation or clarifications for any portions of the contract documents which are unclear or ambiguous. Transmit all requests for interpretation in writing.

B. Assist in the answering of any questions which may arise.

C. Transmit written interpretations to Sub Contractors, Suppliers and Others whose work may be affected by the clarification.

D. Interpretations shall be based on the Architect/Engineers review of the Contract Documents. In case of conflicting data, assumption shall be made that the item of greater quality, cost of quantity was bid.

8. START-UP

A. Direct the check-out of utilities, operational systems, and equipment.

B. Assist in initial start-up and testing.

C. Record dates of the start of the operations of systems and equipment.

D. Submit to Architect/Engineer written notice of the beginning of warranty period for equipment put into service.

9. COORDINATION OF CONTRACT CLOSEOUT

A. Substantial Completion:

1. Coordinate completion and cleanup of work of separate sections in preparation for Substantial Completion.

2. Upon determination of Substantial Completion of work or portion thereof, prepare for the Architect/Engineer a list of incomplete or unsatisfactory items.

B. Final Completion:

1. Upon determination that work is at final completion:

a. Submit written notice to Architect/Engineer that the work is ready for final inspection.

b. Secure and transmit to Architect/Engineer required closeout submittals.

2. Turn over to Architect/Engineer.

a. Operations and maintenance data.

b. Spare parts and maintenance materials.

c. Warranties and other data as required for these specifications.

d. Owner file copies of all submittals, changes, etc.

C. After Owner occupancy of premises, coordinate access to site by various sections for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

D. Assemble and coordinate closeout submittals specified.

PART 2 - PRODUCTS:

Not used.

PART 3 - EXECUTION:

Not used.

END OF SECTION 01040.

SECTION 01042 - COORDINATION DRAWINGS

PART 1 - GENERAL:

Not Required

The Contractor is expected to accommodate site conditions and coordinate with all sub-contractors and tradesmen as necessary to avoid conflicts. Coordination Drawings are not specifically required by the Contract, although they may be needed. The level of formal coordination effort necessary for successful project accomplishment is left to the Prime Contractor.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION 01042.

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SECTION 01045 - CUTTING AND PATCHING (Revised Aug. 26, 2005)

PART 1 - GENERAL:

1A DESCRIPTION OF WORK

1. "Cutting-and-Patching" is hereby defined to include, but is not necessarily limited to, the cutting and patching of nominally completed and previously existing work in order to accommodate the coordination of work or the installation of other work or to uncover other work for access or inspection.

   Restoring or removing and replacing non-complying work is specified separately from cutting-and-patching, but may require cutting-and-patching operations as specified herein.

2. Refer to other sections of these Specifications for specific cutting-and-patching requirements and limitations applicable to individual units of work.

   Refer to Division 15 and Division 16 Sections, for additional requirements and limitations on cutting-and-patching of mechanical and electrical work, respectively. The requirements of this section apply to mechanical and electrical work, unless otherwise indicated.

1B QUALITY ASSURANCE

Requirements for Structural Work:

Do not cut-and-patch structural work in a manner resulting in a reduction of load-carrying capacity of load/deflection ratio.

Prior to cutting-and-patching the following categories of work, obtain Architect's/Engineer's written direction to proceed with cutting-and-patching as proposed in submittal by Contractor:

Structural steel.
Bearing walls.
Miscellaneous structural metals, including lintels, equipment supports, stair systems and similar categories of work.

Operational and Safety Limitations:

1. Do not cut-and-patch operational elements and safety related components in a manner resulting in a reduction of capacities to perform in the manner intended, including energy performances, or resulting in decreased operational life, increased maintenance, or decreased safety.

2. Prior to cutting-and-patching the following categories of work and similar categories where directed, obtain Architect's/Engineer's written direction to proceed with cutting-and-patching as proposed in submittal by Contractor:

   Primary operational systems and equipment Control, communication, conveying, and electrical wiring system.

Visual Requirements:

1. Do not cut and patch work which is exposed on exterior (or exposed in occupied spaces of the building) in a manner resulting in a reduction of visual qualities or resulting in substantial evidence of cut-and-patch work both as judged solely by Architect/Engineer. Remove and replace work judged by Architect/Engineer to be cut-and-patched in a visually unsatisfactory manner.

2. Engage recognized expert entities to perform cutting-and-patching of exposed work including, but not limited to:

   Roofing
   Plaster
   Stucco
   Gypsum drywall
   Acoustic ceilings

1C SUBMITTALS

Proposals for Cutting-and-Patching:

Where prior written direction of cutting-and-patching is required, submit proposal well in advance of time work will be performed and request written direction to proceed. Include description of why cutting-and-patching can not (reasonably) be avoided, how it will be performed, products to be used, forms and tradesmen to perform the work, approximate dates of the work, and anticipated results in terms of variations from work as originally completed (structural, operational, visual and other qualities of significance). Where applicable, include cost proposal, suggested alternatives to cutting-and-patching procedure proposed, and a description of circumstances which lead to need for cutting-and-patching.

Written direction by Architect/Engineer to proceed with proposed cutting-and-patching does not waive the right to later required complete removal and replacement of work found to be cut-and-patched in an unsatisfactory manner.

PART 2 - PRODUCTS:

2A MATERIALS

Provide materials for cutting-and-patching which will result in equal-or-better work than work being cut-and-patched, in terms of performance characteristics and including visual effect where applicable. Comply with requirements, and use materials identical with original materials where feasible and where recognized that satisfactory results can be produced thereby.

2B PREPARATION

Temporary Support:

Provide adequate temporary support for work to be cut to prevent failure. Do no endanger other work.

2C PROTECTION

1. Provide adequate protection of other work during cutting-and-patching to prevent damage and provide protection of the work from adverse weather exposure.

2. At the close of every work day all openings into secure areas and interior spaces left exposed due to cutting and patching activities shall be secured by the contractor to prevent entry or vandalism.

PART 3 - EXECUTION:

3A CUTTING AND PATCHING

1. Employ skilled tradesmen to perform cutting-and-patching. Except as otherwise indicated, proceed with cutting-and-patching at earliest feasible time in each instance and complete work without delay.

2. Cut work by methods least likely to damage work to be retained and work adjoining. Review proposed procedure with original Installer where possible, and comply with recommendations therefrom.

    a. In general, where physical cutting action is required, cut work with sawing and grinding tools, not with hammering and chopping tools. Core drill openings for pipe and conduit through concrete and masonry.

b. Comply with requirements of applicable sections of Division 2 where cutting-and-patching requires excavating and backfilling.

3. Patch with seams which are durable and as invisible as possible. Where feasible, inspect and test patched areas to demonstrate integrity of work.

4. Restore exposed finishes of patched areas and where necessary extend finish restoration onto retained work adjoining in a manner which will eliminate evidence of patching and refinishing.

5. Where patch occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing patch after patched are has received prime and base coats.

6. All penetrations through fire-rated construction shall be fire stopped as per NEC 300-21 using a through penetration fire-stop system (XHEZ) listed in the Underwriters Laboratory Fire Resistance Directory.

END OF SECTION 01045.

SECTION 01050 - FIELD ENGINEERING

PART 1 - GENERAL:

Not Required

PART 2 - PRODUCTS:

Not used.

PART 3 - EXECUTION:

Not used.

END OF SECTION 01050.

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SECTION 01090 - DEFINITIONS AND STANDARDS

PART 1 - GENERAL:

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

2. DEFINITIONS:

   A. General Explanation: A substantial amount of specification language constitutes definitions for terms found in other Contract Documents, including drawings which must be recognized as diagrammatic in nature and not completely descriptive of requirements indicated thereon. Certain terms used on Contract Documents are defined generally in this article. Definitions and explanations of this section are not necessarily either complete or exclusive, but are general for the work to extent not stated more explicitly in another provision of Contract Documents.

   B. General Requirements: The provision or requirements of Division 1 section. General Requirements apply to entire work of contract and, where so indicated, to other elements which are included in project.

   C. Indicated: The term "indicated" is a cross reference to details, notes or schedules on drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in Contract Documents. Where terms such as "shown", "noted", "scheduled", and "specified" are used in lieu of "indicated", it is for purpose of helping reader locate cross-reference, and no limitation of location is intended except as specifically noted.

   D. Directed, Requested, etc.: Where not otherwise explained, terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted", and "permitted" mean "directed by Architect/Engineer", "requested by Architect/Engineer", etc. However, no such implied meaning will be interpreted to extend Architect's/Engineer's responsibility into Contractor's area of construction supervision.

   E. Reviewed: Where used in conjunction with Architect's/Engineer's response to submittals, requests, applications, inquiries, reports and claims by Contractor, the meaning of term "reviewed" will be held to limitations of Architect's/Engineer's responsibilities and duties as specified in General and Supplementary Conditions. In no case will "review" by Architect/Engineer to be interpreted as a release of Contractor from responsibilities to fulfill requirements of Contract Documents.

   F. Project Site: The space available to Contractor for performance of the work, either exclusively or in conjunction with others performing other work as part of the project. The extent of project site is shown on the drawings, and may or may not be identical with description of land upon which project is to be built.

   G. Furnish: Except as otherwise defined in greater detail, term "furnish: is used to mean supply and deliver to project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.

   H. Install: Except as otherwise defined in greater detail, the term "install" is used to describe operations at project site including unloading, storage, unpacking, assembly, erection, placing, anchoring, applying, work to dimension, finishing, curing, protecting, cleaning and similar operations, as applicable in each instance.

   I. Provide: Except as otherwise defined in greater detail, the term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.

J. Installer: The entity (person or firm) engaged by Contractor or its subcontractor or subcontractor for performance or a particular unit or work at project site, including installation, erection, application and similar required operations. It is a general requirement that such entities (installers) be expert in operations they are engaged to perform.

K. Testing Laboratory: An independent entity engaged to perform specific inspections or tests of the work, either at project site or elsewhere; and to report and (if required) interpret results of those inspections or tests.

L. Owner Furnished - Contractor Installed: Equipment or components of a system that are purchased by the Owner and furnished to the Contractor for installation in the project. The Contractor shall receive, store, protect, install, connect and test each time unless otherwise indicated.

M. Contractor Furnished - Contractor Installed: Equipment or components of a system that are purchased, furnished, and installed by the Contractor.

N. Owner Furnished - Owner Installed: Equipment or components of a system that are purchased, furnished and installed by the Owner or his vendors.

3. FORMAT AND SPECIFICATION EXPLANATIONS:

A. Specification Production: None of these explanations will be interpreted to modify substance of requirements. Portions of these specifications have been produced by Architect's/Engineer's standard methods of editing master specifications, and may contain minor deviations from traditional writing formats. Such deviations are a normal result to this production technique, and no other meaning will be implied or permitted.

B. Format Explanation: The format of principal portions of these specifications can be described as follows; although other portions may not fully comply and no particular significance will be attached to such compliance or noncompliance.

1. Sections and Divisions: For convenience, basic unit of specification text is a "section", each unit of which is named and numbered. These are organized into related families of sections, and various families of sections are organized into "divisions", which are recognized as the present industry consensus on uniform organization and sequencing of specifications. The section title is not intended to limit meaning or content of section, not to be fully descriptive or requirements specified therein, not to be an integral part of text.

Each section of specifications has been subdivided into 3 (or less) "parts" for uniformity and convenience (Part 1 - General, Part 2 - Products, and Part 3 - Execution). These do not limit the meaning or and are not an integral part of text which specifies requirements.

2. Underscoring: used strictly to assist reader of specification text in scanning text for key works in content (for quick recall). No emphasis on or relative importance of text is intended where underscoring is used.

3. Imperative Language: Used generally in specifications. Except as otherwise indicated requirements expressed imperatively are to be performed by the Contractor. For clarity of reading at certain locations, contrasting subjective language is used to describe responsibilities which must be fulfilled indirectly by the Contractor, or when so noted, by others.

4. Section Numbering: Used to facilitate cross-references in Contract Documents. Sections are placed in Project Manual in numeric sequence; however, numbering sequence is not complete, and listing of sections at beginning of Project Manual must be consulted to determine numbers and names of specification section on Contract Documents.

5. Page Numbering: Numbered independently for each section' recorded in listing of sections (Index or Table of Contents) in Project Manual. Section number is shown with page number at top right of each page, to facilitate location of text in Project Manual.

C. Specification Content: Because of methods by which this project specification has been produced, certain general characteristics of content, and conventions in use of language are explained as follows:

1. Specifying Methods: The techniques or methods of specifying to record requirements varies throughout text, and may include "prescriptive", "open generic descriptive", "compliance with standards", "performance", "proprietary", or a combination of these. The method used for specifying one unit of work has no bearing on requirements for another unit of work.

2. Overlapping and Conflicting Requirements: Where compliance with 2 or more industry standards or sets or requirements is specified, and overlapping of those different standards or requirements establishes different or conflicting minimums or levels or quality, most stringent requirement (which is generally recognized to be also most costly) is intended and will be enforced, unless specifically detailed language written into contract documents (not by way of reference to an industry standard) clearly indicates that a less stringent requirement is to be fulfilled. Refer apparently-equal-but-different requirements, and uncertainties as to which level of quality is more stringent, to Architect/Engineer for a decision before proceeding.

   a. Contractor's Options: Except for overlapping or conflicting requirements, where more than one set of requirements are specified for a particular unit of work, option is intended to be Contractor's regardless of whether specifically indicated as such.

3. Minimum Quality/Quantity: In every instance, quality level or quantity shown or specified is intended as minimum for the work to be performed or provided. Except as otherwise specifically indicated, actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable limits. In complying with requirements, indicated numeric values are either minimums or maximums as noted or as appropriate for context of requirements. Refer instances of uncertainty to Architect/Engineer for decision before proceeding.

4. Specialists; Assignments: In certain instances, specification text requires (or at least implies) that specific work be assigned to specialists or expert entities, who must be engaged for performance of those units of work. These must be recognized as special requirements over which Contractor has no choice or option. These assignments must not be confused with (and are not intended to interfere with) normal application of regulations union jurisdictions and similar conventions. One purpose of such assignments is to establish which party or entity involved in a specified unit of work is recognized as "expert" for indicated construction processes or operations. Nevertheless, final responsibility for fulfillment of entire set of requirements remains with Contractor.

5. Trades: Except as otherwise indicated, the use of title such as "carpentry" in specification text, implies neither that the work must be performed by an accredited or unionized trades person of corresponding generic name (such as "carpenter"), nor that specified requirements apply exclusively to work by trades persons of that corresponding generic name.

6. Abbreviations: The language of specifications and other contract documents is of the abbreviated type in certain instances, and implies words and meanings which will be appropriately interpreted. Actual work abbreviations of self-explanatory nature have been included in texts. Specific abbreviations have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of specification requirement with notations on drawings and in schedules. These are frequently defined in section at first instance of use. Trade association names and titles of general standards are frequently abbreviated.

Singular works will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of the Contract Documents so indicates.

D. Drawing Symbols:

General: Except as otherwise indicated, graphic symbols used on drawings are those symbols recognized in the construction industry for purposes indicated. Where not otherwise noted, symbols are defined by "Architectural Graphic Standards", published by John Wiley & Sons, Inc., seventh edition.

M/E Drawings: Graphic symbols used on mechanical/electrical drawings are generally aligned with symbols recommended by ASHRAE, supplemented by more specific symbols where appropriate as recommended by other recognized technical associations including ASME, ASPE, IEEE and similar organizations. Refer instances of uncertainty to Architect/Engineer for clarification before proceeding.

E. Industry Standards:

1. General Applicability of Standards: Applicable standards of construction industry have same force and effect (and are made a part of contract Documents) as if published copies were bound herewith.

a. Referenced Standards: (referenced directly in Contract Documents or by governing regulations) have precedence over non-referenced standards which are recognized in industry for applicability to work.

b. Non-referenced standards are hereby defined to have not particular applicability to the work, except as a general measurement of whether work complies with standards recognized in construction industry.

2. Publication Dates: Except as otherwise indicated, where compliance with an industry standard is required, comply with the latest edition of the standard in effect as of date of Contract Documents.

3. Copies of Standards: Provide as needed for proper performance of the work; obtain directly from publication sources. Architect/Engineer may specifically required the Contractor to obtain copies of certain standards.

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

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

AAMA	Architectural Aluminum Manufacturers Association 35 E. Wacker Dr.; Chicago, IL 60601; 312/782-8256
AAN	American Association of Nurserymen 230 Southern Bldg.; Washington, D.C. 20005; 202/737-4060
AASHTO	American Association of State Highway & Transportation Officials 444 N. Capital; Washington, D.C. 20001; 202/624-5800
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215; Research Triangle Park, N.C. 27709; 919/549-8141
ACI	American Concrete Institute P.O. Box 19150; Detroit, MI 48219; 313/532-2600
ACIL	American Council of Independent Laboratories 1725 K Street, NW; Washington, D.C.; 20006; 202/659-3766
ADC	Air Diffusion Council 230 N. Michigan Avenue; Chicago, IL 60601; 312/372-9800
AGA	American Gas Association 1515 Wilson Blvd.; Arlington, VA 22209; 703/841-8400
AI	Asphalt Institute Asphalt Institute Building; College Park, MD 20740; 301/277-4258
AIA	American Institute of Architects 1735 New York Avenue, NW; Washington, D.C. 20006; 202/626-7474
A.I.A.	American Insurance Company 85 John Street; New York, NY 10038; 212/699-0400
AISC	American Institute of Steel Construction 400 North Michigan Avenue; Chicago, IL 60611; 312/670-2400
AISI	American Iron and Steel Institute 1000 16th Street, NW; Washington, D.C. 20036; 202/452-7100
AITC	American Institute of Timber Construction 333 W. Hampden Avenue Englewood, Colorado 80110; 303/761-3212
AMCA	Air Movement and Control Association 30 W. University Dr. Arlington Heights, IL 60004;312/394-0150
ANSI	American National Standards Institute 1430 Broadway New York, New York 10018; 212/354-3300
APA	American Plywood Association

	Post Office Box 11700 Tacoma, Washington 98411;206/565-6600
ARI	Air Conditioning & Refrigeration Institute 1815 North Fort Myer Dr. Arlington, Virginia 22209;703/524-8800
ASC	Adhesive and Sealant Council 1600 Wilson Boulevard Arlington, Virginia 22209;703/841-1112
ASHRAE	American Society of Heating, Refrigeration & Air-Conditioning Engineers 1791 Tullie Circle, NE Atlanta, Georgia 30329; 404/636-8400
ASME	American Society of Mechanical Engineers 345 E. 47th Street New York, New York 10017; 212/644-7722
ASPE	American Society of Plumbing Engineers 15233 Ventura Boulevard Sherman Oaks, California 91403;213/783-4845
ASSE	American Society of Sanitary Engineering Post Office Box 9712 Bay Village, Ohio 44140; 216/835-3040
ASTM	American Society for Testing and Material 1916 Race Street Philadelphia, PA 19103; 215/299-5400
AWI	Architectural Woodwork Institute 2310 South Walter Reed Dr. Arlington, Virginia 22206; 703/671-9100
AWPA	American Wood-Preservers' Association 7735 Old Georgetown Road Bethesda, Maryland 20014; 301/652-2109
AWPB	American Wood-Preservers Bureau 2772 South Randolph Street Arlington, Virginia 22206; 703/931-8180
AWS	American Welding Society 550 LeJune Road Miami, Florida 33135; 305/642-7090
AWWA	American Water Works Association 6666 W. Quincy Avenue Denver, Colorado 80235; 303/794-7711
BHMA	Builder's Hardware Manufacturer's Association (c/o TGAM) 60 EAst 42nd St. Rm. 1807 New York, New York 10017; 212/682-8142

BIA	Brick Institute of America 1750 Old Meadow Rd. McLean, Virginia 22101; 703/893-4010
CDA	Copper Development Association 405 Lexington Avenue New York, New York 10017; 212/953-7300
CE	Corps of Engineers (U.S. Dept. of the Army) Washington, D.C. 20315
CISPI	Cast Iron Soil Pipe Institute 1499 Chain Bridge Rd. McLean, Virginia 22101; 703/827-9177
CRSI	Concrete Reinforcing Steel Institute 180 North LaSalle Street Chicago, Illinois 60601; 312/372-5059
CS	Commercial Standard of NBS (U.S. Dept. of Commerce) Government Printing Office Washington, D.C. 20402
DHI	Door and Hardware Institute 1815 N. Ft. Meyer Dr. Arlington, Virginia 22209; 703/527-2060
EIA	Electronic Industries Association 2001 Eye Street, NW Washington, D.C. 20006; 202/457-4900
FAA	Federal Aviation Administration (U.S. Dept. of Transportation) 800 Independence Avenue, SW Washington, D.C. 20590
FCC	Federal Communications Commission 1919 M Street, NW Washington, D.C. 20554; 202/632-7000
FCI	Fluid Controls Institute Post Office Box 3854 Tequesta, Florida 33458; 407/746-6466
FGMA	Flat Glass Marketing Association 3310 Harrison Topeka, Kansas 66611; 913/266-7013
FHA	Federal Housing Administration (U.S. Dept. of HUD) 451 7th Street, SW Washington, D.C. 20201
FM	Factory Mutual Engineering Corp. 1151 Boston-Providence Turnpike

	Norwood, MA 02062; 617/762-4300
FS	Federal Specification (General Services Administration) Building 197, Washington Navy Yard, SE Washington, D.C. 20407
FTI	Facing Tile Institute Box 8880 Canton, Ohio 44711; 216/488-1211
GA	Gypsum Association 1603 Orrington Avenue Evanston, Illinois 60201; 312/491-1744
HPMA	Hardwood Plywood Manufacturers Association Post Office Box 2789 Reston, Virginia 22090; 703/435-2900
IES	Illuminating Engineering Society of North America 345 E. 47th Street New York, New York 10017; 212/644-7926
ILI	Indiana Limestone Institute of America Stone City Bank Building Bedford, Indiana 47421; 812/275-4426
IRI	Industrial Rick Insurers 85 Woodland Street Hartford, CT 06102; 203/525-2601
MCAA	Mechanical Contractors Association of America 5530 Wisconsin Avenue Washington, D.C. 20015; 202/654-7960
MIA	Marble Institute of America 33505 State Street Farmington, MI 48024; 313/476-5558
MIL	Military Standardization Documents (U.S. Dept. of Defense) Naval Publications and Forms Center 5801 Tabor Avenue Philadelphia, PA 19120
MLSFA	Metal Lath/Steel Framing Association 221 N. LaSalle Street Chicago, IL 60601; 312/346-1600
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry 5203 Leesburg Pike Falls Church, Virginia 22041; 702/998-7996
NAAMM	The National Association of Architectural Metal Manufacturers 221 N. LaSalle Street Chicago, Illinois 60601; 312/346-1600

NAPF	National Association of Plastic Fabricators 1701 N. Street, NW Washington, D.C. 20036; 202/656-8874
NBGOA	National Building Granite Quarries Association 202 South Third Avenue Cold Spring, MN 55107
NBS	National Bureau of Standards (U.S. Dept. of Commerce) Gaithersburg, Maryland 20234
NCMA	National Concrete Masonry Association Post Office Box 781 Herndon, Virginia 22070; 703/435-4900
NEC	National Electric Code (by NFPA)
NECA	National Electric Contractors Association 7315 Wisconsin Avenue Washington, D.C. 20014; 202/657-3110
NEII	National Elevator Industry, Inc. 600 Third Avenue New York, New York 10016; 212/986-1545
NEMA	National Electrical Manufacturers Association 2101 L Street, NW Washington, D.C. 20037; 202/457-8400
NFPA	National Fire Protection Association 470 Atlantic Avenue Boston, MA 02210; 617/482-8755
N.F.P.A.	National Forest Products Association 1619 Massachusetts Avenue, NW Washington, D.C. 20036; 202/797-5800
NHLA	National Hardwood Lumber Association Post Office Box 34518 Memphis, Tennessee 38104; 901/377-1818
NPA	National Particleboard Association 2306 Perkins Place Silver Spring, Maryland 20910; 301/587-2204
NRCA	National Roofing Contractors Association One O'Hare Center 6250 River Road Rosemont, Illinois 60018; 312/318-6722
NSF	National Sanitation Foundation 3475 Plymouth Rd. Ann Arbor, Michigan 48106; 313/769-8010

NSSEA	National School Supply & Equipment Association 1500 Wilson Boulevard Arlington, Virginia 22209; 703/524-8819
NTMA	The National Terrazzo and Mosaic Association 3166 Des Plains Avenue Des Plains, Illinois 60018; 312/635-7744
NWMA	National Wood Manufacturer's Association 205 W. Touhy Avenue Park Ridge, Illinois 60068; 312/823-6747
OSHA	Occupational Safety Health Administration (U.S. Dept. of Labor) Government Printing Office Washington, D.C. 20402
PCI	Prestressed Concrete Institute 20 N. Wacker Dr. Chicago, Illinois 60606; 312/346-4071
PDI	Plumbing and Draining Institute 5342 Boulevard Place Indianapolis, Indiana 46208; 317/251-5298
PEI	Porcelain Enamel Institute 1911 N. Fort Myer Arlington, Virginia 22209; 703/527-5257
PS	Product Standard of NBS (U.S. Dept. of Commerce) Government Printing Office Washington, D.C. 20402
RFCI	Resilient Floor Covering Institute 1030 15th Street, NW Washington, D.C. 20005; 202/833-2635
RIS	Redwood Inspection Service (Grading Rules) 627 Montgomery San Francisco, California 94111
SAMAS	Scientific Apparatus Makers Association 1101 16th Street, NW Washington, D.C. 20036; 202/223-1360
SDI	Steel Deck Institute Post Office Box 3812 St. Louis, MO 63122; 314/965-1741
S.D.I.	Steel Door Institute 712 Lakewood Center, N. Cleveland, Ohio 44107; 216/226-7700

SHLMA	Southern Hardwood Lumber Manufacturers Association 805 Sterick Boulevard Memphis, Tennessee 38103; 901/525-8221
SIGMA	Sealed Insulating Glass Manufacturers Association 111 E. Wacker Dr. Chicago, Illinois 60601; 312/644-6610
SJI	Steel Joist Institute 1703 Parham Rd. Richmond, Virginia 23229; 804/288-3071
SMACNA	Sheet Metal & Air Conditioning Contractors' National Association Post Office Box 70 Merrifield, Virginia 22116
SPIB	Southern Pine Inspection Bureau (Grading Rules) 4709 Scenic Highway Pensacola, Florida 32504; 904/434-2611
SSPC	Steel Structures Painting Council 4400 5th Avenue Pgh, PA 15213; 412/578-3327
TCA	Tile Council of America Post Office Box 326 Princeton, New Jersey 08540; 609/921-7050
TIMA	Thermal Insulation Manufacturers Association 7 Kirby Plaza Mt. Kisco, New York 10549; 914/241-2284
TPI	Truss Plate Institute 100 W. Church St. Frederick, Maryland 21701; 301/694-6100
UL	Underwriters Laboratories 333 Pfingsten Rd. Northbrook, Illinois 60062; 312/272-8800
WCLIB	West Coast Lumber Inspection Bureau (Grading Rules) Post Office Box 2315 Portland, Oregon 97223; 503/649-0651
WIC	Woodwork Institute of California 1833 Broadway Fresno, California 93773; 209/233-9035
WRI	Wire Reinforcement Institute 8900 Westpark Drive McLean, Virginia 22101; 703/790-9790
WSFI	Wood and Synthetic Flooring Institute 2400 E. Devon

Des Plaines, Illinois 60018; 312/635-7700

WWPA Western Wood Products Association (Grading Rules)
1500 Yeon Building
Portland, Oregon 97204; 503/224-3930

W.W.P.A. Woven Wire Products Association
108 W. Lake Street
Chicago, Illinois 60601; 312/332-6502

F. Governing Regulations/Authorities:

General: The procedure followed by Architect/Engineer has been to contact governing authorities where necessary to obtain information needed for the purpose of preparing Contract Documents; recognizing that such information may or may not be of significance in relation to Contractor's responsibilities for performing the work. Contract governing authorities directly for necessary information and decisions having a bearing on performance of the work.

G. Submittals:

Permits, Licenses and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgements, and similar documents, correspondence and records established in conjunction with compliance with records established in conjunction with compliance with standards and regulations bearing upon performance of the work.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable.

END OF SECTION 01090.

SECTION 01200 - PROJECT MEETINGS

PART 1 - GENERAL:

1. REQUIREMENTS INCLUDED:

   A. Contractor shall attend a Pre-Construction meeting administered by the Architect/Engineer.

   B. Contractor shall schedule and administer monthly progress meetings and specially called meetings throughout progress of work. Contractor shall perform the following:

      1. Prepare agenda for meetings.

      2. Distribute written agenda of each meeting four days in advance of meeting date.

      3. Make physical arrangements for meetings.

      4. Preside at meetings.

      5. Record the minutes; include significant proceedings and decisions.

      6. Reproduce and distribute copies of minutes within three days after each meeting:

         a. To participants in the meeting.

         b. To parties affected by decisions made at the meetings.

         c. Furnish three copies of minutes to Architect/Engineer.

   C. Representative of Contractors, Subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

   D. Owner and Architect/Engineer shall be invited to all such meetings and may attend to ascertain that Work is expedited consistent with Contract Documents and construction schedules.

2. RELATED REQUIREMENTS:

   A. I. Bidding Conditions.

   B. II. Contractual Conditions.

C. Shop drawings, product data and samples.

D. Section 01010 - Summary of Work

E. Section 01040 - Coordination

3. PRECONSTRUCTION MEETING:

A. Location: A site designated by Owner.

B. Attendance:

1. Owner's Project Manager.

2. Architect/Engineer and/or his professional consultants.

3. Contractor's Superintendent.

4. Major Subcontractors.

5. Others as Appropriate.

C. Suggested Agendum:

1. Distribution and discussion of:

a. List of major subcontractors and suppliers.

b. Projected Construction Schedules.

2. Critical work sequencing.

3. Major equipment deliveries and priorities.

4. Project Coordination:

Designation of responsible personnel.

5. Procedures and processing of:

a. Field decisions.

b. Proposal requests.

c. Submittals.

d. Change Orders.

e. Applications for Payment.

6. Adequacy of distribution of Contract Documents.

7. Procedures for maintaining Record Documents.

8. Use of Premises:

a. Office, work and storage areas.

b. Owner's requirements.

9. Construction facilities, controls and construction aids.

10. Temporary Utilities.

11. Safety and first-aid procedures.

12. Security procedures.

13. Housekeeping procedures.

4. PROGRESS MEETINGS:

A. Contractor shall schedule regular periodic meetings at least monthly or more often if deemed appropriate by the Architect.

B. Hold called meetings as required by progress of work.

C. Location of the meetings: Project field office of Contractor.

D. Attendance:

1. Owner and Architect/Engineers and his professional consultants as needed.

2. Subcontractors as appropriate to the agenda.

3. Suppliers as appropriate to the agenda.

4. Others.

E. Suggested Agendum:

1. Review, approval of minutes of previous meetings.
2. Review of work progress since previous meetings.
3. Field observations, problems, conflicts.
4. Problems which impeded Construction Schedule.
5. Review of off-site fabrication, delivery schedule.
6. Corrective measures and procedures to regain projected schedule.
7. Revisions to Construction Schedule.
8. Progress, schedule, during succeeding work period.
9. Coordination of schedules.
10. Review submittal schedules; expedite as required.
11. Maintenance of quality standards.
12. Pending changes and substitutions.
13. Review proposed changes for:
    a. Effect on Construction Schedule and on completion date.
    b. Effect on other contracts of the Project.

PART 2 - PRODUCTS
Not used.

PART 3 - EXECUTION
Not used.

END OF SECTION 01200.

SECTION 01210 - PROCEDURES AND PERFORMANCES

PART 1 - PROCEDURES

1. Observation: The Architect/Engineer may review all the work including Architectural, Civil, Structural, Plumbing, Electrical and Mechanical on this project.

2. Tests: Required tests on the project will be Welding Integrity Testing, Soil Density Tests, concrete cylinder and slump tests, and others as may be deemed appropriated by the Architect/Engineer and Owner.

PART 2 - PERFORMANCE

1. Measurements and Dimensions: Before ordering materials or doing work which is dependent for proper size, or installation upon coordination with building conditions, the Contractor shall verify all dimensions by taking measurements at the building and shall be responsible for the correctness of same. No consideration will be given any claim based on the difference between the actual dimensions and those indicated on the drawings. Any discrepancies between the drawings and/or the specifications and the existing conditions shall be referred to the Architect/Engineer for adjustment before any work affected thereby is begun.

PART 3 - EXECUTION

Not used.

END OF SECTION 01210.

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SECTION 01310 - CONSTRUCTION SCHEDULE

PART 1 - GENERAL

1. The progress schedule required under the General Conditions shall be prepared using the critical path method as described in the Supplementary General Conditions and herein.

   A. The critical path schedules requirement will consist of a two-part network submittal (interim schedule, and detailed schedule), along with monthly progress status reports (Monthly Report), and monthly update to the networks and analysis. The planning, scheduling, management, and execution of the Work is the sole responsibility of the Contractor. The progress schedule requirement is established to allow Owner to review Contractor's planning, scheduling, management and execution of the work; to assist owner in evaluating work progress and make progress payments; and to allow other contractors to cooperate and coordinate their activities with those of the Contractor.

   B. Review of the schedule of submittals shall not relieve Contractor from responsibility for any deviations from the Contract Documents unless Contractor has, in writing, submission and received written concurrence to the specific deviations, nor shall any concurrence by Owner and Architect/Engineer relieve Contractor from, responsibility for errors and omissions in the submittals.

2. INTERIM SCHEDULE SUBMITTALS

   A. Submittal set shall include a time-scaled graphic arrow diagram, a detailed schedule of values incorporating shop drawing submittals, and interim status reports. The initial submittal shall be delivered within fourteen (14) calendar days of the effective date of the Agreement and shall use the Notice to Proceed as the data date. The submittal shall be submitted on time, be completed, comply with all contract conditions, and represent a realistic approach to the Work. No progress payments for work performed shall be made until this submittal set is submitted and accepted.

   B. The graphic arrow diagram shall show one (1) detailed activity for all work to be performed during the first 120 calendar days after Notice to Proceed, and two (2) summary activities for the remainder of the contract.

   C. Interim status reports shall be revised and submitted monthly following the initial preliminary schedule submittal, and continue through 120 calendar days.

3. DETAILED SCHEDULE SUBMITTAL

   A. Submittals shall include a time-scaled (day after Notice to Proceed) graphic arrow diagram showing all contract activities, computer printout reports, and a supporting narrative. The initial detailed schedule submittal shall be delivered within 30 calendar days after the

Notice to Proceed, and shall use the Notice to Proceed as the data date. The submittal shall be on time, complete, comply with all Contract conditions, and represent a reasonable approach to the Work. No progress payments shall be made for work performed after the first 60 days of the Contract until the detailed schedule submittal is submitted and accepted.

B. The graphic arrow diagram shall be formatted in accordance with the paragraph 2A above. The diagram shall include all detailed activities included in the interim schedule submittal grouped by major areas of work and detailed activities, as shown on the Schedule of Values.

4. MONTHLY PROGRESS REPORTS

A. Not later than 30 calendar days after the Notice to Proceed, and at monthly intervals thereafter, Contractor shall submit to the Architect/Engineer, a draft Monthly Progress Report with data as of the last day of the current pay period. Within thirty calendar days after receipt of this report, Owner, Architect/Engineer, and Contractor shall meet to discuss the draft report and reach an agreement on job progress. Job progress shall specifically include:

1. Actual completion dates for activities completed during the report period, and actual start dates for activities commenced during the report period.

2. Estimated start dates for activities scheduled to commence during the following report period.

3. Changes in the duration of any activity and minor logic changes.

4. Activities not included in the currently accepted, detailed graphic arrow diagram.

5. Major changes in scope and other identifiable changes.

5. SUBMISSIONS

A. Submit initial schedules within 14 days after award of Contract.

1. Architect/Engineer will review schedules and return review copy within 10 days after receipt.

2. If required, resubmit within 7 days after return of review copy.

B. Submit revised and/or updated progress schedules with each application for payment.

6. DISTRIBUTION

A. Distribute copies of the reviewed schedules to:

1. Architect/Engineer

2. Owner's Representative

3. Subcontractors

4. Other concerned parties

B. Instruct recipients to report promptly to the Contractor, in writing, any problems anticipated by the projections shown in the schedules.

7. COMPLIANCE

See the Supplementary General Conditions for consequences of non-compliance.

PART 2 - PRODUCTS
Not used.

PART 3 - EXECUTION
Not used.

END OF SECTION 01310.

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SECTION 01340 - SUBMITTALS

PART 1 - GENERAL

1. REQUIREMENTS INCLUDED:

   Submit Shop Drawings, Product Data and Samples required by Contract Documents.

   Submittals may include, but are not limited to the following:

   See individual Specification Sections

2. RELATED REQUIREMENTS:

   A. Definitions and Additional Responsibilities of Parties: General Conditions of the Contract.

   B. Designate in the Construction Schedule, Application for Payments, or in a separate coordinated schedule, the dates for submission of Shop Drawings, Product Data and Samples.

   C. II Contractual Conditions

3. SHOP DRAWINGS:

   A. Drawings shall be presented in a clear and thorough manner.

      Details shall be identified by reference to sheet and detail, schedule or room numbers shown on Contract Drawings.

   B. Shall be original drawings, prepared by Contractor, Subcontractor, Supplier or Distributor, which illustrate some portion of the work, showing fabrication, layout, setting or erection details. **DUPLICATION OF CONTRACT DOCUMENTS FOR ANY SUBMITTAL SHALL NOT BE ACCEPTABLE.**

      1. Prepared by a qualified detailer.

      2. Identify details by reference to sheet and detail numbers shown on Contract Drawings.

      3. The Contractor may, at his expense, purchase a limited set of electronic files of the Contract Documents from the Architect/Engineer to assist in the production of the Shop Drawings. The file set shall be limited to the specific area of interest to the Contractor. All fee schedules for the files shall be set

by the Architect/Engineer. The Architect/Engineer reserves all rights to the files under copyright laws and reserves the right to not release any electronic files.

C. Shop Drawing transmittal letter shall be submitted separate for each required section as provided at the end of this section. Submittal shall note any and all deviations from Contract Documents.

4. PRODUCT DATA:

A. Preparation

1. Clearly mark each copy to identify pertinent products or models.

2. Show performance characteristics and capacities.

3. Show dimensions and clearances required.

4. Show wiring or piping diagrams and controls.

5. Note all deviations from Contract Documents.

B. Manufacturer's standard schematic drawings and diagrams:

1. Modify drawings and diagrams to delete information which is not applicable to the work.

2. Supplement standard information to provide information specifically applicable to the work.

3. Note all deviations from Contract Documents.

5. SAMPLES:

A. Office samples shall be of sufficient size and quantity to clearly illustrate materials, equipment or workmanship, and to establish standards by which completed work is to be judged.

1. Functional characteristics of the product, with integrally related parts and attachment devices.

2. Full range of color, texture and pattern.

3. After review, samples shall be used for comparison in construction of project.

4. Note deviations from Contract Documents.

B. Field samples and mock-ups.

1. Erect at project site at location acceptable to Architect/Engineer.

2. Construct each sample or mock-up complete, including work of all trades required in finished work.

3. Note deviations from Contract Documents.

6. CONTRACTOR RESPONSIBILITIES:

A. Review Shop Drawings, Product Data and Samples prior to submission.

Check and stamp submittal with his approval.

B. Determine and verify:

1. Field measurements.

2. Field construction criteria.

3. Catalog numbers and similar data.

4. Conformance with specifications.

5. Note deviations from Contract Documents.

C. Coordinate each submittal with requirements of the work and of the Contract Documents.

D. Notify the Architect/Engineer in writing, at time of submission, of his review and approval of submittal and of any deviations in the submittals from requirements of the Contract Documents.

1. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Architects/Engineers review of submittals, unless specific deviations are called to the attention of the Architect/Engineer in writing and the Architect/Engineer gives written acceptance of specific deviations.

2. Contractor's responsibility for errors and omissions in submittals is not relieved by Architect's/Engineer's review of submittals.

E. Begin no fabrication or work which requires submittals until return of submittals with Architect/Engineer review.

F. Submittals not reviewed and approved by the Contractor will be rejected.

7. SUBMISSION REQUIREMENTS:

A. Make submittals promptly in accordance with accepted schedule, and in such sequence as to cause no delay in the work or in the work of any other Contractor. Use transmittal format included herein.

B. Number of submittals required:

1. Shop Drawings: Submit sufficient quantity of prints of shop drawing for the Contractor's use and two (2) copies to be retained by the Architect/Engineer.

2. Product Data: Submit sufficient quantity of Product Data for the Contractor's use and two (2) copies to be retained by the Architect/Engineer.

3. Samples: Submit the number stated in each specification section. Provide two (2) samples if not indicated.

C. Submittals shall contain:

1. The date of submission and the dates of any previous submissions.

2. The project title and number.

3. Contract identification.

4. The names of Contractor, Supplier and Manufacturer.

5. Identification of the product, with the specification section number.

6. Field dimensions, clearly identified as such.

7. Relation to adjacent or critical features of the work or materials.

8. Identification of revisions on re-submittals.

9. Applicable Standards (such as ASTM or Federal Specification numbers).

10. An 8 inch x 3 inch blank space for contractor and Architect/Engineer or

provide review status cover page.

11. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the work and of Contract Documents.

D. RE-SUBMISSION REQUIREMENTS:

A. Make any corrections or changes in the submittals required by the Architect/Engineer and resubmit until accepted.

B. Shop drawings and product data:

1. Revise initial drawings of data, and resubmit as specified for the initial submittal.

2. Cloud any change which has been made.

3. Indicate shop drawing is being resubmitted, use Architect's/Engineer's shop drawing identification number if provided.

C. Samples: Submit new samples if requested by Architect/Engineer.

9. DISTRIBUTION

Distribute reproductions of Shop Drawings and copies of Product Data which carry the Architect/Engineer stamp of acceptance to:

1. Job site file.

2. Subcontractors.

3. Supplier or Fabricator.

4. Project close-out documents (Section 01700).

10. ARCHITECT/ENGINEER DUTIES

A. Review submittals; allowing Architect/Engineer a period of 14 calendar days for review and return of Shop drawings.

B. Affix stamp and initials or signature and indicate requirements for

resubmittal or approval of submittal.

C. Return submittals to Contractor for distribution of for re-submission.

D. Forward copy of submittal for Owner's use and information. This shall not relieve contractor's requirements in other sections to provide the Owner with a complete record copy at job close-out.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

1. Shop Drawing Submittals shall be reviewed in accord with the following:

A. Review of submittals by Architect/Engineer is for general conformance with the design concept as presented by the Contract Documents. No detailed check of quantities or dimensions will be made.

B. The General Contractor/Construction Manager is responsible for assuring that all submittals comply with the latest project plans, specifications, governing codes and regulations and is solely responsible for confirming all quantities, dimensions, fabrication techniques and coordinating work with all trades.

C. Shop drawings are to be submitted in a timely manner allowing adequate time for processing. The submittal is reviewed by the Architect/Engineer of Record within 14 calendar days of receipt.

D. Submit shop drawings for specific components, such as columns, footings, etc., in their entirety. Shop drawings for similar floors shall be submitted in the same package.

E. All submittals are to be accompanied by a letter of transmittal. Do not combine different submittals on the same transmittal.

F. All shop drawings must bear evidence of the Contractor's approval prior to submitting to the Architect/Engineer of Record.

G. Submit quantities per Part 1; 7.B.

H. All changes and additions made on re-submittals must be clearly flagged and noted. The purpose of the re-submittals must be clearly noted on the letter of transmittal.

Architect/Engineer of Record review is limited to those items causing the resubmission.

I. For criteria applicable to shop drawings requiring engineering input by a specialty engineer, see below.

J. Shop drawings not meeting the above criteria or submitted after fabrication will not be reviewed.

K. The Contract Documents are not to be reproduced for use as shop drawings.

2. Shop Drawings requiring input by Specialty Engineer shall be reviewed in accord with the following:

A. Specialty Engineer:

1. Definition - A Florida registered professional engineer, not the structural engineer of record, who specializes in and who undertakes the design of structural components or structural systems included in a specific submittal prepared for this project.

2. Shall be:

a. An employee or officer of a fabricator.

b. An employee or officer of an entity supplying components to a fabricator.

c. An independent consultant retained by the fabricator of his supplier.

B. Shop Drawings requiring a specialty engineer are fabrication and erection drawings prepared for, but not limited to the following items:

Aluminum or light gage steel exterior wall systems, prefabricated steel stairs, handrails, precast concrete components, post-tensioning systems, prefabricated wood components, open web steel joists, formwork and falsework shoring and reshoring.

C. Submittals shall clearly identify the specific project, applicable codes, list the design criteria, and shall show all details and plans necessary for proper fabrication and installation. Calculations and shop drawings shall identify specific product utilized. Generic products will not be accepted.

D. Shop drawings and calculations must be prepared under the direct supervision and control of the specialty engineer.

E. Shop drawings and calculations require the impressed seal, date and signature, or electronic equivalency thereof, of the specialty engineer. Computer printouts are an acceptable substitute for manual computations provided they are accompanied by sufficient descriptive information to permit their proper evaluation. Such descriptive information shall bear the impressed seal and signature of the specialty engineer as an indication that he has accepted responsibility for the results. Architect/Engineer of Record will retain one signed and sealed print for record.

F. Drawings prepared solely to serve as a guide for fabrication and installation (such as reinforcing steel shop drawings or structural steel erection drawings) and requiring no engineering input do not require the seal of a specialty engineer.

G. Catalog information on standard products does not required the seal of a specialty engineer.

H. Review by the Architect and Structural Engineer of record of submittals is limited to verifying the following:

1. That the specified structural submittals have been furnished.

2. That the structural submittals have been signed and sealed by the specialty engineer.

3. That the specialty engineer has understood the design intent and has used the specified structural criteria. (No detailed check of calculations will be made.)

4. That the configuration set forth in the structural submittals is consistent with the contract documents. (No detailed check of dimensions or quantities will be made.)

I. List of drawings shall be prepared and maintained for all shop drawings requiring participation of a specialty engineer. The list shall contain project name, name of General Contractor/Construction Manager, name of subcontractor, name of specialty engineer, drawings number, drawing title and latest revision number and date. For partial submittals, the list shall contain all anticipated drawing numbers and titles required to complete the contract. The General Contractor/Construction Manager is responsible for submitting the latest updated list of drawings with each submittal.

J. Upon the completion of the submittal process for the project, the Contractor shall submit to the Architect/Engineer of Record a notarized affidavit stating the following:

"This is to certify that the undersigned as General Contractor/Construction

Manager for the referenced project has furnished to and has received acceptance from the Architect/Engineer of Record for all structural submittals requiring participation of a specialty engineer. These submittals were prepared for work performed by the following subcontractors: (name of subcontractors)..." The final lists of shop drawings shall be attached to the affidavit.

K. Submittals not meeting the above criteria will not be reviewed.

L. Submit quantities per Part 1; 7.B.

END OF SECTION 01340.

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SECTION 01370 - SCHEDULE OF VALUES

PART 1 - GENERAL

GENERAL REQUIREMENTS:

A. Related requirements specified elsewhere.

1. Progress Meetings: Section 01200.

2. Construction Schedule: Section 01310.

B. Submit to the Architect/Engineer a Schedule of Values, **no later than** 14 calendar days after date of Notice to Proceed.

C. Upon request by Architect/Engineer, support values given with data that will substantiate their correctness.

D. use Schedule of Values only as basis for Contractor's Application for Payment.

FORM OF SUBMITTAL:

A. Submit Typewritten Schedule of Values on AIA form G702, and G703. Computer generated formats of this form are acceptable.

B. Use table of Contents of this specification as a minimum basis for format for listing cost of Work. Additional breakdowns shall be as determined and required by the Architect/Engineer and Owner. Work shall be broken into labor and material costs.

C. Identify each line item with number and title as listed in Table of Contents of this Specification.

PREPARING SCHEDULE OF VALUES:

A. Itemize separate line item cost for each of the following general cost items as applicable.

1. Performance and Payment Bonds.

2. Field Supervision and Layout.

3. General Conditions.

4. Temporary Facilities and Controls.

5. Other items as deemed appropriate.

6. Mobilization

7. De-Mobilization

B. Itemize separate line cost for work required by each section of this Specification. Quantities should be sufficiently detailed and subdivided as necessary to describe all of the labor and materials incorporated into the work to accurately measure the Contractor's progress for periodic payments.

C. Round off figures to nearest dollar.

D. Make sum of total cost of all items listed in each schedule equal in total Contract Sum.

REVIEW AND RESUBMITTAL:

A. After review by owner and Architect/Engineer, revise and resubmit Schedule of Values as required.

B. Resubmit revised Schedule of Values in the same format.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTIONS

Not used.

END OF SECTION 01370.

SECTION 01410 - SPECIAL TESTING & INSPECTION REQUIREMENTS

PART 1 - GENERAL

REQUIREMENTS INCLUDED:

Owner will employ and pay for the services of an independent testing laboratory to perform specified testing. Testing to be provided by Owner includes, but is not limited to, construction materials, soil compaction, subsurface improvements, concrete, mortar, grout, steel, roofing and HVAC test and balance.

1. Contractor shall cooperate with the laboratory to facilitate the execution of its required services.

2. Employment of the laboratory shall in no way relieve Contractor's obligations to perform the work of the Contract.

3. RETESTS DUE TO FAILURE FOR ANY AND ALL REASONS SHALL BE AT THE EXPENSE OF THE CONTRACTOR. Costs of retests shall be recovered by deducting the costs of same from the Contract amount by Change Order.

RELATED REQUIREMENTS:

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

B. Respective sections of specifications: Certification of products.

C. Each specification section where required: laboratory tests required, and standards for testing.

LABORATORY DUTIES:

A. Cooperate with Architect/Engineer and Contractor; provide qualified personnel after due notice.

B. Perform specified inspections, sampling and testing of materials and methods of construction:

1. Comply with specific standards.

2. Ascertain compliance of materials with requirements of Contract Documents.

C. Promptly notify Architect/Engineer and Contractor of observed irregularities or deficiencies of work or products.

D. Promptly submit written report of each test and inspection; two (2) copies each to Architect/Engineer and Contractor, and one (1) copy to Owner's Representative. Each report shall include:

1. Date issued.

2. Project title and number.

3. Testing Laboratory name, address and telephone number.

4. Name and signature of laboratory inspector.

5. Date and time of sampling or inspection.

6. Record of temperature and weather conditions.

7. Date of test.

8. Identification of product and specification section.

9. Location of sample or test in the project.

10. Type of inspection or test.

11. Results or tests and compliance with Contract Documents.

12. Interpretation of test results, when requested by Architect/Engineer.

E. Perform additional tests as required by Architect/Engineer or the Owner.

LIMITATIONS OF AUTHORITY OF TESTING LABORATORY:

Laboratory is not authorized to:

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

2. Approve or accept any portion of the work.

3. Perform any duties of the Contractor.

CONTRACTOR'S RESPONSIBILITIES:

A. **Contractors requesting inspections shall provide UBCI a minimum of 24 hour notice in written format. Inspection will not be conducted under normal circumstances on Saturdays, Sundays, or observed holidays. If required due to extenuating conditions, an inspection may be requested on these days with 3 working days written notice. The UBCI reserves the right to approve or deny such requests.**

1. The following information is to be included in ALL submitted requests:
   - Permit number
   - Job location
   - Contractor requesting inspection
   - Contact number of requesting party
   - Type of inspection requested
   - Date and time when the item will be ready for inspection

B. Cooperate with laboratory personnel, provide access to work, or to manufacturer's operations.

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

D. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other material mixes which require control by the testing laboratory.

E. Furnish copies of Products test reports as required.

F. Furnish incidental labor and facilities:

1. To provide access to work to be tested.

2. To obtain and handle samples at the Project site or at the source of the product to be tested.

3. To facilitate inspections and tests.

4. For storage and curing of test samples.

G. **Notify the appropriate persons sufficiently in advance (24 hr. minimum) of operations to allow for laboratory assignment of personnel and scheduling of tests.**

When tests or inspections cannot be performed in a timely manner by no fault of the Owner after such notice, reimburse Owner for laboratory personnel and travel expenses incurred due to contractor's negligence.

G. Make arrangements with laboratory and pay for additional samples and tests required for Contractor's convenience.

H. Maintain a log at the site of all inspections and tests performed. The log shall indicate the date, time and type of inspection and/or test and shall be initialed by the person who performed the same.

I. At the A/E's or UBCI's discretion, uncover any work concealed by subsequent construction that was not inspected and/or tested by the appropriate persons. The uncovering shall be performed at the Contractor's expense without change in the Contract time.

PROJECT INSPECTION ITEMS:

Items requiring inspection or notification by the Contractor include, but are not limited to the list below using the following key:

A. Items for which inspection by the UBCI is mandatory.

B. Items for which the Contractor shall provide notification. The UBCI shall inspect the item or waive the inspection or the A/E may perform the inspection in the UBCI's stead.

General:

-	Any inspections performed by Manufacturer's Representative for any products incorporated in the work	B

Sitework:

-	Soil removal for over-excavation	B
-	Soil compaction	B
-	Soil compaction testing	B
-	Subsurface preparation for all landscaping	B
-	Placing piles for foundations	B

Concrete (Note: Each occurrence, regardless of size, requires notification):

-	Footings immediately prior to placing concrete (de-watered with rebar in place)	A

-	Concrete slabs immediately prior to placing concrete (reinforcing, vapor barrier and utilities in place)	A
-	Rebar placement and formwork for all structural concrete elements	A
-	Structural concrete placement	A

Masonry (Note: Each occurrence, regardless of size, requires notification):

-	CMU cells with reinforcing in place prior to filling with grout	A
-	Placing grout in CMU cells	B

Steel:

-	Structural steel erection	B
-	Testing of structural steel connections	A
-	Structural steel members and connections prior to concealment by subsequent construction	A

Thermal & Moisture Protection:

-	Inspect deck condition prior to commencement of roofing	A
-	Commencement of roof insulation installation	B
-	Application of roofing membrane plys (or cap sheet)	B
-	Installation of metal roofing	B
-	Inspection of finished roof by Manufacturer's Representative	A
-	Insulation placement prior to concealment	A

Windows:

-	Inspection of finished installation by Window Manufacturer's Representative	B

Finishes:

-	Metal stud walls prior to application of Gypsum Panel Products	A
-	"Screw Inspection" prior to commencing taping and finishing of Gypsum Panel Products	B
-	Installation of ceramic tile, carpet, VCT or other building finishes	B

Buried Pipe:

-	Before insulation	A
-	Prior to any pour of anchors or other underground concrete over pipes, including foundations	A
-	Prior to backfill (Insulation Inspection)	A
-	Witness pressure tests	A

Ductwork:

-	Prior to external insulation	B
-	Blower leak test	B
-	Above gypsum ceilings - before ceiling installed	A

Above Ground Pipe:

-	Prior to any concrete pour around pipe penetration	A
-	Prior to insulation	B

Gas Pipe, Buried:

-	Under slab-inspect before installation in sleeves	A

-	Inspect all gas pipe in sleeves or not, prior to burial	A
-	Witness pressure test	A

Underground Tanks:

-	Inspect steel in deadmen or slabs prior to pour	A
-	Inspect pit and tank prior to lowering tank	B
-	Inspect tank and tie-down prior to backfill	A

Domestic Water Pipe Below Slab:

-	Inspect and witness pressure test before backfill	A

Electrical:

-	Testing of all electrical systems (intercom, clocks, power, etc.)	A
-	Installation of electrical conduit, wiring and equipment	B
-	Inspect underground conduits prior to backfilling	A

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION 01410.

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SECTION 01510 - TEMPORARY UTILITY CONNECTIONS

PART 1 - GENERAL

REQUIREMENTS: Furnish, install and maintain temporary utilities required for construction, remove on completion of work. These may include, but are not limited to, the following:

A. Temporary lighting and power for all construction activities, including extension of temporary electrical service into buildings.

B. Temporary heat and ventilation.

C. Temporary telephone.

D. Temporary water for construction, including all distribution systems.

E. Temporary sanitary facilities for construction personnel.

F. Temporary fire protection system as required by local authorities.

G. Provide and make available for use by Subcontractors temporary light, power and water required in the performance of their Work as part of the Work of this Section.

RELATED REQUIREMENTS:

A. Section 01010, Summary of Work.

B. Section 01590, Field Offices and Sheds.

REQUIREMENTS OF REGULATORY AGENCIES:

A. Comply with National Electric Code.

B. Comply with Federal, State and local codes and regulations and with utility company requirements.

PART 2 - PRODUCTS

MATERIALS: may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions and must not violate requirements of applicable codes and standards.

TEMPORARY ELECTRICITY AND LIGHTING:

A. Contractor may use the Owner's power provided the privilege is not abused.

B. Install circuit and branch wiring, with are distribution boxes located so that power and lighting is available throughout the construction by the use of construction type power cords.

C. Provide adequate artificial lighting for all areas of work when natural light is not adequate for Work and for areas accessible to the public.

D. Provide and maintain temporary feeders to permanent mechanical equipment requiring service, including ventilation, until permanent feeds are connected and energized.

E. When directed by Architect/Engineer after permanent power has been switched over, remove those portions of temporary light and power installation which are the responsibility of the Contractor.

F. Provide temporary site security lighting to maintain 3 fc measured minimum light level.

TEMPORARY HEAT AND VENTILATION:

Not Required

TEMPORARY TELEPHONE SERVICE:

A. Arrange with local telephone service company, provide direct line telephone service at the construction site for the use of personnel and employees. Service required:

1. One direct line instrument in Contractor's Field Office.

2. Other instruments at the option of the Contractor or as required by regulations.

3. One direct line instrument in Architect/Engineer's Field Office.

B. Pay all costs for installation, maintenance and removal and service charges for local calls. Toll charges shall be paid by the party who places the call unless preapproved by the Contractor.

TEMPORARY WATER:

A. The Contractor may use the Owner's site water provided the privilege is not abused.

B. Install branch piping with taps located so that water is available throughout the construction by the use of hoses. Protect piping and fittings against freezing.

TEMPORARY SANITARY FACILITIES:

A. Provide sanitary facilities in compliance with laws and regulations.

1. Since no services will be available for temporary toilets, provide, maintain and remove when directed, portable chemical toilets for construction personnel.

2. Provide quantity and location of temporary toilets as required by authorities having jurisdiction, including, but not limited to OSHA, and subject to further directions by the Engineer. Temporary toilets shall be located as accepted by the Owner and Architect/Engineer.

B. Service, clean and maintain facilities and enclosures.

C. Field office trailer toilet may be provided with temporary connections into existing sanitary gravity drains.

TEMPORARY FIRE PROTECTION SYSTEM:

Provide laborers with fire extinguishers. Provide fire blankets when ever operations produce flames or sparks.

PART 3 - EXECUTION

GENERAL:

A. Comply with applicable requirements specified in Division 15 Mechanical and in Division 16 Electrical.

B. Maintain and operate systems to assure continuous service.

C. Modify and extend systems as work progress requires.

REMOVAL:

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Clean and repair damage caused by temporary installations or use of temporary facilities.

C. Restore existing facilities used for temporary services to specified, or to original condition.

D. Restore permanent utilities used for temporary services to specified condition. Prior to Final Inspection, remove temporary lamps and install new lamps.

END OF SECTION 01510.

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SECTION 01590 - FIELD OFFICES AND SHEDS, AND TEMPORARY BARRIERS

PART 1 - GENERAL

REQUIREMENTS:

A. Furnish, install and maintain temporary field office during entire construction period.

B. Furnish, install and maintain storage and work sheds needed for construction.

C. Furnish and install all barriers, fences and gates, concrete encasement, signs and all other personnel warning and safety measures and devices of every kind required by code, local utility company, or site conditions.

D. At completion of work, remove field offices, sheds and contents.

RELATED DOCUMENTS:

A. Section 01010 - Summary of Work

B. Section 01510 - Temporary utilities

C. Section 01580 - Project Identification Signs

OTHER REQUIREMENTS:

A. Prior to installation of offices and sheds, consult with Owner and Architect/Engineer on location, access and related facilities.

B. Review location of temporary fencing with Owner and Architect/Engineer prior to installation.

C. Installation of any temporary item shall not unnecessarily restrict the daily activities of the school. If necessary, a schedule of erection and removal shall be developed with school personnel and coordinated with the Owner and Architect/Engineer.

REQUIREMENTS FOR FACILITIES:

A. Contractor shall provide a temporary field office on site and adjacent to the work. Confer with Architect/Engineer and Owner's Project Manager for location.

1. Provide with seating space for ten individuals, with a minimum 10'x3' work table.
2. Provide a toilet.

3. Provide a station for drinking water.
4. Temporary field office shall have a suitable environment for holding meetings and discussions and shall be located away from noisy work or sufficiently insulated such that general conversational level speaking is clearly understandable by all participants.

B. Access and Parking:

1. ~~Minimum of five (5) vehicle parking spaces are to be provided and maintained for visitor use; Designate Architect/Engineer (2); Owner (2) and Other (1).~~

2. Construction equipment and vehicles shall safely enter or exit site without interrupting local traffic. Coordinate location with Owner's Project Manager.

C. Subcontractors Field Office: This shall not preclude subcontractors from setting up their own field offices if accepted by the Owner and Architect/Engineer.

D. Storage:

1. Provide storage facilities as needed. Storage space for subcontractors shall be as agreed upon by Contractor and his subcontractors.

2. Locate storage facilities as directed by Owner and Architect/Engineer.

~~E. Project Construction Sign:~~

~~Provide project construction sign in accordance with Specification Section 01580 - Project Identification Signs. No added signs by the General or his Subcontractors will be allowed.~~

F. Directional Signage:

Contractor shall provide additional directional signage as deemed appropriate and or required by the Owner and Architect/Engineer.

G. Temporary Fencing and Gates:

1. Refer to section 02821 Chain Link Fencing and Gates for material requirements for temporary fencing.

2. Refer to Construction Documents for temporary silt fence and signage details.

3. **Install fence posts in a manner that provides adequate load resistance but allows for removal at time of project completion. All surfaces damaged by fence installation shall be repaired or replaced.**

4. **Install visual screening on all fencing identified by Owner and Architect/Engineer at time of pre-installation review and as designated in Construction Documents.**

PART 2 - PRODUCTS

MATERIALS, EQUIPMENT & FURNISHINGS:

May be new or used, but must be serviceable, adequate for required purpose, and must not violate applicable codes or regulations.

PART 3 - EXECUTION

PREPARATION:

Fill and grade sites for temporary structures to provide surface drainage.

INSTALLATION:

A. Construction temporary field offices and storage sheds on proper subgrade, provide connections for utility services.

   1. Secure portable or mobile buildings when used.

   2. Provide steps and landings at entrance doors.

B. Mount thermometer at convenient outside location, not in direct sunlight.

MAINTENANCE AND CLEANING:

Provide periodic (weekly minimum) maintenance and cleaning for temporary structures, furnishings, equipment and services.

REMOVAL:

A. Remove temporary field offices, contents and services at a time no longer needed.

B. Remove storage sheds when no longer needed.

C. Remove foundations and debris; grade site to required elevations and clean the areas and replace any plant material damaged.

D. **Remove temporary fencing, gates and signage at the end of project. Replace or repair any damaged surfaces and or plant material.**

END OF SECTION 01590.

SECTION 01600 - MATERIAL AND EQUIPMENT

PART 1 - GENERAL

REQUIREMENTS:

Material and Equipment Incorporated into the Work:

1. Conform to the applicable specifications and standards.

2. Comply with size, make, type and quality specified, or as specifically accepted in writing by the Architect/Engineer.

3. Manufactured and Fabricated Products:

    a. Design, fabricate and assemble in accord with the best engineering and shop practices.

    b. Manufacturer like parts of duplicate units to standard sizes and gauges, to be interchangeable.

    c. Two or more items of the same kind shall be identical, by the same manufacturer.

    d. Products shall be suitable for service conditions.

    e. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically accepted in writing.

4. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

RELATED DOCUMENTS:

A. II. Contractual Conditions

B. Section 01010 - Summary of Work

C. Section 01300 - Submittals

D. Section 01710 - Cleaning

MANUFACTURER'S INSTRUCTIONS:

A. When Contract Documents require that installation of Work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, including two (2) copies each to Owner and Architect/Engineer.

Maintain one set of complete instructions at the job site during installation and until complete.

B. Handle, install, connect, clean, condition and adjust products in strict accord with such instructions and in conformity with specified requirements.

1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Architect/Engineer for further instructions.

2. Do not proceed with work without clear instructions.

C. Perform Work in accord with manufacturer's instructions, unless otherwise specified. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

TRANSPORTATION AND HANDLING:

A. Arrange deliveries of Products in accord with construction schedules, coordinate to avoid conflict with Work and conditions at the site.

1. Deliver Products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.

2. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and submittals, and that Products are properly protected and undamaged.

B. Provide equipment and personnel to handle Products by methods to prevent soiling or damage to Products or packaging.

STORAGE AND PROTECTION:

A. Store products in accord with manufacturer's instructions, with seals and labels intact and legible.

1. Store products subject to damage by the elements in weather-tight enclosures.

2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.

B. Exterior Storage.

1. Store fabricated products above the ground, on blocking or skids, prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings, provide adequate ventilation to avoid condensation.

2. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

3. All storage means and methods are subject to acceptance by the Owner and Architect/Engineer.

C. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored Products to assure that Products are maintained under specified conditions, and free from damage or deterioration.

D. Protection After Installation:

1. Provide substantial coverings as necessary, to protect installed products from damage from traffic, water and subsequent construction operations. Remove when no longer needed.

2. All protection means and methods are subject to acceptance by the Owner and Architect/Engineer.

SUBSTITUTIONS AND PRODUCT OPTIONS:

A. Products List:

Within 30 days after Contract Date, submit to Architect/Engineer, a complete list of major products proposed to be used, with the name of the manufacturer and the installing subcontractor.

B. Product Options:

1. For Products specified only by reference standard, select any product meeting that standard.

2. For Products specified by basis for design and naming several acceptable manufacturers, select any one of the acceptable manufacturers named, which complies with the specification.

3. For Products specified by naming only one Product and manufacturer, there is no option.

C. Substitutions

1. Substitutions after bidding are not acceptable except as indicated in C.2 below.

2. Substitutions of products will be considered after bids are opened only under the following conditions:

a. The Contractor shall place orders for specified materials and equipment promptly upon award of contract. No excuse or proposed substitution will be considered for materials and equipment due to unavailability unless proof is submitted that firm orders were placed ten days after review by the Architect/Engineer of the item listed in the specifications.

b. The reason for the unavailability is beyond the control of the Contractor; unavailability will be construed as being due to strikes, lockouts, bankruptcy, discontinuance of the manufacture of the product, or acts of God.

c. Requests for such substitution shall be made all in writing to the Architect after the award of a contract and within 10 days of the date that the Contractor ascertains that he cannot obtain the material or equipment specified.

d. Requests shall be accompanied by a complete description of the material or equipment which the contractor wishes to use as a substitute. Substitutions must be recommended by the Architect/Engineer to the Owner who will accept in writing.

e. Contractor's Representative:

A request for substitution constitutes a representation that Contractor:

1. Has investigated the proposed product and determined that it is equal to or superior in all respects to that specified.

2. Will provide the same warranties or bonds for the substitution as for the Product specified.

3. Will coordinate the installation of an accepted substitution into the Work, and make such other changes as may be required to make the Work complete in all respects.

4. Waives all claims for additional costs, under his responsibility, which may subsequently become apparent.

f. Architect/Engineer will review request for substitutions with reasonable promptness and notify Contractor, in writing, of the decision to accept or reject the requested substitution.

g. Submit a separate request for each Product, supported with complete data, with drawings and samples as appropriate, including:

1. Comparison of the qualities of the proposed substitution with that specified. Provide data of specified product for comparison.

2. Changes required in other elements of the work because of the substitution.

3. Effect on the construction schedule.

4. Cost data comparing the proposed substitution with the Product specified.

5. Any required license fees or royalties.

6. Availability of maintenance service, and source of replacement materials.

7. Submit a sample of the basis for design and the requested substitution; samples will not be returned. Should basis for design not be available, submit product by listed acceptable manufacturer.

h. Architect/Engineer shall be the sole judge of the acceptability of the proposed substitution.

i. Review of substitutions shall be at Contractor's expense. Architect/Engineer shall charge the Contractor his standard hourly rates.

j. Modification of Contract Documents to accept such substitutions shall be at Contractor's expense. Architect/Engineer shall charge the Contractor his standard hourly rates.

3. Substitutions of products will be considered during bidding only under the following conditions:

a. Submit a separate request for each Product, supported with complete data, with drawings and samples as appropriate, including:

1. Comparison of the qualities of the proposed substitution with that specified. Provide data of specified product for comparison.

2. Changes required in other elements of the work because of the substitution.

3. Effect on the construction schedule.

4. Cost data comparing the proposed substitution with the Product specified.

5. Any required license fees or royalties.

6. Availability of maintenance service, and source of replacement materials.

7. Submit a sample of the basis for design and the requested substitution; Samples will not be returned.

b. Architect/Engineer shall be the sole judge of the acceptability of the proposed substitution.

c. Modifications of contract Documents to accept such substitutions accepted during bidding, should same be used by the Contractor in his bid and presented during the submittal process, shall be charged to the Contractor at the Architect's standard hourly rates.

d. Substitutions must be presented to the Architect/Engineer 15 days prior to the date set for the receipt of bids; telephone requests shall not be accepted. Persons requesting substitutions will be notified only by mail, whether request is acceptable; all bidders holding plans during bidding will receive addenda incorporating acceptable substitutions.

REUSE OF EXISTING MATERIAL:

Except as specifically indicated or specified, materials and equipment removed from an existing structure shall not be used in the completed work.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION 01600.

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SECTION 01700 - CONTRACT CLOSEOUT Revised Jan. 11, 2007

PART 1 - GENERAL

REQUIREMENTS:

Closeout is hereby defined to include general requirement near end of Contract Time in preparation for final acceptance, final payment, normal termination of contract, occupancy by Owner and similar actions evidencing completion of the Work. Time of closeout is directly related to "Substantial Completion" and therefore may be either a single time period for entire work or a series of time periods for individual parts of the work which have been certified as substantially complete at different dates. That time variation (if any) shall be applicable to other provisions of this section.

PREREQUISITES TO SUBSTANTIAL COMPLETION:

A. Prior to requesting Architect's/Engineer's inspection for certification of substantial completion for either entire Work or portions thereof, complete the following and list known exceptions in request:

1. In progress payment request, show either 100% completion for portion of work claimed as "substantially complete" or list incomplete items, value of incompletion and reasons for being incomplete.

2. Include supporting documentation for completion as indicated in these Contract Documents.

3. Submit statement showing accounting of changes to the Contract sum.

4. Advise Owner of pending insurance change-over requirements.

5. Submit specific warranties, workmanship/maintenance bonds, maintenance agreements, final certifications and similar documents.

6. Obtain and submit releases enabling Owner's full and unrestricted use of the Work and access to services and utilities, including (where required) occupancy permits, operating certificates and similar releases.

7. Deliver tools, spare parts, extra stocks of materials and similar physical items to Owner.

8. Complete start-up testing of systems and instructions of Owner's operating/maintenance personnel. Discontinue (or change over) and remove from project site temporary facilities and services, along with construction tools and

facilities, mock-ups and similar elements.

9. **Deliver original, fully executed hard PERMIT Card with all appropriate signatures indicating each applicable Division is finally completed and signed off by the appropriate tradesperson.**

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

PREREQUISITES TO FINAL ACCEPTANCE

A. Prior to requesting Architect's/Engineer's final inspection for certification of final acceptance and final payment as required by General Conditions, complete the following and list known exceptions (if any) in request:

1. Submit final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.

2. Submit updated final statement accounting for additional (final) changes to Contract Sum.

3. Submit certified copy of Architect's/Engineer's final punch-list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, endorsed and dated by Architect/Engineer.

4. **Asbestos: [Reference: State Requirements for Educational Facilities, Section 4.2(3)(e) Asbestos:** ***The federal Asbestos Hazard Emergency Response Act (AHERA) of October 22, 1986, requires the architect or engineer of record to sign a statement that NO asbestos-containing building materials were specified, or, to the best of his/her knowledge, were used as a building material in the project. The contractor should certify to the board that to the best of his/her knowledge, no asbestos containing building materials were used as a building material in the project. Section 255.40, F.S. prohibits the use of asbestos-containing materials in the construction of new public buildings.***

4. Submit final meter readings for utilities, measured record of stored fuel and similar data as of time of substantial completion or when Owner took possession of and responsibility for corresponding elements of the work.

5. Submit original Consent of Surety.

6. Submit final liquidated damages settlement statement, acceptable to Owner.

7. Submit record drawings, maintenance manuals, final project photographs, damage or settlement survey, property survey and similar final record information.

8. Complete final cleaning up requirements, including touch-up of marred surfaces.

9. Touch-up and otherwise repair and restore marred exposed finishes.

10. Revise and submit evidence of final, continuing insurance coverage complying with insurance requirements.

11. Certificates of elevator inspection.

12. Mechanical:

    a. Air System Test and Balance (prepared by Owner's independent agent)

    b. Piping pressure tests and certificates

    c. Project certification

13. Electrical:

    a. System tests

    b. Project certification

B. Re-inspection Procedure:

Upon receipt of Contractor's notice that work has been completed including punch-list items resulting from earlier inspections, and excepting incomplete items delayed because of acceptable circumstances, Architect/Engineer will re-inspect work. Upon completion of re-inspection, Architect/Engineer will either prepare certificate of final acceptance or advise Contractor of work not completed or obligations not fulfilled as required for final acceptance. If necessary, procedure will be repeated.

If re-inspections of above referenced items are required by the Architect/Engineer due to the failure of any of the Work t comply with the claims made by the Contractor as to the status of their completeness, the Owner will deduct the costs incurred by such re-inspections from the Contract amount.

RECORD DOCUMENT SUBMITTAL:

A. Specific requirements for record documents are indicated in individual sections of these specifications. Other requirements are indicated in General Conditions. General submittal requirements are indicated in Section 01340. Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for Architect's/Engineer's reference during normal working hours.

At time of final acceptance, submit complete sets of all required record documents to the Architect/Engineer for Owner's records.

B. **As-Built** Record Drawings:

Maintain a white-print set of contract drawings and shop drawings in clean, undamaged condition with mark-up of actual installations which vary substantially from the work as originally shown. Mark whichever drawings are most capable of showing "field" condition fully and accurately; however, where shop drawings are used for mark-up, record a cross-reference at corresponding location on working drawings. Mark-up new information which is recognized to be of importance to Owner but was for some reason not shown on either contract drawings or shop drawings. Give particular attention to concealed work which would be difficult to measure and record at a later date. Note related change order numbers where applicable.

Upon completion of the Work, this data shall be recorded to scale, by a competent draftsman on transparent paper of the Contract Drawings. Where changes are to be recorded, the prints shall be erased in such a way as to properly represent the work as installed. Where the work was installed exactly as shown on the Contract drawings, the prints shall not be disturbed. In showing the changes, the same legend shall be used to identify piping, etc., as was used on the Contract Drawings.

The Contractor shall review the completed record drawings and ascertain that all data furnished on the drawings are accurate and truly represent the Work as actually installed. When manholes, boxes, underground conduits, plumbing, hot or chilled water lines, etc., are involved as part of the Work, the Contractor shall furnish true elevations and locations, all properly referenced for the site. Information for reference data can be obtained from the office of the Architect/Engineer. Upon completion, the subcontractor involved shall date and sign the drawings, signifying compliance with the requirements set forth herein prior to submission of prints required.

The Contractor shall sign all pages to certify completeness of the **As-Built** Record Set of Drawings. Contractor shall submit the **marked-up** prints to the Architect/Engineer for the Owner.

In addition to the marked-up as-built record drawings, the Contractor shall submit two (2) sets of, bound white prints, of the complete record drawings to the Architect/Engineer; which shall be carefully checked and transmitted to the Owner.

C. **Electronic Files of Record Drawings**

If the Construction Documents were created by Computer Aided Drafting (CAD) then upon the receipt of the final record drawings from the Contractor, the Architect/Engineer shall revise the electronic files to reflect the as-built conditions. The CAD files shall be in a file format that can be read by Autocad version 2000 and above.

A copy of the electronic files shall be recorded onto compact disk media. Two (2) copies of the disk shall be submitted to the Owner at time of transference of the Record Drawings.

Each disk shall be labeled with:

- **Name of Project**
- **Name of General Contractor and or Construction Manager at Risk**
- **Name of Architect, or Engineer, and their Address**
- **Description of software used to create files**

D. **As-Built** Record Specifications:

Maintain one copy of specifications including addenda, change orders and similar modifications issued in printed form during construction and mark-up variations (of substance) in actual Work in comparison with text of specifications and modifications as issued. Give particular attention to substitutions, selection of options and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation. Note related record drawing information and product data where applicable.

Upon completion of the Record Specifications, the Contractor shall submit two (2) bound and printed copies to the Architect/Engineer; which shall be carefully checked and transmitted to the Owner.

E. Record Shop Drawings and Product Data:

Maintain one copy of each product data submittal and mark-up significant variations in actual work in comparison with submitted information. Include both variations from manufacturer's instructions and recommendations for installation. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned at a later date by direct observation. Note related change orders and mark-up or record drawings and specifications.

F. Record Sample Submittal:

Immediately prior to date(s) of substantial completion, Architect/Engineer (and including Owner's personnel where desired) will meet with Contractor at site and will determine which (if any) of submitted samples maintained by Contractor during progress of the work are to be transmitted to Owner for record purposes. Comply with Architect's/Engineer's instructions for packaging, identification marking and delivery to owner's sample storage space.

G. Miscellaneous Record Submittals:

Refer to other sections of these specifications for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to date(s) of substantial completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference.

H. Operation and Maintenance Data:

See section 01730

I. Warranties and Bonds:

See section 01740

J. Spare Parts and Maintenance Materials:

See section 01750

FINAL CLEANING

A. Special cleaning for specific units of work is specified in sections of Divisions 2 through 16. General cleaning during progress or work is specified in General Conditions and as temporary service in "Temporary Facilities" section of this Division. Provide final cleaning of the work at time indicated, consisting of cleaning each surface or unit of Work to normal "clean" condition expected for a first-class building cleaning and maintenance program. Comply with manufacturer's instructions for cleaning operations. The following are examples of cleaning levels required:

1. Remove labels which are not required as permanent labels.

2. Clean transparent materials including mirrors and window or glass to a polished condition removing substances which are noticeable as vision-obscuring materials. Replace broken glass and damaged transparent materials.

3. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of dust, stains, films and similar noticeable distracting substances. Avoid disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to original reflective condition.

4. Wipe surfaces of mechanical and electrical equipment clean; remove excess lubrication and other substance.

5. Remove debris and surface dust from limited-access spaces including roofs, plenums, shafts, trenches, equipment vaults, manholes and similar spaces.

6. Clean concrete floors in non-occupied spaces broom clean.

7. Vacuum clean carpeted surfaces and similar soft surfaces.

8. Clean plumbing fixtures to a sanitary condition free of stains including those resulting from water exposure.

9. Clean light fixtures and lamps so as to function with full efficiency.

10. Clean project site (yard and grounds) of litter and foreign substances. Sweep paved areas to a broom-clean condition; remove stains, petro-chemical spills and other foreign deposits. Rake grounds which are neither planted nor paved, to a smooth, even-textured surface.

11. Vacuum clean and sanitize all cabinetwork, equipment, etc. for a move-in condition.

B. Removal of Protection:

Remove temporary protection devices and facilities which were installed during course of the Work to protect previously completed Work during remainder of construction period.

C. Compliances:

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

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

CLOSEOUT DOCUMENTS CHECKLIST

All items listed below, with the exception of Item No. 1 and Item No. 2 shall be bound in individual heavy duty 3-ring vinyl covered binders. Mark appropriate identification on front and spine of each binder.

All applicable items shall be submitted in triplicate within fifteen day of Substantial Completion for the project.

1. Application and Certification for Payment (Final). Four copies with original signatures and seals.

2. Final schedule of contract values. Four copies attached to Application and Certification for Payment.

3. Contractor's Affidavit of Payment of Debts (AIA G706).

4. Contractor's Affidavit of Release of Liens from all Contractors, Subcontractors, and Suppliers (AIA G706A).

5. Power of Attorney from Surety to make Final Payment.

6. Consent of Surety to Final Payment (AIA G707).

7. Contractor's Guarantee and Warranties as specified under Division 01740.

8. Fully executed Roof Warranty in the name of the Owner.

9. Special warranties as required by the specifications, in the name of the Owner.

10. Provide a list summarizing the various guarantees and warranties and stating the following with respect to each:

    a. Character of work affected.
    b. Name, address and telephone number of each Subcontractor.
    c. Name, address and telephone number of each local firm designated to provide warranty service for an out-of-town firm. Copy of agreement between the firms.
    d. Period of guarantee and effective date.
    e. Statement of guarantee in the following form.

    "If within any guarantee period, repairs or changes are required in conjunction with the guarantee work, which in the opinion of the Architect or Engineer is rendered necessary as the result of the use of materials, equipment or workmanship, which are defective or inferior, or not in accordance with the terms of the Contract, the Contractor shall, upon written notice

from the Owner, and without expense to the Owner, proceed within twenty four (24) house to place in satisfactory condition in every particular all of such guaranteed work, correct all defects therein; and make good all damages to the structure or site or equipment or contents thereof disturbed in fulfilling any such guarantee work.

11. Verification that the Owner's personnel has been trained in the use of their new equipment. Submit attendance lists and videotape record of all training sessions.

12. Operation and Maintenance Manuals.

13. Equipment Inventory List - A list of the following equipment furnished for the project, to include drawings code designation, location (FISH number) description, manufacturer, full model number, serial number, warranty period and warranty expiration date.

    a. All HVAC equipment.

    b. Any plumbing equipment which carries a serial number (water heaters, compressors, electric water coolers, etc.)

    c. Emergency generator.

    d. Contractor furnished appliances.

14. Notarized Affidavit of all Subcontractor payrolls, bills for materials/equipment and other indebtedness paid and satisfied.

15. As-built drawings. Provide in accordance with other specification sections.

16. Energy management system programming, operation, maintenance, and parts service manuals. Guaranteed parts price list.

17. Date certain schedule for LCS personnel to be trained at Energy Management Supplier's training facility.

18. Punch lists signed off by Owner's Representatives.

Note: A/E shall use the enclosed "Leon County School Board Documents Receipt" form during contract close-out performance.

LEON COUNTY SCHOOL BOARD DOCUMENTS RECEIPT
PROJECT: _____ SUBSTANTIAL COMPLETION DATE: _____

Note:

1. Receipt or Waiver of all of the following documents must be signed by the A/E and by LCS staff person prior to final payment. Fill in last name in receipt blocks. When this form with documents is received by LCS, having been received by the A/E, then A/E reviewed and accepted it. Acceptance must be signed off by a LCS person within 10 days after receipt, or the A/E must be notified in writing that a document is not acceptable. If no correspondence is received from LCS within 10 days, acceptance is automatic.
2. See specifications for specific requirements.

DESCRIPTION	Received				Accepted
	A/E	Date	LCS	Date	(LCS)
AIA G706 (Payment of Debts)					
AIA G706A (Release of Lien)					
Surety Power of Attorney					
Consent of Surety					
All Required Guarantees & Warranties					
List-Various Guarantees/Warranties					
Verification of Training					
Operation & Maintenance Manuals					
Equipment Inventory List					
Certificate-NO Asbestos-materials GC					
Certificate-No Asbestos-materials A/E					
As-Built Drawings					
EMCS Manuals					
EMCS Training Dates					
As-Built Certification to DER					
Punch List Corrections Complete					
Approved Submittals Package					
Control Key and Key Code					
Termite Control					
Fire Alarm Certification					
Stormwater Operating Permit					
Cert. Occupancy & Cert. Final Inspect.					
Fiber & /Copper Test Results					
M/WBE Utilization Report					
HARD COPY PERMIT TO BUILDING OFFICIAL					

Updated September 9, 2005
Revised November 10, 2005 – Asbestos Certificate.

End of Section 01700.

SECTION 01730 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

REQUIREMENTS:

A. Format and content of manuals.

B. Instruction of Owner's personnel.

C. Schedule of submittals.

RELATED REQUIREMENTS:

A. Shop Drawings, Product Data, and Samples.

B. Testing, Adjusting, and Balancing of Systems: Test and balance reports.

C. Section 01700 - Contract Closeout

D. Warranties and Bonds

E. Individual Specification Sections: Specific requirements for operation and maintenance data.

FORMAT:

A. Prepare data in the form of an instructional manual.

B. Binders: Commercial quality, 8-1/2 x 11, three-ring binders with hardback, cleanable, vinyl covers.

C. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; list title of Project; use volumes as needed.

D. Arrange content by systems, process flow, under section numbers and sequence of Table of Contents of this Project Manual.

E. Provide tabbed fly leaf for each separate project and system, with typed description of product and major component parts of equipment.

F. Text: Manufacturer's printed data, or typewritten data.

G. Drawings: Provide with reinforced pocket folders. Bind in with text; fold drawings; insert into pocket folders.

CONTENTS OF EACH VOLUME:

A. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect/Engineer and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

B. For Each Product or System: List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

C. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.

D. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

E. Warranties and Bonds: Bind in copy of each.

MANUAL FOR MATERIALS AND FINISHES:

A. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, color and texture designations. Provide information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

C. Moisture-protection and Weather-exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation; delete inapplicable information.

D. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

E. Warranties and Bonds: Bind in copy of each.

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B. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

C. Moisture-protection and Weather-exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

D. Additional Requirements: As specified in individual Specifications sections.

MANUAL FOR EQUIPMENT AND SYSTEMS:

A. Each Item of Equipment and Each System: Include description of unit or system, and component parts. Give function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number or replaceable parts.

B. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications.

C. Include as-installed color coded wiring diagrams.

D. Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

E. Maintenance Requirements: Include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

F. Provide servicing and lubrication schedule, and list of lubricants required.

G. Include manufacturer's printed operations and maintenance instructions.

H. Include sequence of operation by controls manufacturer.

I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

J. Provide as-installed control diagrams by controls manufacturer.

K. Provide Contractor's coordination drawings, with as-installed color coded piping diagrams.

L. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

M. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

N. Include test and balancing reports as specified.

O. Additional Requirements: As specified individual specifications sections.

P. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

INSTRUCTION OF OWNER PERSONNEL:

A. Before final inspection, instruct Owner's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times.

B. Use operation and maintenance manuals as basis of instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

C. Prepare and insert additional data in Operation and Maintenance Manual when need for such data become apparent during instruction.

SUBMITTALS:

A. Submit one (1) copy of completed volumes in final form 15 days prior to final inspection. Copy will be returned after final inspection, with Architect/Engineer comments. Revise content of documents as required prior to final submittal.

B. Submit three (3) copies of revised volumes of data in final form within ten days after final inspection.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION 01730

SECTION 01740 - WARRANTIES AND BONDS

PART 1 - GENERAL

REQUIREMENTS:

A. Preparation and submittal of warranties and bonds.

B. Schedule of submittals.

RELATED REQUIREMENTS:

A. Section of 01700 - Contract Closeout

B. Individual Specifications Sections: Warranties and bonds required for specific Products or work.

Warranties and Bonds may include, but are not limited to the following:

See Individual Specification Sections

FORM OF SUBMITTALS:

Bind with operation and maintenance manuals specified in Section 01730.

PREPARATION OF SUBMITTALS:

A. Obtain warranties and bonds, executed in triplicate (3) by responsible subcontractors, suppliers, and manufacturers within ten days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

TIME OF SUBMITTALS:

A. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.

B. For items of Work when acceptance is delayed beyond Date of Substantial Completion,

submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

WARRANTY SERVICE

A. The Contractor shall proceed with warranty repair or replacement within 24 hours of being notified that a warranty deficiency exists.

B. In order to insure prompt and effective correction of warranty deficiencies, the Contractor shall, if he or any of his Subcontractors do not maintain fully staffed service organizations within Leon County, designate firms within Leon County authorized to perform warranty work on the Contractor's behalf. The name, addresses, and phone numbers of these designated firms shall be included within the closeout documents, along with affidavits signed by officers of the designated firms stating that they have been retained and will perform required warranty service.

END OF SECTION 01740.

SECTION 01750 - SPARE PARTS AND MAINTENANCE MATERIALS

PART 1 - GENERAL

REQUIREMENTS:

A. Products required.

B. Storage and delivery of products.

RELATED REQUIREMENTS:

A. Materials and Equipment: Storage and protection.

B. Contract Closeout.

C. Individual Specifications Sections: Specific spare parts and materials required.

Spare Parts and Maintenance Materials may include, but are not limited to the following:

See Individual Specification Sections

PRODUCTS REQUIRED:

A. Provide quantity of products, spare parts, maintenance tools, and maintenance materials specified in individual sections to be provided to Owner, in addition to that required for completion of Work.

B. Products: Identical to those installed in the Work. Include quantities in original purchase from supplier or manufacturer to avoid variations in manufacture.

STORAGE AND MAINTENANCE:

A. Store products with products to be installed in the Work, under provisions of Section 01600.

B. Maintain spare products in original containers with labels intact and legible, until delivery to Owner.

DELIVERY:

A. Coordinate with Owner: Deliver and unload spare products to Owner at Project site and obtain receipt prior to final payment.

PART 2 - PRODUCTS:

Not used.

PART 3 - EXECUTION:

Not used.

END OF SECTION 01750.

SECTION 01760 - PROJECT PHOTOGRAPHS

PART 1 - GENERAL

REQUIREMENTS:

A. One half hour minimum site document digital video prior to commencing construction; narrated.

B. Ten minute minimum weekly digital video progression of work; narrated; show work action in progress.

C. Monthly ground level, still photographs; 1800x1200 pixel; (min. 36 per month); notated for locations; shall be delivered to the Architect/Engineer each month.

SUBMITTAL:

A. Submit record video to document site to Architect/Engineer for owner files.

B. Submit weekly video to Architect/Engineer for review.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION 01760.

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TECHNICAL SPECIFICATION - INDEX

DIVISION 2 – SITEWORK

DIVISION 15 – MECHANICAL

DIVISION 16 - ELECTRICAL

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SECTION 02830 - FENCING

PART 1 - GENERAL

DESCRIPTION

Furnish all labor, equipment, materials and services necessary for and reasonably incidental to the proper completion of the chain link fencing as described on the Drawings and herein specified.

PART 2 - PRODUCTS

FABRIC

No. 9 gauge finshed size steel wires, 2" mesh, aluminized with not less than 4.0 ounces aluminum per square foot of surface.

ZINC COATING

All steel parts shall be zinc-coated with not less than 2.0 ounces zinc aluminum alloy per square foot of surface.

END, CORNER OR GATE POSTS

2-7/8" o.d. steel pipe, 5.79 lbs/foot. Post tops shall be weathertight.

LINE POSTS

2-3/8" o.d. steel pipe, 2.70 lbs/foot. Post tops shall be weathertight.

TOP RAIL, BOTTOM RAIL AND BRACES

1-5/8" o.d. steel pipe, 2.27 lbs/foot.

GATE FRAMES

1-7/8" o.d. steel pipe, 2.72 lbs/foot. Provide forked type latch for each gate.

STRETCHER BARS

3/16" X 3/4", full height of fabric.

PART 3 - EXECUTION

INSTALLATION

Fence height shall be four feet unless otherwise indicated on the Drawings.

Posts shall be set in 36" deep, 12" diameter holes filled with 2500 psi concrete crowed to shed water. Posts shall be spaced no more than eight feet on center.

Fabric shall be attached on both sides with stretcher bars and tension bands at 15" o.c. Fabric shall be attached to top and bottom rails with aluminum tie wire at 12" o.c.

END SECTION

SECTION 15010 - MECHANICAL GENERAL PROVISIONS

PART 1 - GENERAL

GENERAL CONDITIONS

The work described hereunder shall be installed subject to the Contractual Conditions for the entire Specifications.

CORRELATION

This Section of the Specifications and its accompanying Drawings are made separate for the convenience of the General Contractor in preparing his bid and in no way relieves the General Contractor of his responsibility to correlate the work under this Section with that of all other trades as regards the items to be furnished by various Subcontractors, the exact location of all equipment and materials and the necessity of planning the work of all trades to avoid interference.

PLANS AND SPECIFICATIONS

Drawings and Specifications are intended to clearly set forth all work, and the detailed description is added to assist in establishing the scope and the location of the several parts of the work. Collectively, they shall govern and control the scope, character, and design of the Work, and any item called for in any one of the documents shall be as though mentioned in all.

Failure to make reference in the Specifications to any items of the work shown on the Drawings, but necessary to the completion of the Work shall not relieve the Contractor of the full responsibility to furnish the materials and perform the work of such items, in a manner comparable to other items of similar nature for which detailed Specifications are included.

PROJECT FAMILIARIZATION

The bidder is expected to visit the site and familiarize himself with conditions at the site before submitting his bid. He shall familiarize himself with the work required throughout the entire project and shall make allowances for contingencies which may occur in the interconnection of the various systems.

ALTERNATES AND ADDENDA

The Contractor shall investigate all Alternates, Addenda and Allowances as they relate to the Work of this Section.

TESTING

The Work shall include complete testing of all equipment and piping at the completion of the Work and making any connection changes or adjustments necessary for the proper functioning of the system and equipment.

WORK INCLUDED

Work covered under this Section consists of furnishing all labor, materials, tools, equipment, transportation, scaffolding, services, supervision, and performing of all operations required to properly complete all mechanical work in accordance with this Division of the Specifications and as indicated on the applicable Drawings, subject to terms and conditions of the Contract.

SUPERVISION OF WORK

The Mechanical Contractor shall have a qualified and experienced superintendent on the job when any related work is in progress.

RELATED WORK SPECIFIED ELSEWHERE

The Contractor is cautioned to note carefully other Sections of the project Specifications with their cross references to other specific standard specifications, standard detail, etc., describing work to be furnished under these Specifications as well as any mechanical work that may be shown on electrical, structural, architectural, or other drawings, in order that he may fully understand the requirements and work to be provided under this Section of the Specifications.

ORDINANCES AND REGULATIONS

All work shall conform with all local and State ordinances or regulations governing the installation of such equipment. If work as laid out, indicated or specified is recognized to be contrary to or conflicting with local ordinances or regulations, the Subcontractor shall report same to the Architect/Engineer before submitting a bid. The Architect/Engineer will then issue instructions as to procedure.

CODES AND STANDARDS

The standards of the following organizations, and individual standards named, shall be followed the same as if they were fully written herein and constitute a part of the Specification requirements except where otherwise specified:

National Fire Protection Associations - Standards
- NFPA 70, National Electric Code
- NFPA 101, Life Safety Code

NFPA 90-A, Installation of Air Conditioning and Ventilating Systems.
FL Building Code
FL Mechanical Code
FL Plumbing Code
Florida Fire Prevention Code
SREF
National Board of Fire Underwriters
SMACNA HVAC Duct Construction Standard
ANSI/ASME B31.1- Power Piping
ANSI/ASME B31.9 - Building Services Piping

The foregoing rules, standards, regulations, specifications, recommendations and requirements shall be followed by the Contractor as minimum requirements. They shall not relieve the Contract from furnishing and installing higher grades of materials and workmanship which are specified herein or indicated on the Drawings.

Any material, equipment or workmanship specified by reference to the number, symbol or title of Specification or detail, or other standard rules, codes, regulations, etc., shall comply with the latest edition amendments and revisions thereto in effect on the date of these Specifications.

The Contractor shall submit proof, if requested by the Engineer or his representative, that the materials, appliances, equipment or devices that he furnishes and installs under this Contract meet the requirements of the Underwriters' Laboratories, Inc., or Factory Mutual, as regards fire and casualty hazards.

PERMITS, INSPECTIONS AND UTILITY FEES

The Contractor shall obtain necessary permits and inspections required for work and pay all charges incidental thereto. Contractor shall coordinate all utility taps and shall pay all associated fees, impact charges, etc. Upon completion of the work the Contractor shall deliver to the Engineer a certificate of inspection and approval from the local inspection department, if required.

MINOR DEVIATIONS

The Contractor shall note that the Mechanical Drawings are intended to indicate only the extent diagrammatically, general character and location of the work included. Work intended, but having minor details obviously omitted or not shown, shall be furnished and installed complete to perform the functions intended.

Arrangements of piping, ductwork, and equipment that differ materially from the obvious intent of the Drawings will not be permitted except where necessary to avoid interferences, and only where specifically approved by the Architect/Engineer. Drawings

shall be furnished showing all changes. Any change resulting in a saving in labor and materials shall be made in accordance with a Contract change order.

BASIC MATERIALS AND METHODS

The materials and methods specified in this article are to be used for work specified throughout this Section of the Specifications.

All materials and workmanship shall be of the highest quality.

Any materials on the job rejected by the Architect/Engineer shall be removed from the premises.

The installation shall be made in a workmanlike manner in accordance with acceptable industry standards except where specific procedures are called for in these Specifications, in which case they shall be followed.

All materials shall be new, free of defects and of the manufacturers latest standard design.

Reference to a particular material or specific equipment by name, make or catalog number is to describe equipment which will meet the requirements of the project and is not intended to restrict bidding.

It is the intent that all of the equipment of a similar type shall be the products of the same (one) manufacturer when practicable, providing unit responsibility for each group.

REVIEW OF MATERIALS

Submittals shall be made in compliance with the General Conditions of the Contract for Construction and the following:

Submittals shall be identified by items numbers as listed in the pertinent section of the specifications and shall be accompanied by a letter of transmittal.

Certificates shall be in triplicate and where required in conjunction with other submittals shall accompany such submittals.

Materials and other items subject to approval shall not be purchased or incorporated in the work before receipt of written approval.

Submittals shall be rendered all at one time for the entire project. Partial submittals will not be accepted or acknowledged. Exception: If a few items have long shop drawing preparation time, then these items will be accepted later to avoid delaying the shop drawing procedure.

SHOP DRAWINGS

Shop Drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are prepared by the Contractor or any subcontractor, manufacturer, supplier or distributor and which illustrates some portion of the Work.

All shop drawings submitted shall bear the stamps of approval of the Contractor as evidence that the drawings have been checked by the Contractor. Any drawings submitted without this stamp of approval will not be considered and will be returned to contractor for proper resubmission. If the shop drawings show variances from the other requirements of the contract because of standard shop practice or other reason, the Contractor shall make specific mention of such variation in his letter of transmittal in order that, if acceptable, suitable action may be taken for proper adjustment. Otherwise, the Contractor will not be relieved of the responsibility for executing the work even though such shop drawings have been approved.

Submit shop drawings as required by the General Conditions to be retained and additional copies as required by the Contractor, all items required under appropriate sections of the Specifications.

All materials are to be submitted in a hard cover, three ring binder. All materials are to be labeled with the pertinent Specification Section and are to be separated with dividers for each section of the Mechanical Specifications.

All materials submitted late or re-submitted shall be 3-ring punched and marked with the appropriate Specification Section Numbers.

PROJECT CLOSEOUT

The Contractor shall remove all temporary work and temporary facilities prior to final pay request.

The Contractor shall clean spaces that were occupied by temporary work and temporary facilities. Remove debris, rubbish and excess materials from the sites. Burning or burying is not permitted on the sites.

Repair damages caused by installation or use of temporary facilities. Restore to original condition.

Restore grass, landscaping, hardscaping to original condition.

GUARANTEES, BONDS AND AFFIDAVITS

Warranties:

The Contractor shall submit to the Owner all manufacturer's warranties on equipment furnished and installed under this Contract.

In addition, to the guarantee of equipment by the manufacturer of each piece specified herein, the Contractor shall also guarantee such equipment and shall be held for a period of one year from final acceptance test to make good any defects of the materials or workmanship occurring during this period, without expense to the Owner.

Warranty Tags:

Install Equipment Warranty Tags: See Specifications Section: Identification

Affidavits:

The Contractor shall provide affidavits as required in the non-technical portion of these Specifications.

OPERATION AND MAINTENANCE DATA

Manuals and Instructions:

The Contractor shall deliver to the Engineer, upon substantial completion of the Work, two copies of descriptive literature related to the equipment installed under this Contract, including parts lists, wiring diagrams, maintenance and operation manuals and warranties customarily supplied by manufacturers for equipment incorporated in this work. The literature shall be neatly bound in a 3-ring binder and delivered to the Engineer prior to final acceptances. Each manual shall include a copy of the Control Diagrams and a complete description of the operation of the control systems.

The Contractor shall give physical demonstration and verbal instructions for proper operation and maintenance of equipment to the Owner or his designated representative. Schedule these demonstrations and instructions at the Owner's convenience.

Provide two (2) hours of tour and demonstration of all equipment installed under this project.

LCS HVAC Unit Information

Complete the HVAC Unit Information form for each new HVAC unit.

AS-BUILT DRAWINGS

As-Built Drawings are required. Maintain a current and legible record set (full size set) on the job. Final record prints will be drafted by the Engineer and signed off by the Contractor. The Contractor is solely responsible for providing accurate asbuilts.

QUALITY ASSURANCE

Products Criteria:

Standard Products: Material and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of the products. Items of equipment shall essentially duplicate equipment that has been in satisfactory use at least two (2) years prior to bid opening. Provide list of users upon request.

Equipment having less than a two-year use record, which in the opinion of the Engineer, provided significant benefits to the Owner such as improved energy efficiency, will be acceptable if it is a product of a manufacturer who has been regularly engaged in the manufacture of that specific type of product which has been used in similar applications for a period of two years. The Engineer reserves the right to require the Contractor to submit evidence to this effect for his approval.

Equipment Service: Products shall be supported by a service organization which maintains an adequate inventory of repair parts and is located, in the opinion of the Engineer, reasonably close to the site.

Manufacturer's Nameplates: Nameplate bearing manufacturer's name or identifiable trademark shall be securely affixed in a conspicuous place on equipment, or name or trademark cast integrally with equipment, stamped or otherwise permanently marked on each item of equipment.

Welding: Weldors shall be qualified and tested (certified) to weld the size pipe for this project. Certification shall be within 24 months commencement of welding operations for this project. Certification shall be by a qualified welding testing firm. Weldors shall carry proof of cerfication on the jobsite.

The types and extent of non-destructive examinations required for pipe welds are shown in Table 136.4 of the Code for Pressure Piping, ANSI/ASME B 31.1.

The engineer of record reserves the right to require destructive testing of welds. The contractor shall bear all costs of welding tests that fail and replacing failed welds.

Manufacturer's Recommendations: Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Engineer prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

FIRESTOPPING

Provide for firestopping of all mechanical systems. UL listed methods conforming to the situations present shall be utilized. Submit shop drawings of intended methods, including installation instructions and proof of UL Listing.

WALL, FLOOR AND CEILING PLATES

Material and Type: Chrome plated brass or chrome plated steel. Use plates that fit tight around pipes, cover openings around pipes, and cover the entire pipe sleeve projection.

Thickness: Not less than 3/32 inch for floor plates. For wall and ceiling plates, not less than 0.025 for up to 3 inch pipe, 0.035 for larger pipe.

Locations: Use where pipe penetrates floors, walls and ceilings in exposed locations, except mechanical rooms or chases. Use also where insulation ends on exposed water supply pipe drop from overhead. Provide a watertight joint in spaces where brass or steel pipe sleeves are specified.

INSTALLATION

Coordinate location of piping, sleeves, inserts, hangers, ductwork and equipment. Locate piping, sleeves, inserts, hangers, ductwork and equipment clear of windows, doors, openings, light outlets, and other services and utilities. Follow manufacturer's published recommendations for installation methods not otherwise specified.

Protection and Cleaning:

Equipment and materials shall be carefully handled, properly stored, and adequately protected to prevent damage before and during installation, in accordance with the manufacturer's recommendations and as approved by the Engineer. Damaged or defective items, in the opinion of the Engineer, shall be replaced.

Protect all finished parts of equipment, such as shafts and bearings, where accessible, from rust prior to operation by means of protective grease coating and wrapping. Close pipe openings with caps or plugs during installation. Tightly cover and protect fixtures and equipment against dirt, water, chemical or

mechanical injury. At completion of all work thoroughly clean fixtures, exposed materials and equipment.

Concrete and Grout: Use concrete and shrink-compensating grout, 3000 psi minimum.

Install gauges, thermometers, valves and other devices with due regard for ease in reading or operating and maintaining said devices. Locate and position thermometers and gauges to be easily read by operator or staff standing on floor or walkway provided. Servicing shall not require dismantling adjacent equipment or pipe work.

PAINTING

Paint all bare steel pipe, supports, hangers, fabricated parts, etc. with two coats of enamel paint. Prepare surfaces in accordance with the manufacturer's recommendations. Coordinate colors with existing like components or per the Owner.

Paint all cut or heat affected galvanized steel components with two coats of cold galvanizing spraypaint, ZRC Cold Galvanizing compound or equal. Prepare surfaces per the manufacturer's recommendations.

PIPE AND EQUIPMENT SUPPORTS

Generally, support in accordance with industry standards and as described in Section 15150.

Use of chain, wire or strap hangers, wood for blocking, stays and bracing, nor hangers suspended from piping above will not be permitted.

Use hanger rods that are straight and vertical. Turnbuckles for vertical adjustments may be omitted where limited space prevents use. Provide a minimum of 1" clearance between pipe or pipe covering and adjacent work.

LUBRICATION

Field check and lubricate equipment requiring lubrication prior to initial operation.

END OF SECTION

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SECTION 15150 – SUPPORTS AND ANCHORS

PART 1 - GENERAL

DESCRIPTION OF WORK

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

This section is a Division 15 Basic Materials and Methods section, and is part of each Division 15 section making reference to or requiring supports, anchors, and seals specified herein.

Extent of supports, anchors and seals required by this section is indicated on drawings and/or specified in other Division 15 sections.

Code Compliance: Comply with applicable codes pertaining to product materials and installation of supports, anchors and seals.

MSS Standard Compliance:

Provide pipe hangers and supports of which materials, design and manufacture comply with ANSI/MSS SP-58.

Select and apply pipe hangers and support, complying with MSS SP-69.

Fabricate and install pipe hangers and supports, complying with MSS SP-89.

Terminology used in this section is defined in MSS SP-90.

UL Compliance: Provide products which are Underwriters Laboratories listed.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS

Subject to compliance with requirements, provide supports and hangers by Grinnel, Michigan Hanger Company, B-Line Systems, or approved equal.

HORIZONTAL PIPING HANGERS AND SUPPORTS

Except as otherwise indicated, provide factory fabricated horizontal piping hangers and supports complying with ANSI/MSS SP-58, of one of the following MSS types listed, selected by Installer to suit horizontal piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Use only one type by one manufacturer for each piping service. Select size of hangers and support to exactly fit pipe size for bare piping, and to exactly fit around piping insulation with saddle or shield for insulating piping. Provide copper plated hangers and support for copper piping systems. Provide zinc electroplated or hot dipped galvanized finish.

Adjustable Steel Clevises: MSS Type 1.

Steel Double Bolt Pipe Clamps: MSS Type 3.

Adjustable Steel Band Hangers: MSS Type 7.

Steel Pipe Clamps: MSS Type 4.

Adjustable Pipe Roller Support: MSS Type 41.

Pipe Stanchion Saddles: MSS Type 37, including steel pipe base support and cast iron floor flange.

Vertical Piping Clamps: Except as otherwise indicated, provide factory fabricated vertical piping clamps complying with ANSI/MSS SP-58, of one of the following MSS types listed, selected by Installer to suit vertical piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Select size of vertical piping clamps to exactly fit pipe size of bare pipe. Provide copper plated clamps for copper ping systems.

Two-Bolt Riser Clamps: MSS Type 8.

Four-Bolt Riser Clamps: MSS Type 42.

HANGER-ROD ATTACHMENTS

Except as otherwise indicated, provide factory fabricated hanger-rod attachments complying with ANDI/MSS SP-58, of one of the following MSS types listed, selected by Installer to suit horizontal piping hangers and building attachments, in accordance with MSS-69 and manufacturer's published product information. Use only one type by one manufacturer for each piping service. Select size of hanger-rod attachments to suit hanger rods. Provider copper plated hanger-rod attachments for copper piping systems.

Steel Turnbuckles: MSS Type 13.

Malleable Iron Sockets: MSS Type 16.

BUILDING ATTACHMENTS

Except as otherwise indicated, provide factory fabricated building attachments complying with ANSI/MSS SP-58, of one of the following MSS types listed, selected by Installer to suit building substrate conditions, in accordance with MSS SP-69 and manufacturer's published product information. Select size of building attachments to suit hanger rods.

Center Beam Clamps: MSS Type 21.

C-Clamps: MSS Type 23.

Malleable Beam Clamps: MSS Type 30.

Side Beam Brackets: MSS Type 34.

Concrete Inserts: MSS Type 18.

SADDLES AND SHIELDS

Except as otherwise indicated, provide saddles or shields under piping hangers

and supports, factory fabricated, for all insulated piping. Size saddles and shields for exact fit to mate with pipe insulation.

Protection Shields: MSS Type 40; of length recommended by manufacturer to prevent crushing of insulation.

Protection Saddles: MSS Type 39; use with rollers, fill interior voids with segments of insulation adjoining insulation.

MISCELLANEOUS MATERIALS

Metal Framing: Provide products complying with NEMA STD ML 1.

Steel Plates, Shapes and Bars: Provide products complying with ANSI/ASTM A 36.

Cement Grout: Portland cement (ANSI/ASTM C 150, Type I or Type III) and clean uniformly graded, natural sand (ANSI/ATM C 404, Size No. 2). Mix at a ratio of 1.0 part cement to 3.0 parts sand, by volume, with minimum amount of water required for placement and hydration.

Heavy Duty Steel Trapezes: Fabricate from steel shapes or continuous channel struts selected for loads required; weld steel in accordance wit AWS standards.

PART 3 - EXECUTION

PREPARATION

Proceed with installation of hangers, supports and anchors only after required building structural work has been completed in areas where the work is to be installed. Correct inadequacies including (but not limited to) proper placement of inserts, anchors and other building structural attachments.

Prior to installation of hangers, supports, anchors and associated work, Installer shall meet at project site with Contractor, installer of each component of associated work, and installers of other work requiring coordination with work of this section for purpose of reviewing material selection and procedures to followed in performing the work in compliance with requirements specified.

INSTALLATION OF BUILDING ATTACHMENTS

Install building attachments as required locations within concrete or structural steel for proper piping support. Space attachments within maximum piping span length indicated in MSS SP-69. Install additional building attachments where support is required for additional concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is places; fasten insert securely to forms. Where concrete with compressive strength less than 2500 psi is indicated, install reinforcing bars through openings at top of inserts.

In areas of work requiring attachments to existing concrete, use self-drilling rod inserts, Phillips Drill Co., “Red-Head” or equal.

INSTALLATION OF HANGERS AND SUPPORTS

General: Install hangers, supports, clamps and attachments to support piping properly from building structure; comply with MSS SP-69. Arrange for grouping of parallel runs of horizontal piping to be supported together on trapeze type hangers where possible. Install supports with maximum spacings complying with MSS SP-69 or as listed herein, whichever is most limiting. Where piping of various sizes is to be supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe. Do no use wire of perforated metal to support piping, and do not support piping from other piping.

Horizontal steel pipe and copper tube 1-½" diameter and smaller: support on 6-foot centers.

Horizontal steel pipe and copper tube over 1-½" diameter: support on 10-foot centers.

Locate pipe hangers/supports within 1' of elbow when pipe turns up or down, e.g. for suppy/return piping to AHU coils/headers.

Support piping to not bear on coil headers or on flexible piping connections.

Vertical steel pipe and copper: support at each floor.

Plastic pipe: support in accordance with manufacturer's recommendations.

Fire protection piping: support in accordance with NFPA 13.

Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers and other accessories.

Paint all black steel hangers with black enamel. Galvanized steel and copper clad hanger do not require paint.

Prevent electrolysis in support of copper tubing by use of hangers and supports which are copper plated, or by other recognized industry methods.

Provision for Movement:

Install hangers and supports to allow controlled movement of piping systems and to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.

Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.

Pipe Slopes: Install hangers and supports to provide indicated pipe slopes, and so that maximum pipe deflections allowed by ANSI B31 are

not exceeded.

Insulated Piping: Comply with the following installation requirements.

Shields: Where low compressive strength insulation or vapor barriers are indicated, install noncompressible insert and use a coated protective insulation shield.

Clamps: Attach clamps, including spacers (if any) to piping projecting through insulation; do not exceed pipe stresses allowed by ANSI B31.

Support fire protection piping independently of other piping.

INSTALLATION OF ANCHORS:

Install anchors at proper locations to prevent stresses from exceeding those permitted by ANSI B31, and to prevent transfer of loading and stresses to connected equipment.

Fabricate and install anchors by welding steel shapes, plates and bars to piping and to structure. Comply with ANSI B31 and with AWS standards.

Anchor Spacings: Where not otherwise indicated, install anchors at ends of principal pipe runs, at intermediate points in pipe runs between expansion loops and elbows. Make provisions for present of anchors as required to accommodate both expansion and contraction of piping.

Where expansion compensators are indicated, install anchors in accordance with expansion unit manufacturer's written instructions to limit movement of piping and forces to maximums recommended by manufacturer for each unit.

EQUIPMENT BASES

Where specified, provide concrete housekeeping bases for all floor-mounted equipment furnished as part of the work of Division 15. Size bases to extend minimum of 4" beyond equipment base in any direction; and 4" above finished floor elevation unless otherwise specified. Construct of reinforced concrete, roughen floor slab beneath base for bond, and provide steel rod anchors between floor and base. Locate anchor bolts using equipment manufacturer's templates. Chamfer top edge or corners ¾" on all sides.

Provide structural steel stands to support equipment not floor mounted or hung from structure. Construct of structural steel members or steel pipe fittings. Provide factory fabricated tank saddles for tanks mounted on steel stands. Prime and paint with black enamel.

END OF SECTION

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SECTION 15190 - MECHANICAL IDENTIFICATION

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of contract, including General and Supplementary Conditions and Division-15 Specification sections, apply to work of this section.

DESCRIPTION OF WORK:

Provide identification of the following:

Mechanical Equipment
Mechanical Controls
Mechanical Piping Mechanical Valves

Tag all valves old and new throughtout the plant (chilled water, hot water & make-up water). The Engineer will provide a list valves to be tagged.

Extent of mechanical identification work required by this section is indicated on drawings and/or specified in other Division 15 sections.

Types of identification devices specified in this section include the following:

Laminated Self adhesive Identification Materials.
Self-Adhering Pipe Identification Materials

QUALITY ASSURANCE:

Manufacturer's Qualifications: Firms regularly engaged in manufacturer of identification devices of types and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

Codes and Standards:

ANSI Standards: Comply with ANSI A13.1 for lettering size, colors, and viewing angles of identification devices.

SUBMITTALS

Product Data: Submit six (6) copies of manufacturer's technical product data and installation instructions for each identification material and device required.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURES:

Manufacturer: Subject to compliance with requirements, provide mechanical identification materials of one of the following:

Allen Systems, Inc.
Brady (W. H.) Co.; Signmark Div.
Industrial Safety Supply Co., Inc.
Seton Name Plate Corp.

MECHANICAL IDENTIFICATION MATERIALS:

General: Provide manufacturer's standard products of categories and types required for each application. Where more than one type is specified for application, selection is Installer's option, but provide single selection for each product category. Labels and lettering shall be neat and machine made.

EQUIPMENT IDENTIFICATION MATERIALS:

Plastic or phenolic self-adhesive labels with 3/8" high stenciled letters. Lable shall be black color with white stenciling.

Provide engraved 19 gauge brass valve tags (1-1/2" dia) for each valve and attach with solid brass bead chain. Stamp/engrave piping abbreviations in ¼" high letters and sequenced valve numbers ½" high with a 5/32" hole for fastening. Fill tag engraving with black enamel.

PAINTED IDENTIFICATION MATERIALS:

Stencils: Standard fiberboard stencils, prepared for required applications with letter sizes generally complying with recommendation of ANSI A13.1

Stencil Paint: Standard exterior type stenciling enamel; black, except as otherwise indicated; either brushing grade or pressurized spray-can form and grade.

Identification Paint: Standard identification enamel to match existing systems elsewhere in the building.

PLASTIC PIPE MARKERS:

Snap-On Type: Provide manufacturer's standard pre-printed, semi-rigid snap-on, color-coded pipe markers, complying with ANSI A13.1 and matching existing.

Pressure-Sensitive Type: Provide manufacturer's standard pre-printed, permanent adhesive, color-coded, pressure-sensitive vinyl pipe markers, complying with ANSI A13.1 and matching existing.

Small Pipes: For external diameters less than 6" (including insulation if any), provide full-band pipe markers, extending 360 degrees around pipe at each location.

Large Pipes: For external diameters 6" and larger (including insulation if any), provide either full-band or strip-type pipe markers, but not narrower than 3 times letter height.

Lettering: Comply with piping system nomenclature to match existing systems else where in the building.

Arrows: Apply printed pipe markers with arrows indicating direction of flow.

PART 3 - EXECUTION

EQUIPMENT IDENTIFICATION:

General: Coordinate names, abbreviations with the schedules on the plans.

Install equipment labels on all new and affected panels, and equipment. Place labels in conspicuous location. Ensure label does not interfere with access.

Valve Schedule Frame: For each valve schedule page provide display/frame with screw holes for mounting on walls. Provide wood or metal frame with SSB grade sheet glass.

Install valve tags to wheel/handle with bead chain. Verify valve service per the plans and schedule.

PIPING SYSTEM IDENTIFICATION:

General: Coordinate names, abbreviations, pipe colors and other designations used in mechanical identification work, with existing corresponding designations with plans and existing equipment. Consult with the engineer regarding conflicts with existing equipment names.

Install pipe markers of one of the following types on each system indicated to receive identification, and include arrows to show normal direction of flow:

Plastic pipe markers, with application system as indicated under "Materials" in this section.

Stenciled marker, black or white for best contrast.

Locate pipe markers as follows wherever piping is exposed to view in occupied spaces, machine room, accessible maintenance spaces and exterior non-concealed locations.

Near each valve and control device.

Near each branch, excluding short take-offs for fixtures and terminal units; mark each pipe at branch, where there could be question of flow pattern.

Near locations where pipes pass through walls or floors/ceiling, or enter non-accessible enclosures.

At access doors, manholes and similar access points which permit view of concealed piping.

Near major equipment items and other points of origination and termination.

Spaced intermediately at maximum spacing of 25' along each piping run, except reduce spacing to 15' in congested areas of piping and equipment.

On piping above removable acoustical ceilings, except omit intermediately spaced markers.

END OF SECTION

SECTION 15250 - MECHANICAL INSULATION

PART 1 - GENERAL

GENERAL CONDITIONS

The work described hereunder shall be installed in accordance with the "Mechanical General Conditions," Section 15010.

DESCRIPTION OF WORK:

Extent of the mechanical insulation required by this section is indicated on the Drawings and schedules , and by the requirements of this section.

Types of mechanical insulation specified in this section include the following:

Piping System Insulation:
- Cellular glass
- Closed-cell elastomeric

QUALITY ASSURANCE:

Manufacturer's Qualifications: Firms regularly engaged in the manufacture of mechanical insulation products, of types required, whose products have been in satisfactory use in similar service for not less than three (3) years.

Installer's Qualifications: Installer shall be an insulation specialty sub-contractor. A professional insulator with adequate experience and ability shall install all insulation. Firm with at least 5 years successful installation experience on projects with mechanical insulations similar to that required for this project.

Flame/Smoke Ratings: Provide composite mechanical insulation (insulation, jackets, coverings, sealers, mastics and adhesives) having flame spread index of 25 or less, and smoke developed index of 50 or less, as tested by ASTM E 84 (NFPA 255) methods.

Comply with the manufacturer’s recommendations for installation of insulation materials.

SUBMITTALS

Submit to the Architect/Engineer for approval six (6) copies of brochures, technical data and/or shop drawings of the following, and as many additional copies as required for Contractor use:

Each type of insulation material and accessory

DELIVERY, STORAGE, AND HANDLING:

Deliver insulation, coverings, cements, adhesives and coatings to the site in containers with manufacturer's stamp or label, affixed and showing fire hazard indexes of products.

Protect insulation against dirt, water, and chemical and mechanical damage. Do not install damaged or wet insulation; remove from project site.

PART 2 - PRODUCTS

PIPING INSULATION MATERIALS:

Cellular Glass Piping Insulation: ASTM C 552, 8 pcf density, k=0.38, rated to 900 degrees F operating temperature. Pittsburgh Corning Foamglass or an approved equivalent.

Cellular glass bedding mastic: Benjamin Foster 30-45

Exterior Insulation Jacket: Aluminum jacketing 0.016" thickness with bands and seal of same product. Childers Products or equal.

Closed Cell Elastomeric Plastic Pipe Insulation: ASTM C 534, k=0.27, rated to 200 degrees F operating temperature, maximum permeability = 0.20 perm-in. Armaflex or an approved equivalent.

Exterior Insulation Jacket: Aluminum jacketing 0.016" thickness with bands and seal of same product. Childers Products or equal.

PART 3 - EXECUTION

INSULATION SYSTEMS:

Chilled Water Piping: Insulate with 2" thick cellular glass pipe insulation with mastic and glass fabric finish. Exposed piping shall be protected with aluminum jacketing.

Equipment, valves, etc: Where access is required for servicing or adjusting equipment, insulated in layers of 3/4" closed cell elastomeric insulation to match adjacent insulation. Provide 1.5" thickness where chilled water equipment is subject to ambient conditions.

GENERAL INSTALLATION REQUIREMENTS:

Examine areas and conditions under which mechanical insulation is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

Surfaces shall be clean and dry before attempting to apply insulation. A professional insulator with adequate experience and ability shall install insulation.

Install insulation products in accordance with manufacturer's written instructions, and in accordance with recognized industry practices to ensure that insulation serves its intended purpose. Seal all joints, seams, etc. air and water tight.

Exposed/exterior piping & piping in mechanical rooms, shall be finished with an aluminum jacket.

INSTALLATION OF PIPING INSULATION:

Insulation is not to be installed until the piping systems have been checked and found free of all leaks, and piping is dry, and free of debris.

Provide hanger or pipe support shields of 18 gauge galvanized steel over or embedded in the insulation. Shield shall extend halfway up the pipe insulation cover and at least 6" on each side of the hanger.

Securely fasten shield with straps at each end. Insulate anchors adequately to prevent moisture condensation problems.

Install insulation materials with smooth and even surfaces. Insulate each continuous run of piping with full-length units of insulation, with single cut piece to complete run. Do not use pieces or scraps abutting each other.

Clean and dry pipe surfaces prior to insulating. Butt insulation joints firmly together to ensure complete and tight fit over surfaces to be covered.

Maintain integrity of vapor-barrier jackets, and protect to prevent puncture or other damage. Gaps and openings in chilled water insulation vapor barrier will not be tolerated.

Cover valves, fittings and similar items in each piping system with equivalent thickness and composition of insulation applied to adjoining pipe. Optional: install factory molded, precut or job fabricated units.

Extend piping insulation without interruption through walls, floors and similar piping penetrations, except where otherwise indicated.

INSTALLATION OF CELLULAR GLASS PIPE INSULATION:

Apply bedding mastic to the entire pipe surface, inside of insulation and all joints of insulation. Stagger joints and butt insulation firmly together.

Insulation sections shall be secured in place with 16 gauge copper wires or plastic ties or fiberglass reinforced tape spaced approximately 4' on center.

Apply vapor barrier jacket in accordance with the manufacturer's instructions. Insure integrity of the vapor barrier with properly apply butt strips. Repair all punctures, penetrations, and holes with tape approved by the manufacturer.

INSTALLATION OF CELLULAR GLASS PIPE INSULATION FITTINGS:

Apply a heavy coat of vapor barrier finish to the exterior surface of the insulation. Embed a layer of fabric membrane in the vapor barrier finish, overlapping seams at least 2".

Apply a final coat of vapor barrier finish at least 1/8" thick and finish smooth.

Vapor barrier shall be maintained complete and continuous.

PROTECTION AND REPLACEMENT:

Replace damaged insulation which cannot be repaired satisfactorily, including units with vapor barrier damage and moisture saturated units.

Protection: Insulation installer shall advise Contractor of required protection for insulation work during remainder of construction period, to avoid damage and deterioration.

END OF SECTION

SECTION 15370 - VARIABLE FREQUENCY DRIVES

PART 1 - GENERAL

SCOPE OF WORK

Furnish all labor, materials equipment and incidentals required and install variable frequency drives as shown on the Drawings and as specified here.

These specifications are intended to give a general description of what is required but do not cover all details that will vary in accordance with the requirements of the equipment furnished. They are, however, intended to cover the furnishing, the shop testing, the delivery and complete installation and field testing of all materials equipment and appurtenances for the variable frequency drives specified here.

DESCRIPTION OF SYSTEM

The variable frequency drives specified here will become part of a complete mechanical control system as specified in Division 15. Variable Speed Drives shall be furnished and installed as part of the Motor Control System Center. Complete coordination with Section 16920 is required.

The variable frequency drives shall operate standard induction motors. Remote or automatic control of the variable frequency drive shall be as specified elsewhere. The drives furnished herein shall be totally compatible with the motors to be controlled and the controls supplied.

REFERENCES

Comply with the latest applicable standards: UL508, National Electric Code, NFPA 70, and IEEE.

QUALIFICATIONS

Variable speed drives shall be of sufficient size for the duty to be performed and shall not exceed their continuous rated capacity when the driven equipment is operating as specified.

All equipment furnished under these Specifications shall be new and unused and shall be the standard catalog product of the manufacturer.

The drives covered by these specifications are intended to be equipment of proven ability as manufactured by reputable manufacturers having 5 years experience in the production of similar units. The equipment furnished shall be designed,

constructed and installed in accordance with the best practice and methods, and shall operate satisfactorily when installed.

For the equipment specified herein, the manufacturer shall be ISO 9001 certified.

The variable frequency drive manufacturer shall maintain and staff engineering service and repair shops throughout the United States with personnel trained to do start-up service, emergency service calls, repair work, service contracts and training of customer personnel.

SUBMITTALS

Copies of all materials required to establish compliance with the Specifications shall be submitted in five (5) copies. Submittals shall include at least the following:

1. Shop Drawings showing all important details of construction, dimensions and anchor bolt locations. Submit in conjunction with 16920 MOTOR CONTROL CENTER.

2. Descriptive literature, bulletins, and catalog product sheets of the equipment.

3. Data on the characteristics and performance of the variable frequency drives. Data shall include certification that the variable frequency drives are warranted for use with standard induction motor and the equipment specified in Division 15 and is to be compatible with the instrumentation and control devices installed.

4. Complete Drawings shall be furnished for approval and shall consist of power and control connection diagrams, elementary or control schematics, including coordination with other electrical control devices operating in conjunction with the Variable Frequency Drive, and suitable outline drawings with sufficient details for locating conduit locations and field wiring.

OPERATING INSTRUCTIONS

Three copies of the operating and maintenance manuals shall be furnished. The manuals shall be prepared specifically for this installation and shall include all required cuts, drawings, equipment lists, descriptions, etc. that are required to instruct operating and maintenance personnel unfamiliar with such equipment.

A factory representative who has complete knowledge of proper operation and maintenance shall be provided for one (1) day to instruct representatives of the Owner on proper operation and maintenance. This shall be done in conjunction and in cooperation with the O&M instructions to be provided for the pumps, motors, and instrumentation.

TOOLS AND SPARE PARTS

One (1) set of all special tools required for normal operation and maintenance shall be provided.

The manufacturer shall provide one spare for each type of plug-in type PC card. These spares will be coded or otherwise keyed to its original counterpart. In addition to the cards, the manufacturer shall provide two spares per drive of all Owner-replaceable items such as fuses, pilot lamps, etc.

PRODUCT HANDLING

All parts shall be properly protected so that no damage or deterioration will occur from the time of shipment until installation is completed and the units and equipment are ready for operation.

Factory assembled parts and components shall not be dismantled for shipment or installation unless explicitly stated in manufacturer's installation instructions.

WARRANTY AND SERVICE AGREEMENT

All equipment supplied under this section shall be covered by a warranty and service agreement. This warranty and service agreement shall be for three (3) years from the date of Owner acceptance.

PART 2 - PRODUCTS

GENERAL

The Contractor shall be responsible for the installation and start up of the equipment covered by this specification.

CONSTRUCTION

Each Variable Frequency Drive shall consist of a 480 volt, three phase rectifier and variable frequency inverter with features, functions and options as specified.

The Variable Frequency Drives shall be rated for the HP, duty, full load current and RPM of the motor. The variable frequency drives shall be designed to provide continuous speed adjustment of three phase motors. The variable frequency output voltage shall provide constant volts-per-Hertz excitation to the motor terminals up to 66 hertz.

Controllers shall be rated for an ambient temperature of 0 degrees Celsius to 40 degrees Celsius, an altitude of up to 3,000 feet above sea level and humidity of 0 to 95% non-condensing.

The following standard basic control features shall be provided on the inverter:

1. Start, Stop, Power On indicating lights and speed control potentiometer. Terminations for remote mounted operator control devices shall be furnished.
2. Unidirectional operation, coast to rest upon stop.
3. Variable linear independent timed acceleration.
4. Variable torque performance from 4 to 60 Hertz.
5. Dual speed stepover, to prevent operation at two discrete speeds, adjustable.
6. The installation shall meet IEEE 519 Standards for five per cent distortion.
7. Frequency stability of 0.5% for 24 hours with voltage regulation of +-2% of maximum rated output voltage.
8. 115V AC isolated control power supply for operator devices.
9. Phase insensitive to input power.
10. Automatic restart upon return of power following a utility outage.
11. A HAND-OFF-REMOTE switch (H-O-R) shall be provided and interface with the control sequence specified.
12. Each VFD shall have a non-resettable 0 to 99999.9 hour elapsed run time meter.
13. Each VFD shall have an optically isolated 4-20 mA input for remotely setting motor speed.
14. Each VFD shall have an optically isolated 4-20 mA output signal proportional to the motor speed. Accuracy of the signal shall be verified by comparing the signal to actual motor speed as measured in the field and set to match if required.

The following protective features shall be provided on the drive:
1. Input phase loss and phase reversal protection.
2. Electronic overcurrent trip for instantaneous overload protection.
3. Undervoltage protection of output.
4. Overfrequency protection.
5. Overtemperature protection.
6. Integral transient protection from input AC line transients meeting ANSI/IEEE Standard C62.41.
7. Electrical isolation between the power and logic circuits, as well as between the 115V AC control power and the static digital sequencing.
8. Drive shall be capable of withstanding output terminal line short or open circuits without component damage.
9. Units shall have an alpha-numeric or light emitting diodes for diagnostic display of overfrequency, instantaneous overcurrent, DC overvoltage, AC undervoltage/loss of phase, emergency stop, overload, overtemperature, inverter pole trip and standby modes; unit mounted.

10. A protective coating (moisture, dirt, mold) shall be applied to both sides of all printed circuit boards.
11. All potentiometers, including pots on printed circuit boards, shall be sealed.

The following standard independent adjustments shall be provided on the inverter:
1. Minimum speed (as required).
2. Maximum speed (as required).
3. Acceleration time 2 to 60 seconds (minimum).
4. Deceleration time 2 to 60 seconds (minimum).
5. Critical frequency avoidance.
6. Volts per Hertz profile.

The following shall be furnished with the controller:
1. Run indicating relay contacts (closes when VFD is supplying power to the motor) to be wired to Distributed Control Unit.
2. Delayed motor failure indicating relay contact (opens on failure) to be wired to Distributed control Unit.
3. Door mounted output load ammeter, voltmeter, and speed output indicating meters.
4. Built-in self-diagnostics.

BYPASS

Provide a manual or automatic (selectable by keypad input) bypass controller, microprocessor based. Controller shall consist of a a built-in motor starter and a three position DRIVE/OFF/BYPASS/ switch controlling two contactors. In the DRIVE position, the motor is operated at an adjustable speed from the drive. In the OFF position, the motor and drive are disconnected. In the BYPASS position, the motor is operated at full speed from the AC power line and power is disconnected from the drive so that service can be performed. Provide a normally closed dry contact interlocked with the drive safety trip circuitry to stop the motor whether in drive or bypass mode in case of an external safety fault. Start/Stop control shall shall function in both DRIVE and BYPASS MODE.

PERFORMANCE

Drives shall have an efficiency at full load and speed that exceeds 95%. The efficiency shall exceed 90% at 50% speed and load.

Drives shall maintain the line side displacement power factor at not less than 0.95, regardless of motor speed and load.

Drives shall be capable of operating any NEMA design B squirrel cage induction motor, regardless of manufacturer, with a horsepower and current rating within the capacity of the drive.

Drives shall be capable of starting into a spinning motor without any adverse affect on the motor and without exceeding normal operating parameters of the drive.

Drives shall meet or exceed IEEE 519 for reflected harmonic distortion.

APPROVED MANUFACTURERS

Furnish units by the motor control center manufacturer, or suitable units approved for service and factory installed by motor control center manufacturer.

PART 3 - EXECUTION

INSTALLATION

Installation shall be in strict accordance with the manufacturer's instructions and recommendations in the location shown on the Drawings. Field wiring shall be in accordance with the manufacturer's recommendations.

TESTING

Tests and checks: Variable frequency drives shall be tested with a motor load of full horsepower rating prior to shipment.

All printed circuit boards shall be functionally tested prior to unit installation.

After all operational tests have been performed, each drive shall undergo a burn-in test. The drive shall be burned in at 100% inductive or motor load without an unscheduled shutdown.

A copy of all tests and checks performed in the field, complete with meter readings and recordings, where applicable, shall be submitted to the Owner.

END OF SECTION

SECTION 15510 - HYDRONIC PIPING & SPECIALTIES

PART 1 - GENERAL

GENERAL CONDITIONS

The work described hereunder shall be installed in accordance with the "Mechanical General Conditions," Section 15010.

DESCRIPTION OF THE WORK

The extent of the work is indicated on the Drawings. In general, the work consists of, but is not limited to, the following:

Chilled water systems

Valves

Instrumentation

Hydronic specialties

QUALITY ASSURANCE AND CODES/STANDARDS:

Construct and install piping for highest pressures and termperature in respective systems in accordance with the latest revision of the ASME Code for Pressure Piping, ANSI/ASME B31.1 and Buidling Services Piping, ANSI/ASME B31.9.

Qualifications for Welding Processes and Operators: ASME "Boiler and Pressure Vessel Code", Section IX, "Welding and Brazing Qualification."

Regulatory Requirements:

ASME Compliance: fabricate and stamp air separators and compression tanks to comply with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1.

Quality Control Submittals:

Welders' certificates certifying that welders comply meet the quality requirements specified herein.

Certification of compliance with ASTM and ANSI manufacturing requirements for pipe, fittings, and specialties.

Submit reports specified in Part 3 of this Section.

SUBMITTALS:

Product Data: Provide data from manufacturer's, for each hydronic specialty and special duty valve specified. Include rated capacities of selected models, weights (shipping, installed, and operating), furnished specialties and accessories, and installation instructions.

Submit manufacturer's installation instructions.

Submit to the Architect/Engineer for approval six (6) copies of brochures, technical data and/or shop drawings and as many additional copies as required for Contractor use.

Submit copies of the Weldors' qualifications, certificates, and driver's licenses.

MAINTENANCE DATA:

Maintenance Data: for hydronic specialties and special duty valves, for inclusion in operating and maintenance manual.

PART 2 - PRODUCTS

PIPE AND TUBING MATERIALS:

Steel Pipe: ASTM A 53, Schedule 40, seamless, black steel pipe, beveled ends.

FITTINGS:

Steel Fittings: ASTM A 234, seamless or welded, for welded joints.

Cast-Iron Threaded Flanges: ANSI B16.1, Class 125, raised ground face, bolt holes spot faced.

Weld Neck Steel Flanges and Flanged Fittings: ANSI B16.5.

Gasket Material: thickness, material, and type suitable for fluid to be handled, and design temperatures and pressures.

BUTTERFLY VALVES:

Comply with MSS SP-67, Butterfly Valves. Provide butterfly valves designed for tight shut-off. Provide gear operators on all butterfly valves 6" and larger. Provide lever operators for valves under 6 inches.

Wafer type valves are prohibited.

Types of Butterfly (BF) Valves: Lug Type 3" and Larger (BF1): 200 CWP, cast iron body, cadmium plated ductile iron disc, Type 410 stainless steel stem, EPT seat. Stockham LG-712. Nibco LD 2110-3. Nibco WD 2110-5. Crane 44-FXB-TL. Milwaukee ML123B-8416.

Lug Type 3" and Larger (BF2): 150/200 CWP, cast iron body, cadmium plated ductile iron disc, Type 410 stainless steel stem, EPT seat. Stockham LG-722 and LG-721. Nibco LD 2110-5. Crane 44-FXB-G. Milwaukee ML 123B-8115.

Lug Type 4" and Larger (BF3): 175 WWP, cast iron body, nickel-plated ductile or aluminum bronze disc, Type 410 stainless steel stem, EPT seat, UL listed. Stockham LG-72U. Nibco LD 3510-8.

Grooved Type 4" and Larger (BF4): 175 WWP, cast iron body, nickel plated ductile iron or aluminum bronze disc, Type 410 stainless steel stem, EPT seat, UL listed. Stockham LG-82U. Nibco GD 1765-2.

BALL VALVES:

General: Select valve size equal to or greater than connecting pipe area, include seat ring designed to hold sealing material.

Construction: Ball valves shall be rated for 150 psi saturated steam and 600 psi non-shock cold water. Pressure containing parts shall be constructed of ASTM B-584 alloy 844, or ASTM B-124 alloy 377. Valves shall be furnished with blowout proof bottom loaded stem constructed of ASTM B-371 alloy 694 or other approved low zinc material. Provide TFE packing, TFE thrust washer, chrome plated ball and reinforced Teflon seats. Valves 1" and smaller shall be full port design. Valves 1 ¼" and larger shall be conventional port design. Stem extensions shall be furnished for use in insulated piping where insulation exceeds ½" thickness.

Comply with the following standards:

MSS SP-72. Ball Valves with Flanged or Butt Welding Ends for General Service.

MSS SP-110. Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.

Types of Ball Valves:

Threaded Ends 3" and Smaller: Bronze two-piece full port body with adjustable stem packing. Nibco T-585-70. Stockham S216-BR-R-T. Milwaukee BA 125. Apollo 77-100.

Soldered Ends 3" and Smaller: Bronze three-piece full port body with adjustable stem packing. Nibco S-595-Y-66. Milwaukee BA350. Apollo 82-200.

Threaded Ends 3" and Smaller: Bronze two-piece full port body, UL listed (UL842) for use with flammable liquids and LP gas. Nibco T-585-70-UL.

Threaded Ends 2" and Smaller: 175 WWP, bronze two-piece body, gear operator with handwheel, indicator flag, accepts tamper switch, for fire protection, UL listed. Nibco T-505-4 and G-505-4.

Threaded Ends 2" and Smaller: 400 WWP, bronze two-piece body, for fire protection service. Nibco KT-580.

Threaded Ends 2 ½ " and Smaller: 300 WWP, bronze three-piece body, gear operator with handwheel, indicator flag, accepts tamper switch, for fire protection, UL listed. Nibco T-505-4 and G-505-4.

Flanged Ends 2 ½" and Larger: Class 150, carbon steel full bore two-piece body with adjustable stem packing. Nibco F515-CS series. Apollo 88-240.

SPECIAL DUTY VALVES:

Calibrated Plug Valves (Circuit Setter): 125 psig water working pressure, 250 deg F maximum operating temperature, bronze body, plug valve with calibrated orifice. Provide with connections for portable differential pressure meter with integral check valves and seals. Valve shall have integral pointer and calibrated scale to register degree of valve opening. Valves 2 inch and smaller shall have threaded connections and 2-1/2 inch valves shall have flanged connections.

Safety Relief Valves: Unless specified otherwise, one hundred twenty-five (125) psig working pressure and 250 deg F maximum operating temperature; designed, manufactured, tested, and labeled in accordance with the requirements of Section IV of the ASME Boiler and Pressure Vessel Code. Valve body shall be cast-iron, with all wetted internal working parts made of brass and rubber. Select valve to suit actual system pressure and Btu capacity.

HYDRONIC SPECIALTIES:

Manual Air Vent: iron body and nonferrous internal parts; 150 psig working pressure, 225 deg F operating temperature; manually operated with screwdriver or thumbscrew: and having 1/8 inch discharge connection and 1/2 inch inlet connection.

Automatic Air Vent: designed to vent automatically with float principle; iron body and nonferrous internal parts; 150 psig working pressure, 240 degree F operating temperature; and having 1/4 inch discharge connection and 1/2 inch inlet connection.

Y-Pattern Strainers: cast-iron body (ASTM A 126, Class B), flanged ends for 2-1/2 inch and larger, threaded connections for 2 inch and smaller, bolted cover, perforated Type 304 stainless steel basket, bottom drain connection; 125 psig working pressure.

Flexible Pipe Connections: Rubber-bellows type for chilled water service and stainless steel reinforced for heating hot water systems. Working pressure rating shall be 150 psig (minimum) at 200 deg F. Rubber bellows shall include multi-layered Kevlar tire cord fabric and solid steel retention ring for higher ratings. Flexible pipe connectors shall be same size as the connecting pipe and either screwed or ANSI flanged.

INSTRUMENTATION:

ASME and ISA Compliance: Comply with applicable portions of ASME and Instrument Society of America (ISA) standards pertaining to construction and installation of meters and gages.

Pressure Gauges: ASME B40.1, Grade A, phosphor bronze bourdon-tube type, bottom connection. Drawn steel or brass case, glass lens, 4-1/2 inches diameter. White coated aluminium scale with permanently etched markings. Accuracy of 1% of range span. Range of 2 times operating pressure.

Gauge Snubber: 1/4-inch NPS brass bushing with corrosion-resistant porous metal disc. Disc material shall be suitable for fluid served and rated pressure.

Mercury-in-glass Thermometers: Die cast case, aluminum finished in baked epoxy enamel, glass front, spring secured, 9 inches long. Adjustable joint finished to match case, 180-degree adjustment in vertical plane, 360-degree adjustment in horizontal plane, with locking device. Tube shall be red reading, mercury filled, magnifying lens. Scale shall be satin-faced, nonreflective aluminum, with permanently etched markings. Stem shall be copper-plated steel, aluminum or brass, for separable socket, length to suit installation. Accuracy shall be plus or minus 1 percent of range span or plus or minus one scale division to maximum of 1.5 percent of range span.

Temperature ranges for services listed as follows:

Chilled Water	0 to 100

Thermometer Wells: Brass or stainless steel, pressure rated to match piping system design pressure; with 2-inch extension for insulated piping and threaded cap nut with chain permanently fastened to well and cap.

Test/Pete's Plugs: Shall be nickel-plated brass body, with 1/2 inch NPS fitting and 2 self-sealing valve-type core inserts suitable for inserting a 1/8 inch OD probe assembly from a dial-type thermometer or pressure gauge. Core material shall be EPDM or neoprene. Test plug shall have gasketed and threaded cap with retention chain and body of length to extend beyond insulation.

PART 3 - EXECUTION

PIPE APPLICATIONS:

Chilled Water: Use steel pipe with welded joints for 2-1/2 inch and larger. Weld flanges shall be weld-neck type.

PIPING INSTALLATIONS:

Locations and Arrangements: Drawings (plans, schematics, and diagrams) indicate the general location and arrangement of piping systems. Locations and arrangements of piping take into consideration pipe sizing and friction loss, expansion, pump sizing, and other design considerations. So far as practical, install piping as indicated.

Install piping generally parallel to walls and column center-lines, unless shown otherwise on the Drawings. Space piping, including insulation, to provide 1 inch minimum clearance between adjacent piping or other surface.
Slope water supply and return piping at a uniform grade of 1 inch in 40 feet upward in the direction of flow.

Install branch connections to mains using Tee fittings in main with take-off out the bottom of the main, except for up-feed risers which shall have take-off out the top of the main line.

Install unions in pipes 2 inch and smaller, adjacent to each valve, at final connections each piece of equipment, and elsewhere as indicated. Unions are not required on flanged devices.

Install weld neck flanges on valves, apparatus, and equipment having 2-1/2 inch and larger connections.

Install flexible connectors at inlet and discharge connections to pumps (except fractional horsepower inline pumps) and other vibration producing equipment.

Install strainers on the supply side of each control valve, pressure reducing valve, pressure regulating valve, solenoid valve, inline pump, and elsewhere as indicated. Install nipple and ball valve in blow down connection of strainers 2 inch and larger.

Locate and orient valves to permit proper operation and access for maintenance of packing, seat and disc. Generally locate valve stems in overhead piping in horizontal position.

Provide a union adjacent to one end of all threaded end valves. Control valves usually require reducers to connect to pipe sizes shown on the Drawings.

Install butterfly valves with the valve open as recommended by the manufacturer to prevent binding of the disc in the seat.

Offset equipment connections to allow valving off for maintenance and repair with minimal removal of piping. Provide flexibility in equipment connections and branch line take-offs with 3-elbow swing joints where noted on the Drawings.

Thermometer Wells: In pipes 2-1/2 inch and smaller increase the pipe size to provide free area equal to the upstream pipe area.

Flanged Joints: Align flange surfaces parallel. Assemble joints by sequencing bolt tightening to make initial contact of flanges and gaskets as flat and parallel as possible. Use suitable lubricants on bolt threads. Tighten bolts gradually and uniformly using torque wrench.

PIPE WELDING:

All welding shall be performed by qualified and certified welders. Welders' qualifications/certification shall be current, i.e. not more than 24 months since issuance, and fully completed by a reputable source. Welders shall submit copy of certificate and driver's license to engineer for review/approval. Maintain copies of certificates/licenses onsite. Welders shall be qualified on the size pipe utilized for this project. Engineer reserves the right to reject welders or their work.

Unless otherwise specified, welding shall be performed using Shielded Metal Arc Welding (SMAW), otherwise referred to as "stick" welding.

Welds require preparation of surfaces, beveling, and multiple passes.

All welds shall be inspected prior to insulating. The engineer reserves the right to utilize any examination procedure listed in Chaper VI of ANSI/ASME B31.1 to verify integrity of welds in question. If welds are found to be in compliance, then testing costs shall be paid by the project. Otherwise the contractor shall bear all related testing costs, weld/pipe replacement costs, additional engineering inspection and/or reporting costs, etc.

VALVE APPLICATIONS:

General Duty Valve Applications: The Drawings indicate valve types to be used. Where specific valve types are not indicated the following requirements apply:

Shut-off duty: use gate, ball, and butterfly valves.

Throttling duty: use globe, ball, and butterfly valves.

Install shut-off duty valves at supply connection to each piece of equipment, and elsewhere as indicated.

Install throttling duty valves as indicated.

Install calibrated plug valves on the outlet of each pump, heating or cooling element and elsewhere as required to facilitate system balancing.

Install drain valves at low points in mains, risers, branch lines, and elsewhere as required for system drainage.

Install check valves on each pump discharge and elsewhere as required to control flow direction.

Install safety relief valves on hot water generators, and elsewhere as required by ASME Boiler and Pressure Vessel Code. Pipe discharge to floor without valves. Comply with ASME Boiler and Pressure Vessel Code Section VIII, Division 1 for installation requirements.

Install pressure reducing valves on make up water system, and elsewhere as required to regulate system pressure.

VALVE FEATURES

General: Provide valves with features indicated and where not otherwise indicated, provide proper valve features as determined by Installer for installation requirements. Comply with ANSI B31.1.

Valve features specified or required shall comply with the following:

Flanged: Provide valve flanges complying with ANSI B16.1 (cast iron), ANSI B16.5 (steel), or ANSI B16.24 (bronze).

Threaded: Provide valve ends complying with ANSI B2.1.

Solder-Joint: Provide valve ends complying with ANSI B16.18.

Trim: Fabricate pressure-containing components of valve, including stems (shafts) and seats from brass or bronze materials, of standard alloy recognized in valve manufacturing industry unless otherwise specified.

Non-Metallic Disc: Provide non-metallic material selected for service indicated in accordance with manufacturer's published literature.

Renewable Seat: Design seat of valve with removable disc, and assemble valve so disc can be replaced when worn.

Extended Stem: Increase stem length by 2: minimum, to accommodate insulation applied over valve.

Mechanical Actuator: Provide factory fabricated gears, gear enclosure, external chain attachment and chain designed to provide mechanical advantage in operating valve for all valves 4" and larger that are mounted more than 7' 0" above the floor, or are otherwise difficult to operate regardless of height.

HYDRONIC SPECIALTIES INSTALLATION:

Install manual air vents at high points in the system, at heat transfer coils, and elsewhere as required for system air venting.

Install automatic air vents at high points in the system, heat transfer coils, and elsewhere as required for system air venting.

Install drain valves at low points in mains, risers, branch lines, and elsewhere as required for system drainage.

Use dielectric unions, nipples, or flanges to isolate dissimilar materials.

FIELD QUALITY CONTROL

Preparation for testing: Coordinate tests with the engineer three days in advance and prepare hydronic piping in accordance with ASME B 31.9 and as follows:

> Leave joints including welds uninsulated and exposed for examination during the test.
>
> Flush system with clean water. Clean strainers.
>
> Isolate equipment that is not to be subjected to the test pressure from the piping. If a valve is used to isolate the equipment, its closure shall be capable of sealing against the test pressure without damage to the valve. Flanged joints at which blinds are inserted to isolate equipment need not be tested.

Use ambient temperature water as the testing medium, except where there is a risk of damage due to freezing.

Examine system to see the equipment and parts that cannot withstand test pressures are properly isolated.

Subject piping system to a hydrostatic test pressure which at every point in the system is not less than 1.5 times the design pressure. The test pressure shall not exceed the maximum pressure for any vessel, pump, valve, or other component in the system under test.

After the hydrostatic test pressure has been applied for at least 15 minutes, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components as appropriate, and repeat hydrostatic test until there are no leaks. Document all tests by recording test area, setup, participants names, test pressure, duration, and final results.

FLUSHING/CLEANING/TREATMENT:

Water treatment shall be provided by Owner.

Coordinate water re-treatment with the Owner.

Flush new piping system. Remove, clean, and replace strainer screens.

Close and fill system as soon as possible after final flushing to minimize corrosion.

END OF SECTION

SECTION 15530 – PREINSULATED UNDERGROUND HVAC PIPING

PART 1 - GENERAL

GENERAL CONDITIONS

The work described hereunder shall be installed in accordance with the "Mechanical General Conditions," Section 15010.

DESCRIPTION OF WORK:

Furnish a complete HDPE jacketed system of factory preinsulated steel piping for the specified service. The system shall incorporate electrical monitoring leak detection. All preinsulated pipe, fittings, insulating materials, and technical support shall be provided by the Preinsulated Piping System manufacturer. A complete layout of the system, showing anchors, expansion provisions, and building entrance details, shall be provided by the preinsulated pipe manufacturer. Means for expansion must be made in pipe off-sets or loops.

Extent of the mechanical insulation required by this section is indicated on the Drawings and schedules, and by the requirements of this section.

Types of piping system specified in this section include the following:

Chilled Water Piping
Heating Hot Water Piping

QUALITY ASSURANCE:

Manufacturer's Qualifications: Firms regularly engaged in the manufacture of preinsulated piping products, of types required, whose products have been in satisfactory use in similar service for not less than 3 years.

Installer's Qualifications: Firm with at least 5 years successful installation experience on projects with mechanical installation similar to that required for this project.

Qualifications for Welding Processes and Operators: ASME "Boiler and Pressure Vessel Code", Section IX, "Welding and Brazing Qualification."

Quality Control Submittals:

Welders' certificates certifying that welders comply meet the quality requirements specified in Quality Assurance below.

Certification of compliance with ASTM and ANSI manufacturing requirements for pipe, fittings, and specialties.

SUBMITTALS:

Submit to the Architect/Engineer for approval six (6) copies of brochures, technical data and/or shop drawings and as many additional copies as required for Contractor use.

Product Data: Provide data from manufacturer including construction specification, rated capacities, weights (shipping, installed, and operating), furnished specialties and accessories.

Submit manufacturer's installation instructions.

Provide manufacturer's shop drawings with dimensioned piping layout and details of all expansion loops, elbows, anchor points, building and/or manhole entry points. Prefabricated pipe units are to be subsequently dimensionalized and numbered to fit actual job conditions as field verified by the installing contractor prior to the start of factory fabrication work.

AS-BUILT DRAWINGS

As-Built Drawings are required. Maintain a record set on the job. Provide final CADD drawings including GPS position and elevations of all new piping and all utilities uncovered along the pipe route.

DELIVERY, STORAGE, AND HANDLING:

Deliver preinsulated pipe to the site in containers with manufacturer's stamp or label, affixed.

Protect piping against dirt, water, and chemical and mechanical damage. Do not install piping that is damaged or that has a damaged jacket; remove from project site.

Handle pre-insulated pipe in accordance with the manufacturer’s recommendations. Do not hook pipe ends. Do not use chains or other devices that might puncture insulation jacket. Lift pipe with minimum 4” wide strap.

PART 2 - PRODUCTS

PREINSULATED PIPING SYSTEM:

Carrier pipe shall be domestic ASTM A-106 or A53, seamless, standard weight for all sizes (Std. Wt. is the same as Sch. 40 through 10"). When practical, piping shall be provided in 40-foot double-random lengths. All carbon steel pipe shall have ends cut square and beveled for butt-welding. Straight sections of factory insulated pipe shall have 6" of exposed pipe at each end for field joint fabrication.

Insulation shall be polyurethane foam either spray applied or high pressure injected with one shot into the annular space between carrier pipe and jacket. Insulation shall be rigid, 90-95% closed cell polyurethane with a 2.0 to 3.0 pounds per cubic foot density and coefficient of thermal conductivity (K- Factor) of 0.14 and shall conform to ASTM C-591. Maximum operating temperature shall not exceed 250°F. Insulation thickness shall be 1.5" minimum.

Jacketing material shall be extruded, black, high density polyethylene (HDPE), having a minimum wall thickness of 165 mils for jacket sizes less than or equal to 12", 165 mils for jacket sizes larger than 12" to 24", and 200 mils for jacket sizes greater than 24". The HDPE jacket throughout the entire factory manufactured system shall incorporate electric fusion, butt fusion, or extrusion welding at all fittings, joint closures, or other points of connection. This shall create a jacket that is seamless throughout the entire system with the exception of anchors, whose water shed rings are sealed with a Raychem Dirax or Canusa GTS-65 wrap prohibiting the ingression of water.

Moisture barrier end seals shall be factory applied**,** sealed to the jacket and carrier pipe. End seals shall be certified as having passed a 20-foot head pressure test. End seals shall be high temperature mastic completely sealing the exposed end of the insulation. Field applied end seals shall be installed at any field cut to the piping before continuing with the installation.

Straight run joints are insulated in the field using polyurethane foam to the thickness specified, jacketed with a Canusa Supercase joint closure. The joint will be pressure tested at 5 psi for 5 minutes while simultaneously soap tested at the joint closure's seams for possible leaks. After passing the pressure test, the field joint is insulated and a closure patch is welded (as per joint closure instructions) over the foam holes. All joint closures and insulation shall occur at straight sections of pipe only.

Fittings are factory prefabricated and preinsulated with polyurethane foam to the thickness specified and jacketed with a one piece seamless molded HDPE fitting cover, a butt fusion welded, or an extrusion welded and mitered HDPE jacket.

NO TAPING OR HOT AIR WELDING SHALL BE ALLOWED. All fitting jackets/covers shall be connected to the straight lengths of pipe by electro fusion, butt fusion, or extrusion welding. Carrier pipe fittings shall be butt-welded, except sizes smaller than 2" shall be socket-welded. Fittings include expansion loops, elbows, tees, reducers and anchors. Elbows, loops, offsets, or any other direction changes shall conform to the standards set by ANSI B31.1, Code for Power Piping. 100% X-ray testing is required of all factory welds.

Expansion/contraction compensation will be accomplished utilizing factory prefabricated and preinsulated expansion elbows, Z-bends, expansion loops and anchors specifically designed for the intended application. External expansion compensation utilizing flexible expansion pads (minimum one inch thickness), extending on either side, both inside and outside the radius of the fittings used, with all fittings having expansion in excess of 1/2".

The system shall be leak detection ready by means of manufacturing into the foam between the jacket and pipe a copper wire along each length of pipe and fittings. The piping system manufacturer shall install the wire so that the wire is embedded in the foam insulation and not touching the steel carrier pipe. The contractor shall connect the wire together at each field joint with a recommended crimping tool. After crimping the wire at a joint, the contractor shall check the joined pieces for continuity of the wire and electrical isolation from the carrier pipe by use of a standard volt ohmmeter. This check shall be repeated after each crimp, until the entire system is connected (more detailed contractor installation requirements can be found in the "ERM Installation Instruction" section of this specification). After the piping system is installed, the owner at any time may check the system for a leak by using a standard volt ohmmeter. If a leak is detected (a leak is signaled by a drastic drop in the electrical resistance of the circuit) the owner should contact the system manufacturer for a TDR instrument to determine the location of the leak.

At owner's option, continuous monitoring ohmmeter panels may be purchased from the pipe manufacturer, which will provide continuous leak detection monitoring of the system.

Terminations shall have a corrosion coated steel sleeve protecting the foam. This steel sleeve shall be fillet welded onto the carrier pipe and come up and extend back on the jacket a distance of 12". A high temperature shrink sleeve 4" wide shall be used to seal the steel sleeve to the HDPE jacket. Moisture barrier end seals shall be factory applied to any exposed foam at the end of a pipe length, including the foam that is also protected by the steel sleeve at manhole terminations. End seals shall be high temperature mastic completely sealing the exposed end of the insulation. End seals shall be certified as having passed a 20-foot head pressure test. If any field cutting of the pipe is required, field

applied end seals shall be installed to the piping before continuing with the installation.

Prefabricated anchors shall be furnished and installed and shall consist of a 316L stainless steel plate conforming to ASTM SA240, welded to the carrier pipe in accordance with ASME B31.1. The stainless steel anchor plate shall be 1/2" thick and shall be 5" larger horizontally and 2" larger vertically than the HDPE jacket outer diameter. Raychem Dirax or Canusa GTS-65 wrap shall be used seal the overlap of the anchor water shed ring over the HDPE jacket. Concrete will have a compressive strength of 3000psi and will be ready mix. The amount of concrete will be approved by the piping manufacture.

PART 3 - EXECUTION

GENERAL

~~Full time Field Service is required by a manufacture's factory employee during the entire installation of the project. Field service support solely from a local factory sales representative is not acceptable. The cost of field service shall be figured on a per month basis and submitted to the contractor during the time of bid. The contractor is responsible for determining the total amount of time required.~~

Piping Installation will be installed in sections as required by the owner and engineer to allow for the least amount of disruption to the owners mission. Temporary egress will be made available for the owner to receive and ship materials and or equipment. This contractor will supply temporary bridges for personal and shipments. Bridges will have a capacity of at least 20,000 pounds per axle.

Fencing and signage will be required with audio devices at all excavations and any areas that may be of danger to the owner. The owner will have access to all areas to meet its mission. The fencing will be at least 5' high and will require materials that will not be easily climbed over or on.

Certified welders shall perform all welding. Welders shall provide identifying mark at each weld.

Welding will be preformed in accordance with ANSI B31.1 Code for Pressure Piping. Bevel pipe with wall thickness over 5/16". Shop or field beveling will be in accordance with recognized standards. Remove dirt, scale and other foreign matter from piping before tying in sections. Utilize backing rings for weld of steam and condensate return piping. Set joints true and square with no more than 1/16-inch separation. Welds will include a root bead, one or more filler

layers and a final cover pass. Root bead will provide for complete penetration into the root of the joint.

Take care to protect piping from introduction of foreign debris. Clean new piping of loose scale, rust and weld spatter. Remove tightly adhering debris with wire brush or by grinding as necessary. Flush piping prior to final tie-ins.

Install anchors & expansion loops per manufacturer's instructions. The Manufacturer must authorize field changes. Install expansion pads per manufacturer's recommendations to cover both the inside and outside radius of elbows.

Anchor blocks shall be poured and cured, prior to testing of the carrier pipe. Bleed all air from lines. Hydrostatically test all carrier piping in accordance with normal practice. Test piping to 150 psi. Test duration shall exceed 2 hours. Inspect all fittings for leaks. Make repairs if necessary and retest.

Building entrances shall require a stainless steel (316L) sleeve inserted into the preinsulated piping system at least 20 " long, along with a stainless steel sleeve in the wall (10gage) for proper application of link seals with stainless steel hardware. Note: the sleeve in the preinsulated piping system shall be inside the HDPE jacket so the HDPE jacket and foam are not damaged or miss formed by the link seal system. It is imperative that the entrance into each building be watertight.

All joints shall be repaired to provide a completely waterproof jacket. HDPE jacket joint closure shall be by electric-fusion method. Taping and hot air welding will not be allowed. Contractor must provide the electric-fusion equipment recommended by the pipe manufacturer. Jacket joints shall be pressure tested in accordance with the manufacturer's recommendations to a pressure of 5 psi for 5 minutes while simultaneously soap testing seams for leaks.

LAYOUT AND COORDINATION

Drawings indicate, to the best of available information, known underground utilities. Indicated locations of underground utilities are not exact. Indicated inverts of underground utilities are not exact.

Route underground utilities parallel or perpendicular to buildings and roadways.

It is the responsibility of the installing contractor to make his own locations and should include all associated costs to protect the existing utilities. The Contractor is expected to request the assistance of underground utility locator services, engage in early exploratory digging and other investigation as is

practical for utility location. It will be necessary to coordinate piping offsets with the engineer and the pipe manufacturer. Field changes must be authorized by the Manufacturer.

As some conflict with existing utilities can be expected, provide 8 @ 45 degree fittings and 1 extra anchor for each piping service (CHW & HHW). As the location of these fittings is as-of-yet unknown, these extra fittings are not indicated on the plan. Include the cost of installation of these extra coordination fittings in the bid.

TRENCHING, BACKFILLING, ROAD BASE AND PAVEMENT

The Contractor is expected to take all possible care during excavations not to damage known and even unknown utilities.

Comply with the requirements of Section 553.60 FS the Trench Safety Act.

Carefully excavate trench to smooth finished surface. Hand trim excavations. Remove any loose materials, large stones and other hard matter that could damage piping or impede consistent backfilling or compaction. Prevent surface water from flowing into trench by temporary grading.

Remove all excavated materials from the site. Backfill materials to be clean clayey sand, free of rocks and debris.

Cut out soft areas of pipe subgrade at bedding location not capable of compaction in place. Compact subgrade to density equal to or greater than requirements for subsequent fill materials.

Contractor shall employ a qualified testing service to perform compaction density testing. Testing shall be performed each 100 linear feet per each 6" lift. Evaluate compaction by ASTM D 1557 / AASHTO T-180 Method "A" (Modified Proctor).

Modified Proctor test compaction for backfill under pavements shall be:

For Cohesive Soils: 95% of maximum density @ ±2% of optimum moisture content.

For Cohesionless Soils: 98% of maximum density @ ±2% of optimum moisture content.

Before backfilling clean trench of any cave-ins and trash especially metal and other hard objects. Place initial pipe bedding material to 6" and compact. Upon completion of pipe installation and testing, backfill in 6" layers. Backfill material shall be evenly wetted with enough water where necessary to assure it being within ±2% of optimum moisture content.

Place color-coded 6” wide 0.004” thickness polyethylene printed plastic identification tape directly over each pipe and approximately 12” below finished grade.

All roadway construction shall conform to the Florida Department of Transportation Standard Specification for Road and Bridge Construction 2000 edition.

Provide 5-1/2” limerock base. Compact to 98% of maximum density determined by AASHTO T 180.

Install 1-1/2” Type S asphalt concrete pavement. Prepare the mixture, place and compact per DOT specifications.

FIELD QUALITY CONTROL

Preparation for testing: Prepare hydronic piping in accordance with ASME B 31.9 and as follows:

Leave joints including welds uninsulated and exposed for examination during the test.

Flush system with clean water. Clean strainers.

Isolate equipment that is not to be subjected to the test pressure from the piping. If a valve is used to isolate the equipment, its closure shall be capable of sealing against the test pressure without damage to the valve. Flanged joints at which blinds are inserted to isolate equipment need not be tested.

Use ambient temperature water as the testing medium, except where there is a risk of damage due to freezing.

Examine system to see the equipment and parts that cannot withstand test pressures are properly isolated.

Subject piping system to a hydrostatic test pressure which at every point in the system is not less than 1.5 times the design pressure. The test pressure shall not exceed the maximum pressure for any vessel, pump, valve, or other component in the system under test.

After the hydrostatic test pressure has been applied for at least 10 minutes, examine piping, joints, and connections for leakage. Eliminate

leaks by tightening, repairing, or replacing components as appropriate, and repeat hydrostatic test until there are no leaks.

FLUSHING AND CLEANING:

Flush entire water piping system at 125% of maximum design flow rate.

Circulate cleaning solution for 4 hours.

Final flush entire water piping system.

Provide initial water treatment. Close and fill system as soon as possible after final flushing to minimize corrosion.

END OF SECTION

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SECTION 15540 - HVAC PUMPS

PART 1 - GENERAL

GENERAL CONDITIONS

The work described hereunder shall be installed in accordance with the "Mechanical General Conditions.

DESCRIPTION OF THE WORK

The extent of the work is indicated on the Drawings. In general, the work consists of, but is not limited to, the following:

Close-Coupled End Suction Pumps
Horizontal Split Case Pumps

QUALITY ASSURANCE

Manufacturer's Qualifications: Firms regularly engaged in manufacture of general-use centrifugal pumps with characteristics, sizes and capacities required, whose products have been in satisfactory use in similar service for not less than 5 years.

Compliance with the following codes and standards is required:

HIS Compliance: Design, manufacture, and install HVAC pumps in accordance with HIS "Hydraulic Institute Standards."

UL Compliance: Design, manufacture, and install HVAC pumps in accordance with UL 778 "Motor Operated Water Pumps."

UL and NEMA Compliance: Provide electric motors and components which are listed and labeled by Underwriters Laboratories and comply with NEMA standards.

ANSI/ASHRAE/IESNA Standard 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings

Certification, Pump Performance: Provide pumps whose performances, under specified operating conditions, are certified by manufacturer.

SUBMITTALS

Product Data: Identify pumps as referenced in the construction documents; submit manufacturer's pump capacities/ratings, installation and start-up instructions,

current/accurate pump characteristic performance curves with selection points clearly indicated. Include motor data, seal and sleeve types, materials of construction, dimensions and weights, and any other pertinent data to ensure comprehensive review/approval by the engineer.

Submit to the Architect/Engineer for approval six (6) copies of brochures, technical data and/or shop drawings of the above information, and as many additional copies as required for Contractor use.

MAINTENANCE DATA

Submit maintenance data and parts lists for each type of pump, control, and accessory; including "trouble-shooting" maintenance guide. Include this data, product data, shop drawings, and wiring diagrams in maintenance manual; in accordance with requirements of Division 1.

PRODUCT DELIVERY, STORAGE, AND HANDLING

Furnish pumps complete with motors, impellers, drive assemblies, bearings, coupling guards, where required, lubrication ports/fittings/extensions to ensure access even when insulated, and accessories as hereinafter specified.

Select motor with sufficient horsepower rating for non-overloading operation over entire pump curve.

Pumps shall meet or exceed operating efficiencies specified on the plans/schedules.

Where pump is indicated for parallel operation, scheduled conditions are for that pump with two pumps in operating; i.e. total system flow rate is twice that scheduled for single pump. When only one of the two pumps is operating, operating point of that pump must fall within manufacturer’s recommended operating range.

Furnish each pump and motor with nameplate giving manufacturer’s name, serial number of pump, capacity in GPM and head in feet at design conditions, horsepower, voltage, frequency, speed and full load current.

Factory test all pumps at 150 percent of rated pressure. Manufacturer shall certify all pump ratings.

Pumps shall operate without objectionable noise or vibration.

Furnish one set of spare seal(s) for each pump to Owner.

After testing, each pump shall be thoroughly cleaned and painted with at least one coat of high-grade machinery enamel prior to shipment and preserved/protected for shipping/storage.

Pumps shall be of same manufacturer for each project unless otherwise approved in advance by the engineer.

Unless otherwise specified, pump and motor bearings shall be permanently lubricated, sealed for life, meeting all industry standards for a minimum L 10 life of 60,000 hours.

Handle HVAC pumps and components carefully to prevent damage, breaking, denting and scoring. Do not install damaged HVAC pumps or components; replace with new.

Store HVAC pumps and components in clean dry place. Protect from weather, dirt, fumes, water, construction debris, and physical damage.

Comply with Manufacturer's rigging and installation instructions for unloading HVAC pumps, and moving them to final location.

PART 2 - PRODUCTS

CLOSE-COUPLED END SUCTION PUMPS

General: Provide close-coupled end suction pumps where indicated, and of capacities and having characteristics as scheduled.

Type: Horizontal mount, single stage, designed for 175 psi working pressure. Pump volute or casing shall be center-line discharge for positive air venting constructed of class 30 cast iron with integrally cast mounting feet. The pump shall have a self flushing seal design or a positive external seal flushing line. Pump may be furnished with a seal flush line and a Purocell # 900 replaceable cartridge filter with shut-off isolation valve installed in the seal flushing line. The filter shall have the ability to remove particles down to five microns in size.

Casing: Cast iron, 125 psi ANSI flanges, tappings for gage and drain connections. The pumps shall have case wear rings. Mounting feet shall be integrally cast into the casing to allow servicing without disturbing piping connections.

Shaft: Steel with bronze or stainless steel replaceable shaft sleeve.

Seal: Shall be mechanical with carbon seal ring and ceramic seat rated at 250 deg F.

Motor: Motor shall meet EPAC/NEMA specifications and shall be the size, voltage and enclosure (ODP/TEFC) called for on the plans and as specified in related Division 15 sections. Motors shall be premium efficiency and rated for inverter duty (where scheduled) with 1.15 minimum service factor.

Impeller: The impeller shall be bronze and hydraulically balanced by either back vanes or balancing holes. The impeller shall be dynamically balanced to ANSI Grade G6.3 and shall be fitted to the shaft with a key.

DOUBLE SUCTION SPLIT CASE HORIZONTAL CENTRIFUGAL PUMPS

Furnish and install double suction split case horizontal centrifugal pump(s) with capacities and characteristics as shown on the plans.

Pumps to be base mounted, double suction, flexible coupled, horizontal split case with cast iron casings, bronze fitted with working pressure of 175 psig and operating temperature of 225 deg F continuous, 250 deg F intermittent. Pump design must allow for servicing without disturbing piping, motor, or requiring shaft realignment. Pump bearings shall be regreaseable.

Casings to have tapped and plugged openings for vent, drain, suction and discharge guage connections.

Impellers to be enclosed double-suction type made of cast bronze, hydraulically and dynamically balanced, keyed and locked to pump shafts with replaceable bronze shaft sleeves. Impellers to have bronze wearing rings securely locked in place.

Pump shafts to be high-strength carbon steel, sealed and gasketed from pumped fluid. Pumps shall be designed for a maximum shaft deflection of 0.002” at the seal face.

The pumps shall have a replaceable bronze or stainless steel shaft sleeve and shall cover the liquid area under the seal.

Pumps to be furnished with single inside, unbalanced mechanical seals with carbon rotating faces, ceramic stationary seats, Buna-N elastomer and 316 SS metal hardware rated to 225 deg F continuous operation. Seals to be flushed with recirculation line from discharge to stuffing box.

Flexible coupling shall be sized for non-overloading conditions and capable of absorbing torsional vibration and ease of serviceability. The coupling guard shall be of safety yellow and meet all OSHA standards, secured to the base. Pump and motor shall be factory aligned. The contractor shall re-align upon installation of pump unit assembly prior to startup.

Pumps should be suitable for 175 PSI working pressure (std.) or 300 PSI (optional). Flanges shall be 125 lb. ANSI (std.) or 250 lb. ANSI (optional).

Motor shall be single winding and speed, 1800 rpm, totally enclosed fan cooled (TEFC) ball-bearing type, premium efficiency, NEMA Design B with a service factor of 1.15 and total temperature rise of 50 deg C (resistance measured) in 40 deg C ambient, with

Class F insulation. Motor shall be of the size, voltage as outlined in the plans and henerin.

PART 3 - EXECUTION

INSPECTION

Examine areas and conditions under which HVAC pumps are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

INSTALLATION/STARTUPOF PUMPS

General: Install HVAC pumps where indicated, in strict accordance with manufacturer's published installation instructions to avoid stress, minimize noise, maximize life, and ensure alignment; complying with recognized industry practices to ensure that HVAC pumps comply with requirements and serve intended purposes over the expected service life.

Access: Provide access space around HVAC pumps for service as indicated, but in no case less than that recommended by manufacturer. Provide access to all lubrication fittings, including extensions to accommodate depth of insulation, where applicable.

Piping Connections: Refer to the Hydronic Specialties section for piping-related work. Provide piping, valves, accessories, gages, supports, and flexible connections as indicated. Provide concentric (for vertical piping) and eccentric (for horizontal piping) reducers, increasers where pump connection sizes are not identical to connecting piping.

Support: Install base-mounted and foot-mounted pumps on minimum of 4" high concrete base, with anchor bolts poured in place. Set and level pump, grout under pump base with non-shrink grout.

Alignment: Pumps shall be aligned by a millwright after installation per the manufacturer’s recommendations and tolerances. Align all flexible coupled pumps after grouting is complete/set in accordance with the manufacturer’s recommendations. Record and submit written report/results of alignment to engineer for review/approval. After alignment is complete, pin pump and motor to base.

Verify piping system has been flushed, cleaned, and filled prior to startup. Prime pump, vent air from system/casing, and verify pump rotation. Do not start pumps in a dry condition as this will damage the seals. Remove start-up strainers once the system has been circulated and verified “clean”.

Verify that electrical wiring installation is in accordance with manufacturer's submittal and installation requirements of Division-16 sections. Do not proceed with equipment start-up until wiring installation is acceptable to equipment installer.

Cleaning: Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint.

END OF SECTION

SECTION 15682 - AIR COOLED, ROTARY SCREW, WATER CHILLERS

PART 1 GENERAL

GENERAL CONDITIONS

The work described hereunder shall be installed in accordance with the "Mechanical General Conditions," Section 15010.

DESCRIPTION OF THE WORK

In general, the work consists of, but is not limited to, the following:

Provide & install water chillers including factory start-up and warranties.

RELATED WORK SPECIFIED ELSEWHERE

Electrical power wiring is specified in the Electrical Sections.

REGULATORY REQUIREMENTS

ARI 590 – Centrifugal and Rotary Screw Water Chillers.

ANSI/ASHRAE 15 - Safety Code for Mechanical Refrigeration.

ASME SEC 8 - Boiler and Pressure Vessel Code.

SUBMITTALS

Submit for approval (6) copies of the following data.

Performance data indicating capacity, electrical current and power required, efficiency, evaporator entering and leaving water temperatures, flow rates and pressure drops.

Sound data: Indicate unit sound power level (dBA), measured per ARI Standard 575.

Submit product data required clearances, field connections, weight, specialties and accessories, electrical nameplate data, and wiring diagrams.

Submit with approval data: one copy of manufacturer's installation instructions including field wiring diagrams, required utility connections and manufacturer’s recommendations.

OPERATION AND MAINTENANCE DATA:

Submit three (3) copies of operation and maintenance data with project close-out book. Include manufacturer's descriptive literature, wiring diagrams, start-up instructions, installation instructions, and maintenance procedures.

OWNER'S INSTRUCTION & DOCUMENTATION:

Provide four (4) hours instruction specifically associated with operation and maintenance of the chiller.

WARRANTY / MAINTENANCE AGREEMENT

Provide comprehensive parts, labor, refrigerant, warranty on entire unit for **ten (10) years** from date of start-up. Warranty includes travel and all other related expenses. To the extent that any specific maintenance is required to keep the warranty inforce, provide that maintenance as part of the warranty / maintenance agreement.

DELIVERY, STORAGE, AND HANDLING:

Comply with manufacturer's installation instructions for rigging, unloading, and transporting units.

Protect units on site from physical damage. Protect coils.

MANUFACTURER'S FIELD SERVICES

Supply service of factory representative for a period as required, to supervise testing, start-up, and instruction on operation and maintenance to Owner.

Provide manufacturer's service capabilities no more than 120 miles from the installation.

PART 2 PRODUCTS

GENERAL UNIT DESCRIPTION

Provide factory assembled and tested outdoor air cooled chillers consisting of compressors, condenser, evaporator, thermal expansion valve, refrigeration accessories, and control panel. Construction and ratings shall be in accordance with ARI 590.

See schedules on Drawings for additional requirements specific to this project.

COMPRESSORS

The unit shall have multiple compressors and multiple independent refrigerant circuits for redundancy. Each refrigerant circuit includes compressor suction and discharge service valve, liquid line shutoff valve, removable core filter, liquid line sight glass, charging port and one electronic expansion valve per circuit. Fully modulating compressors and electronic expansion valves provide variable capacity modulation over the entire operating range.

Compressors shall be industrial grade, energy efficient direct drive 3600 RPM rotary screw type. The motor may be hermetic, semi-hermetic, or open design with thermal protection.

REFRIGERANT CIRCUIT AND CAPACITY MODULATION

Refrigerant may be: HFC-134a or R410a.

Provide refrigerant connections as necessary to facilitate refrigerant reclaim during maintenance.

Provide full operating charge of refrigerant and oil completely piped and factory leak tested.

Provide for each refrigerant circuit:

1. Liquid line solenoid valve.
2. Filter dryer.
3. Liquid line sight glass and moisture indicator.
4. Electronic expansion valve.
5. Charging valve.

Unit shall have capacity control down to 20%.

EVAPORATOR

Provide finned copper tube shell in tube, or brazed plate evaporator made of stainless steel with copper as the braze material. Evaporator shall be tested at 1.1 times maximum allowable refrigerant side working pressure and 1.5 times maximum allowable water side working pressure. Evaporator shall include a water strainer and flow switch that are factory installed. Evaporator shall be designed and constructed according to, and listed by, Underwriters Laboratories (UL).

Design, test, and stamp refrigerant side in accordance with ASME Code.

Insulate with 1.5 inch thick flexible elastomeric rubber, closed cell insulation with maximum K value of 0.26. Provide thermostatically controlled heat tape to protect evaporator to 0 degrees F.

Provide water drain connection, vent connection, and fittings for temperature control sensors.

Provide thermal flow switch.

CONDENSERS

Provide Condenser coils with aluminum fins and copper tubes or Aluminum Alloy MicroChannel design. Coils will have a 5000+ hour salt spray resistance applied to both the coil and the coil frame (Electro Fin Coating).

Provide vertical discharge direct drive propeller type condenser fans with fan guard on discharge. Condenser motors shall be three-phase with permanently lubricated ball bearings and thermal overload protection.

ENCLOSURES

House components in 14 gauge welded galvanized steel frame with 14-16 gauge galvanized steel panels and weather resistant access doors, phosphatized and finish painted.

Provide factory mounted, condenser coil guard panels. Panels shall have access holes for piping connections. Panels shall be easily removable for servicing.

Provide factory mounted compressor area (below condenser) guard panels. Panels shall be easily removable for servicing.

STARTER, CONTROLS & WIRING

Provide unit mounted weatherproof steel control panel, containing power and control wiring.

Unit shall be factory wired for single point three phase power connection for compressors and fans. Unit shall include transformer, wiring, and terminals for controls.

Provide separate 115 V evaporator heater.

Provide unit-mounted starter, containing power and control wiring. Unit shall be reduced voltage wye-delta or solid-state type. Unit shall have a non-fused disconnect. Unit to have solid state three-phase overload protection. Provide protection from phase loss, phase reversal and phase imbalance.

Provide standard electronic control panel with operation monitoring and self diagnostics.

Provide Building Automation System (BAS) Interface with operation monitoring, self diagnostics and interface for BACnet MS/TP connectivity to BAS. BACnet protocols shall be compliant to ANSI/ASHRAE 135.

Provide the following failure controls:

1. Loss of chilled water flow.
2. Chiller freeze protection.
3. High and low refrigerant pressure.
4. Oil pressure switch.
5. Loss of refrigerant charge.
6. Compressor running overcurrent.
7. Ground current protection.

Provide the following operating controls:

1. Leaving water temperature control with O/A or RWT reset capability.
2. Five minute anti-recycle timer to prevent compressor from short cycling.
3. Compressor sequencing including automated lead-lag.
4. Condenser fan sequencing.
5. Primary chilled water pump control.
6. Electronic expansion valve modulation.
7. Units shall have loop pull-down controls from 95^{o} F loop temperature.

Low Ambient Controls: Not Required.

Ambient Operation: Unit shall operate down to 25 deg F without low ambient controls.

SOUND

Sound pressure levels for the unit shall not exceed the specified level, see schedule. All manufacturers shall provide the necessary sound treatment (parts and labor) to meet these levels if required. Sound data shall be provided with the quotation. Test shall be in accordance with AHRI Standard 370.

PART 3 EXECUTION

INSTALLATION

Install in accordance with manufacturer's instructions.

Install unit on vibration isolators/pads. Space isolators per manufacturer's recommendations.

Level unit.

Secure unit to concrete pad using 1/4" thick hot-dipped galvanized angle and 7/16" diameter concrete expansion bolts. Oversize the holes by 1/8" diameter at unit's base connection angle and only snug the nuts to allow for unit movement/vibration. Locate anchors 6" from edge of concrete. Use cold galvanizing spray on cut ends of angle.

Electrical connection by electrical subcontractor, including evaporator heater circuit.

Install controls and integrate into BAS system, by controls contractor.

Connect to chilled water piping, install instrumentation, sensors, safeties, insulate piping, etc. as called for on the plans and as required to comply with the manufacturer's requirements. Install factory supplied devices to be field installed.

Label unit.

Provide closure panels around piping penetrations into cabinet/frame, seal conduits, etc.

Clean work area, pads, etc.

Touch up paint any damage painted surfaces.

STARTUP

Provide factory certified startup and written report.

Test safeties and report.

Program unit to meet the Owner's operating and setpoint requirements.

END OF SECTION

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SECTION 15902 - DIGITAL HVAC CONTROLS COORDINATION

PART 1 - GENERAL

GENERAL CONDITIONS

This work is to be completed by the Controls Vendor in accordance with a separate direct contract agreement with Leon County Schools as assigned to the Construction Manager for coordination & implementation.

Equipment Installation Subcontractors shall be responsible for the following tasks:

a. Coordinate activites with the Control Subcontractor.

b. Provide Control Subcontractor with all drawings, submittals, specifications and manufacturer's performance data needed.

c. Maintaining systems in operation during controls installation and testing.

d. Installation of all control devices in piping.

e. Interface with equipment controls

Equipment Installation Subcontractors to install equpment provided by the Control Subcontractor including:

a. Piping pressure and temperature wells & sockets.

b. Other as needed

END OF SECTION

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SECTION 15980 -TEST AND BALANCE

PART 1 - GENERAL

QUALITY ASSURANCE

The Testing Contractor shall be independent of the Mechanical Subcontractor, certified by NEBB member of AABC.

The personnel involved in performing the tests shall be experienced and specifically trained in balancing mechanical systems.

SUBMITTALS:

Prior to any test & balance work, submit the TAB agency and job supervisor qualifications for approval. Also submit TAB agenda including sample forms, system diagrams for each air and water system and a synopsis of testing and adjusting procedures.

After completion of test, submit draft test reports.

Prior to Contractors request for final completion inspections, submit final test reports.

Submit 5 copies in accordance with general submittal requirements.

DESCRIPTION OF WORK:

The TAB work shall include:

Adjust and balance the complete mechanical system as hereinafter specified.

Record all test data and submit reports upon completion.

Install at each piece of mechanical equipment a "Data Sheet" showing all significant operating temperatures, pressures, amperes, voltage, brake horsepower, etc. "Data Sheet" to be enclosed in vinyl holder securely attached to the equipment or wall in the immediate area.

TEST & BALANCE SCOPE OF WORK

- test chillers
- test primary chilled water pumps
- test existing or new secondary chilled water pumps

Testing and balancing shall not begin until the system has been completed and in full working order. The mechanical contractor shall be responsible for putting all equipment into full operation and shall continue the operation of same during each working day of testing and balancing.

The Contractor shall furnish the Test and Balance Subcontractor with a full set of Drawings and Specification, applicable submittal data, and manufacturer's performance data.

Mark equipment settings, including balance valve positions, and similar controls and devices, to show final settings. Mark with paint or other suitable, permanent identification materials.

PART 2 - PRODUCTS: (NOT APPLICABLE)

PART 3 - EXECUTION:

GENERAL

All systems shall be tested, adjusted and balanced in accordance with applicable NEBB or AABC standards and the TAB agenda.

All instruments will have been calibrated recently and verification of calibration shall be provided with submittal data.

The Agenda shall also include the following detailed narrative procedures, system diagrams and forms for test results.

Specific standard procedures required and proposed for each system. Additional procedures for variable flow systems shall be developed by the TAB Agency and included for review and approval.

System diagrams for each air and water system. Diagrams may be single line. In addition to the information recorded for standard AABC or NEBB procedures, report the following information:

Water systems: Record system fill pressures and expansion tank (level, pressure, temperature) conditions. Record shut-off heads for all pumps and compare with pump curves to determine if correct pump impellers have been installed.

Report Format: Report forms shall be those standard forms prepared by the referenced standard for each respective item and system to be tested, adjusted, and balanced. Bind report forms complete with schematic systems diagrams and other data in reinforced, vinyl, three-ring binders.

General Information and Summary: Inside cover sheet to identify testing, adjusting, and balancing agency, Contractor, Owner, Architect, Engineer, and Project. Include addresses, and contact names and telephone numbers. Also include a certification sheet containing the seal and name, address, telephone number, and signature of the Certified Test and Balance Engineer. Include in this division a listing of the instruments used for the procedures along with the proof of calibration.

Calibration Reports: Submit proof that all required instrumentation has been calibrated to tolerances specified in the referenced standards, within a period of six months prior to starting the project.

HYDRONIC BALANCE:

Verify that strainers have been removed and cleaned.

Check expansion tanks and verify that the system is not air bound and is completely filled with water.

Check air vents at coils and high points of the water system and verify all are installed and operating freely.

Hydronic balance includes performance readings on all pumps, chillers, and flow measuring devices. Adjust pump flows to actual system heads by adjustment of balancing valves. Flow measuring devices take precedence over pump head readings.

Report pressure drop readings across all major system components both for flow determination and deviations between actual and design values.

Chillers:

a) With each chiller operating independently test the following parameters
   1) Designation
   2) Location
   3) Manufacturer
   4) Capacity
   5) Model
   6) Evaporator entering water temperature, design and actual
   7) Evaporator leaving water temperature, design and actual
   8) Evaporator pressure drop, design and actual
   9) Evaporator water flow rate, design and actual

b) With Chillers 1 & 2 operating retest steps 6-9

c) With Chillers 1, 2 & 3 operating retest steps 6-9

Pump Data (for each pump):

a) With each chiller operating independently test the following parameters
   1) Designation
   2) Location
   3) Manufacturer
   4) Size/Model
   5) Impeller diameter
   6) Service
   7) Design flow rate, pressure drop
   8) Actual flow rate, pressure drop
   9) Discharge pressure
   10) Suction pressure
   11) Total operating head pressure
   12) Shut-off, discharge and suction pressures
   13) Shut-off, total head pressure

b) With Chiller 1 & 2 operating retest steps 8-13

c) With Chiller 1, 2 &3 operating retest steps 8-13

EQUIPMENT ELECTRICAL OPERATION:

Measure applied voltage and running load current for all chillers and pump motors described above.

Pump Motors(for each pump):

a) With each chiller operating independently test the following parameters
   1) Manufacturer
   2) HP
   3) Frame
   4) Phase, voltage, amperage; nameplate and actual
   5) RPM
   6) Service factor
   7) Starter size, rating, heater elements

b) With Chiller 1 & 2 operating retest step 4

c) With Chiller 1, 2 & 3 operating retest step 4

END OF SECTION

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SECTION 16010 ELECTRICAL - GENERAL PROVISIONS

PART 1 - GENERAL

APPLICATION

The work described hereunder shall be installed subject to the Contractual Conditions for the entire Specifications.

These provisions apply to all sections of Division 16 of this project except as specified otherwise in each individual section.

CORRELATION

This Section of the Specifications and its accompanying Drawings are made separate for the convenience of the General Contractor / Construction Manager in preparing his bid and in no way relieves the General Contractor / Construction Manager of his responsibility to correlate the work under this Section with that of all other trades as regards the items to be furnished by various Subcontractors, the exact location of all equipment and materials and the necessity of planning the work of all trades to avoid interference.

DESCRIPTION OF WORK

Furnish all labor, materials, equipment and incidentals required to complete all electrical work as specified in this Division and as shown on the Contract Drawings. Division 16 work shall include the installation of a complete and properly operating electrical system. This system required consists basically of, and is not limited to, the following:

Extend the distribution system for lighting and power including the necessary feeders, branch circuits, installation of and connection to lighting fixtures, devices, panelboards, transformers, switches, and all other equipment shown or specified, and the connection to machines, motors, controls and other power loads furnished under separate divisions.

Extend the building ground system and provide special grounds as indicated.

Connect all control devices as indicated, including all line voltage connections to equipment provided under other sections of the Specification or by other trades.

Furnish and install all necessary access panels or pulling structures for work performed under this section.

Refer to other Divisions of this specification for electrical requirements of factory installed motors, controllers, power supplies, etc. Electrical connections to equipment furnished as specified in other sections of these Specifications or shown on other than the Electrical Drawings shall be governed by this Division of the Specifications.

The bidder shall inspect the present jobsite conditions before preparing his bid. The submission of a bid will be considered evidence that such a visit and inspection was performed by the bidder and that he takes full responsibility for all factors governing his work.

The electrical work shall be complete, fully operational, and suitable in every way for the service required. Drawings are generally diagrammatic in nature and do not show all details, devices and incidental materials necessary to accomplish their intent. Therefore, it shall be understood that such devices and incidental materials required to accomplish the intent shall be furnished at no cost to the Owner.

RELATED WORK

Drawings and general provisions of Contract, including General Conditions, Supplementary General Conditions, and Special Conditions sections apply to work specified in Division 16.

The Contractor shall be aware that other divisions of these Specifications may apply to related work required to perform Division 16 requirements. All related work shall be performed in accordance with those divisions.

CONFORMANCE

If the Contractor takes no exceptions to these Specifications in the Submitted Bid, the Contractor will be held totally responsible for failure to comply.

Any exception to the Specification shall reference the affected paragraph(s), subject(s), and list benefit to the Owner.

The Owner reserves the right to have the Contractor replace installed material or equipment which does not comply with these Specifications at the Contractor's expense.

SUBMITTALS

Obtain approval before procurement, fabrication, or delivery of items to the job site. Submit manufacturers' data on the equipment listed below and as directed in other Sections of Division 16. Follow the procedures required in Division 1 of this

specification. Data shall be in the form of manufacturer's descriptive data sheets and engineering drawings and will be reviewed by the Architect/Engineer before materials and equipment are delivered to the work site. Review of the submittal by the Architect/Engineer is to check for general conformance to the design intent and will not relieve the Contractor of the responsibility for the correctness of all dimensions, conformance and the proper fitting of all parts of the work.

Panelboards and Circuit Breakers
Disconnect Switches
Plugs and Receptacles
Motor Starters
Surface Mounted Raceway and Installation Drawings
Lighting Fixtures
Lamps and Ballasts
Lighting Controls and Installation Drawings*

Submit manufacturers' names and catalog numbers for the following materials:

Conduit, Fittings, and Couplings
Boxes and Fittings, including boxes for direct burial
600 Volt Wire and Cables
Grounding Equipment

The Contractor shall thoroughly check the submittal for accuracy and compliance with the contract requirements. Shop drawings and data sheets shall bear the date checked and shall be accompanied by the Contractor's statement that they have been checked for conformity to the Specifications and Drawings. Submittals not so checked and noted will be returned without review.

Deliver the entire electrical submittal to the Architect/Engineer complete and in one package. An incomplete submittal will be returned to the Contractor without review.

EQUIPMENT SUBSTITUTIONS

Substitutions that do not increase installation value will not be accepted.

Contractor proposed substitutions may result in necessary changes to the construction documents. Coordination effort due to Contractor proposed substitutions shall be the complete responsibility of the Contractor. All potential conflicts are to be addressed. The Contractor shall also be responsible for any work of any other trades made necessary by the substitution. All potential conflicts with other trades are to be addressed.

The Engineer's review of the proposed substitutions and coordination documents is for the benefit of the Owner and not the Contractor and does not relieve the

Contractor of responsibility for making any corrections necessary to insure the Owner receives full benefit of the original design intent.

Detailed coordination documents shall be provided for any equipment that, in the opinion of the Architect/Engineer, materially differs from the design documents. This difference includes but is not limited to any equipment having:

- access requirements that differ from the design / specification
- operating characteristics that differ from the design / specification
- footprints or elevations that differ from the design / specification
- connection requirements or locations that differ from the design / specification
- venting or combustion air requirements that differ from the design / specification
- electrical characteristics that differ from the design / specification
- control requirements that differ from the design / specification
- hydronic characteristics that differ from the design / specification
- plumbing requirements that differ from the design / specification

Documentation shall include a detailed listing of all differences from the design / specification. Also included will be a detailed explanation as to why these differences should be considered equal or an improvement.

Any physical differences shall be coordinated with drawings. All Coordination Drawings shall be produced by a competent drafts person and shall be equivalent in quality, detail, and scope to the Construction Drawings.

Acceptance of the substitution as an equal will be the sole descretion of the Architect/Engineer. Items of necessary coordination or review omitted from the documentation shall be grounds for rejection of the substitution.

No cost increase to the Owner for any changes due to coordination will be considered.

CODES, INSPECTION AND FEES

Comply with the indicated edition of the following codes and ordinances. Where specific edition is not indicated, comply with the latest published edition.

NFPA 70 - 2011; The National Electrical Code
NFPA 90A – 2012; Standard for the Installation of Air Conditioning and Ventilating Systems
NFPA 101 – 2012; The Life Safety Code
NFPA 111 – 201; Standard on Stored Electrical Energy Emergency and Standby Power Systems
UL Standard 467; Electrical Grounding and Bonding Equipment
UL Standard 506; Enclosures

UL Standard 869; Electrical Service Equipment
UL Standard 1008; Automatic Transfer Switches
ANSI C2 – 1994 - The National Electrical Safety Code
ANSI/NEMA MG 1 - Motors and Generators
ANSI/NEMA MG 2 - "Safety and Use of Electrical Motors and Generators"
IEEE Standard 446 - "IEEE Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications".
NEMA ICS 1 and 2, and IEEE 472
FBC 2010; The Florida Building Code with Supplements
FBC 2010; The Florida Fire Prevention Code
FBC 2010; The Florida Mechanical Code
FBC 2010; The Florida Plumbing Code
Serving Utility Company Policies
State and Municipal Codes and Requirements

Obtain all permits required. Contractor shall pay all fees for permits and inspections.

COMPLIANCE AND REVIEW

Within two weeks of the awarding of the contract, and before any work is commenced, the Contractor shall meet with all legal authorities having jurisdiction, review all materials and details of this project, and agree on any required revisions. A letter shall be forwarded to the Architect/Engineer listing the names, dates and place of such review and the revisions required. A copy of the letter shall also be sent to the reviewing authority.

The Contractor shall also meet with each serving utility and repeat the above procedure. A letter certifying each meeting shall also be written with the information as described above.

TEMPORARY LIGHTING AND POWER

Provide temporary lighting and power during construction. The Contractor may utilize existing building distribution power for temporary and construction power. Temporary power shall be 120/240 volt, single phase.

The Contractor shall pay all service disconnect, re-connect and lineman fees for all service disruptions required to accomplish the work.

The Contractor is responsible for all temporary construction power required during required utility outages.

Temporary wiring shall be done in a safe and neat manner. See Article 590 of the NEC.

Provide a adequate source of artificial lighting where may be needed by other trades. This includes supplemental receptacles for droplights as required.

Provide 30 amp, 120/240 volt single phase power points throughout the construction area such that a power point will be within fifty feet of where any saws, drills, or other electrical tool is being used. Each power point shall have a disconnecting safety switch.

Provide 20 amp receptacles with ground fault interrupting circuitry. Outdoor or otherwise exposed receptacles shall have weatherproof covers. Provide any necessary special outlets required.

Size temporary power conductors so that voltage drop is kept below 5% at maximum designed load at the delivery point.

RECORD DOCUMENTS

Prepare record documents in accordance with Division 1 requirements. Record documents shall be complete and accurate and clearly show deviations to the Contract Drawings. Additionally, indicate major raceway sizes and routings, locations of all control devices, all equipment and locations to scale, and fuse and circuit breaker ratings and arrangements.

Prepare bound sets of equipment Operation and Maintenance Instructions. These instructions shall include the name and location of the system, the name and telephone number of the Contractor, and all subcontractors installing the system or equipment, and the name and telephone number of each local manufacturer's representative for the system or equipment.

Furnish bound copies of all test results required in other sections of this division.

GUARANTEES

Equipment (excluding lamps): one (1) year from final acceptance by the Owner. Materials and labor: one (1) year from final acceptance by the Owner.

All equipment shall be warranted to be free from defects in workmanship, design and materials. If any part of the equipment should fail during the warranty period, it shall be replaced and the unit(s) restored to service at no expense to the Owner.

In addition to the guarantee of equipment by the manufacturer the Contractor shall also guarantee such equipment for a period of one (1) year from final acceptance

by the Owner. The Contractor's one (1) year guarantee shall be for equipment, materials, and labor.

The manufacturer's warranty period shall run concurrently with the Contractor's warranty period. No exception to this provision will be allowed.

Additional guarantee requirements specific to certain parts or assemblies or installations may be in the General and Special Conditions, or other Sections of these Specifications.

PART 2 - PRODUCTS

EQUIPMENT AND MATERIALS

Furnish materials or equipment specified by manufacturers named.

Materials furnished shall be new, undamaged and packed in the original manufacturer's packing.

All equipment and apparatus shall bear the seal of approval of the Underwriter's Laboratory where testing and listing performance criteria has been established for like items.

Protect equipment and materials from mechanical and water damage during construction. Suitable storage facilities shall be provided. Equipment shall not be stored out-of-doors except as follows:

> Concrete items, plastic conduit if protected from sunlight, rigid metal conduit if protected from water and debris, padmounted equipment for outdoor installation if maintained in a normal weathertight condition, ground rods, and large spools of cables with ends properly sealed. In no case will materials be stored directly on the ground. Provide suitable timbers or billets on which items will be stored out of direct contact with the earth.

All items to be installed shall be free of rust and dirt. Damaged materials and equipment shall be replaced by the Contractor at no cost to the Owner.

All electrical panels, enclosures, raceways, conduit, and boxes shall be fabricated of metal unless indicated otherwise. Temporary and direct buried items are the only exception to this requirement.

EQUIPMENT AND MATERIALS STANDARDS

Design and fabrication of electrical equipment and materials:

The American National Standards Institute (ANSI)
The American Society of Mechanical Engineers (ASME)
The American Society for Testing and Materials (ASTM)
The Institute of Electrical and Electronic Engineers (IEEE)
The National Electrical Manufacturers Association (NEMA)
The Occupational Safety and Health Administration (OSHA)
The Underwriters Laboratories (UL)
The National Fire Protection Association (NFPA)

Comply with the latest edition and revisions of these codes and standards.

EQUIPMENT RATINGS

Horsepower and wattages of equipment shown on the Drawings are estimated and comply with a certain basis of design. It is the Contractor's responsibility to coordinate with, and furnish proper connections to equipment substituted and accepted as equivalent to the basis of design.

Conduit, wire, disconnects, fuses, and circuit breakers shall be sized to suit the horsepower and wattage of equipment actually furnished. However, conduit, boxes, wire or disconnects shall not be sized smaller than shown on the Drawings.

PART 3 - EXECUTION

QUALITY ASSURANCE

Installer's Qualifications: At least five years of successful installation experience on projects with electrical work similar to that required for this project.

Manufacturer's Qualifications: Manufacturers regularly engaged in the manufacture of electrical components and equipment of the types and sizes required, whose products have been in satisfactory use in similar service for not less than five years.

Electrical work shall be performed by experienced persons skilled in the trade.

Work shall be supervised by a licensed journeyman or master electrician who shall be on the job site at all times while work is in progress.

Work shall be done neatly and in keeping with good practice and conventions of the trade. The electrical installation shall be of high quality, and of the performance level associated with top level commercial electrical installations as determined by the Architect/Engineer and the National Electrical Code.

IDENTIFICATION

Provide laminated plastic nameplates for each panelboard, automatic transfer switch, safety disconnect, equipment enclosure and all other major pieces of equipment installed or modified as part of this contract.

Furnish all starters, disconnect switches and control panels with engraved name plates identifying the equipment served. Attach nameplates to equipment, aligned with structural features of equipment, with two pressure pins or #4 stainless steel screws, nuts, and lockwashers.

Identification of flush mounted panelboards and other cabinets shall be on the inside of the cabinet only.

Panelboards shall have typewritten directories with all loads thoroughly described for each circuit. Update existing panelboards and their directories to reflect new work.

CLEANING AND PAINTING

Clean all equipment and boxes thoroughly inside and outside at the completion of installation. Do not leave dirt and debris inside panelboard and equipment cabinets, device and junction boxes, etc.

All painting shall be done according to the Finishes Section of these specifications.

Paint all exposed conduit and wiremold installed on painted surfaces to match surrounding surface. Paint exposed threads on conduits and touch up all scratches in galvanized pipe and fittings with a high quality cold galvanizing compound.

Touchup scratched or marred surfaces of lighting fixtures, panelboards, motor control centers, switchboards, etc. with paint furnished by the equipment manufacturer specifically for the purpose.

Plywood backboards shall be of fire retardant plywood, or painted with two coats of fire-resistive finish.

EXCAVATION, TRENCHING AND BACKFILLING

Perform all excavation and trenching to install raceways indicated on the drawings.

No tunneling shall be allowed unless written permission is received by the Architect/Engineer.

Excavated material not suitable for backfill shall be removed from the job site.

Insure that the bottom of trenches are uniform, without large rocks or lumps of dirt which could damage the raceway or conductors.

Backfill with material that will compact readily. Compact backfill material from bottom of excavation up, to within 2” of surrounding undisturbed material.

Cover shall not be less than surrounding grade and no greater than 2" above surrounding grade.

All trenching in and around rooted areas shall be by hand. Contractor shall take all steps necessary to protect existing root growth from damage by trenching or digging. Trenching in proximity to trees and other growth shall be directed radially away from the main trunk so as not to cut across major roots.

All trenching routing shall be coordinated with and approved by the Architect/Engineer before digging. Contractor shall contact the Architect/Engineer twenty four hours before work is scheduled to begin. Conduit routing shall be clearly laid out with paint or staking before inspection takes place. The Architect/Engineer reserves the right to specify final routing before digging begins, or at any point during the operation.

TESTS

Contractor shall test all wiring for shorts and all equipment for proper grounding before energizing. Equipment shall be thoroughly checked and adjusted for proper operation. Check motors for proper rotation before energizing and adjust if necessary.

END OF SECTION

SECTION 16100 BASIC MATERIALS AND METHODS

PART 1 - GENERAL

SCOPE OF WORK

Furnish all labor, materials and equipment and incidentals required to construct and install the complete electrical systems as indicated on the Drawings and as specified in this Section.

STANDARD OF MATERIALS

All materials, equipment and apparatus covered by this specification shall be new, of current manufacture and shall bear the seal of approval of the Underwriters' Laboratories.

All equipment and materials shall have ratings established by a recognized independent agency or laboratory. The Contractor shall apply the items used on this project within the ratings and subject to any stipulations or exceptions established by the independent agency or laboratory.

All conduits and raceways, wire, devices, panelboards, switches, etc. of a given type shall be the product of one manufacturer.

SUBMITTALS

Manufacturer's data and shop drawings for all components, fixtures, assemblies and accessories indicated in this Division. Submit in accordance with Division 1.

PART 2 - PRODUCTS

RIGID CONDUIT, TUBING AND FITTINGS

Rigid steel conduit: zinc coated, threaded type conforming to the requirements of UL 6 and ANSI C80.1 standards. Zinc coating shall be applied to both inner and outer surfaces.

Intermediate metal conduit: hot-dipped galvanized, threaded type conforming to the requirements of UL 1242 and ANSI C80.6 standards.

A fitted thread protector shall protect threaded ends from damage during shipment and handling.

Fittings for rigid steel and IMC conduit: zinc coated, threaded type, conforming to Federal Specification W-F-408.

Electrical Metallic Tubing (EMT): UL 797 and ANSI C80.3 standards.

Fittings for electrical metallic tubing: Federal Specification W-F-408. Steel compression type, galvanized or cadmium plated, and suitable for location of installation. Conduit bushings shall be metallic with insulated throats. Insulating grounding type bushings shall be provided where required under "Grounding". EMT connectors shall be similar to T&B "Insuline" with completely insulated throats. Field applied insulated throats are not acceptable.

Rigid aluminum conduit: UL 6 and ANSI C80.5 standards.

Couplings, fittings, pipe straps and spacers used with aluminum conduit shall be fabricated of aluminum.

Fittings for rigid aluminum conduit: threaded type, fabricated of aluminum.

Plastic conduit for direct burial: UL labeled Schedule 40 PVC manufactured to NEMA TC-2 specifications, and UL 651 specifications.

Plastic interduct for installation in PVC conduits: UL labeled and listed for installation of inside/outside communication cable.

Couplings, fittings, pipe straps and spacers used with rigid plastic conduit shall be fabricated of plastic.

Fittings for plastic conduit: manufactured to NEMA TC-3 specifications.

Acceptable Metal Conduit and Tubing Manufacturers:

EMT: Allied Tube & Conduit Co.
Wheatland Tube Co.
Triangle PWC, Inc.

Fittings: Steel City
Thomas & Betts (T&B)
Raco Inc.

FLEXIBLE METAL CONDUIT, COUPLINGS AND FITTINGS

Flexible metal conduit for dry interior applications: Federal Specification WW-C-566 and UL 1, continuous, spiral wound galvanized steel type.

Fittings (connectors) for flexible metal conduit: UL E 23018. Squeeze Type malleable iron zinc plated.

Flexible metal conduit for damp or exterior applications: liquid tight, UL listed, spiral wound galvanized steel with PVC outer jacket.

Fittings for liquid tight conduit: Federal Specification W-F-406. Provide cadmium plated, malleable iron fittings with compression type steel ferrule and gasket sealing rings and insulated throats.

Acceptable Metal Conduit and Fittings Manufacturers:

FMC:	Alflex Corp. American Flexible Conduit Co. Anaconda Metal Hose, ANAMET Inc.
FMC Fittings:	Steel City Thomas & Betts (T&B) Raco Inc.
Wall and Floor Seals:	O-Z/Gedney Co. Spring City Electrical Mfg. Co. Chase Technology Corp.

CONDUIT MOUNTING EQUIPMENT

Hangers, rods, backplates, beam clamps etc. shall be hot-dipped galvanized iron or steel. They shall be as manufactured by the Appleton Electric Co., Thomas and Betts Co., Unistrut Corp., or approved equal.

JUNCTION BOXES

Sheet Steel Outlet Boxes: conform to UL 514A, “Metallic Outlet Boxes, Electrical”, UL 514B, “Fittings for Conduit and Outlet Boxes, Covers, and Box Supports”, and NEMA OS1, “Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports”.

Sheet Steel: Flat-rolled, code gauge galvanized steel.

Acceptable Manufacturers: Sheet-steel boxes shall be manufactured by RACO, Steel City or equal.

All junction boxes and pull boxes shall be sized per NEC requirements and be of the proper NEMA classification for the locations where they are installed. Where boxes occur above other than lift-out ceilings, access panels must be provided.

Wet location covers shall meet NEC wet location requirements (shall comply with NEC 2011 Article 406.9 (B)(1)). Covers shall be “in-use” type and shall mount vertically or horizontally and be of gasketed heavy-duty polycarbonate construction with clear cover with lockable hasp for 1/8" shank lock.

OUTLET BOXES

Switch, receptacle and wall or ceiling mounted junction boxes shall be the 4" X 2 1/8" square type. Tile, dry wall, or flat cover plates for one or two devices shall be furnished for each box as required.

LIGHTING FIXTURE BOXES

Lighting fixture boxes shall be the 4" X 1 1/2" octagonal type.

OTHER SYSTEM OUTLETS

Wall outlets shall in general consist of four inch (4") square boxes with single gang switch ring. Conduits shall be supplied turned out of wall above ceiling assembly. Conduits shall be ¾” or larger, with insulated bushing installed on all bare ends.

Install finished blank plates on all unused openings.

OUTDOOR BOXES

Cast Aluminum Boxes: exposed, exterior locations; copper free aluminum, threaded raceway entries, and features and accessories suitable for each location including mounting ears, threaded screw holes for devices, and closure plugs.

Boxes shall have a rear opening in addition to necessary top and bottom openings. Boxes shall be provided complete with a minimum of two closure plugs and self-threading ground screw. Boxes shall have a thermoset, baked enamel silver gray finish. Weatherproof cover plates for one or two devices shall be furnished for each box as required.

Covers shall be of heavy duty die-cast construction. Mounting screws shall be stainless steel. Covers shall have a thermoset, baked enamel silver gray finish and be equipped with a sealing gasket. Covers shall be equipped with a hasp-type locking tab.

Nonmetallic boxes shall be thermoplastic or polyester fiberglass types as manufactured by Carlon or Pass & Seymour. Exterior pulls and handholes shall be glass reinforced concrete, Class 170 or greater. All hardware for exterior service shall be 300 series stainless steel.

LOCATION OF OUTLETS

The approximate locations of outlets, etc. are shown on the drawings. The exact locations shall be determined at the building.

It is the responsibility of the Contractor to note the locations and heights of cabinets, counters, shelving units, etc. before the installation of outlets.

WIREWAY

16 gauge galvanized steel with polyester powder coat finish over a phosphate preparation. UL listed as steel enclosed wireway and auxiliary gutter. Conform to NEMA 3R for outdoor locations.

Size: nominal 8" by 8" square cross section, or as required for the purpose.

Fittings and Accessories: Male and female lengths shall be factory constructed. L's, T's, sweeps and other connectors as required. Junction boxes shall be standard and furnished where required or directed.

CONDUIT BODIES

Conduit bodies shall be constructed of galvanized or cadmium plated malleable iron or copper-free aluminum. Galvanized steel or aluminum covers and gaskets shall be supplied.

LB's 3" and greater shall be mogul type with domed covers.

HOUSEKEEPING PADS

Housekeeping pads shall be provided for all floor-mounted equipment such as switchgear, motor control centers, transformers, etc. Pads shall be made of concrete extending 3 to 4 inches vertically above finished floor and extending 6 inches horizontally around equipment.

CABLE TRAY

Provide ventilated trough type tray for suspension of cabling as indicated on the plans. Ventilated bottom pan shall be corrugated with solid panels spaced 6 inches on center for cable support and shall be welded to side rails.

Cable tray shall be supplied in lengths of 12' or 24' and shall have a minimum loading width of 24". Tray shall be 4" in depth. Construction shall be aluminum alloy. Provide appropriate 90 degree horizontal bend and 90 degree outside

vertical bend as shown on the drawings. Provide factory fittings, hardware connectors and accessories as required for a complete and satisfactory installation.

Loading: Tray shall support 100 lbs/ft with 1.5 safety factor over 12 foot span.

Installation: suspend cable tray from concrete roof system using acceptable anchors and threaded rods. Rods shall not be less than 3/8" diameter. Suspend cable tray 5 foot on center or as required to meet manufacturer's loading performance.

Cable drop-outs shall be through bushed openings.

Acceptable manufacturer: B-Line Systems, Atlas Manufacturing, or equivalent.

CONDUCTORS

Compliance: Provide wires, cables and connectors that comply with the following standards as applicable:

UL Standard 83	Thermoplastic Insulated Wires and Cables
UL Standard 486A	Wire Connectors and Soldering Lugs for Use with Copper Conductors
UL Standard 854	Service Entrance Cable
NEMA/ICEA WC-5	Thermoplastic Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
NEMA/ICEA WC-8	Ethylene Propylene Rubber Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
IEEE Standard 82	Test procedures for Impulse Voltage Tests on Insulated Conductors

Wire and cable manufactured more than twelve months before delivery to the jobsite shall not be used.

All conductors shall be soft-drawn copper of not less than ninety-eight percent (98%) conductivity, with NEC Type THW, THHN, or THWN for No. 4 and smaller, and Type RHW, THW, or THWN for No. 2 and larger, 600 volt insulation.

Jackets: Factory applied nylon or PVC external jacketed wires and cables for installation in raceways and where indicated.

Color coding of all ungrounded service, feeder, and branch circuits conductors shall be required according to the following convention:

120/240 Volt, 1 phase: black and red

120/208 Volt, 3 phase: black, red, and blue
277/480 Volt, 3 phase: brown, orange, and yellow

Ground wires shall be green and neutrals shall be white. Isolated grounding conductors shall be green with yellow stripe or green with applied yellow tape to indicate isolated ground. Green and white shall be used for these purposes only. Where grounded conductors of different systems are installed in the same raceway, box, auxiliary gutter, or other type of enclosure, each grounded conductor shall be individually identified by system. Additional grounded conductors shall be white with a readily distinguishable colored stripe, other than green, running along the insulation.

Conductors No. 12 AWG through No. 10 AWG may be solid or stranded, and No. 8 AWG and larger shall be stranded. No conductors smaller than No. 12 AWG shall be used except as otherwise noted.

Control conductors shall be No. 14 AWG Type TW, stranded unless indicated otherwise.

Multi-conductor control cable shall be stranded copper, 600 volt polyvinyl chloride insulated and jacketed Type PNR.

Conductors for installation in cable tray shall be specifically approved for installation in cable trays per Article 336 of the NEC.

Acceptable manufacturers: Anaconda Wire and Cable Co., General Electric Co., Okonite Co., Southwire Co., or Rome Cable Co.

CABLES AND CABLE ASSEMBLIES

Armored and metal sheathed cable: Federal Specification J-C-30B, UL 4, 83, 1479 and 1581.

Type AC metal sheathed cable shall consist of a factory assembly of solid copper conductors, Type THHN insulated material and paper or other suitable filler and overwrap sheathed in a galvanized interlocking steel strip.

Type AC cable shall be used in sizes #12 and #10 phase conductors only. Cables consisting of phase conductors larger than #10 AWG are not acceptable. Grounding: Cables shall have a separate and dedicated full size (identical to phase conductor) grounding conductor. In addition, the outer jacket shall incorporate a 16AWG integral bond wire, formed and electrically continuous with the jacket.

Provide armored cables in conductor configurations as appropriate.

Cables with aluminum armor are not acceptable.

Couplings, fittings, cable straps and connectors used with cable assemblies shall be fabricated of steel and shall be UL listed.

Cables and cable assemblies for variable frequency drive (VFD) application shall conform to the following: 4-conductor, (3) stranded tinned copper ungrounded conductors plus (1) grounding conductor with cross linked polyethylene XLP insulation. Overall metal foil shielding plus tinned copper braided shielding not less than 85 per cent coverage. Tinned copper drain wire, polyvinyl chloride PVC jacket. Grounding wire shall be not less than #10AWG.

Acceptable manufacturer: Belden Type 2950x, rating as noted on plans.

CABLE AND WIRE SPLICES

General: the materials shall be compatible with the conductors, insulations and protective jackets of the respective cables and wires. Use connectors with ampacity and temperature ratings equal to or greater than those of the wires upon which used.

In manholes and other locations where moisture might be present, the splice shall be watertight and submersible.

Connectors: UL 486A. Aluminum and aluminum alloy fittings will not be accepted. Connectors shall be plated with tin or tin alloy.

Conductor Sizes No. 6 AWG and Larger: Splices in conductors shall be made with indenter, crimp connectors and compression tools or with bolted clamp type connectors to insure a satisfactory mechanical and electrical joint.

WIRE AND CABLE MARKERS

Wire and cable markers shall be "Omni-Grip" as manufactured by Brady Worldwide, Inc., or equal.

Wire and cables with diameters exceeding the capacity of the “Omni-Grip” shall be marked with pre-printed, self-adhesive vinyl tapes as manufactured by Brady Worldwide, Inc., 3M Co., or equal.

RECEPTACLES

Receptacles shall be furnished and installed where shown on the drawings and shall conform to the following requirements:

Grounding type duplex receptacle: rated 20 amperes, 125 volt, 2 wire, 3 pole with grounded shunt (yoke permanently grounded to third clip), NEMA Configuration No. 5-20R, and conforming to Federal Specification W-C-596F (submit proof of compliance).

All receptacles listed on the drawings shall be specification grade receptacles.

All exterior devices shall be designed for the application and shall be installed in a waterproof enclosure with proper cover.

Acceptable manufacturer: Eagle, GE, Hubbell, Leviton or Pass and Seymour.

SWITCHES

Flush, enclosed type, specification grade, rated at 20 amperes, 120/277 volts, alternating current only, quiet operation, and shall comply with Federal Specification W-S-896F (submit proof of compliance). Switch housing shall be color coded for current rating.

Acceptable manufacturer: Eagle, GE, Hubbell, Leviton or Pass and Seymour.

Motor switches with inherent thermal overload protection shall be Square D, Type F for flush or surface mounting as required by the location of the unit. Units shall be furnished with pilot lights as indicated.

DEVICE PLATES

All plates for switch, receptacles and telephone outlets located on finished walls shall be UL listed stainless steel with the number of gangs required for the application. All plates for outlets located on unfinished walls or on condulet type fittings shall be zinc coated sheet metal with rounded or beveled edges.

Weatherproof plates shall be of stainless steel, gasketed, sized with twin covers for duplex receptacles, and weatherproof switch for switch plates.

Device plates shall be factory engraved where indicated on the drawings. Letters shall be black filled.

RELAYS

Relays shall be electrically held and operated. Relays shall be mounted in a NEMA-1 enclosure. The contactors shall be capable of switching inductive and resistive loads.

CIRCUIT BREAKERS - SERVICE ENTRANCE PANELBOARD

Provide appropriate overcurrent protection as indicated on the drawings, compatible in every way with the existing factory assembled, dead-front safety constructed service entrance circuit breaker type panelboard. Select components that are fabricated by same manufacturer as panelboards.

Branch circuit protective devices shall be molded case circuit breakers unless noted otherwise on the drawings. Breakers shall indicate trip rating on the operating handle or other portion normally visible.

Group mounted molded case circuit breakers shall have solid state trips when indicated, and for all units 600 amperes nominal and larger. The solid state trips will consist of: adjustable current, adjustable long time pick-up and delay, adjustable short time pick-up and delay, adjustable instantaneous with maximum setting of 15X, and adjustable I^2t ramp (in or out).

Circuit breakers installed in existing panels shall have an A.I.C. rating equal to that of the panel in which they are installed.

METERING AND PROTECTIVE SYSTEM

Where indicated on the drawings provide a digital line metering and protection system having the features and functions specified below. The device shall consist of a single microprocessor based unit capable of monitoring and displaying the functions listed below with the accuracy indicated; the device shall auto-range between units, Kilo-units, and Mega-units. The device shall provide the adjustable protection functions indicated and capability to communicate via twisted pair network. The device shall be UL recognized, CSA certified and also meet ANSI Standard C37.90. Accuracy indicated shall be of the read or calculated value.

METERED VALUES (Accuracy)

AC Phase Amperages (1%)
AC Phase Voltage (1%)
Watts (2%)
Vars (2%)
Power Factor (4%)
Frequency (0.5%)
Watt-hours (2%)
Watt Demand (2%) with 30 minute interval

PROTECTIVE FUNCTIONS

Voltage Phase Loss (less than 50% rms)
Current Phase Loss (0.0625 largest phase)
Phase Voltage Unbalance (5 to 40% in 5% steps)
Phase Voltage Reversal
Overvoltage (105 to 140% in 5% steps)
Undervoltage (95 to 60% in 5% steps)
Time Delay for Overvoltage, Undervoltage, and phase unbalance (0 to 8 sec.)

Inputs: Input ranges of the device shall accommodate external current transformers with ranges from 100/5 through 5000/5 amperes. Provide three (3) external current transformers with rating as indicated on the drawings or sized for incoming service. Potential transformers shall be self-included and fused up to 600 volts. Control power shall be derived from the metered line.

Outputs: Outputs shall have separate Form C (NO/NC) trip and alarm contacts with ratings of 10 amperes at 115/240 volt AC or 30 volt DC resistive. In addition, provide a separate Form C (NO/NC) contact to provide a programmable kilowatt-hour pulse output.

Display Screen: the display face shall be membrane type and rated suitable for NEMA 3R and NEMA 12 mounting. The device shall have a durable 6 digit LED display screen. The display screen and LED's shall indicate both cause of trip and alarm conditions. The cause of a trip or alarm shall be indicated in the display window.

Data Communication: Provisions shall be made for an addressable communication card capable of transmitting all data, including trip data, over a compatible two-wire local area network to a central personal computer for storage and/or printout. The network shall also be capable of transmitting data in RS232 format via a translator module.

Operating and Construction Features: The device shall have an operating temperature range of 0 degrees C to 70 degrees C, and 0 to 95% relative humidity non-condensing.

The device shall allow the user to disable undesired values/functions and to later reactivate them if required. A neutral terminal shall be provided and wired for 4 wire, grounded systems. The 600 volt and below voltage power module shall be detachable from the chassis. Three (3) in-line fuses shall protect the device from current overloads.

In the event of a trip or alarm condition, a built-in reset button shall allow a manual reset of the device. The device shall also be capable of being remotely reset via its

communication port. The device shall have the capability for resetting both watt-hours and watt demand.

Control power shall be drawn from the monitored incoming AC line terminal connections. No separate AC supply input shall be required.

The device shall have non-volatile memory and not require battery backup; in the event of a power failure, the device shall retain all preset parameters, accumulated watt-hours and watt demand. Data at time of power loss, and cause of trip shall be stored.

SAFETY DISCONNECT SWITCHES

Compliance: NFPA 70 National Electrical Code, UL 98, “Enclosed and Dead Front Switches”, NEMA Publication KS1, “Enclosed Switches”, and NEMA KS 250, “Enclosures for Electrical Equipment (1000 Volts Maximum)”.

Safety switches shall be provided for all motors and equipment indicated or required by the National Electrical Code.

Safety switches shall be Type "HD" (heavy duty) unless noted otherwise, fused or non-fusible as indicated with number of poles as shown or required. Safety switches for equipment may be non-fused only if equipment is UL tested with circuit breaker protection.

Fuses: general use, dual element time-delay, current limiting. Manufactured by Bussman, Littlefuse, Edison, or equivalent.

Safety switches for indoor general purpose application shall be NEMA 1 and for exterior application shall be NEMA 3R.

Acceptable manufacturer: provide safety switches manufactured by Cutler-Hammer, Square D, or Siemens.

Construction: Gray baked enamel finish. NEMA 3R enclosures shall be manufactured from galvanized steel.

Ratings: Fusible disconnects shall be 240 or 600 volt rated depending on the service voltage.

Fusible disconnects shall be furnished with Class R fuses of the indicated ampere rating (up to 600 amps) and be equipped with rejection clips.

Fusible disconnects shall be UL listed for 200,000 RMS symmetrical ampere short circuit current when equipped with Class R or Class L fuses.

Lugs shall be front removable and be UL listed for aluminum or copper conductors at 60 degrees C or 75 degrees C.

Disconnect switches shall be horsepower rated.

GROUNDING AND BONDING

Conductors: type THW, THHN/THWN, or RHW to match power supply wiring.

Bonding Jumper Braid: copper braided tape, constructed of 30 gage bare copper wires and properly sized for application.

Flexible Jumper Strap: flexible flat conductor, 48,250 circular mils, with copper bolt hole ends sized for 3/8" diameter bolts.

Grounding Electrodes: solid steel core with a heavy uniform covering of electrolytic copper, 5/8" X 10'. Provide sectional rods if required. Threads, on sectional rods, shall be rolled (not cut) into the composite metal after the copper covering has been applied. Sectional rod couplings shall be of a corrosion resistant alloy.

Plate Electrodes: plate electrodes are not permitted. If sufficiently low resistance cannot be obtained with driven rods, the Architect shall be notified and will provide written instruction on grounding methodology.

SURGE PROTECTION DEVICES

General: provide hybrid high-energy filter units utilized for a facility wide protection system. Each unit in the system shall incorporate surge suppression and high frequency electrical line noise filtering. The system shall provide effective high-energy surge voltage suppression, surge current diversion, high frequency attenuation in all environments connected on the load side of the facility's main overcurrent device. Connection shall be parallel, located as shown on the Drawings. System shall feature fast response time and low clamping voltage with high current capability. SPD's shall be manufactured specifically for the intended service by a manufacturer having a least five years continuous experience designing and manufacturing power conditioning equipment of the type specified.

Manufacture units using redundant metal oxide varistors (MOV) installed in a parallel arrangement. Not less than two MOV's are required per mode regardless of suppression rating.

Standards: Surge Protective Devices shall comply with the following:

1. ANSI/IEEE Std C62.41.1™-2002, IEEE Guide on the Surge Environment in Low- Voltage (1000 V and Less) AC Power Circuits

2. ANSI/IEEE Std C62.41.2™-2002, IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and Less) AC Power Circuits
3. ANSI/IEEE Std C62.45™ -2002, IEEE Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage (1000 V and Less) AC Power Circuits
4. ANSI C84.1, American National Standard for Electric Power Systems and Equipment – Voltage Ratings (60 Hertz)
5. ANSI/IEEE Standard 1100-2005, IEEE Recommended Practice for Power and Grounding Electronic Equipment (Emerald Book) - Clause 8.6.1
6. National Fire Protection Association (NFPA) 70 (N.E.C.) – 2002 - Article 285
7. ANSI/UL Standards 1449-2006 Listed (UL 1449 Third Edition), UL 1283 Listed, CUL Listed & CE compliant "low-voltage directive."
8. IEEE Standard C62.72™ - 2007 – IEEE Guide for the Application of Surge-Protective Devices for Low-Voltage (1000 V or less) AC Power Circuits

The system and each SPD module shall be UL listed for the service and conditions indicated on the Drawings and specified here and shall be enclosed in NEMA 1, 12, or 3R enclosure.

Module shall be tested in accordance with ANSI/IEEE C62.11, C62.41 and C62.45 Categories A, B and C3. Current diverter modules shall withstand one thousand Category C3 surges per IEEE C62.45.

The system shall be protected from fault currents up to 100,000 amperes by suitable integral fuse network. All components shall be protected. High current capacitors shall effectively sink harmonic currents generated by line distortion and shall effectively attenuate line noise (RFI/EMI filtering).

The system shall be equipped with built-in monitoring with status indicators, audible alarm and test switch front panel mounted. Form C dry contacts shall be provided for remote annunciation.

Provide SPD unit with built-in surge counter to indicate and totalize all transients in all modes. Counter shall be LCD or LED and shall read in plain Arabic numbers.

Warranty: 5 years.

Service entrance locations: The nominal unit operating voltage shall be coordinated with the service voltage indicated. The maximum continuous operating voltage of all components utilized in the unit shall not be less than 115% of nominal operating voltage. Operating frequency shall be 60±3 hertz. Protection modes shall be line-to-line, line-to-neutral, line-to-ground and neutral-to-ground.

Maximum repetitive surge current capacity, in amps, shall not be less than as follows:

L-L	200,000
L-N	100,000
L-G	100,000
N-G	100,000

Minimum line noise attenuation above 10 MHz - 50 dB

Install protective module adjacent to main switchboard as indicated on the Drawings. Provide molded case circuit breaker as indicated for isolating module.

NAMEPLATES

Nameplates: 0.125 inch thick laminated plastic; white and black finish; rectangular shaped; minimum of 1.0 X 2.5 inches with 0.25 inch high block style engraved lettering.

PART 3 - EXECUTION

RACEWAY INSTALLATION

All interior and above grade exterior wiring shall be installed in a metal conduit and all embedded in concrete or below grade wiring shall be in PVC conduit unless indicated otherwise on the drawings.

Exterior low voltage (less than 50 volts) wiring may be installed in liquid tight, non-metallic flexible conduit ("Sealtite") where installation is above grade and not subject to damage.

No conduit smaller than 3/4 inch electrical trade size shall be used, nor shall any have more than three 90 degree bends in any one run. Pull boxes shall be provided as required or directed.

No wire shall be pulled until the conduit system is complete in all details.

The ends of all conduits shall be tightly plugged to exclude dust and moisture during construction.

Conduit support shall be spaced at intervals of 8 ft. or less, as required to obtain rigid construction.

Single conduits shall be supported by means of two-hole pipe clamps. Multiple runs of conduits shall be supported on trapeze type hangers with steel horizontal

members and threaded hanger rods. The rods shall be not less than 3/8 inch diameter. The channel shall be not less than 1 1/2" nominal size.

Conduit hangers shall be attached to structural steel by means of beam or channel clamps.

All conduits on exposed work shall be run at right angles to and parallel with the surrounding walls and shall conform to the form of the ceiling. No diagonal runs will be allowed. Bends in parallel conduit runs shall be concentric. All conduit shall be run straight and true.

Conduit terminating in sheet steel boxes shall have double locknuts and insulated bushings.

Flexible metal conduit shall be used for all motor terminations and other equipment where vibration is present. Flexible conduit length shall not exceed 1'-6" in length for this application.

Provide expansion coupling every 100 feet for long runs of conduit and at concrete expansion joints. Provide ground bonding jumpers around expansion couplings, used on metallic conduit, sized according to Table 250-122 of the NEC.

Transitions from below grade to above grade shall be with rigid galvanized steel long sweep nineties with a bituminous coating where in contact with earth or concrete. Area of transition shall not be subject to standing puddles of water.

Seal all wall penetrations to watertight condition. Finish as applicable to location.

Aluminum conduit shall not be embedded in concrete. Aluminum and steel conduit, when buried in soil, shall be treated with a protective coating of bitumastic or asphalt-base paint, or wrapped with plastic tape.

Approval by the Engineer shall be required to install conduit in structural members.

In general, the conduit installation shall follow the layout shown on the plans. This layout is, however, diagrammatic only, and where changes are necessary due to structural conditions, other apparatus or other causes, such changes shall be made without additional cost to the Owner. It is recognized that branch circuit routing shown on the drawings may not always be the most economical or the most feasible method. Routing may be changed by the Contractor subject to the following provisions:

Conduits shown routed overhead may not be installed in or below slabs or in walls.

Not more than three circuits may be installed in any one conduit. Care must be taken to provide the appropriate number of neutrals where multi-circuit branch circuits are installed. Do not install circuits of the same phase in the same raceway.

Exposed conduit will be permitted. Exposed conduit shall be run parallel with or at right angles to the building walls. Exposed conduit shall be installed neatly and in a workmanlike manner

All empty conduits shall be provided with a plastic pull wire rated for a minimum of 200 lbs.

Conduit stub-ups at panels shall be secured in place by use of Unistrut and clamps.

Conduit and tubing shall be kept at least twelve (12) inches from parallel runs of flues, steam pipes or hot water lines.

Where exposed connections to motors and equipment from overhead conduits are made without benefit of a wall for conduit mounting, the connection shall consist of vertical conduit (minimum size 1") from Type "LL", "LR" or “TT” Unilet to floor flange. Connection to equipment shall be with flexible liquid-tight from Type FDT boxes located in the vertical conduit.

Flexible conduit in all areas subject to moisture shall be liquid-tight flexible conduit.

All electrical connections to vibration isolated equipment shall be made with flexible conduit.

Connections to indoor dry type transformers shall be made with weatherproof flexible conduit.

All conduit entering the building shall be suitably sealed to prevent the entrance of moisture.

All conduit passing through a structural expansion joint shall be provided with a UL approved expansion joint fitting and bonded as required by the National Electrical Code.

Conduit run overhead shall be installed as close to the roof or floor deck structure as possible, or attached directly thereto. Conduits shall be supported from the structure.

Flexible metal conduit connections to light fixtures shall be at least 4 feet but not more than 6 feet in length per NEC 410-117(c).

Where raceways are indicated installed under slabs, they shall be placed not less than 2” below surface of prepared fill. Under no circumstances shall raceways be laid directly on vapor barrier or in or on reinforcing.

Raceways concealed in ground outside building shall be a minimum of 2 feet below grade and topped with a two inch concrete cap before backfilling. Install plastic warning tape 12 inches above raceway, buried in backfill.

RACEWAY INSTALLATION - CONDITIONS

Conduit raceways shall be installed as indicated herein. Where more than one type of raceway is listed under one condition, the Contractor may exercise his option of the raceway used. Conditions of raceway installation are as follows:

Exposed Raceway Below 8'-0" from Finish Floor and in Areas Subject to Moisture: Rigid galvanized steel conduit.

Raceway Concealed Overhead, or in Walls: Rigid galvanized steel conduit, intermediate metallic conduit or electrical metallic tubing (EMT).

Raceway Concealed in Ground Outside Building: Schedule 40 PVC or rigid steel. Rigid steel conduits installed below slab-on-grade or in the earth shall have a factory-applied PVC coating, two coats of a coal-tar system, or shall be field-wrapped with 0.010 inch thick pipe-wrapping plastic tape applied with a 50-percent overlay. Nineties and sweeps shall be rigid steel conduit (see below).

Final Raceway Connection to Recessed Fixtures in Accessible Locations: Flexible steel conduit maximum of 6'-0" long.

Final Raceway Connection to Pumps, Motors, Transformers, Etc.: Liquid-tight flexible steel conduit maximum of 1'-6" long.

Raceway That Extend Through the Slab or Above Finish Grade: 90° elbows, nipples and couplings of rigid galvanized steel or IMC shall be used where any raceway extends through the slab or above finished grade. In general PVC conduit shall not be allowed above finished slab inside the building or within 1 1/2' of finished grade outside the building.

WIRING

All conductors shall be carefully handled to avoid kinks or damage to insulation.

All wires, cables and each conductor of multi-conductor cables shall be uniquely identified at each end by color or with wire and cable markers. Lighting and receptacle wiring shall be distinctly differentiated and junction boxes marked.

Lubrications shall be used, if required, to facilitate wire pulling. Lubricants shall be UL approved for use with the insulation specified.

Neutral wires shall be pigtailed to receptacles so that a receptacle can be removed for replacement without the neutral connection to other receptacles on the circuit being disconnected.

Tighten electrical connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values. Where manufacturer's torqueing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL 486A.

When stranded wire is used for receptacle and lighting circuit, connections to the devices shall be made using vinyl insulated "Sta-Kon" connector terminals.

Shielded instrumentation wire shall be installed from terminal to terminal with no splicing at any intermediate point.

Shielding on instrumentation wire shall be grounded at the transmitter end only.

All 600 Volt wire insulation shall be tested with a "megger" after installation. Tests shall be made at not less than 500 Volts.

OUTLET BOXES

Outlet boxes for flush mounted lighting fixtures shall be accessible. If lighting fixture is in a non-accessible ceiling the box shall be accessible when the fixture is removed.

Set boxes plumb and such that their device mounting plane is within 1/8" of the finished wall.

Surface mounted raceways shall be painted to match surrounding surfaces.

Sub-system boxes shall be labeled and color coded. Junction box covers shall be color coded. The following conventions shall be used:

Fire alarm	RED
Building Automation	BLUE

DEVICES

Unless indicated otherwise on the drawings all light switches shall be mounted with the centerline of the device 48" above the finished floor.

Unless indicated otherwise on the drawings or in the specifications all receptacles shall be mounted with the centerline of the device 18" above the finished floor.

Receptacles shall be installed with the grounding contact at the top. Where receptacles are required to be mounted horizontally they shall be installed with the neutral contact at the top.

Mount all devices so that the cover plate edges are in contact with the wall and are parallel to building features.

DISCONNECTS

Motor circuit disconnects shall be mounted within fifty feet and in sight of the load being served.

Disconnects shall be labeled in accordance with Section 16010.

GROUNDING

Ground all non-current carrying metal parts of the electrical system to provide a low impedance path for ground fault current. Route ground connections and conductors to ground and protective devices in shortest and straightest paths as possible.

Insulated grounding bushings shall be required for all raceways, service entrance panels, distribution panels, all raceways one inch and larger and any raceway entering a concentric knock-out.

In general a ground wire shall be installed in every conduit. The conduit installation itself shall serve as an additional grounding means.

Where there are parallel feeders installed in more than one raceway, each raceway shall have a ground conductor.

Where conduits terminate without mechanical connection (i.e., locknuts and bushings) to panelboards, and for all terminations of conduit sizes one inch and larger; and for all sizes of metallic conduit (rigid or flexible) terminating in concentric knockouts, the following procedure shall be followed: Each conduit shall be provided with an insulated grounding bushing and each bushing connected with a bare copper conductor to the ground bus in the electrical equipment. The ground conductor shall be in accordance with Article 250 of the NEC.

Install ground rods as necessary to provide an earth ground having a test resistance of no more than 25 ohms.

Grounding connections shall be made by exothermal weld or by using a compatible mechanical connector and brazing completely over. Exothermal welds shall be made strictly in accordance with the weld manufacturer's written recommendations. Welds that have puffed up or which show convex surfaces, indicating improper cleaning, are not acceptable. No mechanical connector is required at exothermal welds.

Grounding conductors shall be attached to equipment with a bolt-on lug or approved tapered screw used for no other purpose. Use crimp-on spade lugs for stranded conductors.

IDENTIFICATION

Equipment identification shall be made using engraved laminated plastic plates (indented tape labels will not be permitted). Characters shall be white on a black background and 1/4" high minimum. Plates shall be secured to the panels by means of screws or metal pressure pins. Cement, by itself, will not be acceptable. All nameplates shall be mounted on the outside surface of the piece of equipment.

Individually enclosed safety switches, circuit breakers, and motor starters, pull boxes, control cabinets and other such items shall be identified indicating load, electrical characteristics, and source. For example, a disconnect switch for a 7-1/2 horsepower, 208 volt, 3 phase air handling unit, Number 8 feed from Panel "MDP", Circuit Number 2 shall be labeled as follows:

AHU-8
7-1/2 HP, 208V, 3Ø
Cir: MDP-2

Service entrance panel, distribution panels, panelboards, and transformers shall be identified indicating panel designation from the drawings, electrical characteristics and source. For example, a 277/480 volt 3 phase panel "LPA" feed from "MDP" Circuit No. 3 shall be labeled as follows:

LP-A
277/480V, 3Ø
(Feeder: MDP-3)

Service entrance panel and distribution panels shall also have each circuit identified as to circuit number, load, and electrical characteristics of load. For example, a 5 HP, 208 volt, 3 phase hot water pump Number 6 feed from panel MDP, Circuit No. 4 would be labeled as follows with the plate attached adjacent to the circuit:

MDP-4

HWP-6
5 HP, 208V, 3Ø

All enclosures containing energized components shall be marked with mylar labels identifying hazards. Such warning messages as "WARNING-HAZARDOUS VOLTAGE", “480 VOLTS", "240 VOLTS", etc. are acceptable. Labels shall be EZ-Code by Thomas & Betts or similar product.

Junction Box Identification: Each junction box cover shall be labeled with a permanent "magic" marker or other means to identify the circuits within. For example, a junction box containing lighting circuits 21, 23, 25 from Panel L2A would be labeled "L2A-21,23,25". Telephone junction boxes shall be labeled "T". Fire alarm system junction boxes shall be labeled “FA”. Public address, nurse call, and other system junction boxes shall be labeled accordingly.

Conductor Identification: All cables and wires shall be color coded as to phase per convention. See color coding above.

Raceway Identification: All raceways leaving the service entrance panel and distribution panels shall be clearly marked as to their circuit number. For example, a conduit containing conductors for Panel MDP, Circuit No. 5 would be marked MDP-5. Empty conduits shall be marked "empty".

Warranty Signage Identification: Provide equipment tags to identify equipment and warranty information on all electrical equipment including panelboards, motor control centers, transformers, starters, etc. See sample format below. Labels shall be at least 2” x 4”, laminated in plastic, and affixed to equipment in conspicuous location.

Equipment Information Tag
Unit ID: PANEL ‘N1A’
Manufacturer: Siemens
Model No. : CDP-7
Serial No. : 56742 OG1
Warranty Period Ends: December 12, 2013
Warranty Contact: Short Circuit, Inc. 123.456.7890

END OF SECTION

SECTION 16115 ELECTRICAL – SELECTIVE DEMOLITION

PART 1 - GENERAL

RELATED DOCUMENTS

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

SUMMARY

This Section includes all labor, material, equipment and services necessary and incidental to complete all the demolition and removal of electrical work as shown on the Drawings or as required.

The demolition drawings do not necessarily indicate all the conditions, details, or work required. The Bidder shall examine the building to determine the actual conditions and extent of the work. Any details not clear to the Bidder must be referred to the Engineer for clarification prior to bidding.

The Contractor shall be responsible for demolition and removal of all existing electrical systems where shown for demolition. No portion of electrical systems shown for demolition may be abandoned in place.

SUBMITTALS

Shop Drawings: Indicate demolition and removal sequence and location of salvageable items.

Schedules: Submit schedule showing time and detailed sequence of demolition, removal of materials and arranged coordination of anticipated electrical interruptions.

1. Schedule demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.

Project Record Documents: Accurately record actual locations of abandoned or dead ended utilities.

QUALITY ASSURANCE

Contractor shall verify the extent of the demolition work. Any questions as to which systems are to be removed versus which systems are to remain shall be referred to the Engineer for clarification prior to commencing demolition work.

The demolition work shall be a phased operation and shall comply with the construction sequence schedule.

Do not close or obstruct egress width of fire exits or access.

Do not disable or disrupt building fire or life safety systems without written permission from the Owner. In all cases, permission shall have been granted not less than ten (10) working days prior to the intended interruption.

PROJECT CONDITIONS

Owner will continuously occupy areas of building immediately adjacent to selective demolition areas.

Conduct selective demolition work in manner that will minimize need for disruption of Owner's normal operations.

Provide minimum of ten (10) working days advanced notice to Owner of demolition activities which will severely impact Owner's normal operations.

Maintain free and safe passage to and from Owner occupied areas.

Condition of Structures: Owner assumes no responsibility for actual condition of areas to be demolished.

Traffic and Passageways: Maintain accessibility for fire fighting apparatus.

1. Conduct demolition operations and debris removal to avoid interference with adjacent occupied facilities.

2. Obtain written permission from authorities having jurisdiction prior to closing or obstructing adjacent occupied facilities.

3. Provide alternate routes when closing or obstructing traffic ways when required by governing authorities.

4. Ensure safe passage of persons around area of demolition. Provide and maintain temporary covered passageways; comply with requirements of governing authorities.

Protection: Perform work in manner to eliminate hazards to persons or property and avoid interference with adjacent areas.

1. Maintain existing utilities that are to remain in service and protect from damage during demolition operations.

2. Do not interrupt existing utilities serving occupied facilities, except when authorized by Owner in writing. Provide temporary services during interruptions.

3. Coordinate in advance with Owner electrical interruptions.

4. Protect existing floors with suitable coverings when necessary.

COORDINATION

The Contractor shall be responsible for coordinating demolition of all affected electrical systems to prevent disruption to the Owner and minimize downtime.

The Contractor shall be responsible for coordinating demolition by other Divisions of the Specifications to prevent disruption to the Owner and minimize downtime.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

EXAMINATION

Beginning alterations to existing building systems means the installer accepts existing conditions.

PREPARATION

Provide, erect, and maintain temporary barriers, warning notifications (signs) and other security devices as may be required for personnel safety.

Inventory each panelboard where circuits are indicated to be reused. Sequentially consolidate existing circuits within each panelboard with regard to area served. Maximize capacity for service to the project area by including existing spares with the group of circuits breakers to be disconnected as a result of this selective

demolition. Prepare a current directory, post demolition, for each panelboard as the base upon which the final directories will be compiled.

Temporarily tag every circuit breaker serving systems outside the demolition area. The tag shall be an OSHA compliant, commercially preprinted, 3¼ inch by 5-5/8 inch, accident prevention card with write on matte finish plastic surface, ¼ inch reinforced grommet and attachment string loop. The message on the card front shall read: "DANGER, DO NOT OPEN" and the message on the reverse side shall read: "DANGER, DO NOT REMOVE THIS TAG. NECESSARY DISCIPLINARY ACTION WILL BE TAKEN IF THESE ORDERS ARE DISREGARDED. SEE OTHER SIDE." The tags shall remain in place until the demolition and renovation are complete.

TEMPORARY CONDITIONS

The Contractor shall include all temporary connections necessary to permit the Owner to occupy areas of the building during the various construction phases.

SALVAGEABLE MATERIAL AND EQUIPMENT

Carefully remove, store and protect the salvage materials and equipment shown on the Drawings for Owner's use. Deliver to location directed by Owner.

Carefully salvage, remove and store, and protect for re-installation the materials and equipment shown on the Drawings.

Materials Retained by Contractor:

1. Items of salvageable value not indicated as Owner salvaged or scheduled for reinstallation may be removed as work progresses.

2. Salvaged items must be removed from site as they are removed. Storage or sale of salvaged items on site will not be permitted.

REMOVAL OF DEMOLITION MATERIAL

Contractor shall remove existing systems, shown or specified, necessary or reasonably inferred, for completion of his/her work. Owner will have the option of retaining any item of material removed under this contract. Item or materials not retained by Owner will become the property of the Contractor, removed from the premises and legally disposed off-site.

Contractor shall dispose of fluorescent lamps, ballasts, and other hazardous materials in accordance with all Local, State and Federal regulations.

Contractor shall remove all wiring determined to be disconnected and abandoned, and remove all conduit and junction boxes determined to be empty and not intended to be used during the reconstruction phase.

Remove abandoned wiring to source of supply.

Remove all exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Remove all junction boxes and conduit supports associated with conduit being removed.

Repair adjacent construction and finishes damaged during demolition and extension work.

Maintain continuity of circuits, which remain in service.

Remove all existing luminaires, switches, receptacles, and other electrical equipment and devices and associated wiring from walls, ceilings floors, and other surfaces scheduled for demolition unless specifically shown as retain or relocate on drawings.

Remove auxiliary and signal systems (ie: fire alarm, security, telephone, data, sound/paging and the like) not scheduled for reuse or relocation. Remove associated devices, appliances and cabling complete.

Remove electrical systems associated with equipment (ie: Elevators, motorized doors/shades/gates/ dampers, mechanical HVAC and plumbing equipment, landscape, civil, kitchen and other equipment served by the electrical systems) not scheduled for reuse or relocation on the drawings. Remove switchboards, motor control centers, panelboards, busway, electrical junctions boxes, pull boxes, conduit, raceway systems (IE: bus gutter, cable tray, plugmold), wiring, safety switches, enclosed circuit breakers, control panels, Energy management systems, relays and contactors associated with equipment scheduled for removal.

PERFORMANCE

Perform drilling, cutting, block-offs, and demolition work required for removal of necessary portions of electrical system. Do not cut joists, beams, girders, trusses, or columns without prior written permission from Architect/Engineer.

CLEANING

Broom clean demolition areas of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing prior to start of work.

Remove temporary work and protection when no longer needed.

Unless noted otherwise, existing fixtures that are to remain shall be cleaned and lamps and ballasts replaced with new lamps and ballasts.

END OF SECTION

CONFLICT OF INTEREST CERTIFICATE

Bidder **must** execute either Section I or Section II hereunder relative to Florida Statute 112.313(12). Failure to execute either section may result in rejection of this bid proposal.

SECTION I

I hereby certify that no official or employee of the Leon County School District requiring the goods or services described in these specifications has a material financial interest in this company.

Signature	*Company Name*
Name of Official (Type or print)	*Business Address*
	City, State, Zip Code

SECTION II

I hereby certify that the following named Leon County School District official(s) and employee(s) having material financial interest(s) (in excess of 5 %) in this company have filed Conflict of Interest Statements with the Supervisor of Elections, 315 South Calhoun Street, Tallahassee, Leon County, FL prior to bid opening.

Name	**Title or Position**	**Date of Filing**

Signature	*Company Name*
Name of Official (Type or print)	*Business Address*
	City, State, Zip Code

LEON COUNTY SCHOOLS

LEON COUNTY SCHOOLS
2757 West Pensacola Street – Tallahassee, FL 32304-2998
FAX FORM TO: (850) 487-7869

APPLICATION FOR VENDOR STATUS

(IRS W-9 Facsimile)

NEW VENDOR ☐
UPDATE ☐

COMPANY NAME: _____

CONTACT PERSON: _____

PHONE NUMBER: (____) _____

FAX NUMBER (____) _____

CORRESPONDENCE:

ADDRESS: _____

CITY: _____ STATE: _____

ZIP + 4: _____ - ____ ____ ____ ____

REMITTANCE: NAME (if different than above): _____

ADDRESS: _____

CITY: _____ STATE: _____

ZIP + 4: _____ - ____ ____ ____ ____

WEBSITE: _____

EMAIL ADDRESS: _____

PLEASE CHECK APPROPRIATE BOX: ☐ Individual/Sole Proprietor ☐ S Corporation ☐ C Corporation
☐ Partnership ☐ Other_____
☐ LLC – Type (Check one) ☐ C ☐ D ☐ P

TAX IDENTIFICATION NUMBER: _____ - _____ OR _____ - ____ - _____
Federal Employer Identification Number — Social Security Number

Section 6109 of the Internal Revenue Service Code requires you to provide your correct TIN to persons, businesses, or agencies that are required to file information returns with the IRS. Purchase orders will not be issued to vendors who fail to provide a TIN.

PLEASE INDICATE THE FOLLOWING: ***Minority Vendor?** ☐ Yes ☐ No Male ☐ Female ☐

**If yes, certification required – (Please submit with form)*

Race: White: ☐ Hispanic: ☐ African American: ☐
Asian: ☐ American Indian: ☐ Other: _____

By: _____ _____ _____
SIGNATURE — PRINTED NAME — DATE

LCSB site contact requesting vendor: _____ _____
NAME — PHONE/EMAIL

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION -LOWER TIER COVERED TRANSACTIONS

(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS ON THE FOLLOWING PAGE)

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Organization Name	PR/Award Number or Project Name
Name(s) of Authorized Representative(s)	Title(s) of Authorized Representative(s)
Signature(s)	Date

Form AD-1048 (1/92)

INSTRUCTIONS FOR CERTIFICATION OF DEBARMENT

1. By signing and submitting this form, the prospective lower tier participant is providing the certification set out on the reverse side in accordance with these instructions.

2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

3. The prospective lower tier participant shall provide immediate written notice to the person to whom this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

4. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

5. The prospective lower tier participant agrees by submitting this form that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

6. The prospective lower tier participant further agrees by submitting this form that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion -Lower Tier Covered Transactions," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

Form AD-IO48 (1/92)

U. S.GPO: 1996-757-776/201 07

LEON COUNTY SCHOOLS

BUILDING THE FUTURE TOGETHER

SWORN STATEMENT – NEW CONTRACTS
SWORN STATEMENT PURSUANT TO SECTION 1012.465,
FLORIDA STATUTES AS AMENDED BY
HB 1877, THE JESSICA LUNSFORD ACT

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

1. This sworn statement is submitted to The School Board of Leon County, Florida *(hereinafter "Board" or "School Board")* by _____
(Print individual's name and title)

for _____
(Print name of entity submitting sworn statement)

whose business address is _____

_____

and its Federal Employer Identification Number (FEIN) is _____
If the entity has no FEIN, include the Social Security Number (SSN) of the individual signing this sworn statement and so indicate.

2. I, _____ am duly authorized to make this sworn statement
(Print individual's name and title)

on behalf of: _____

_____

_____
(Print name of entity submitting sworn statement)

3. I understand that during the 2005 Legislative Session, House Bill 1877, The Jessica Lunsford Act (hereinafter "The Act" or "Act") was passed and approved by Governor Bush on May 2, 2005, with an effective date of September 1, 2005.

4. I understand that the Act amends the background screening requirements of section 1012.465, Florida Statutes (2004) for all non-instructional school district employees or **"contractual personnel"** by requiring all non-instructional school district employees or contractual personnel who are permitted access on school grounds when students are present to undergo and pass "level 2 background screening," and further I understand the Act defines **"contractual personnel"** to include any vendor, individual, or entity under contract with the Board.

5. I understand that pursuant to section 1012.465, Florida Statutes as amended by the Act, non-instructional school district employees or contractual personnel who are permitted access on school grounds when students are present, who have direct contact with students or who have access to or control of school funds must meet level 2 screening requirements as described in sections 1012.32 and 435.04, Florida Statutes.

6. I understand that as _____ *(eg. a charter bus company)* a
(Type of entity)
all contractual personnel, as defined in section 1012.465, Florida Statutes, must meet Level 2 screening requirements as outlined in sections 1012.32 and 435.04, Florida Statutes in order to do business with the

School Board.

7. I understand that "level 2 screening requirements" as defined in sections 1012.32 and 435.04, Florida Statutes means that fingerprints of all contractual personnel must be obtained and submitted to the Florida Department of Law Enforcement for state processing and to the Federal Bureau of Investigation for federal processing.

8. I understand that the School Board has implemented Board Policy 2.021 to comply with level 2 screening requirements, as defined in sections 1012.32 and 435.04, Florida Statutes. I understand that my company must comply with these local procedures as they are developed or amended from time to time.

9. I understand that any costs and fees associated with the required background screening will be borne by my company.

10. I understand that any personnel of the contractor found through fingerprint processing and subsequent level 2 background screening to have been found guilty of, regardless of adjudication, or entered a plea of nolo contendere or guilty to any offense outlined in Section 435.04, Florida Statutes (or any similar statute of another jurisdiction), **shall not be permitted** to come onto school grounds or any leased premises where school-sponsored activities are taking place when students are present, shall not be permitted direct contact with students, and shall not be permitted to have access to school district funds.

11. I understand that the failure of any of the company's or my affected personnel to meet level 2 screening standards as required by section 1012.465, Florida Statutes, may disqualify my company from doing business with the School Board.

12. I hereby certify that the foregoing statement is true and correct in relation to the company for which I am submitting this sworn statement. I further certify that this statement is being given knowingly and voluntarily by me on behalf of my company.

The company submitting this sworn statement agrees to be bound by the provisions of SECTIONS 1012.32, 1012.465, AND 435.04 OF THE FLORIDA STATUTES AS AMENDED BY HB 1877, THE JESSICA LUNSFORD ACT 2005.

I CERTIFY THAT THE SUBMISSION OF THIS FORM TO THE SCHOOL BOARD OF LEON COUNTY, FLORIDA ON BEHALF OF THE COMPANY IDENTIFIED IN PARAGRAPH ONE (1) ABOVE BINDS THE COMPANY TO FULLY COMPLY WITH THE BACKGROUND SCREENING REQUIREMENTS OF SECTIONS 1012.32, AND 435.04, FLORIDA STATUTES.

_____

(Signature)

Sworn to and subscribed before me this_____ day of _____ 20_____

_____ is personally known to me ☐ OR produced identification ☐

by showing _____

(Type of Identification)

Notary Public – State of _____ My commission expires on: _____

_____ _____

Signature of Notary Public *(Printed, typed or stamped commissioned name of Notary Public)*

PRINCIPAL

AREA LEADER

DIRECTOR OF MAINTENANCE

DIRECTOR OF CONSTRUCTION

CHIEF OF FACILITIES CONSTRUCTION AND PLANNING

PROJECT COORDINATOR

LEON COUNTY SCHOOLS

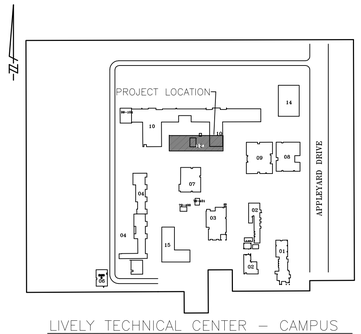
The Best Place to Learn

LIVELY TECHNICAL CENTER
CHILLER PLANT UPGRADES

LCS No 33017

CONSTRUCTION DOCUMENTS

June 3, 2015



LIVELY TECHNICAL CENTER – CAMPUS
NOT TO SCALE

To the best of my knowledge these drawings and the project manual are complete, and comply with the State Requirements for Educational Facilities.

Peter J. McGinniss PE

McGinniss & Fleming
Engineering, Inc.

Mechanical • Electrical • Fire Protection • Plumbing

INDEX OF SHEETS

Set No. _____

WATER PIPE INSTALLATION

General Piping Installation:
All mechanical systems piping will be schedule 40, ASTM A 53, black steel pipe. Steel flanges will conform to ANSI B16.5. Steel fitting will conform to ASTM A 234. Threaded fittings will conform to ANSI B16.3, Class 150.

Support 4" piping at no more than 14' on center. Support 6" and 8" pipe at no more than 17' on center.

Install piping parallel to walls. Install drains at any low point that will trap over 5 gallons of water. Leak test all piping in accordance with normal practice but no less than 1.5 times operating pressure and not less than 150 psi.

Welded Pipe:
Welding will be preformed in accordance with ANSI B31.1 Code for Pressure Piping. Bevel pipe with wall thickness over 5/16". Shop or field beveling will be in accordance with recognized standards. Remove dirt, scale and other foreign matter from piping before tying in sections. Set joints true and square with no more than 1/16 inch separation. Welds will include a root bead, one or more filler layers and a final cover pass. Root bead will provide for complete penetration into the root of the joint.

All welding shall be performed by certified welders adequately familiar with welding safety practices including NFPA 51B. Welders shall provide identifying mark at each weld. Certified welders shall be identified by photo ID.

Protect building finishes from weld spatter with fire retardant shields. Maintain a fire extinguisher at hand at all times when welding. Provide adequate ventilation for welding operations.

Hydronic Devices:
Install miscellaneous devices in accordance with manufacturer's recommendations and the schematic diagrams.

Coordinate with the Control Provider and make piping preparations for BAS control devices.

Install valves, instrumentation and devices as indicated on the schematic diagrams. Install devices shipped loose with the chillers. Locate and orient valves for easy access and maintenance. Install all gauges and thermometers as near to eye level as practical.

Install meters to conform to manufacturer's recommendations for up and down stream straight lengths of pipe. Install backflow preventers with pressure test ports vertical to avoid accumulation of trash. Install compression tanks, shot feeders, and miscellaneous devices in accordance with manufacturer's recommendations and the schematic diagrams.

Take care to protect existing piping from introduction of foreign debris. Clean new piping of loose scale, rust and weld spatter. Remove tightly adhering debris with wire brush or by grinding as necessary. Protect system control valves and circulate system fluid at the greatest flow possible. Clean system strainers. Provide initial chemical treatment.

Install blowdown piping with valve for all strainers.

INSULATION

General Insulation Installation:
All insulation shall be installed by professional insulators with adequate experience and ability to insure a successful job. Install insulation products in accordance with manufacturer's written instructions, and in accordance with recognized industry practices to ensure that insulation serves its intended purpose.

Provide composite mechanical insulation (insulation, jackets, coverings, sealers, mastics and adhesives) having flame spread index of 25 or less, and smoke developed index of 50 or less, as tested by ASTM E 84 (NFPA 255) methods.

Vapor barrier shall be maintained complete and continuous. Gaps and openings in cold pipe or duct insulation vapor barrier will not be tolerated.

Insulation is not to be installed until the piping systems have been checked and found free of all leaks. Surfaces shall be clean and dry before attempting to apply insulation.

Rated partitions shall be penetrated only with insulation materials and techniques UL listed to maintain rated assembly. Any questions shall be referred to the Engineer.

Water Pipe Insulation:
Insulate chilled water piping with 2" thickness of cellular glass pipe insulation: ASTM C 552, k=0.38, 8 pcf density, Pittsburgh Corning Foamglass.

Mechanical Room Jacket: Aluminum jacketing 0.016" thickness with bands and seal of same product. Childers Products or equal.

Apply bedding mastic to the entire pipe surface, inside of insulation and all joints of insulation. Stagger joints and butt insulation firmly together. Insulation sections shall be secured in place with 16 gauge copper wires or plastic ties or fiberglass reinforced tape spaced approximately 9' on center. Apply a heavy coat of vapor barrier finish to the exterior surface of the insulation. Embed a layer of fabric membrane in the vapor barrier finish, overlapping seams at least 2". Apply a final coat of vapor barrier finish at least 1/8" thick and finish smooth.

EQUIPMENT INSTALLATION NOTES

Install unit in strict accordance with manufacturer's instructions. Contractors are required to have equipment installation instructions on site for all equipment that is on site.

All equipment shall be secured to pads or building structure. Insure that proper access to the unit is maintained. Do not run piping in front of access panels.

Install miscellaneous devices shipped loose.

Coordinate controls and power wiring installation.

Start-up all equipment in accordance with manufacturer's instructions. Provide start-up reports.

Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint. Turnover any special tools provided by the equipment manufacturer.

Chiller Installation:
Handle and install chillers in accordance with the manufacturer's installation manual. Chiller check test and startup will be by the chiller manufacturer.

Concrete chiller supports pads. Provide neoprene isolation pads as recommended by the manufacturer. Set chiller to ensure proper access and door swings.

Connect chilled water piping as indicated on the schematic drawings. Provide piping flanges such that water-piping connections to the chiller can be removed with minimal effort for access to tube barrel.

Provide piping, valves, accessories, gages, supports, and flexible connections as indicated. Install any control devices shipped loose with the chiller.

Coordinate with the Owner's Control Provider and make piping preparations for BAS control devices.

Touch-up any damaged paint or insulation materials.

General Pump Installation:
Handle and install pumps in accordance with the manufacturer's installation manual. Unpack and clean pumps as recommended. Set pumps on concrete pads as indicated on the plan.

Install base-mounted and foot-mounted pumps on concrete base, with anchor bolts. Set and level pump, grout under pump base with non-shrink grout.

Provide piping, valves, accessories, gages, supports, and flexible connections as indicated.

Lubricate pumps and bleed air from pump casing before start-up. Start-up pumps in accordance with manufacturer's instructions. Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint.

Frame Mount Pump Installation:
Disconnect the flexible coupling and level pump base on shims approximately 1" thickness placed on each side of each anchor-bolt. Adjust the base plate shims until the pump is level vertically and horizontally as indicated by level suction and discharge flanges and vertical flexible coupling half.

Insert shims under the motor feet and correct both parallel and angular misalignment of the flexible connection to within the manufacturer's recommended tolerances. Recheck all alignments after each adjustment.

With proper pump/motor alignment, snug the base plate bolts and grout the pump base plate to complete a rigid installation. Construct a wooden dam around the base plate to contain the grout. Fill the entire base plate with a non-shrink grout by Embco or equal. After the grout has completely set (48 to 72 hours) recheck alignment and tighten base plate anchor-bolts firmly.

Install piping, devices and instrumentation as indicated on the drawings. Insure proper piping alignment to insure that objectionable forces are not transmitted to the pump flanges.

Disconnect coupling halves. Bump the motor to insure the direction of rotation is the same as the direction indicated on the pump casing. Reverse rotation could damage the pump.

Re-align the motor coupling to correct both parallel and angular misalignment of the flexible connection to within the manufacturer's recommended tolerances. Recheck all alignments after each adjustment. Lubricate pump bearings. Prime and vent the pump. Perform start-up procedures recommended by the manufacturer.

Start pump with discharge valve closed and suction valve open. After the pump is up to operating speed, open the discharge valve slowly. Bring system to operating temperature. Shut down and recheck alignment with coupling halves both connected and disconnected. Make sure all pump, motor and base plate mounting bolts are firmly tightened down.

Re-check pump alignment after one week of operation.

SPECIAL CONDITIONS

The campus will be occupied during construction. Take every precaution to insure the safety of the occupants. Provide for reasonable safety precautions, signage and other warnings. Keep exits clear. Coordinate the work to minimize the disturbance of building occupants. Keep construction areas clean on a daily basis. Take care to maintain the condition of existing materials and surfaces. Repair any damage to match existing.

The contractor is expected to take every precaution against the initiation of fires and will, as a minimum, maintain fire extinguishers for use by his employees. No smoking will be allowed inside the building.

GENERAL DEMO NOTES

The contractor shall take the proper care in protecting existing surfaces of building from damage during demolition and new construction. Repair any damage to match existing.

Contractor shall turn over to the owner any items or equipment that the owner desires.

Contractor shall remove and properly dispose of all other materials and equipment to be demolished. Contractor shall properly terminate all items demolished. Cap piping systems that remain in service or are abandoned in place. Seal/cap drains that are no longer in use.

Equipment and materials identified for salvage shall be secured of power, water, etc. and left in place for the Owner's salvage.

MECHANICAL GENERAL NOTES

Provide phenolic labels indicating equipment designation for each piece of equipment scheduled with a unique identification.

Provide dielectric isolation fittings to isolate dissimilar materials.

CONTROL NOTES

Control notes:

Existing controls are to remain active until the new chiller plant is fully functioning and tested. Both the old and new quipment must be operaable in parrallel.

Control wiring of this contract is limited to that specifically required by these drawings and specifications. The mechanical subcontractor is to be responsible for manufacturer's controls of mechanical equipment installed.

Install miscellaneous, control valves, actuators, meters, wells, and other devices provided by the control subcontractor for installation in the mechanical system.

Low voltage wire must be in conduit throughout its entire length. Comply with Division 16.

VARIABLE FREQUENCY DRIVE SCHEDULE - NEW

DESIGNATION		VFD - CHP S2	VFD - CHP-S1
NEW / EXISTING		NEW	EXISTING
SERVICE		SEC CHW PUMPS	
DRIVE RATED HORSEPOWER CAPACITY (MIN)	HP	75	
DRIVE MOTOR FULL LOAD AMPACITY (MIN)	AMP	93	
DRIVE AMBIENT OPERATING TEMP (MAX)	°F	104	
MOTOR ELECTRICAL SERVICE	V/PH/HZ	460/3/60	
SPEED CONTROL SIGNAL		0-10vDC	
DRIVE EFFICIENCY (MINIMUM AT FULL LOAD)		95%	
POWER FACTOR (MINIMUM)		0.95	
BYPASS TYPE		NONE	
ENCLOSURE TYPE		TYPE 1 OR 12	
BASIS OF DESIGN MANUFACTURER/MODEL		ABB-ACH 550	
APPLICABLE NOTES		1,2,3,4	

NOTES:
1. PROVIDE FACTORY CERTIFIED STARTUP OF NEW DRIVE.
2. PROVIDE BACNET PROTOCOL TO COMMUNICATE WITH THE BAS.
3. PROVIDE HAND-OFF-AUTO SWITCH. (ONLY REQD W/O EXISTING DISCONNECT)
4. PROVIDE THREE (3) YEAR PARTS/LABOR WARRANTY.
5. DRIVE CAPACITY SHALL ACCOMMODATE MOTOR FULL LOAD AMPACITY OR MOTOR HORSEPOWER, WHICHEVER IS HIGHER, AT THE SPECIFIED AMBIENT OPERATING TEMPERATURE.

COORD NOTE: PROVIDE EARLY BREAK CONTACTS ON DISCONNECTS THAT ARE DOWNSTREAM OF DRIVES.

HYDRONIC SYSTEMS DATA / EXPANSION TANKS

DESIGNATION		CHW-ET1	
SYSTEM SERVED		CHILLED WATER	
TANK TYPE		FULL ACCEPT BLADDER	
MANUFACTURER		TACO	
MODEL		CA-450	
SYSTEMS HEIGHT ABOVE PUMP	FT	10	
MAKE-UP FILL PRESSURE	PSI	12	
MAKE-UP RELIEF PRESSURE	PSI	30	
DESIGN OPERATING TEMPERATURE (ovg.)	°F	40	
SYSTEM TEMPERATURE RANGE	°F	40	
APPROXIMATE SYSTEM VOLUME	GALLONS	15,000	
CALCULATED EXPANSION VOLUME	GALLONS	40	
APPLICABLE NOTES		1-2	

NOTES: 1) ASME RATED FOR 125 PSI & 240 F
2) FULL ACCEPTANCE REMOVABLE BUTYL RUBBER BLADDER

SCOPE OF WORK NOTES

General Mechanical Scope of Work:
Furnish all labor, materials, equipment and incidentals required to complete all mechanical work shown on the contract drawings. The work required consists basically of, but is not limited to, the following:

- provide & install new chillers pumps, piping, & hydronic devices
- provide & install chilled water distribution piping
- demolish obsolete chillers & towers as indicated
- remove all abandoned CHW piping

Alternate Scope of Work:
Add the installation of new Chilled Water Secondary Pumps SP1&2 and all associated valves, & hydronic devises, rather than the Base Bid replacement of the 75 Hp motors of SP1&2.

Miscellaneous scope of work (by others):
Miscellaneous related work that is performed by others includes: That work which is not part of this contract includes:
- BAS control work is being provided under separate contract direct to LCS
- Test & Balance (T&B) is being provided under separate contract direct to LCS

General BAS control scope of work (by others):
For compatibility reasons the building automation system (BAS) control work will be provided under separate contract. Coordinate with the controls vendor.

Control work of this contract:
- unitary chiller controls shipped loose by the manufacturer
- installation of control devices provided by control contractor

GENERAL NOTES

All construction will conform to currently (as of Drawing date) adopted editions of the applicable code standards including but not limited to:

National Fire Protection Associations - Standards
NFPA 54, National Fuel Gas Code
NFPA 70, National Electric Code
NFPA 101, Life Safety Code
NFPA 90-A Air Conditioning and Ventilating Systems
FL Building Code
FL Mechanical Code
FL Plumbing Code
State And Local Codes And Ordinances
FL SREF - State Requirements for Educational Facilities

The work will be complete, fully operational, and suitable for the service required. Drawings indicate scope and do not show all details, devices and incidental materials necessary to accomplish the work. It is understood that such devices and incidental materials required will be furnished.

Installers are expected to provide professional work performed in accordance with industry standards and good practice.

Upon completion of the work the installers will clean spaces that were occupied by temporary work and temporary facilities. Remove debris, rubbish and excess materials from the sites. Repair damages caused by installation or use of temporary facilities.

The installers will deliver to the owner, upon substantial completion of the work, two copies of descriptive literature related to the equipment installed under this contract, including parts lists, wiring diagrams, maintenance and operation manuals and warranties customarily supplied by manufacturers for equipment incorporated in this work. The literature will be neatly bound in a 3-ring binder and delivered prior to final acceptances

The Contractor shall give physical demonstration and verbal instructions for proper operation and maintenance of equipment to the Owner or his designated representative. Schedule these demonstrations and instructions at the Owner's convenience.

Layout & coordination:
Installers are expected to coordinate in order to avoid interference between trades. The installers are expected to verify critical dimensions and field fabricate piping as necessary to accommodate conditions. Installers are expected to install equipment such that proper maintenance clearances are maintained for equipment of all trades.

The contractor shall take full and complete responsibility for avoiding conflicts with existing building structure, piping and equipment. Before fabricating any ductwork or piping, field verify the space available while maintaining required access to equipment from all trades. Any changes required so that ductwork or piping will fit existing conditions and any ductwork or piping rendered as scrap by failing to verify field conditions will be at the expense of the contractor.

Hazardous Materials
Contractors are expected to notify the owner when ever they discover that their work will expose them to any materials that are the least bit suspicious. Removal of contaminated materials will be the responsibility of the owner. However the contractor is responsible to inspect future work areas in a timely fashion so as not to be held up waiting for abatement.

CONSTRUCTION NARRATIVE

Construction Sequence Concepts

It is a requirement of this project that the new chiller plant be installed in parrallel to the existing plant, such that either may be operated, until such time as the new plant if fully functioning, tested, and accepted.

1) Install Plant Isolation Valves
To facilitate plant piping work without draining elevated portions of the campus chilled water and hot water piping systems; install plant isolation butterfly valves. To avoid issues associated with draining and associated air admittance into distribution piping, it is required that a pipe freeze kit be employed. This work is to be accomplished off-hours.

2) Install Tie-in Valved Tees
Install Tie-in Tees with valves ready for connection of new work.

3) Install New CHW System in Parallel with Existing CHW System
The new chilled water system must be installed in parallel in order that the existing chilled water system continues to operate throughout construction. The ability to change over from old-to-new and new-to-old systems is necessary so that the new system can be fully tested prior to the demolition of the old chilled water system.

4) Miscellaneous Repairs
- Relocate Expansion Tanks to accommodate new pumps
- During construction one Chilled Water Distribution Pump at a time is to be taken out of service for repair or replacement.
- Install butterflly isolation valves up stream of Triple-duty Valve of existing Hot Water Distribution Pumps.

5) Demolition / Salvage
Cut-loose the old chilled water system. Demolish:
- four (4) chiller pumps
- obsolete chilled water piping
- two (2) cooling towers
- obsolete condenser water piping

6) Deliver the following to LCS @ 2400 Plant St., Tallahassee
- original chilled water expansion tank
- two (2) centrifugal chillers
- two (2) 75 Hp motors from CHW-SP1&2

AIR COOLED ROTARY SCREW CHILLERS

DESIGNATION		CH-1, 2, 3	
MANUFACTURER (basis of design)		TRANE	
MODEL (basis of design)		RTAC-250-Std	
REFRIGERANT		R134A	
COOLING CAPACITY	TONS	240	
UNIT POWER CONSUMPTION	KW	296	
EER ARI STANDARD	BTUH/W	9.7	
IPLV	BTUH/W	13.7	
EVAPORATOR FLOW RATE	GPM	585	
ENTERING WATER TEMPERATURE	°F	54	
LEAVING WATER TEMPERATURE	°F	44	
EVAPORATOR PRESSURE DROP (MAX)	FT	20	
FOULING FACTOR		0.00010	
INDEPENDENT REFRIGERANT CIRCUITS	MIN	2	
COMPRESSORS	MAX	2	
CAPACITY CONTROL DOWN TO	MIN. %	20	
CHILLER ELECTRICAL CHARACTERISTICS	V/ø/HZ	460/3/60	
UNIT POWER REQUIREMENT	MCA/MOP	495/600	
HEATER POWER ELECTRICAL	V/ø/HZ	115/1/60	
HEATER POWER REQUIREMENT	WATTS	1200	
RECEPTACLE POWER ELECTRICAL	V/ø/HZ	NA	
RECEPTACLE POWER REQUIREMENT	MCA/MOP	NA	
SOUND POWER LEVEL ARI 575	dBA	103	
STARTER / DRIVE	-	WYE-DELTA	

NOTES: PROVIDE LOUVERED COIL GUARD, WIRE COMPRESSOR GUARD, TEAO FAN MOTORS, CIRCUIT BREAKERS FOR INDIVIDUAL REFRIGERANT CIRCUITS, SOLID STATE PHASE PROTECTION, CONTROL POWER TRANSFORMER, ELECTRONIC OPERATOR INTERFACE (SEE SPECS), BAS INTERFACE (SEE SPECS), NEOPRENE ISOLATORS, FLOW SWITCHES, 1-1/4" INSULATION.

PUMP SCHEDULE

DESIGNATION		CHP-P1, P2, P3	CHP-S1, S2 ALTERNATE **
SYSTEM SERVED		CHILLED WATER PRIMARY LOOP	CHILLED WATER SECONDARY LOOP
MANUFACTURER (basis of design)		TACO	TACO
MODEL (basis of design)		CI-5009 6 X 5 X 8.2	TA-2030 10 x 8 x 13.5
PUMP TYPE		CLOSE COUPLED END SUCTION	HORIZONTAL SPLIT CASE
FLOW RATE	GPM	585	1755
DYNAMIC HEAD	FT	55	125
MAXIMUM PUMP SPEED	RPM	1760	1760
MINIMUM PUMP EFFICIENCY	%	80	80
ELECTRICAL CHARACTERISTICS	V/ø/HZ	480 / 3 / 60	480 / 3 / 60
MOTOR HORSEPOWER - NOL	HP	15	75
MOTOR TYPE		ODP	ODP / VFD
APPLICABLE NOTES		---	LEAD / STANDBY

NOTES: PREMIUM VFD RATED MOTORS WHERE INDICATED
**CHP-S1 & S2 BASE BID: PROVIDE AND INSTALL NEW MOTORS ONLY.

Peter J. McGinniss, PE #37318

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EB #05990

LIVELY TECHNICAL CENTER
CHILLER PLANT UPGRADES
LCS Project #33017

Tallahassee, Florida

DATE:
June 3, 2015

REVISED:
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.
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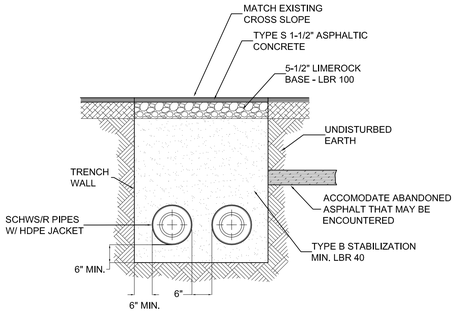
DESIGNED BY: PJM
DRAWN BY: RET

SUBMITTAL:
CONSTRUCTION DOCUMENTS

SHEET TITLE:
MECHANICAL
NOTES & SCHEDULES

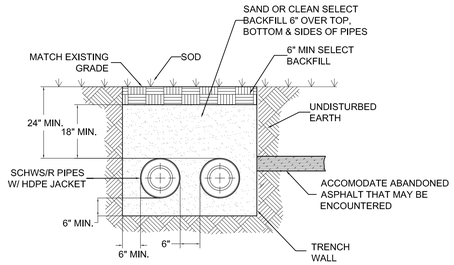
SHEET:
M100

JOB NUMBER:
2014-33



TYPICAL PIPE TRENCH SECTION - THRU ROADWAY

N.T.S.



TYPICAL PIPE TRENCH SECTION - THRU YARD

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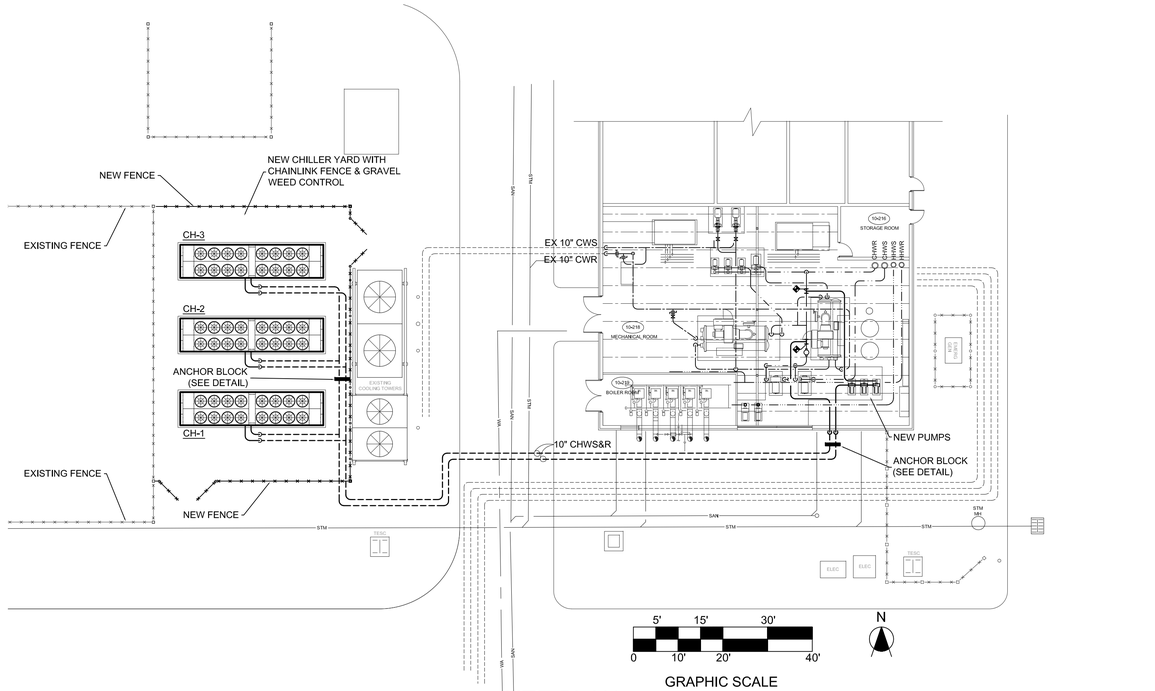
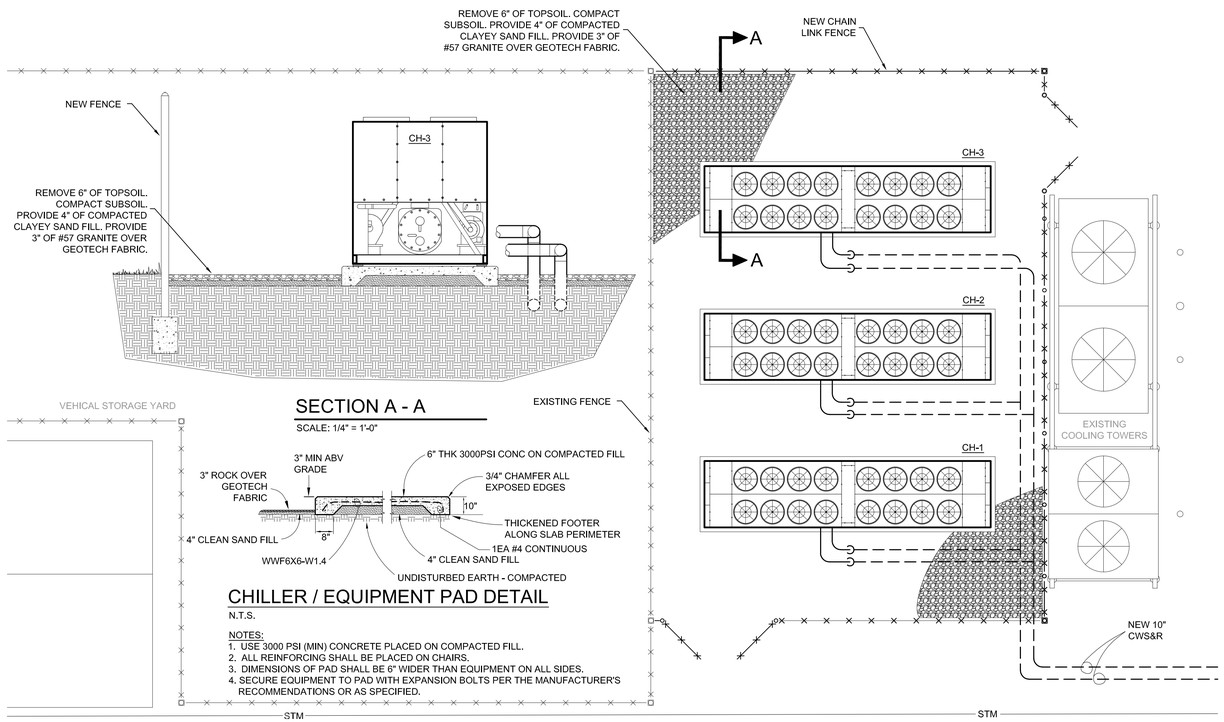


SITE PLAN

SCALE: 1/16" = 1'-0"



SECTION A - A

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

CHILLER / EQUIPMENT PAD DETAIL

N.T.S.

NOTES:
1. USE 3000 PSI (MIN) CONCRETE PLACED ON COMPACTED FILL.
2. ALL REINFORCING SHALL BE PLACED ON CHAIRS.
3. DIMENSIONS OF PAD SHALL BE 6" WIDER THAN EQUIPMENT ON ALL SIDES.
4. SECURE EQUIPMENT TO PAD WITH EXPANSION BOLTS PER THE MANUFACTURER'S RECOMMENDATIONS OR AS SPECIFIED.

ENLARGED CHILLER YARD PLAN

SCALE: 1/8" = 1'-0"

UNDERGROUND PRE-INSULATED PIPE

Installers are expected to provide professional work performed in accordance with industry standards and good practice. All construction will conform to currently adopted editions of the applicable code standards including but not limited to:
- ANSI B31.1 Code for Pressure Piping
- OSHA Standard 29 CFR, Health and Safety Regulations for Construction
- Trench Safety Act - FS 553.60-64

The Installers are expected to verify critical dimensions and field fabricate piping as necessary to accommodate conditions.

General Underground Piping Materials:
Basic piping system will be pre-insulated schedule 40 steel pipe with 1-1/2" polyisocyanurate insulation and 125 mil HDPE jacket: Thermacor Ferro-Therm or equal. All fittings to be preinsulated.

Install insulation products in accordance with manufacturer's written instructions, and in accordance with recognized industry practices to ensure that insulation serves its intended purpose.

General Piping Installation & Testing:
Handle pre-insulated pipe in accordance with the manufacturer's recommendations. Do not hook pipe ends. Do not use chains or other devices that might puncture insulation jacket. Lift pipe with minimum 4" wide strap.

Manufacturer to provide expansion compensation calculations. Provide additional expansion loop if necessary. Install anchors & expansion loops per manufacturer's instructions. The Manufacturer must authorize field changes. Install expansion pads per manufacturer's recommendations to cover both the inside and outside radius of elbows.

Anchor blocks shall be poured and cured, prior to testing of the carrier pipe. Bleed all air from lines. Hydrostatically test all carrier piping in accordance with normal practice. Test piping to 150 psi. Test duration shall exceed 2 hours. Inspect all fittings for leaks. Make repairs if necessary and retest.

All joints shall be repaired to provide a completely waterproof jacket. HDPE jacket joint closure shall be by electric-fusion method. Taping and hot air welding will not be allowed. Contractor must provide the electric-fusion equipment recommended by the pipe manufacturer. Jacket joints shall be pressure tested in accordance with the manufacturer's recommendations to a pressure of 5 psi for 5 minutes while simultaneously soap testing seams for leaks.

Layout and Coordination:
Drawings indicate, to the best of available information, known underground utilities. Indicated locations of underground utilities are not exact. Indicated inverts of underground utilities are not exact.

Route underground utilities parallel or perpendicular to buildings and roadways.

The Contractor is expected to request the assistance of underground utility locator services, engage in early exploratory digging and other investigation as is practical for utility location. It will be necessary to coordinate piping offsets with the engineer and the pipe manufacturer. Field changes must be authorized by the Manufacturer.

Trenching, Backfilling, Road Base and Pavement:
The Contractor is expected to take all possible care during excavations not to damage known and even unknown utilities.

Comply with the requirements of Section 553.60 FS the Trench Safety Act.

Carefully excavate trench to smooth finished surface. Hand trim excavations. Remove any loose materials, large stones and other hard matter that could damage piping or impede consistent backfilling or compaction. Prevent surface water from flowing into trench by temporary grading.

Remove all excavated materials from the site. Backfill materials to be clean clayey sand, free of rocks and debris.

Cut out soft areas of pipe subgrade at bedding location not capable of compaction in place. Compact subgrade to density equal to or greater than requirements for subsequent fill materials.

Contractor shall employ a qualified testing service to perform compaction density testing. Testing shall be performed each 100 linear feet per each 6" lift. Evaluate compaction by ASTM D 1557 / AASHTO T-180 Method "A" (Modified Proctor).

Modified Proctor test compaction for backfill under pavements shall be:
For Cohesive Soils: 95% of maximum density @ ±2% of optimum moisture content.
For Cohesionless Soils: 98% of maximum density @ ±2% of optimum moisture content.

Before backfilling clean trench of any cave-ins and trash especially metal and other hard objects. Place initial pipe bedding material to 6" and compact. Upon completion of pipe installation and testing, backfill in 6" layers. Backfill material shall be evenly wetted with enough water where necessary to assure it being within ±2% of optimum moisture content.

Place color-coded 6" wide 0.004" thickness polyethylene printed plastic identification tape directly over each pipe and approximately 12" below finished grade.

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LIVELY TECHNICAL CENTER
CHILLER PLANT UPGRADES
LCS Project #33017

Tallahassee, Florida

DATE:
June 3, 2015

REVISED:
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DESIGNED BY:	DRAWN BY:
PJM	RET

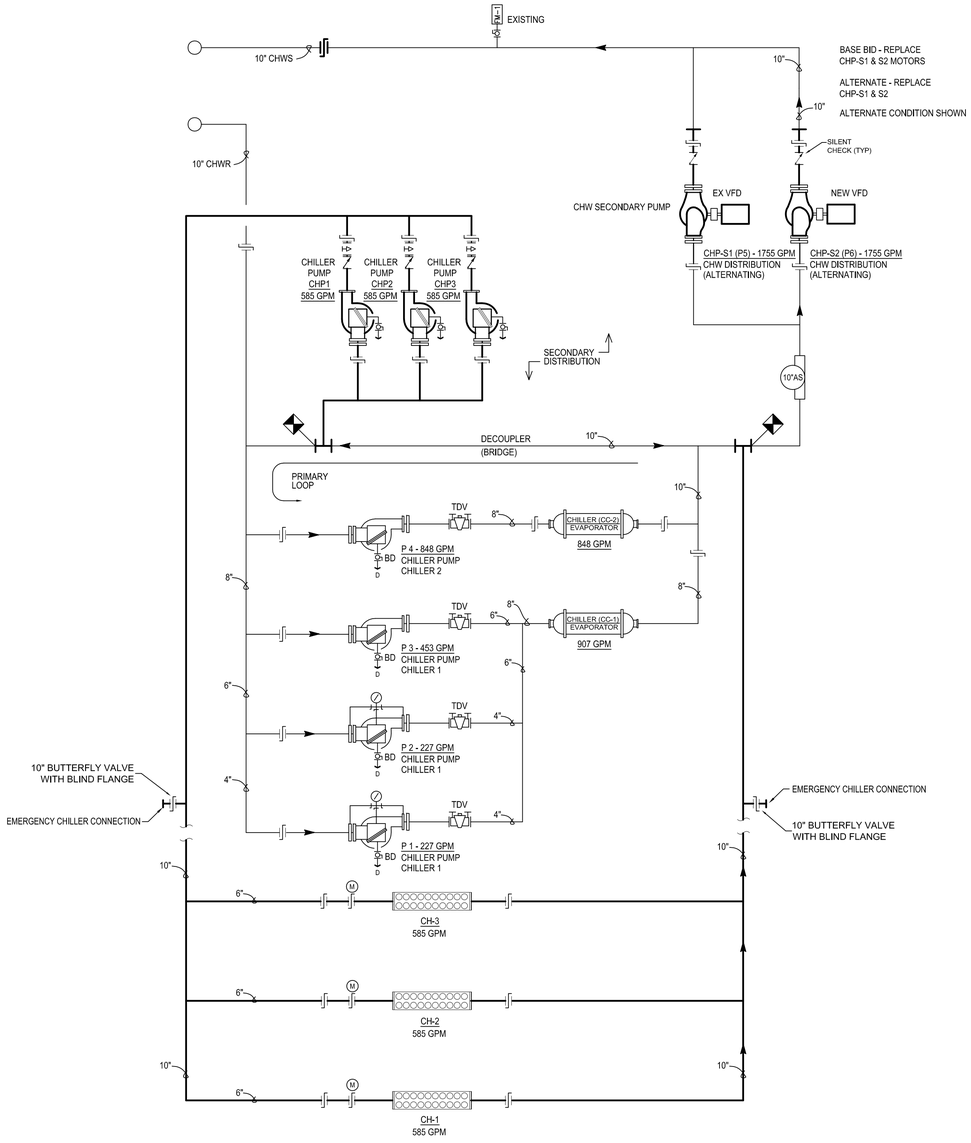
SUBMITTAL:
CONSTRUCTION DOCUMENTS

SHEET TITLE:
CHILLER YARD

SHEET:
M200

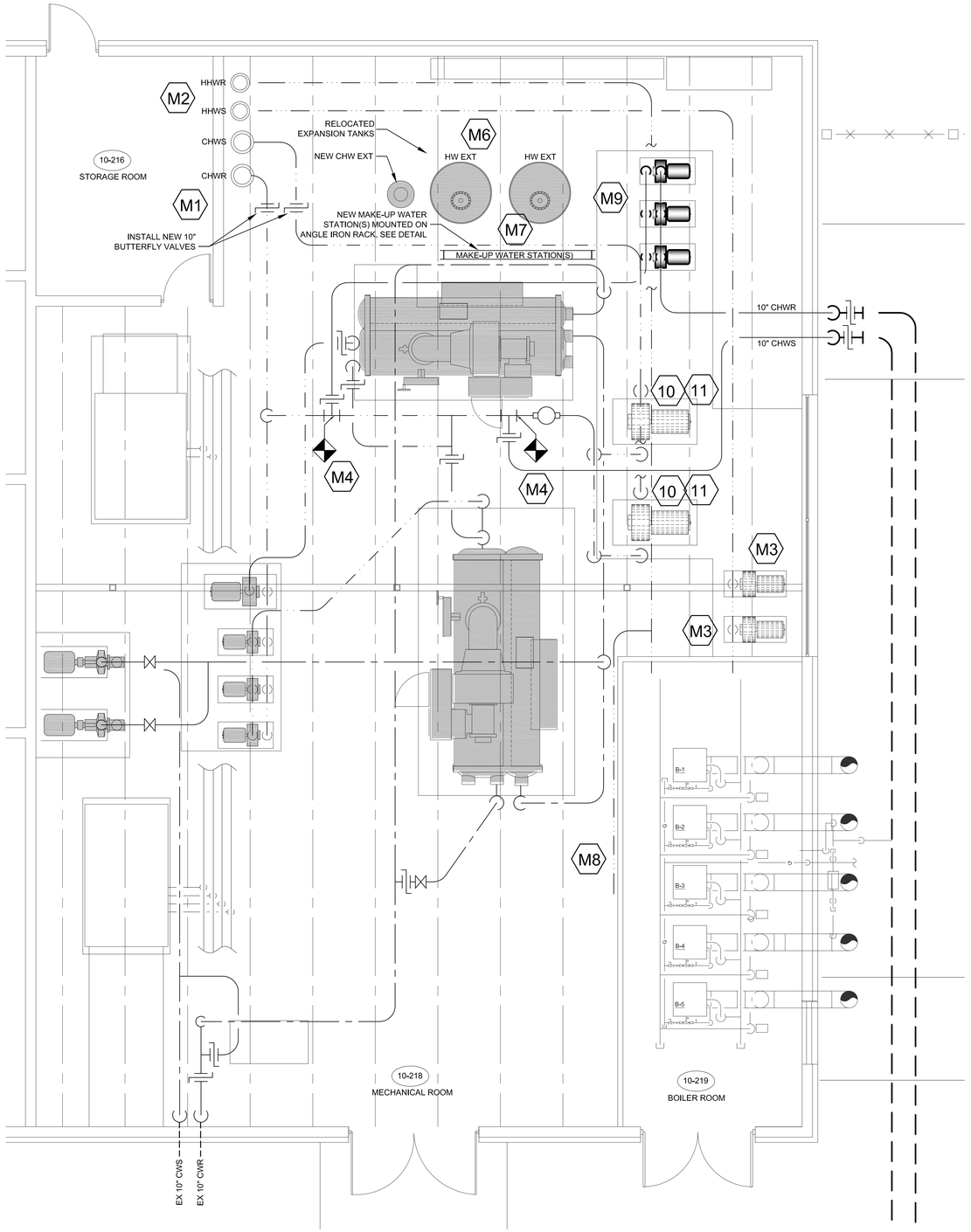
Peter J. McGinniss, PE #37318

JOB NUMBER:
2014-33



CHILLED WATER SYSTEM PIPING SCHEMATIC - NEW WORK

NTS



MECHANICAL ROOM CONSTRUCTION PLAN

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

N

CONSTRUCTION NOTES

M1 Install 10" butterfly plant chilled water isolation valves, freeze piping to campus; drain piping in building.

M2 Install 6" butterfly plant hot isolation valves, freeze piping to campus; drain piping in building.

M3 Install 6" butterfly valve down-stream of the triple duty valves of each hot water distribution pump.

M4 Install 10" valved Tees during initial plant shutdown.

M5 NOT USED.

M6 Relocate existing hot water expansion tanks to floor as indicated. Install Owner furnished chilled water expansion tank.

M7 Install (temporarily in parallel to existing) new chilled water and hot water make-up water systems at an accessible elevation.

M8 Expand backboard for new parallel controls installation.

M9 Install new chilled water primary pumps on existing equipment pad. Replace existing shot feeder.

10 Replace chilled water distribution pump motors. Replace all small instrumentation, drain & vent piping. Provide new instrumentation and control devices.

11 Alternate #1 includes replacement of chilled water distribution pumps in their entirety; along with all new hydronic devices and valves.

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LIVELY TECHNICAL CENTER
CHILLER PLANT UPGRADES
LCS Project #33017

Tallahassee, Florida

DATE: June 3, 2015

REVISED:
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DESIGNED BY:	DRAWN BY:
PJM	RET

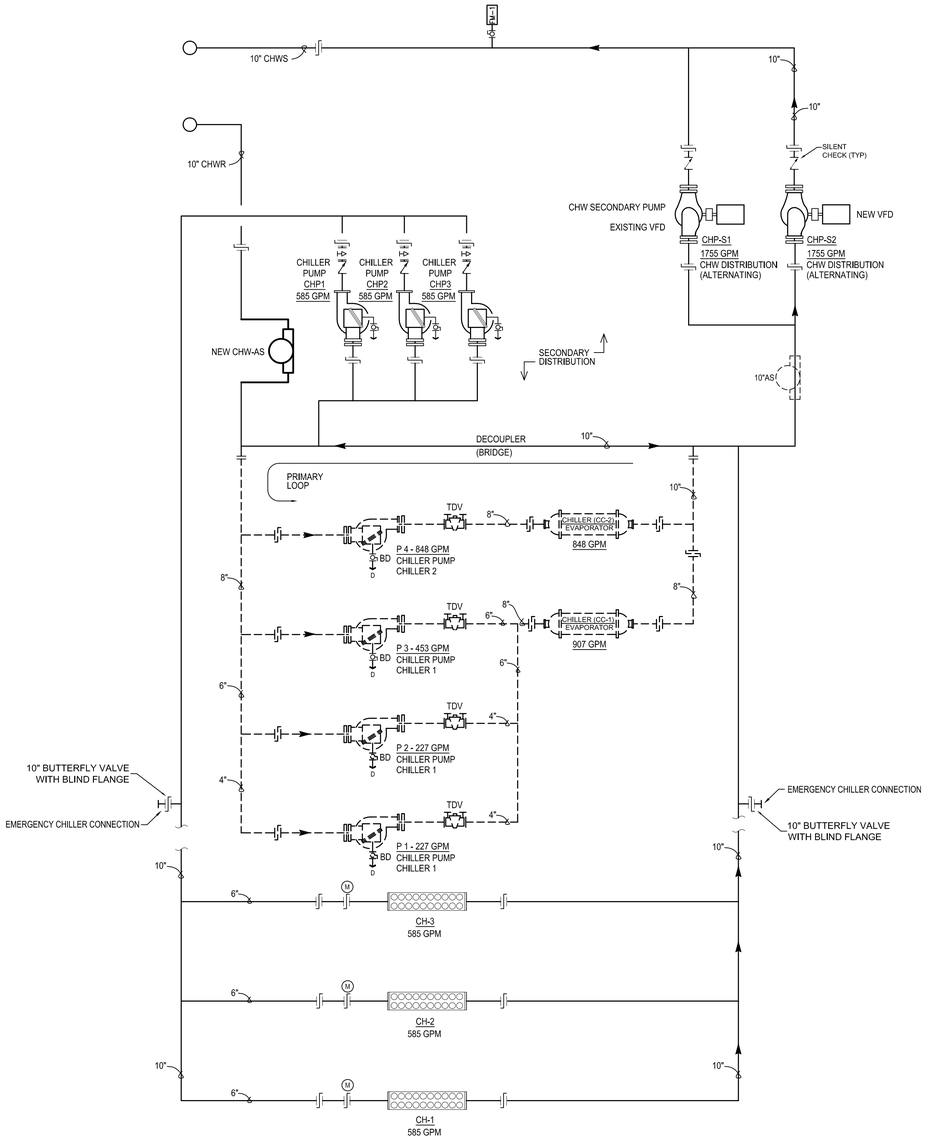
SUBMITTAL: CONSTRUCTION DOCUMENTS

SHEET TITLE: MECHANICAL ROOM CONSTRUCTION PLAN PLAN

SHEET: M300

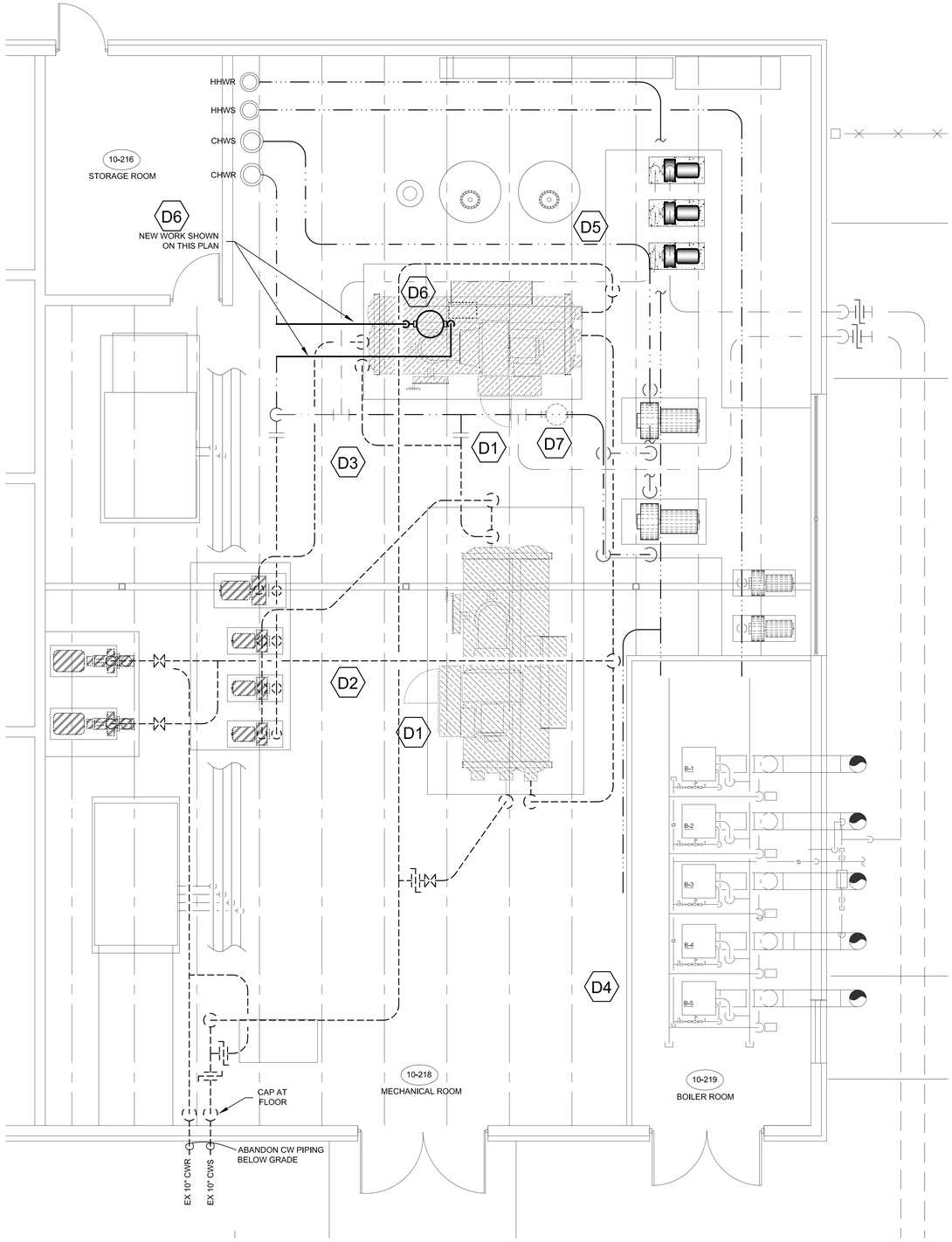
Peter J. McGinniss, PE #37318

JOB NUMBER: 2014-33



CHILLED WATER SYSTEM DEMOLITION PIPING SCHEMATIC

NTS



MECHANICAL ROOM DEMOLITION PLAN

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

DEMOLITION NOTES

After the new plant is fully functional, tested, and accepted, demolition can commence. Demolish cooling towers and supports. See Drawing M600

D1 Owner will salvage refrigerant. Deliver chillers to LCS maintenance.

D2 Demolish all condenser water piping within the mechanical room. Piping below the slab and below ground is to be abandoned in place.

D3 Demolish all obsolete chilled water piping. Install new flanges and blind flanges as indicated.

D4 All obsolete controls are to be removed by the control contractor.

D5 Demolish obsolete make-up water systems.

D6 Install new dirt and air separater.

D7 Demolish existing air separator. Install spool piece.

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LIVELY TECHNICAL CENTER
CHILLER PLANT UPGRADES
LCS Project #33017

Tallahassee, Florida

DATE: June 3, 2015

REVISED: . . .

DESIGNED BY:	DRAWN BY:
PJM	RET

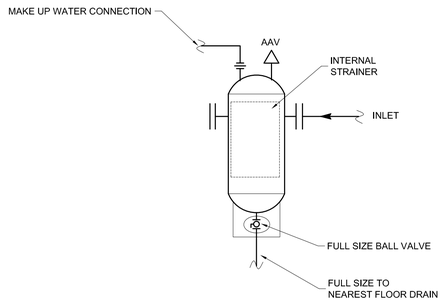
SUBMITTAL: CONSTRUCTION DOCUMENTS

SHEET TITLE: MECHANICAL ROOM DEMOLITION AND SCHEMATIC

SHEET: M400

Peter J. McGinniss, PE #37318

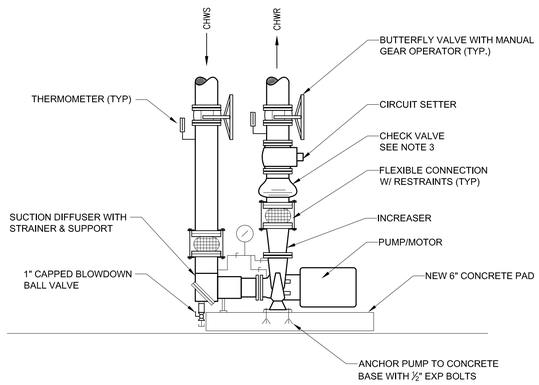
JOB NUMBER: 2014-33



AIR SEPARATOR DETAIL

SCALE: NTS

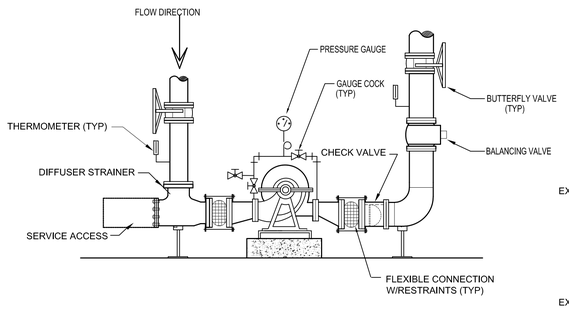
NOTES:
1. SEE EQUIPMENT SCHEDULE FOR SIZE, FEATURES, ETC.
2. AUTOMATIC AIR VENT (AAV) SHALL BE ¾" NPS, HIGH-VOLUME, CAST IRON BODY, FREE-FLOATING TYPE WITH FLOAT
3. PIPE AIR VENT DISCHARGE TO NEAREST DRAIN.
4. INSULATE AIR SEPARATOR, SEE INSULATION SPECIFICATIONS.



NOTES:
1. CONCRETE PAD OR INERTIA BASE TO BE 6" WIDER THAN PUMP & DIFFUSER SUPPORT IN ALL DIRECTIONS, SEE CONCRETE PAD DETAIL.
2. INSTALL PUMP PER THE MANUFACTURER'S RECOMMENDATIONS.
3. CHECK VALVE SHALL BE FLANGED, SILENT TYPE, IRON BODY, GLOBE STYLE, SPRING ACTUATED, WITH RENEWABLE SEAT AND DISC.

END SUCTION CLOSE-COUPLED PUMP DETAIL - CHP P1, 2 & 3

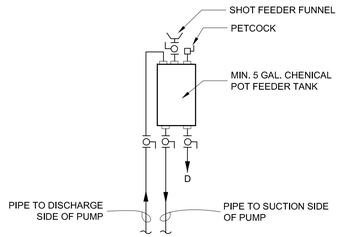
N.T.S.



NOTES:
1. REUSE EXISTING PUMP PAD IF SIZE IS 4" WIDER THAN PUMP BASE. REPLACE IF NOT -SEE HOUSEKEEPING PAD DETAIL.
2. SECURE PUMP TO PAD USING EXPANSION BOLTS PER THE MANUFACTURER'S INSTRUCTIONS.
3. ECCENTRIC REDUCER/INCREASERS SHALL BE FLAT ON TOP AS SHOWN.
4. ALIGN PUMP AFTER INSTALLATION PER THE MANUFACTURER'S RECOMMENDATIONS.

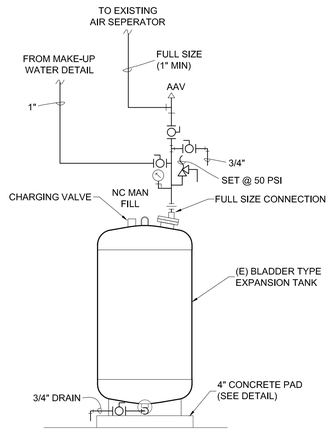
SPLIT-CASE DOUBLE SUCTION PUMP DETAIL - CHP-S1&2 (ALTERNATE)

N.T.S.



WATER TREATMENT SYSTEM DETAIL

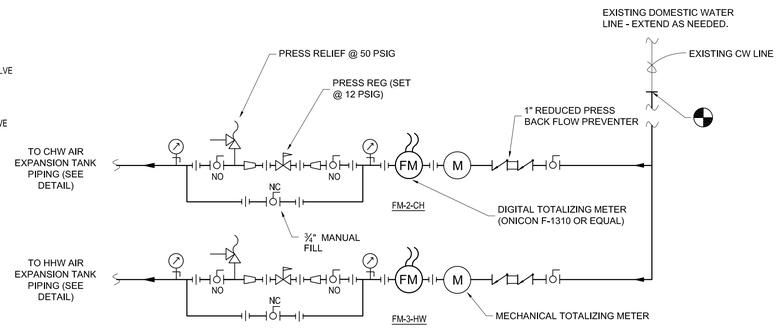
N.T.S.



EXPANSION TANK DETAIL

N.T.S.

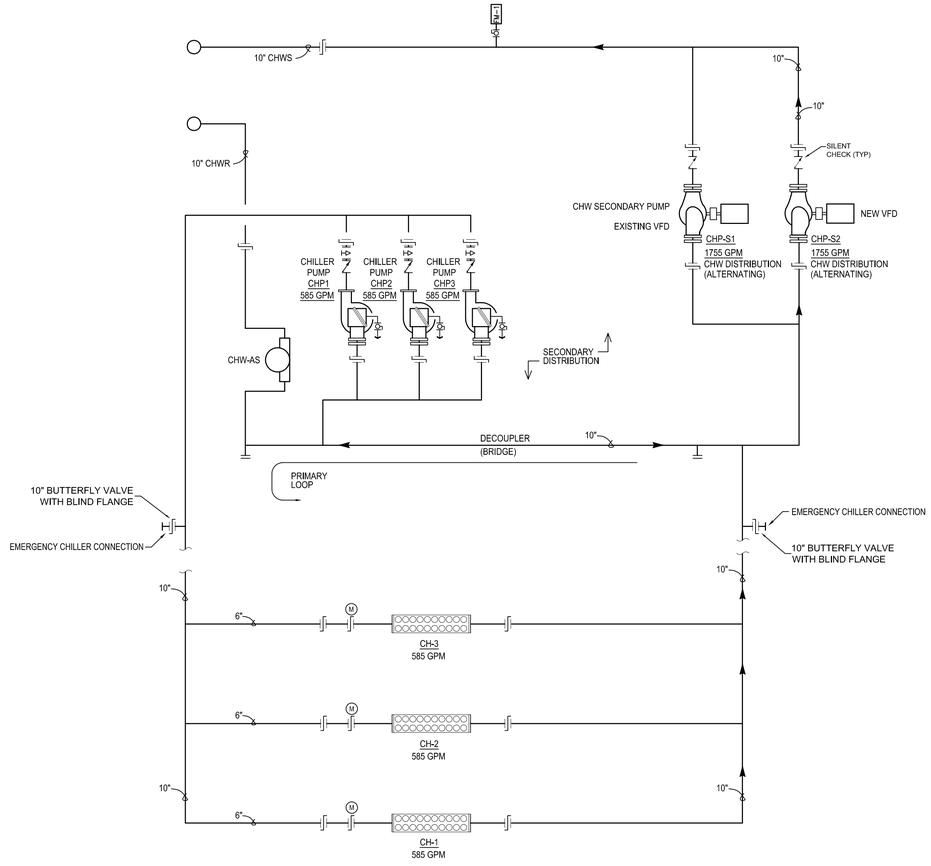
NOTES:
1. FOR EXISTING RELOCATED TANKS, VERIFY BLADDER INTEGRITY AND CONDITION OF TANK EXTERIOR BEFORE REUSING. CONSULT THE MANUFACTURER'S INSTRUCTIONS AND RECHARGE AS NEEDED.
2. NEW PIPING SHALL BE SCHEDULE 40 BLACK STEEL OR TYPE L COPPER.
3. ISOLATE DISSIMILAR MATERIALS.
4. INSTALL VALVES, REGULATOR, ETC. AS LOW AS POSSIBLE FOR ACCESS WITHOUT LADDER.



MAKE-UP WATER SYSTEM DETAIL

NTS

NOTES:
1. LOCATE & SUPPORT MAKE-UP WATER SYSTEM AT APPROX 5' AFF. PROVIDE ANGLE IRON STAND FOR MAKE UP WATER PIPING.
2. PIPING SHALL BE TYPE L COPPER WITH SWEAT/THREADED JOINTS. ISOLATE DISSIMILAR METALS.
3. DIGITAL WATER METER SHALL BE PROVIDED BY THE CONTROLS CONTRACTOR, INSTALLED BY THE MECHANICAL CONTRACTOR. METER SHALL BE CONNECTED TO THE BAS, SEE CONTROLS.



CHILLED WATER SYSTEM FINAL PIPING SCHEMATIC

NTS

AIR & DIRT SEPARATOR SCHEDULE		
DESIGNATION		CHW - AS
SYSTEM SERVED		CHW
MANUFACTURER		TACO
MODEL		4900
CONNECTION SIZE & TYPE		8" FLANGED
FLOW RATE (OPTIMUM)	GPM	1730
PRESS DROP (MAX)	PSI	2.0
STRAINER AREA	SQ FT	290
DIMENSIONS (DIA/HT)	IN	24 X 70
DRY WEIGHT	LB	520
OPTIONS/FEATURES		SEE BELOW
FEATURES: TWO TOP PORTS AND ONE BOTTOM BLOW DOWN PORT, 125# WORKING PRESSURE RATING, PALL RING TECHNOLOGY, DESIGNED AND CONSTRUCTED PER ASME SECTION VIII, DIV. 1, AND RATED FOR 375 °F MAX OPERATING TEMPERATURE.		

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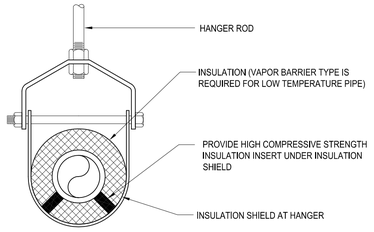
SHEET TITLE:
CHILLED WATER SYSTEM PIPING SCHEMATIC & DETAILS

SHEET:
M500

JOB NUMBER:
2014-33

Peter J. McGinniss, PE #37318

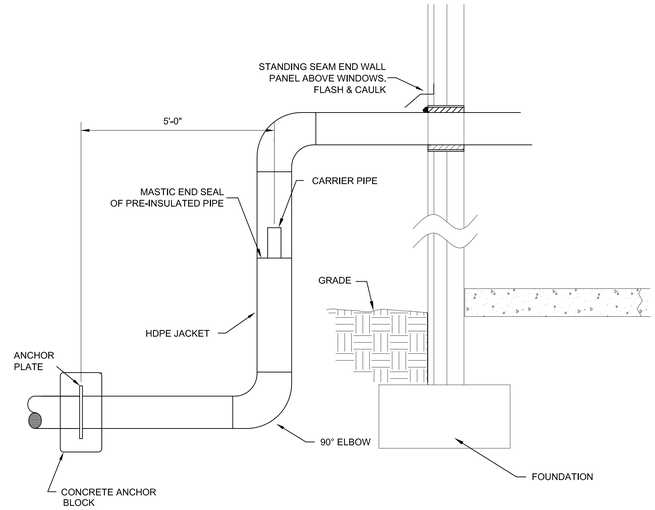


ADJUSTABLE CLEVIS HANGER TYPE 1

N.T.S.

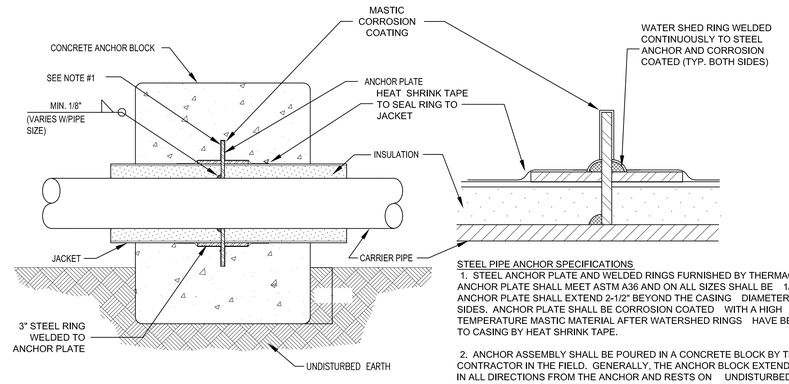
NOTES:

1. INSTALL INCOMPRESSIBLE THERMAL INSERT WITH GALVANIZED SHIELD AT CLEVIS HANGERS WHERE COMPRESSIBLE INSULATION, SUCH AS FIBERGLASS, IS USED. INSERT SHALL BE EQUAL TO VALUE ENGINEERED PRODUCTS PRO-SHIELD FOR SPECIFIC PIPE SIZE.



TYPICAL CENTRAL PLANT RISER DETAIL

N.T.S.



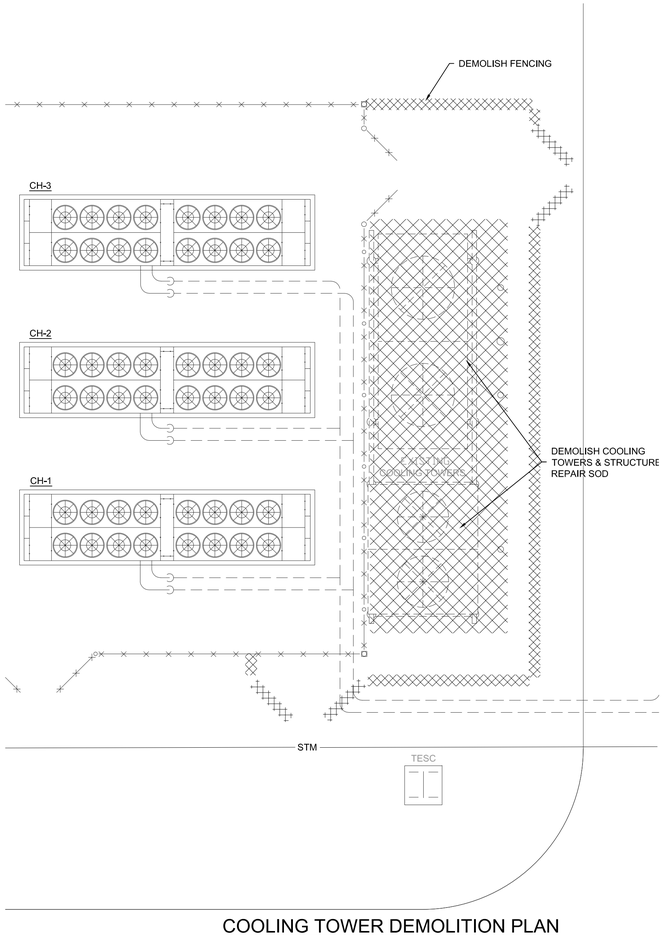
PIPING ANCHOR DETAIL

N.T.S.

STEEL PIPE ANCHOR SPECIFICATIONS

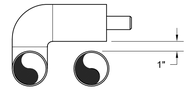
1. STEEL ANCHOR PLATE AND WELDED RINGS FURNISHED BY THERMACOR. ANCHOR PLATE SHALL MEET ASTM A36 AND ON ALL SIZES SHALL BE 1/2" THICK. ANCHOR PLATE SHALL EXTEND 2-1/2" BEYOND THE CASING DIAMETER ON ALL SIDES. ANCHOR PLATE SHALL BE CORROSION COATED WITH A HIGH TEMPERATURE MASTIC MATERIAL AFTER WATERSHED RINGS HAVE BEEN SEALED TO CASING BY HEAT SHRINK TAPE.

2. ANCHOR ASSEMBLY SHALL BE POURED IN A CONCRETE BLOCK BY THE CONTRACTOR IN THE FIELD. GENERALLY, THE ANCHOR BLOCK EXTENDS A MIN. 12" IN ALL DIRECTIONS FROM THE ANCHOR AND RESTS ON UNDISTURBED EARTH. THE JOB SITE CONDITIONS SHALL BE THE FINAL DETERMINING FACTOR FOR ANCHOR BLOCK SIZING.



COOLING TOWER DEMOLITION PLAN

SCALE: 1/8" = 1'-0"

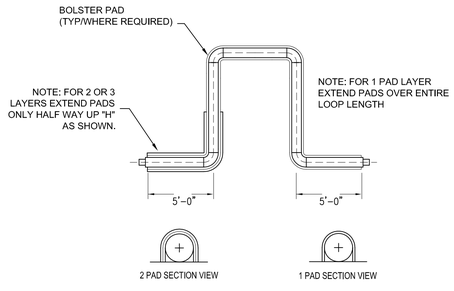


NOTE:

CROSSOVER PIPING TO HAVE APPROX. 1" CLEARANCE BETWEEN JACKETS.

CROSSOVER DETAIL

N.T.S.



EXPANSION LOOP DETAIL

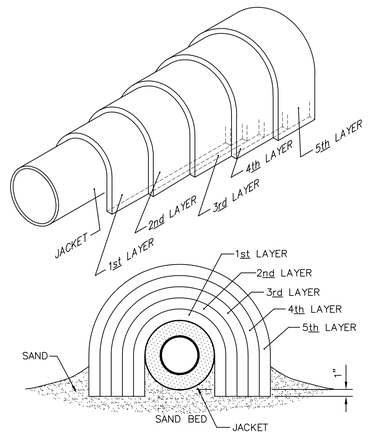
N.T.S.

NOTE: ALL CONSTRUCTION SHALL COMPLY W/ FDOT ROADWAY & TRAFFIC DESIGN STANDARDS.

INSTALLATION INSTRUCTIONS: EXPANSION BOLSTERS (HDPE JACKET)

PROCEDURE

1. EXPANSION BOLSTER MATERIAL IS SUPPLIED IN PRECUT PADS: 41" WIDE x 1" THICK x PRECUT LENGTH.
2. USE APPROPRIATE PADS FOR EASCH ELBOW OR EXPANSION LOOP AS PER THE INSTALLATION INSTRUCTIONS.
3. WRAP BOLSTER AROUND JACKET HOLDING IT IN PLACE WITH BEDDING SAND. BE CERTAIN THAT THE BOLSTER FITS SNUG AROUND JACKET.
4. BUILD THE PADS TO THE REQUIRED LENGTH AND NUMBER OF LAYERS BY BUTTING PADS IN LONG SEGMENTS AND LAYERING AS REQUIRED BY THE DRAWING.



EXPANSION BOLSTER DETAIL

N.T.S.

HDPE JACKET OD (INCHES)	WRAPAROUND DIMENSION PER LAYER (INCHES)				
	FIRST LAYER	SECOND LAYER	THIRD LAYER	FOURTH LAYER	FIFTH LAYER
5.40	17	20	23	27	31
6.68	20	23	27	31	34
8.68	26	30	33	36	39
10.85	32	35	39	42	45
12.85	38	41	44	47	50
14.1	41	45	48	50	53
16.1	46	49	52	55	58
18.2	49	52	55	60	64
20.28	57	60	63	66	70
22.2	61	66	71	77	82
24.38	67	72	77	82	87
28.25	77	82	87	92	97

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SHEET TITLE:
DETAILS

SHEET:
M600

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JOB NUMBER:
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CONTROL SEQUENCES AND NOTES

HVAC Controls Coordination and General Requirements

- The mechanical contractor shall coordinate with the controls' contractor.
- The controls' contractor shall perform demolition of existing controls.
- The controls' contractor shall provide the following equipment to be installed by the mechanical contractor:

  A. differential pressure transducers.
  B. temperature sensors.
  C. flow meter(s), see schedule.

- The controls' contractor shall indicate on the asbuilts and graphics the location of the chilled water system differential pressure transducer(s).
- The chiller supplier shall provide flow switches to be installed by the mechanical contractor.
- Provide complete plant chilled water system graphics.
- Program trend data setups for key operating parameters of plant systems to include chiller % rated amps, leaving and entering water temperatures, setpoints, bridge temperatures, equipment operation status, chw flow, makeup water hourly & daily flow, etc. Coordinate graphics with the Owner.
- Schedule all equipment to meet the Owner's requirements for the specific facility.

Chilled Water System:

- Chilled water production is provided via three air cooled chillers. The chillers have dedicated constant-volume primary pumps. Distribution of chilled water is provided by two variable-volume secondary pumps.
- The chillers shall communicate via BACnet to the BAS system to provide the points as scheduled and for sequencing.
- Chillers shall be staged according to load and their status alternated weekly to maintain equal run-time hours for the three chillers.
- The chillers will call for opening isolation valves and for start of primary pumps, and operate their compressors to maintain leaving water temperature (44 °F - adj.) via their factory-mounted controllers. Compressor operation occurs only after evaporator flow is proofed via the inline flow switch.
- Two alternating secondary pumps are provided and equipped with variable-frequency drives (VFDs) to vary motor speeds for variable flow. The work shall include new differential pressure (DP) transducers across the chilled water mains, associated wiring and programming. The BAS shall be programmed to operate only one secondary pump to meet the demand and to alternate pump lead status weekly to maintain equal run-time hours.
- The controls contractor shall provide a new differential pressure transducers for the mechanical contractor to replace the existing DP at the existing location approx. ⅔ down the longest chilled water piping run. Also install a DP transducer in the plant to serve as a backup in the event the remote one's signal is lost or network has failed.
- Use bridge temperature sensor outputs to monitor overall plant chilled water flow balance. Bridge temperature in excess of chiller leaving water temperature indicates reverse flow in bridge (mixing with return) and will adversely affect plant leaving water temperature. This is not an issue when ambient temperature is below 65°F. However, at all other times bridge flow must be corrected by staging a second chiller (increases primary flow) to ensure consistent plant LWT and dehumidification of air processed by the AHUs and FCUs.
- Chilled water production shall be initiated by the Building Automation System (BAS) as follows:

  a. On call for cooling: (utilize the existing call for cooling stratagy to initiate the chiller plant)
  b. enable the lead secondary chilled water pump.
  c. enable the lead chiller
  d. chiller will open its isolation valve and enable a primary pump.
  e. Chiller controller will operate/modulate compressors to maintain a leaving water temperature (remote adjust).

- The BAS shall sequence/enable the lag chiller for any of the following conditions:

  a. When lead chiller % rated amps is above 95% (adj) for 15 minutes (adj).
  b. When plant leaving water temperature is 3°F (adj) above setpoint for 15 minutes (adj) and ambient temperature is above 65°F (adj).
  c. When decoupler/bridge temperature sensors indicate reverse flow (i.e. secondary flowrate exceeds primary) for 15 minutes and ambient temperature is above 65 °F (adj).
  d. Two (2) minutes (adj) after lead chiller start/run failure.

- Chiller destaging shall occur when the following conditions are satisfied:

  a. When % run amps of any two chillers is below 30% for 15 minutes and
  b. Bridge temperature indicates proper flow and
  c. Plant leaving water temperature is within 1°F (adj) of chiller setpoint.

- Program secondary pump operation to use the plant DP signal when the network is down or failed.
- Program chillers/plant operations to restart 5 min (adj) after normal power resumes.

Make-up Water Totalizing Flow Meters

- Provide hourly average volume on plant graphic for make up water system. Alarm if hourly flow exceeds 20 gallons per hour (adj).

CHILLER & PUMPS POINTS LIST

	CONTROL POINTS																				SYSTEM FEATURES										
	INPUTS												OUTPUTS								PROGRAMS										
	ANALOG							DIGITAL					DIGITAL				ANALOG				ALARMS				CALCULATED				GNL		
CONTROL POINTS SYSTEM DESCRIPTION	DRYBULB TEMPERATURE (F)	DIFFERENTIAL PRESS.	FLOW RATE	RH	% RLA	SPEED	.	STATUS	FLOW SWITCH	RUN HOURS	FLOW (GPH)	.	START / STOP	TIMED OVERRIDE	.	.	SET POINT ADJUST	PROPORTIONAL MODULATION	.	.	GENERAL	TEMPERATURE	.	HOURLY LIMIT (GPH)	SCHEDULE	SEQUENCE/ALTERNATE	TOTAL	.	VFD INTERFACE	TREND LOG	COLOR GRAPHIC
PLANT ENT WATER	X																					X								X	X
PLANT LVG WATER	X		X														X					X								X	X
BRIDGE TEMP SENSORS	X																					X								X	X
CHILLER					X			X	X	X			X	X			X				X				X	X				X	X
CHILLER (EWT & LWT)	X																					X								X	X
COMPRESSORS					X	X		X													X									X	X
ISOLATION VALVES								X		X			X								X									X	X
PRIMARY PUMPS								X		X			X								X									X	X
SECONDARY PUMPS/VFDS		X						X		X			X	X				X			X				X	X				X	X
AMBIENT AIR	X						X																							X	X
CHW MAKE-UP METER											X													X						X	X

NOTES:
1. CHILLER TO COMMUNICATE DIRECTLY WITH OWNER'S BAS VIA MS/TP. CHILLER CONTROLS TO MODULATE CAPACITY.
2. CHILLER TO OPEN ISOLATION VALVES AND START/STOP A PRIMARY PUMP AND COMPRESSORS AFTER PROOF OF FLOW. .
3. SEQUENCE SECONDARY PUMPS TO ALTERNATE WEEKLY. TREND RUN TIMES.
4. HARDWIRE CHILLER START/STOP, ALARMS, AND CHILLED WATER ENTERING AND LEAVING TEMPERATURES.
5. COORDINATE CONTROLS, WIRING, DEVICES, ETC. WITH CHILLER MANUFACTURER.
6. HARDWIRE VARIABLE FREQUENCY DRIVES: START/STOP, ALARM, AMPS AND OTHER AVAILABLE PROGRAMMABLE ANALOG AND DIGITAL POINTS INDICATED ABOVE.
7. SEE CHILLER/PLANT DIAGRAMS FOR LOCATION OF SENSORS/CONTROLS.

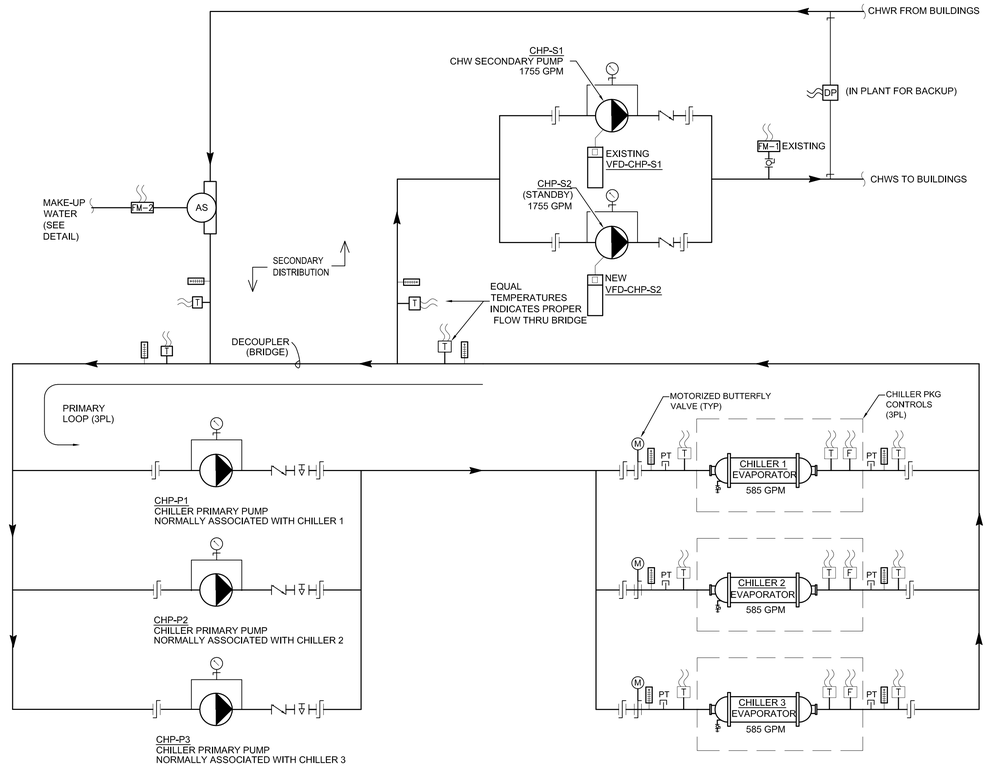
FLOW METER SCHEDULE

DESIGNATION	FM-1	FM-2 & 3
SERVICE	SECONDARY FLOW	MAKEUP FLOW
MANUFACTURER	ONICON	ONICON
MODEL NUMBER	F-3500	F-3100
SENSING METHOD	ELECTROMAGNETIC	ELECTROMAGNETIC
TYPE	INSERTION	INLINE
ACCURACY (FULL SCALE)	+/- 1.0% (2 to 20 fps)	+/- 0.4% (3.3 to 33 fps)
INPUT POWER	20-28 VDC, 250 mA	10-63 VDC, 300 mA
AMBIENT TEMPERATURE RANGE	-20 to 150 °F	-4 to 140 °F
OPERATING PRESSURE (MAX)	400 PSI	230 PSI
OUTPUT	4-20 mA, 0-10 V	4-20 mA, 0-10 V

NOTES:
1. INSTALL INSERTION METER WITH REQUISITE UPSTREAM AND DOWNSTREAM PIPE DIAMETERS FROM OBSTRUCTIONS, FITTINGS, ETC.
2. SEE PLANS AND DETAILS FOR METER PIPE SIZES.

INSTRUMENTATION & CONTROLS LEGEND

DESIGNATION	DESCRIPTION
	THERMOMETER
	PRESS GAUGE & COCK
F	FLOW SWITCH
T	TEMPERATURE SENSOR
FM	FLOWMETER
DP	DIFFERENTIAL PRESS
M	MOTOR ACTUATOR
E	ELECTRIC ACTUATOR
	PUMP
PT	PRESS/TEMP PORT



CHILLED WATER SYSTEM CONTROL DIAGRAM

NTS

NOTES:
1. NOT ALL VALVES, FLEXIBLE PIPE CONNECTIONS, SUCTION DIFFUSERS, ETC. ARE SHOWN. SEE PIPING SCHEMATIC.
2. SEE PIPING SCHEMATIC AND PLAN FOR PIPE SIZES.
3. REMOTE LOCATED DIFFERENTIAL PRESSURE TRANSDUCER FOR SECONDARY PUMP SPEED CONTROL NOT SHOWN.
4. INSTRUMENTATION IS BY THE MECHANICAL CONTRACTOR.
5. SEE DETAILS FOR MAKE-UP WATER PIPING, METER LOCATION, ETC.

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MECHANICAL
CONTROLS, NOTES & SCHEDULES

SHEET:
M700

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ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
EC	EMPTY CONDUIT (3/4" MINIMUM) WITH NYLON PULLWIRE
EM	EMERGENCY
EMCS	ENERGY MANAGEMENT CONTROL SYSTEM
EX	EXISTING - RECONNECT AS REQUIRED AT EXISTING LOCATION, REMOVE AND REINSTALL IF REQUIRED
MCC	MOTOR CONTROL CENTER
NL	NIGHT LIGHT
T	TRANSFORMER
VSD	VARIABLE SPEED DRIVE
WP	WEATHERPROOF (NEMA 3R)

SWITCHES

S — FLUSH TYPE, 20A, 120/277V AC ONLY, QUIET TYPE, SINGLE POLE

S_3 — FLUSH TYPE, 20A, 120/277V AC ONLY, QUIET TYPE, 3 WAY

CONTROLS & MECHANICAL EQUIPMENT

MOTOR CONTROLLER - MAGNETIC - MOUNTS IN SEPARATE ENCLOSURE - SIZE AND RATINGS AS INDICATED - COORDINATE LOCATION AND REQUIREMENTS WITH DIVISION 15

S_M — MOTOR SNAP SWITCH WITH THERMAL OVERLOAD PROTECTION - 20A, 1 POLE UNLESS NOTED OTHERWISE.

(M) — MOTOR - ELECTRICAL CHARACTERISTICS AS NOTED

TC — TIME CLOCK - SEE DRAWINGS FOR REQUIREMENTS

LC — LIGHTING CONTACTOR - SEE DRAWINGS FOR REQUIREMENTS

(R) — RELAY - CONFIGURATION AND COIL VOLTAGE AS INDICATED

CONTACTOR - NORMALLY OPEN

CONTACTOR - NORMALLY CLOSED

BAS — ENERGY MANAGEMENT CONTROL SYSTEM PANEL

MOTOR CONTROL CENTER ASSEMBLIES

MOTOR CONTROLLER - FVNR

MOTOR CONTROLLER - VARIABLE SPEED with INTEGRAL DISCONNECT

POWER, PANELS & POWER EQUIPMENT

PANELBOARD 208 VOLT - SURFACE MOUNTED - SEE PANELBOARD SCHEDULE

POWER DISTRIBUTION PANEL OR 480 VOLT - SEE PANELBOARD SCHEDULE

NF — DISCONNECT SWITCH, NON-FUSIBLE, SIZE AND TYPE AS NOTED.

DISCONNECT SWITCH, FUSIBLE, SIZE, TYPE AND FUSED AS NOTED, FUSE PER MANUFACTURER'S RECOMMENDATION. NON-FUSED SWITCH MAY BE USED IF UNIT IS UL TESTED WITH BREAKER PROTECTION. SIZE, TYPE AND FUSES AS NOTED - 60 AMP INDICATED.

MOLDED CASE CIRCUIT BREAKER

MOLDED CASE CIRCUIT BREAKER WITH MULTI-FUNCTION ELECTRONIC TRIP

R — RELAY - RATING AS SHOWN

JUNCTION BOXES

(J) — IN OR ABOVE CEILING

(J) — IN WALL - MOUNT 1'-6" UNLESS NOTED OTHERWISE.

SWITCHGEAR / MCC ASSEMBLIES

AEM — ASSEMBLIES ELECTRONIC MONITOR

CT — CURRENT TRANSFORMERS

GROUNDING

G-Z — 3/4" X 10'-0" GROUND ROD.

SITEWORK AND SITE LIGHTING

T — PADMOUNTED, OIL-FILLED TRANSFORMER; BY CITY OF TALLAHASSEE

E — ELECTRICAL DIRECT BURIED PULL BOX.

C — SYSTEMS DIRECT BURIED PULL BOX.

ARM MOUNTED EXTERIOR LIGHT FIXTURE WITH POLE. ARROW INDICATES DIRECTION OF OPTICS (IN DIRECTION OF ARM IF NOT SHOWN). SEE LIGHTING FIXTURE SCHEDULE

WALL OUTLETS

DUPLEX RECEPTACLE, 20A, 125V, 2 POLE, 3 WIRE, MOUNT 1'-6" AFF, NEMA 5-20R.

WP — DUPLEX RECEPTACLE, 20A, 125V, 2 POLE, 3 WIRE, WITH WEATHERPROOF COVER (TWO HINGED FLAPS WITH STAINLESS STEEL SPRINGS).

GFI — DUPLEX RECEPTACLE, 20A, 125V, 2 POLE, 3 WIRE, WITH GROUND FAULT INTERRUPTER. MOUNT BOTTOM OF COVERPLATE 2" ABOVE COUNTER OR BACKSPLASH. IF NO COUNTER THEN MOUNT 3'-8"AFF, NEMA 5-20R.

HOMERUNS TO PANELS

ARROW INDICATES CIRCUIT HOMERUNS IN CONDUIT

LPA-2,4 — INDICATES HOMERUN TO CIRCUIT NUMBERS 2 & 4 IN PANEL "LPA"

NOTE:
NUMBER OF HOMERUNS SHOWN ON THE PLANS ARE THE NUMBER OF HOMERUNS REQUIRED. DO NOT RUN MORE THAN THREE HOMERUNS IN ONE CONDUIT. DO NOT RUN 2 CIRCUITS ON THE SAME PHASE IN ONE CONDUIT.

T — THRU CONTACTS OF TIME SWITCH.

M — CIRCUIT THAT IS SHOWN AND SIZED ON MOTOR CONTROL CENTER SCHEDULE. SEE MOTOR CONTROL SCHEDULE FOR CIRCUITS TO MOTOR CONTROL CENTER. FROM VSD TO MOTOR USE 90 DEGREES CELSIUS CONDUCTORS.

CONDUIT STUBBED OUT ABOVE CEILING - PROVIDE BUSHING ON CONDUIT END.

MDP — CIRCUIT SIZE AS SHOWN ON SINGLE LINE DIAGRAM UNLESS OTHERWISE INDICATED.

INDICATES CONTINUATION OF RUN SHOWN ON ANOTHER PLAN VIEW

CIRCUITING AND BRANCH CIRCUITS

CIRCUITS SHOWN — L2A-3 — INDICATES 1 #12 PHASE CONDUCTOR, 1 #12 NEUTRAL & 1 #12 GND - 3/4" C. TO 20 AMP, 1 POLE BREAKER ON CIRCUIT No. 3, IN PANEL L2A.

L2A-2,4 — INDICATES 2 #12 PHASE CONDUCTORS, 1 #10 NEUTRAL & 1 #12 GND - 3/4" C. TO 20 AMP, 1 POLE BREAKER ON CIRCUIT No.'s 2 & 4 IN PANEL "L2A".

L2A-2,4,6 — INDICATES 3 #12 PHASE CONDUCTORS, 1 #10 NEUTRAL & 1 #12 GND - 3/4" C, TO 20 AMP 1 POLE BREAKERS ON CIRCUIT No.'S 2,4,6, IN PANEL "L2A" ETC.

10's — INDICATES ALL CONDUCTORS ARE TO BE MINIMUM #10 GAUGE, CONDUIT PER NEC OR AS INDICATED.

LIGHTING CIRCUITS MAY UTILIZE A #12 NEUTRAL RATHER THAN A #10 NEUTRAL.

NEUTRALS SHALL NOT BE SMALLER SIZE THAN PHASE CONDUCTORS UNLESS SPECIFICALLY INDICATED OTHERWISE.

INSULATED GROUNDING CONDUCTORS SHALL BE USED IN ALL CIRCUITS, SIZED IN ACCORDANCE WITH NEC ARTICLE 250.

2-#12, 1-#12 GROUND SHALL BE RUN IN 3/4" CONDUIT. 4 OR MORE #12 CONDUCTORS SHALL BE RUN IN 3/4" C. OR AS REQUIRED BY NEC. LARGER THAN #12 CONDUCTORS SHALL BE RUN IN CONDUIT SIZED IN ACCORDANCE WITH NEC.

CONCEALED OVERHEAD OR IN WALLS.

CONCEALED IN OR BELOW FLOORS.

FLEXIBLE CONDUIT TO EQUIPMENT

EXPOSED SURFACE MOUNTED METAL RACEWAY.

SERVICE LOAD CALCULATION

LIVELY TECHNICAL CENTER CENTRAL HVAC PLANT & BUILDING 10

SQUARE FOOTAGE: 64,000
CLASSIFICATION: INDUSTRIAL

LOAD:	EXISTING	NEW	NET
CHILLER 1	266,666	338,255	71,589
CHILLER 2	266,666	338,255	71,589
CHILLER 3	n/a	338,255	338,255
SCHWP-1	76,485	76,485	-
SCHWP-2	-	-	-
PRIMARY PUMPS	24,857	50,193	25,336
CW PUMPS	43,022	-	<43,022>
COOLING TOWERS	76,485	-	<76,485>
Total Connected Net Additional Load:			387,262 VA

Plant Load at 80% diversity:	1130 A
Lighting Loads (2W/sf) at 125%	192 A
Receptacle Loads	65 A
Misc Equipment	38 A
AHU and Ventilation	124 A
Service Requirement	1558 A

DEMOLITION NOTES

1. ALL ELECTRICAL ITEMS SHOWN ON DEMOLITION PLANS ARE TO BE REMOVED UNLESS NOTED OTHERWISE. REMOVE ALL ELECTRICAL TRADE MATERIALS ASSOCIATED WITH ITEMS SHOWN TO BE REMOVED. THIS SHALL INCLUDE BUT NOT BE LIMITED TO CONDUIT AND RACEWAYS (BOTH SURFACE MOUNTED AND CONCEALED ACCESSIBLE), WIRE, DEVICES AND CONDUIT SUPPORTS, BACK TO SERVING PANEL. THE CONTRACTOR IS DIRECTED TO OTHER DEMOLITION INSTRUCTION (MECHANICAL, PARTITIONS, ETC.) TO REVIEW AND DETERMINE WHERE ADDITIONAL DEMOLITION WORK MAY BE REQUIRED.
2. REMOVE ALL CONDUIT STUB-UPS IN FLOOR. CUT OR GRIND CONDUITS BELOW FLOOR LEVEL AND GROUT OPENING. GROUT FINISH SHALL BE ABSOLUTELY FLAT AND READY FOR FLOOR FINISH.
3. ALL REMOVED COPPER CONDUCTORS SHALL BE COILED NEATLY AND DELIVERED TO THE OWNER AT HIS MAINTENANCE FACILITIES ON THARPE STREET. ALL ELECTRICAL EQUIPMENT, INCLUDING FIXTURES, DISCONNECTS, MOTORS, ETC., SHALL REMAIN THE PROPERTY OF THE OWNER AND SHALL BE TURNED OVER TO THE OWNER AT A LOCATION DESIGNATED BY THE CONTRACTING OFFICER ON THE SITE OF THE PROJECT. ELECTRICAL CONDUIT, DEVICES, AND ALL OTHER MATERIALS SHALL BE DISPOSED OF OFFSITE BY THE CONTRACTOR AT NO ADDITIONAL COST.
4. BLANKING PLATES SHALL MATCH NEW PLATES INSTALLED.
5. WHERE EXISTING CIRCUITS ARE REWORKED BY THE ADDITION OR REMOVAL OF CONDUCTORS, THE OLD WIRE SHALL BE REMOVED, THE CONDUIT SWABBED OUT, AND NEW THWN WIRES REPULLED UNLESS INDICATED OTHERWISE.
6. IF ANY EXISTING ELECTRICAL EQUIPMENT THAT IS TO REMAIN BECOMES ISOLATED BY THE REMOVAL OF ELECTRICAL EQUIPMENT TO BE REMOVED, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REROUTE AND RECONNECT THE EQUIPMENT SO THAT THE SYSTEM REMAINS OPERABLE, ANY REQUIRED WORK SHALL BE IN ACCORDANCE WITH SPECIFICATIONS.
7. MOTORS AND HVAC DEVICES SHALL BE REMOVED BY CRAFTSMEN SKILLED IN THE HVAC TRADE. REMOVE ELECTRICAL CONNECTIONS TO SAME. COORDINATE REMOVAL OF CONTROL DEVICES AND ASSOCIATED RACEWAY WITH MECHANICAL TRADE. ALL LINE VOLTAGE WIRING SHALL BE DISCONNECTED AND REMOVED BY A QUALIFIED ELECTRICIAN.
8. RELOCATE EXISTING ELECTRICAL EQUIPMENT AND RACEWAYS AS REQUIRED TO AVOID NEW PIPING. ALL WORK REQUIRED SHALL BE PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS. CONTRACTING OFFICER SHALL BE NOTIFIED BEFORE PERFORMING WORK.
9. WHILE REMOVING ALL ELECTRICAL ITEMS INSIDE THE INDICATED ALTERATION AREA, RECONNECT CIRCUITS TO MAINTAIN INTEGRITY OF EXISTING CIRCUITS AND CONTINUED OPERATION OF LIGHTING, EQUIPMENT AND DEVICES TO REMAIN.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY CUTTING OR PATCHING OF WALLS AND CEILINGS REQUIRED. CUTTING AND PATCHING WORK SHALL BE PERFORMED BY SKILLED CRAFTSMEN. RETURN ALL WALLS AND THEIR FINISHES TO ORIGINAL CONDITION.
11. ABANDONED CONDUIT SHALL BE REMOVED WHERE POSSIBLE. ABANDONED CONDUIT IN SLAB OR CONCRETE WALLS WHICH CANNOT BE REMOVED SHALL HAVE WIRES PULLED FROM THEM. CUT OFF CONDUIT FLUSH WITH CONCRETE. PATCH OPENINGS AND PENETRATIONS WITH GROUT AND GRIND OR TROWEL SMOOTH, READY FOR NEW FINISH.
12. EXISTING CONDUITS WHICH PENETRATE EXTERIOR WALLS SHALL BE REMOVED AND EXTERIOR WALL PATCHED WITH LIKE MATERIALS.
13. ANY AND ALL HOLES OR DAMAGED SURFACES DUE TO DEMOLITION WORK SHALL BE PATCHED BY A SKILLED CRAFTSMAN.
14. WHERE ITEMS ARE DESIGNATED EXISTING TO REMAIN, THEY SHALL BE PROTECTED DURING DEMOLITION. RELOCATE AS REQUIRED WHERE ITEMS ARE INSTALLED IN CEILING. WHERE RECEPTACLES ARE NOT EXISTING TO REMAIN, NEW DEVICES AND WALLPLATES SHALL BE INSTALLED AND NEW THHN CONDUCTORS INSTALLED IN EXISTING RACEWAY.

SCOPE OF WORK

1. FURNISH ALL LABOR, MATERIALS, EQUIPMENT AND INCIDENTALS REQUIRED TO COMPLETE ALL ELECTRICAL WORK AS SHOWN ON THE CONTRACT DRAWINGS.
2. THIS SHALL INCLUDE THE INSTALLATION OF A COMPLETE AND PROPERLY OPERATING ELECTRICAL SYSTEM. THIS SYSTEM REQUIRED CONSISTS BASICALLY OF, AND IS NOT LIMITED TO, THE FOLLOWING:
   - EXTEND THE DISTRIBUTION SYSTEM FOR POWER INCLUDING FEEDERS, BRANCH CIRCUITS, INSTALLATION OF AND CONNECTION TO DEVICES, PANELBOARDS, TRANSFORMERS, SWITCHES, AND ALL OTHER EQUIPMENT SHOWN, AND THE CONNECTION TO OTHER POWER LOADS THAT ARE EXISTING OR NEW.
   - EXTEND THE BUILDING GROUND SYSTEM AND PROVIDE SPECIAL GROUNDS AS INDICATED.
   - INSTALL OWNER FURNISHED CONDUCTORS FOR ALL CONTROL AND ANNUNCIATING DEVICES AS INDICATED ON THESE DRAWINGS.
   - INSTALL, PUT INTO SERVICE THE TEMPORARY WORK SHOWN OR REQUIRED. REMOVE THIS SYSTEM AND SECURE APPARATUS AND EQUIPMENT TO REMAIN AT THTHE COMPLETION OF THE PROJECT OR APPROPRIATE TIME.
   - PERFORM THE DEMOLITION WORK INDICATED.
3. THE BIDDER SHALL INSPECT THE PRESENT JOBSITE CONDITIONS BEFORE PREPARING HIS BID. THE SUBMISSION OF A BID WILL BE CONSIDERED EVIDENCE THAT SUCH A VISIT AND INSPECTION WAS PERFORMED BY THE BIDDER AND THAT HE TAKES FULL RESPONSIBILITY FOR ALL FACTORS GOVERNING HIS WORK.
4. THE ELECTRICAL WORK SHALL BE COMPLETE, FULLY OPERATIONAL, AND SUITABLE IN EVERY WAY FOR THE SERVICE REQUIRED. DRAWINGS ARE GENERALLY DIAGRAMMATIC IN NATURE AND DO NOT SHOW ALL DETAILS, DEVICES AND INCIDENTAL MATERIALS NECESSARY TO ACCOMPLISH THEIR INTENT. THEREFORE, IT SHALL BE UNDERSTOOD THAT SUCH DEVICES AND INCIDENTAL MATERIALS REQUIRED SHALL BE FURNISHED AT NO COST TO THE OWNER.

GENERAL NOTES

1. PHASING SHALL BE COORDINATED AND IN COMPLIANCE WITH ALL PHASING DRAWINGS AND NOTES.
2. ALL CONDUCTORS SHALL BE INSTALLED IN METAL CONDUIT OR TUBING. CONDUIT FOR BURIAL IN SOIL OR UNDER CONCRETE SHALL BE PLASTIC. FLEXIBLE CONDUIT INSTALLED OUT-OF-DOORS, IN ANY MECHANICAL EQUIPMENT ROOM, OR IN NORMALLY WET AREAS, SHALL BE LIQUID TIGHT FLEX WITH SUITABLE FITTINGS.
3. COORDINATE WITH ALL MECHANICAL TRADES FOR SPACE REQUIREMENTS. THIS INCLUDES SPACE ABOVE PANELS WHERE DUCTS AND PIPING ARE PROHIBITED.
4. FOR EXACT LOCATIONS OF MECHANICAL EQUIPMENT, SEE MECHANICAL PLANS.
5. WHERE WALL SWITCHES AND CONTROL DEVICES SUCH AS THERMOSTATS ARE SHOWN NEAR EACH OTHER (CONTROL DEVICES SUCH AS THERMOSTATS ARE SHOWN ON THE MECHANICAL DRAWINGS) THEY SHALL BE MOUNTED WITH THE CONTROL DEVICE DIRECTLY BESIDE THE SWITCH.
6. PROVIDE CONDUIT EXPANSION FITTINGS WITH BONDING JUMPERS FOR ALL CONDUITS PASSING THROUGH EXPANSION JOINTS.
7. ALL CEILING MOUNTED AND WALL MOUNTED EQUIPMENT OR DEVICES SHALL BE LOCATED TO AVOID DOOR SWINGS WHERE REQUIRED.
8. CONDUIT SHALL PASS THROUGH WALLS AT 90 DEGREES AND SHALL BE RUN PARALLEL AND PERPENDICULAR TO WALLS.
9. BRANCH CIRCUITS AND HOMERUNS SHALL BE #12 WIRE AND 3/4" CONDUIT MINIMUM. EVERY CONDUIT SHALL HAVE A GREEN GROUNDING WIRE (#12 MINIMUM).
10. NO MORE THAN 3 PHASE CONDUCTORS SHALL BE INSTALLED IN ONE CONDUIT UNLESS NOTED OTHERWISE.
11. COLOR OF ALL RECEPTACLES, SWITCHES, ETC. TO BE LIGHT ALMOND. COVERPLATES SHALL BE STAINLESS STEEL UNLESS NOTED OTHERWISE.
12. PROVIDE BARRIERS BETWEEN ALL 277V SWITCHES MOUNTED UNDER THE SAME COVER PLATE WITH OTHER 277V SWITCHES ON DIFFERENT PHASES OR WITH 120V SWITCHES.
13. MOUNTING HEIGHTS OF WALL OUTLETS ABOVE FINISHED FLOOR SHALL BE AS INDICATED IN THE LEGEND AND IN THE FOLLOWING TABLE UNLESS NOTED OTHERWISE ON THE PLANS (MOUNTING HEIGHTS ARE TO CENTERLINE OF DEVICE):
    SWITCHES (GENERAL) 3'- 2" TO 3'-6"
    RECEPTACLES (GENERAL) 1'- 6"
14. MAINTAIN NEC MINIMUM CLEARANCE IN FRONT OF ALL SAFETY SWITCHES AND PANELBOARDS.
15. PRIOR TO ANY ROUGH-IN CONTRACTOR TO PROVIDE SCALED DRAWINGS (WITH ACTUAL DIMENSIONS OF APPROVED EQUIPMENT) SHOWING LOCATIONS AND PROPER CLEARANCES OF ALL ELECTRICAL PANELS, TRANSFORMERS, COMMUNICATION CABINETS, ETC. FOR APPROVAL. DRAWINGS WILL SHOW MECHANICAL, PLUMBING AND ARCHITECTURAL AS WELL AS ELECTRICAL EQUIPMENT.
16. ALL UNDERGROUND CONDUIT RUNS ENTERING THE BUILDING SHALL BE SEALED TO PREVENT THE ENTRANCE OF MOISTURE AND GASES.
17. UNLESS NOTED OTHERWISE ALL MOTORS 1/2 HP AND LARGER SHALL BE 460V, 3 PHASE AND MOTORS SMALLER THAN 1/2 HP SHALL BE 120V, SINGLE PHASE.
18. EXISTING PANELS TO REMAIN SHALL HAVE THEIR PANEL SCHEDULES UPDATED AND RETYPED AFTER COMPLETION OF NEW WORK.
19. ALL WALL PENETRATIONS SHALL BE SEALED TO MAINTAIN THE RATING OF THE WALL.
20. WHERE RECEPTACLES ARE INDICATED TO BE EQUIPPED WITH GROUND FAULT INTERRUPTING CIRCUITRY, IT SHALL BE INTEGRAL TO THE DEVICE AND HAVE A TEST/RESET MECHANISM INTEGRAL WITH THE DEVICE. REMOTE TEST/RESET OR THE INTERWIRING OF ADDITIONAL RECEPTACLES UTILIZING GF SENSING OF A SINGLE RECEPTACLE IS NOT ACCEPTABLE.

LEON COUNTY SCHOOLS

McGinniss & Fleming
Engineering, Inc.
Mechanical · Electrical · Fire Protection · Plumbing
1401 Miccosukee Road
Tallahassee, Florida 32308 *EB #05990*

LIVELY TECHNICAL CENTER
CHILLER PLANT UPGRADES
LCS Project #33017

Tallahassee, Florida

DATE:
June 3, 2015

REVISED:
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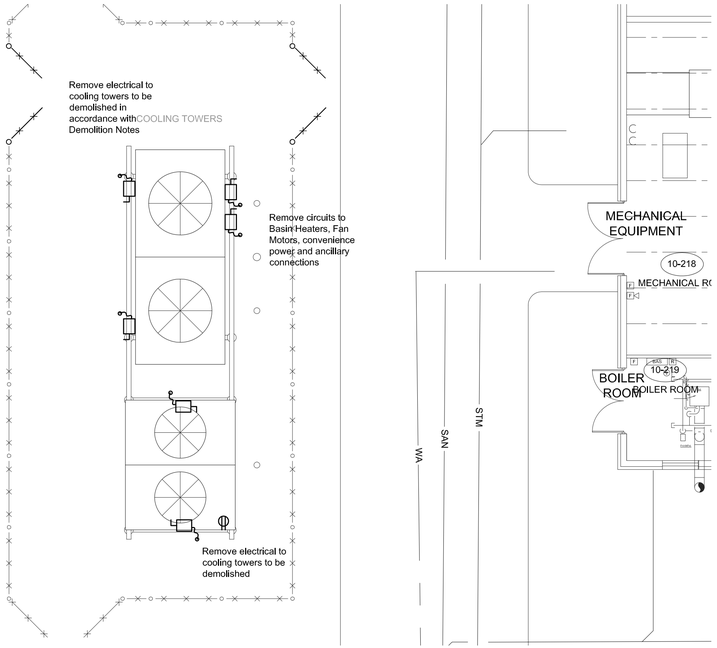
DESIGNED BY:	DRAWN BY:
CKF	RET

SUBMITTAL:
CONSTRUCTION DOCUMENTS

SHEET TITLE:
ELECTRICAL
NOTES & SYMBOLS

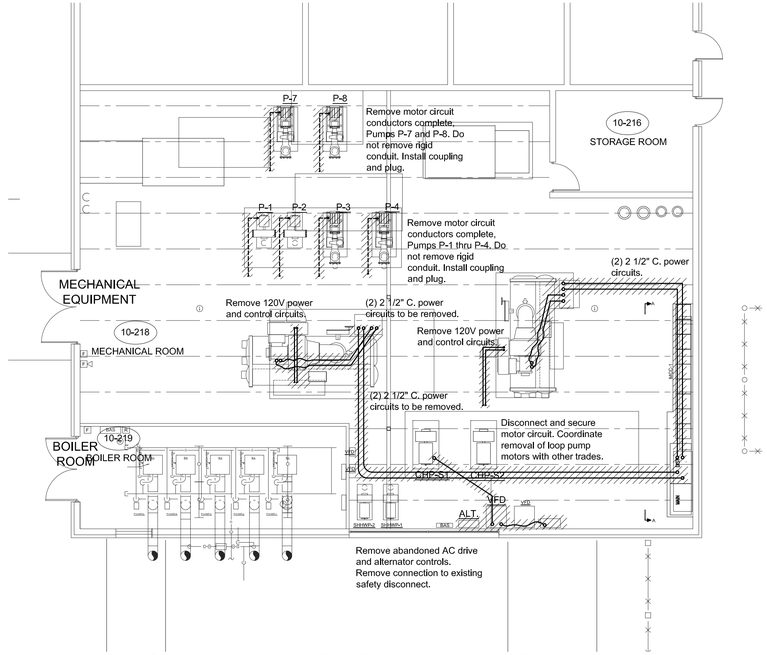
SHEET:
E100

JOB NUMBER:
2014-33



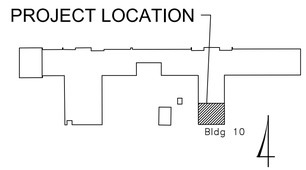
ELECTRICAL - DEMOLITION AT COOLING TOWERS

SCALE: 1/8" = 1'-0"



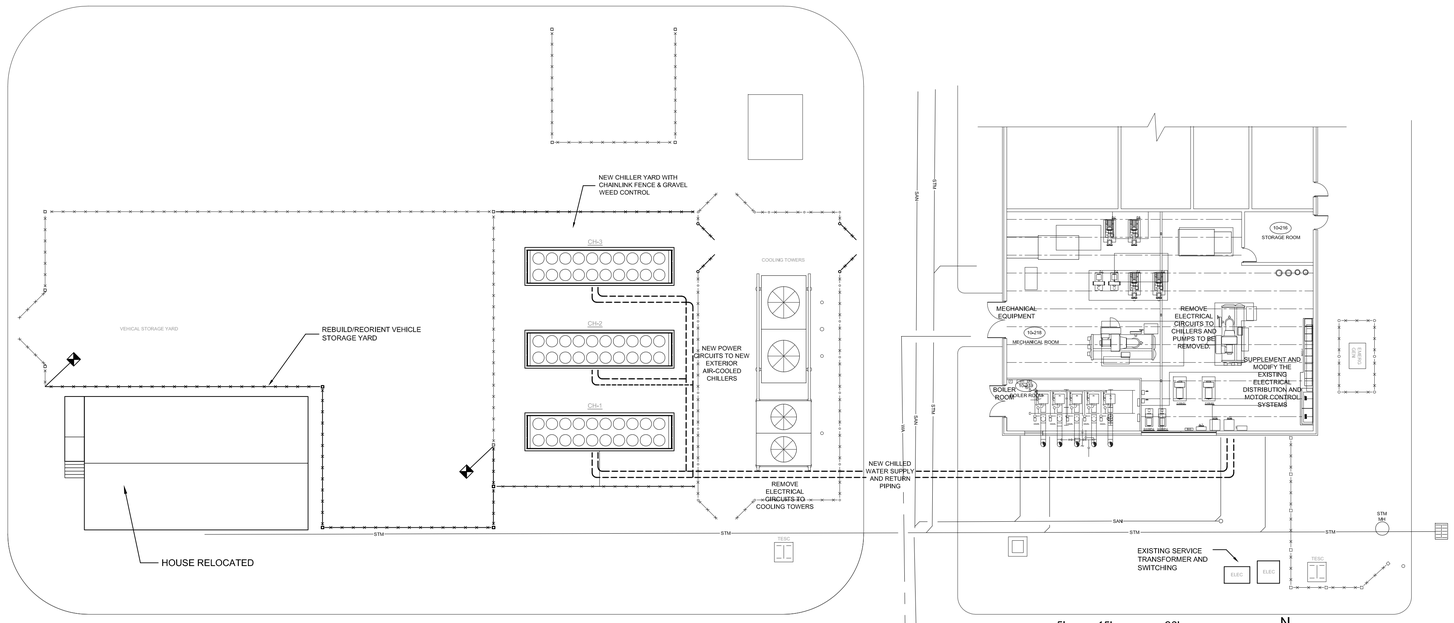
ELECTRICAL - DEMOLITION AT PLANT

SCALE: 1/8" = 1'-0"



KEY PLAN BUILDING 10

NOT TO SCALE



ELECTRICAL - OVERALL PLAN

SCALE: 1/16" = 1'-0"

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LIVELY TECHNICAL CENTER
CHILLER PLANT UPGRADES
LCS Project #33017

Tallahassee, Florida

DATE:
June 3, 2015

REVISED:
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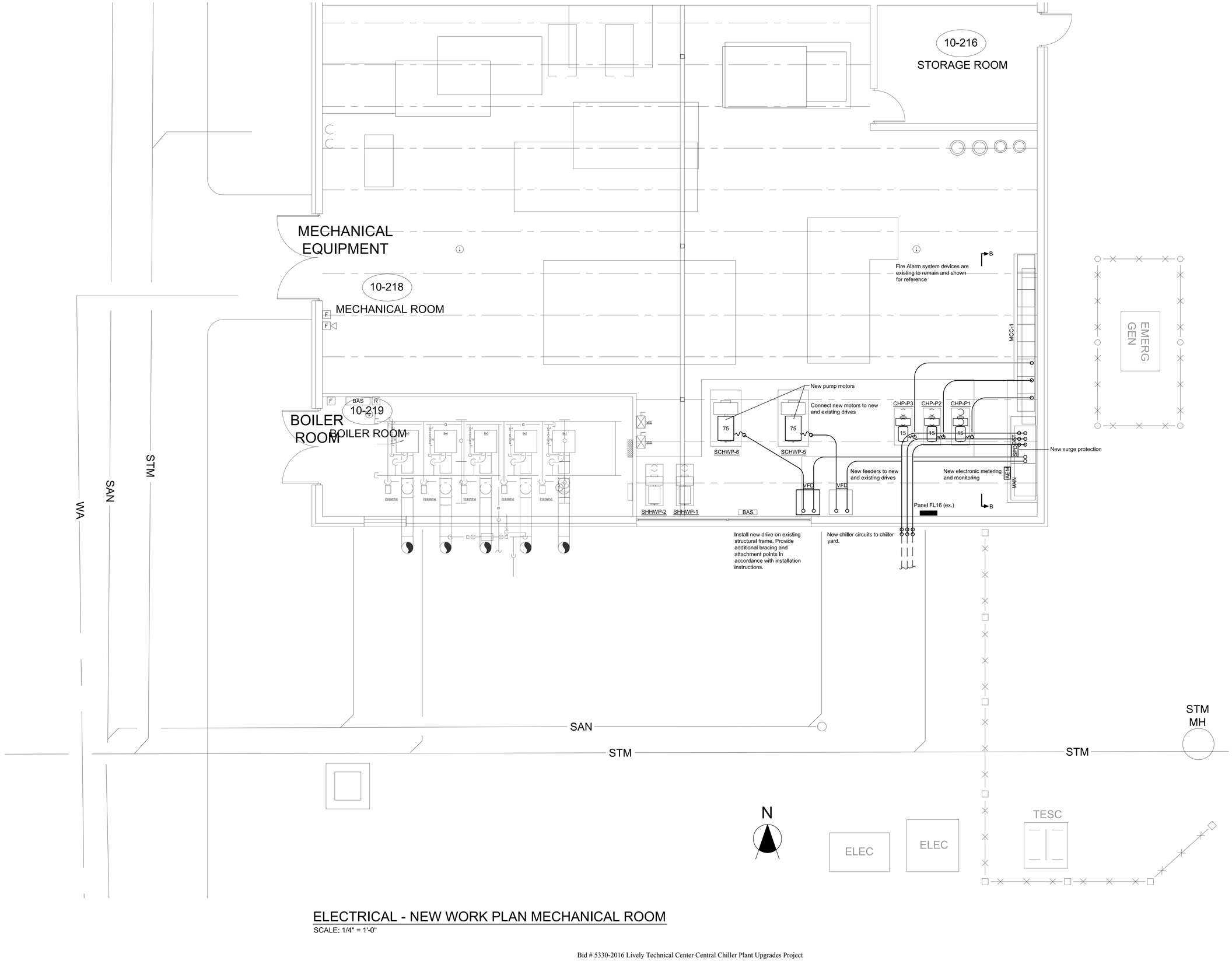
DESIGNED BY:	DRAWN BY:
CKF	RET

SUBMITTAL:
CONSTRUCTION DOCUMENTS

SHEET TITLE:
ELECTRICAL
OVERALL PLAN AND ELECTRICAL DEMOLITION

SHEET:
E200

JOB NUMBER:
2014-33



ELECTRICAL - NEW WORK PLAN MECHANICAL ROOM

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

LEON COUNTY SCHOOLS

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LIVELY TECHNICAL CENTER
CHILLER PLANT UPGRADES
LCS Project #33017

Tallahassee, Florida

DATE:
June 3, 2015

REVISED:
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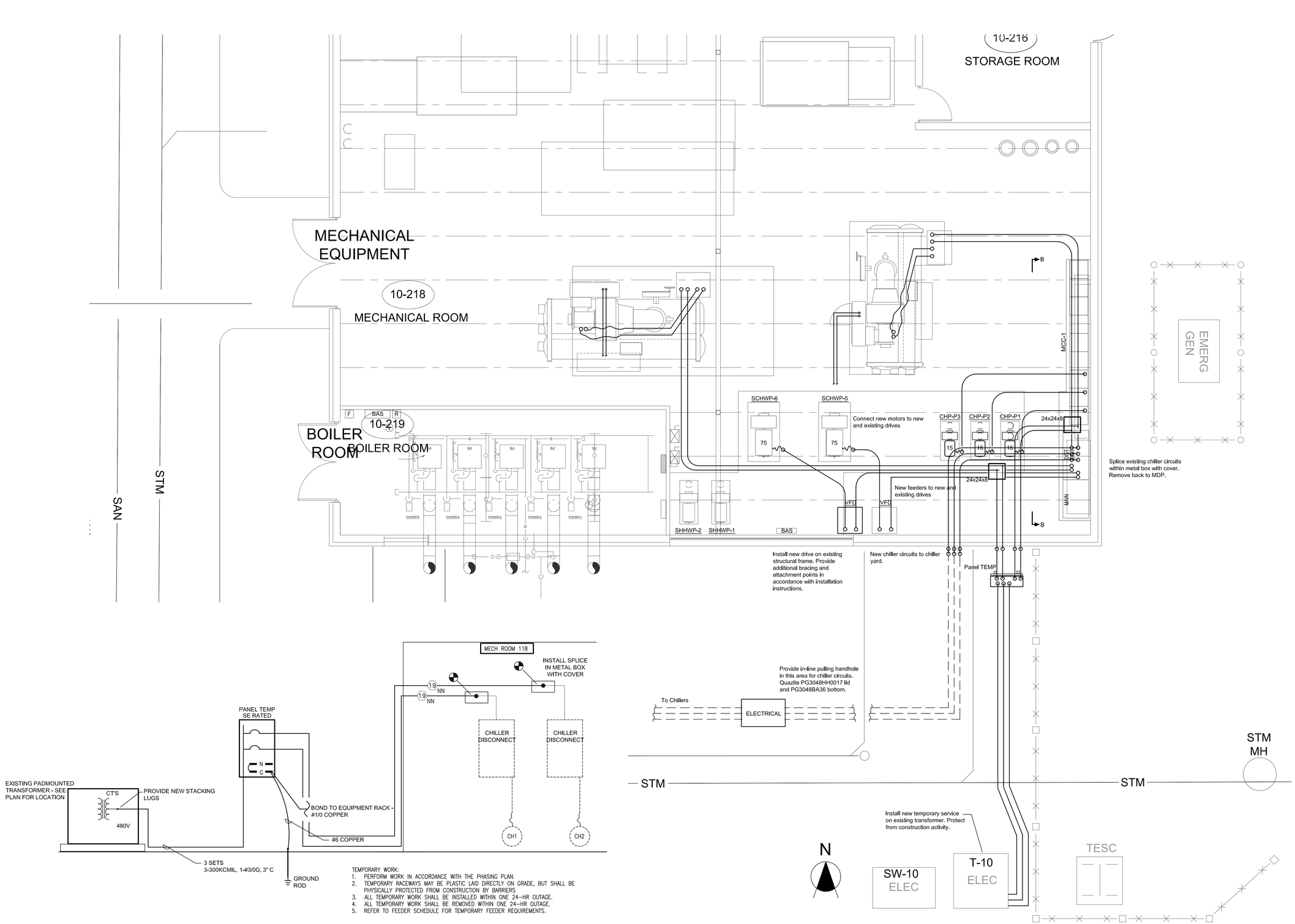
DESIGNED BY:	DRAWN BY:
CKF	RET

SUBMITTAL:
CONSTRUCTION DOCUMENTS

SHEET TITLE:
ELECTRICAL
NEW WORK PLAN
MECHANICAL ROOM

SHEET:
E300

JOB NUMBER:
2014-33



TEMPORARY WORK:
1. PERFORM WORK IN ACCORDANCE WITH THE PHASING PLAN.
2. TEMPORARY RACEWAYS MAY BE PLASTIC LAID DIRECTLY ON GRADE, BUT SHALL BE PHYSICALLY PROTECTED FROM CONSTRUCTION BY BARRIERS
3. ALL TEMPORARY WORK SHALL BE INSTALLED WITHIN ONE 24-HR OUTAGE.
4. ALL TEMPORARY WORK SHALL BE REMOVED WITHIN ONE 24-HR OUTAGE.
5. REFER TO FEEDER SCHEDULE FOR TEMPORARY FEEDER REQUIREMENTS.

ONE LINE DIAGRAM - TEMPORARY CHILLER ELECTRICAL

NO SCALE

ELECTRICAL - INTERIM AND TEMPORARY WORK MECHANICAL ROOM PLAN

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

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LIVELY TECHNICAL CENTER
CHILLER PLANT UPGRADES
LCS Project #33017

Tallahassee, Florida

DATE:
June 3, 2015

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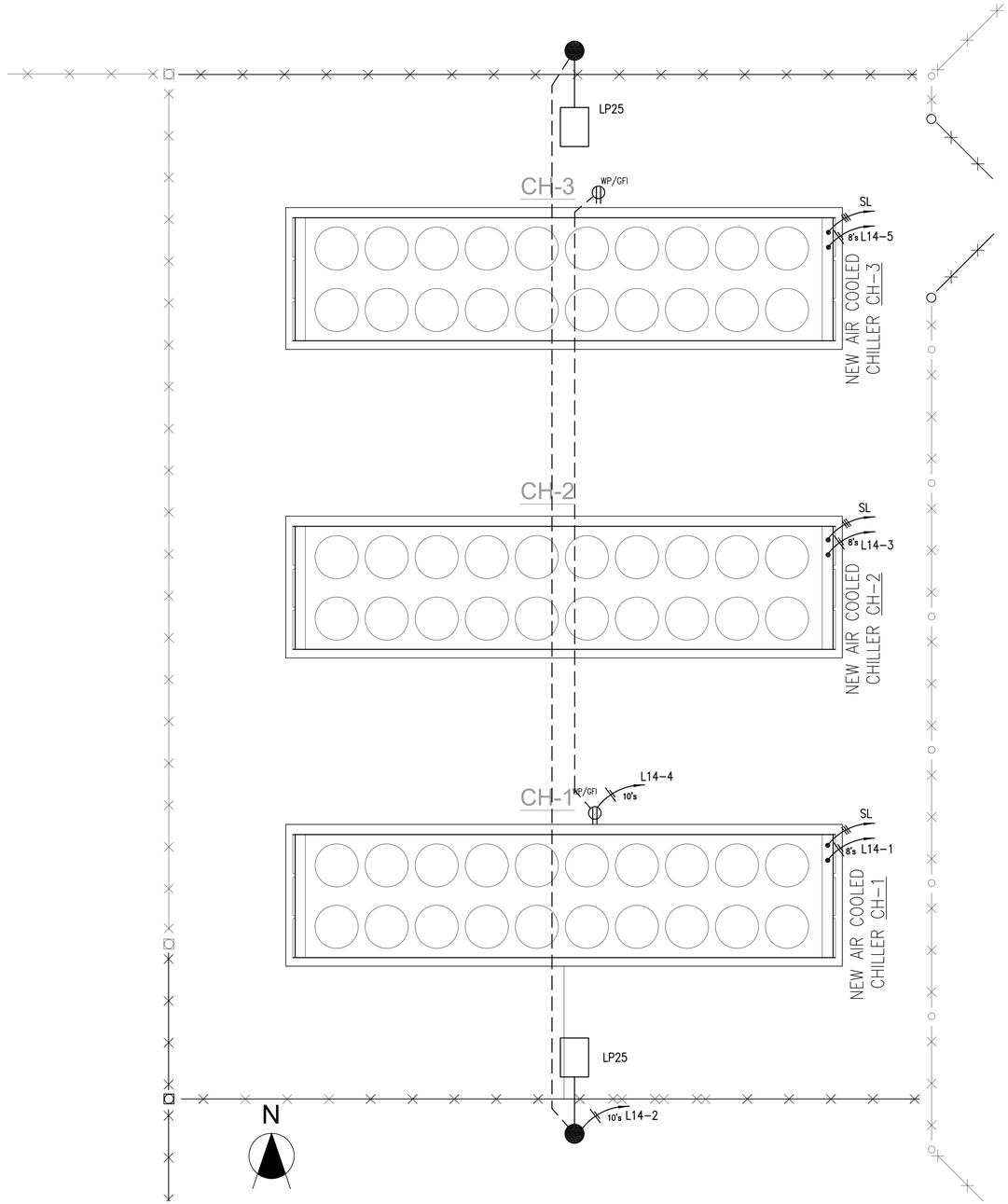
DESIGNED BY:	DRAWN BY:
CKF	RET

SUBMITTAL:
CONSTRUCTION DOCUMENTS

SHEET TITLE:
ELECTRICAL
INTERIM AND TEMPORARY WORK PLAN

SHEET:
E301

JOB NUMBER:
2014-33



ELECTRICAL - NEW WORK MECHANICAL YARD PLAN

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

LIGHTING FIXTURE SCHEDULE

FIXTURE MARK	MOUNTING	LAMPS				DESCRIPTION
		NO.	WATTS	TYPE	LUMENS	
LP25	POLE	-	350mA	LIGHT EMITTING DIODE	-	FIXTURE: LIGHT EMITTING DIODE LUMINAIRE, ONE PIECE DIEFORMED ALUMINUM HOUSING, ONE PIECE DIEFORMED ALUMINUM DOOR FRAME, TEMPERED FLAT GLASS LENS, TYPE 3 DISTRIBUTION, NATURAL ALUMINUM PAINT FINISH, AUTOMATIC PROFILE DIMMING WITH MOTION REPSONSE. 120 VOLT. (GUIDE: GARDCO GULLWING GL13-MR-50 SERIES) POLE: 25-0"' STRAIGHT 5" SQUARE STEEL POLE, ONE PIECE OF 7 GAUGE STEEL, WELDED STEEL BASE PLATE, 2"x4" HANDHOLE, ADDITIONAL HANDHOLE 15' ABOVE POLE BASE. NATURAL ALUMINUM PAINT FINISH. (GUIDE: GARDCO SSS / MSM OPTION)

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Tallahassee, Florida

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DESIGNED BY:	DRAWN BY:
CKF	RET

SUBMITTAL:
CONSTRUCTION DOCUMENTS

SHEET TITLE:
ELECTRICAL
NEW WORK PLAN
MECHANICAL YARD

SHEET:
E302

JOB NUMBER:
2014-33

LOAD / REMARKS	CIR. NO.	BREAKERS AMPS	BREAKERS POLES	H.P. OR K.W.	AMPS PER PHASE LIGHTING ØA	LIGHTING ØB	LIGHTING ØC	GEN. RECEPT. ØA	GEN. RECEPT. ØB	GEN. RECEPT. ØC	SPECIAL ØA	SPECIAL ØB	SPECIAL ØC	H.P. OR K.W.	BREAKERS AMPS	BREAKERS POLES	CIR. NO.	LOAD / REMARKS
EXISTING CHILLER 1	1	500	3	-	-			-			324						2	SPACE
-	-	-	-	-		-			-			324		-	-	-	-	-
-	-	-	-	-			-	-			324			-	-	-	-	-
EXISTING CHILLER 2	3	500	3	-	-			-			-						4	SPACE
-	-	-	-	-		-			-			-		-	-	-	-	-
-	-	-	-	-			-	-			-			-	-	-	-	-
SPACE	5	-	-	-	-			-			-			-	-	-	6	SPACE
-	-	-	-	-		-			-			-		-	-	-	-	-
-	-	-	-	-			-	-			-			-	-	-	-	-
TOTAL CONNECTED LOAD (AMPS)					-	-	-	-	-	-	648	648	648	TOTAL CONNECTED LOAD (AMPS)				

PANELBOARD SCHEDULE

LEON COUNTY SCHOOLS
LIVELY TECHNICAL
Tallahassee, Florida

Panel: PANEL TEMP
Location: EXTERIOR
Service: 3 Phase 4 Wire
☐ 208Y/120V
■ 480Y/277V
Main Bkr. — A — P
Lugs Only: 1200 A
65,000 AIC Min. at 480 Volts, 60 Hz.
■ Surface mounted panel
☐ Flush mounted panel
☐ 200% Neutral Bar

Remarks
NEMA 3R RATING FOR EXTERIOR SERVICE

LOAD / REMARKS	CIR. NO.	BREAKERS AMPS	BREAKERS POLES	H.P. OR K.W.	AMPS PER PHASE LIGHTING ØA	LIGHTING ØB	LIGHTING ØC	GEN. RECEPT. ØA	GEN. RECEPT. ØB	GEN. RECEPT. ØC	SPECIAL ØA	SPECIAL ØB	SPECIAL ØC	H.P. OR K.W.	BREAKERS AMPS	BREAKERS POLES	CIR. NO.	LOAD / REMARKS
CHILLER CH-1 OIL HEATER	1	20	1	-	-			-			10						2	EXTERIOR LIGHTING
CHILLER CH-2 OIL HEATER	3	20	1	-		-			-		1			-	20	1	4	EXTERIOR RECEPTACLES
CHILLER CH-3 OIL HEATER	5	20	1	-			-			-		10		-	-	-	1	6 -
-	7	-	-	-	-			-			-			-	-	-	1	8 -
-	9	-	-	-		-			-			-		-	-	-	1	10 -
-	11	-	-	-			-			-			-	-	-	-	1	12 --
-	13	-	-	-	-			-			-			-	-	-	1	14 -
-	15	-	-	-		-			-			-		-	-	3	16 -
-	17	-	-	-			-			-			-	-	-	-	-	18 -
-	19	-	-	-	-			-			-			-	-	-	-	20 -
-	21	-	-	-		-			-			-		-	-	-	-	22 -
-	23	-	-	-			-			-			-	-	-	-	-	24 -
-	25	-	-	-	-			-			-			-	-	-	-	26 -
-	27	-	-	-		-			-			-		-	-	-	-	28 -
-	29	-	-	-			-			-			-	-	-	-	-	30 -
-	31	-	-	-	-			-			-			-	-	-	-	32 -
-	33	-	-	-		-			-			-		-	-	-	-	34 -
-	35	-	-	-			-			-			-	-	-	-	-	36 -
-	37	-	-	-	-			-			-			-	-	-	-	38 -
-	39	-	-	-		-			-			-		-	-	-	-	40 -
-	41	-	-	-			-			-			-	-	-	-	-	42 -
TOTAL CONNECTED LOAD (AMPS)					-	-	-	-	-	-	11	13	10	TOTAL CONNECTED LOAD (AMPS)				

PANELBOARD SCHEDULE

LEON COUNTY SCHOOLS
LIVELY TECHNICAL
Tallahassee, Florida

Panel: PANEL FL16
Location: ROOM 10-218
Service: 3 Phase 4 Wire
■ 208Y/120V
☐ 480Y/277V
Main Bkr. 125 A 3 P
Lugs Only: -- A
10,000 AIC Min. at 240 Volts, 60 Hz.
■ Surface mounted panel
☐ Flush mounted panel
☐ 200% Neutral Bar

Remarks
EXISTING PANEL – PROVIDE NEW BREAKERS INDICATED AND UPDATE SCHEDULE AT COMPLETION

LOAD / REMARKS	CIR. NO.	BREAKERS AMPS	BREAKERS POLES	H.P. OR K.W.	AMPS PER PHASE LIGHTING ØA	LIGHTING ØB	LIGHTING ØC	GEN. RECEPT. ØA	GEN. RECEPT. ØB	GEN. RECEPT. ØC	SPECIAL ØA	SPECIAL ØB	SPECIAL ØC	H.P. OR K.W.	BREAKERS AMPS	BREAKERS POLES	CIR. NO.	LOAD / REMARKS
PANEL 10N4A	1	100	3	–	–			1			27				20	3	2	SURGE PROTECTION DEVICE
-	-	-	-	–		–			–			27		-	-	-	-	-
-	-	-	-	–			–			–			23	-	-	-	-	-
CHILLER CH-2	3	600	3	–	–			–			431			-	30	3	4	AREA LIGHTING
-	-	-	-	–	20			–			-			-	-	-	-	-
-	-	-	-	–		20			–			431		-	-	-	-	-
-	-	-	-	–			20			–			431	-	-	-	-	-
PANEL FH-1	5	150	3	–	29 78			–			–			-	70	3	6	TRANSFORMER / PANEL FL16
-	-	-	-	–		29 78			–			–		-	-	-	-	-
-	-	-	-	–			29 78			–			–	-	-	-	-	-
PANEL FH-3	7	175	3	–	–			–			75 5			-	20	3	8	AIR HANDLER AHU-1
-	-	-	-	–		–			–			75 5		-	-	-	-	-
-	-	-	-	–			–			–			75 5	-	-	-	-	-
MOTOR CONTROL CENTER	9	200	3	–	–			–			117 5			-	20	3	10	AIR HANDLER AHU-2
-	-	-	-	–		–			–			117 5		-	-	-	-	-
-	-	-	-	–			–			–			117 5	-	-	-	-	-
PANEL FH-4	11	300	3	–	–			–			152 3			-	20	3	12	EF-16
-	-	-	-	–		–			–			152 3		-	-	-	-	-
-	-	-	-	–			–			–			152 3	-	-	-	-	-
SPARE	13	400	3	–	–			–			5			-	30	3	14	AIR COMPRESSOR
-	-	-	-	–		–			–			5		-	-	-	-	-
-	-	-	-	–			–			–			5	-	-	-	-	-
CHILLER CH-1	15	600	3	–	–			–			431 96			-	75	150	16	SCHWP-1
-	-	-	-	–		–			–			431 96		-	-	-	-	-
-	-	-	-	–			–			–			431 96	-	-	-	-	-
CHILLER CH-3	17	600	3	–	–			–			431 24			-	80	3	18	PANEL FL-16
-	-	-	-	–		–			–			431 24		-	-	-	-	-
-	-	-	-	–			–			–			431 24	-	-	-	-	-
–	19	–	–	–	–			–			–			-	75	150	20	SCHWP-2
-	-	-	-	–		–			–			96		-	-	-	-	-
-	-	-	-	–			–			–			96	-	-	-	-	-
–	21	–	–	–	–			–			–			-	150	3	22	#1
-	-	-	-	–		–			–			–		-	-	-	-	-
-	-	-	-	–			–			–			–	-	-	-	-	-
–	23	–	–	–	–			–			–			-	20	3	24	#4
-	-	-	-	–		–			–			–		-	-	-	-	-
-	-	-	-	–			–			–			–	-	-	-	-	-
–	25	–	–	–	–			–			–			-	50	3	26	#3
-	-	-	-	–		–			–			–		-	-	-	-	-
-	-	-	-	–			–			–			–	-	-	-	-	-

DISTRIBUTION PANELBOARD SCHEDULE

LIVELY TECHNICAL CENTER
BUILDING 10
Tallahassee, Florida

Panel: PANEL MDP
Location: ROOM 1002
Service: 3 Phase 4 Wire
☐ 208Y/120V
■ 480Y/277V
Main Bkr. 1600 A 3 P
Lugs Only: --- A
50,000 AIC Min. at 480 Volts, 60 Hz.
■ Surface mounted panel
☐ Flush mounted panel
☐ 200% Neutral Bar

Remarks
FREESTANDING, 58.5" mounting space

Chiller circuits are new, including electronic circuit breaker.

Primary loop pump circuits are new. Loop pump #1 circuit breaker is new. Loop pump #2 circuit breaker may be reused.

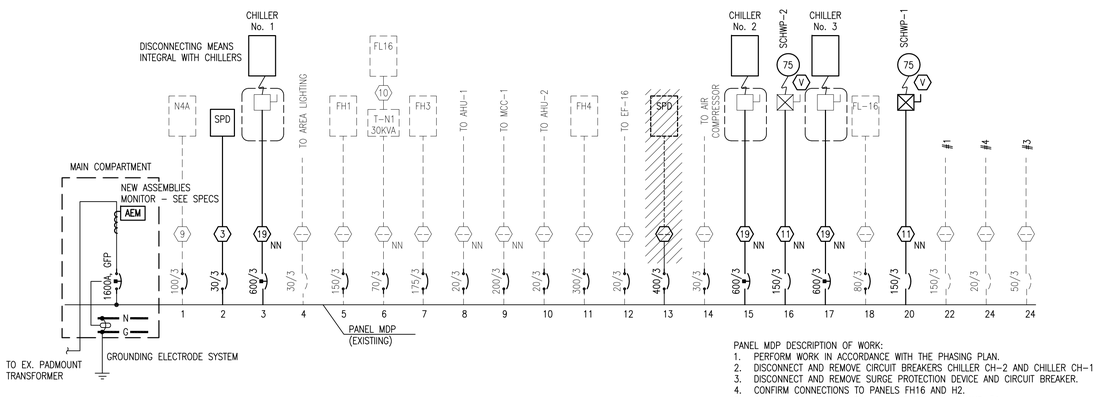
Surge protection circuit is new, including circuit breaker.

FEEDER SCHEDULE – 3ø, 600 VOLTS AND BELOW

(ALL CONDUCTORS SHALL BE COPPER) 8/27/01

FEEDER SIZE INDICATOR	NOMINAL AMPACITY (FEEDER)	SYMBOL "⬡" DRY & WET LOCATIONS CONDUCTORS	SYMBOL "⬡NN" (NO NEUTRAL) DRY & WET LOCATIONS (NO NEUTRAL) CONDUCTORS	RACEWAY	NOMINAL AMPACITY (FEEDER)	FEEDER SIZE INDICATOR
①	20	4 #12 & 1 #12 (GND.)	3 #12 & 1 #12 (GND.)	3/4"	20	①
②	30	4 #10 & 1 #10 (GND.)	3 #10 & 1 #10 (GND.)	3/4"	30	②
③	40	4 #8 & 1 #10 (GND.)	3 #8 & 1 #10 (GND.)	1"	40	③
④	50	4 #6 & 1 #10 (GND.)	3 #6 & 1 #10 (GND.)	1 1/4"	50	④
⑤	60	4 #6 & 1 #10 (GND.)	3 #6 & 1 #10 (GND.)	1"	60	⑤
⑥	70	4 #4 & 1 #8 (GND.)	3 #4 & 1 #8 (GND.)	1 1/4"	70	⑥
⑦	80	4 #3 & 1 #8 (GND.)	3 #3 & 1 #8 (GND.)	1 1/2"	80	⑦
⑧	90	4 #3 & 1 #8 (GND.)	3 #3 & 1 #8 (GND.)	1 1/4"	90	⑧
⑨	100	4 #2 & 1 #8 (GND.)	3 #2 & 1 #8 (GND.)	1 1/2"	100	⑨
⑩	125	4 #1/0 & 1 #6 (GND.)	3 #1/0 & 1 #6 (GND.)	2"	125	⑩
⑪	150	4 #1/0 & 1 #6 (GND.)	3 #1/0 & 1 #6 (GND.)	2"	150	⑪
⑫	175	4 #2/0 & 1 #6 (GND.)	3 #2/0 & 1 #6 (GND.)	2"	175	⑫
⑬	200	4 #3/0 & 1 #6 (GND.)	3 #3/0 & 1 #6 (GND.)	2"	200	⑬
⑭	225	4 #4/0 & 1 #4 (GND.)	3 #4/0 & 1 #4 (GND.)	2 1/2"	225	⑭
⑮	250	4–250 KCMIL & 1 #4 (GND.)	3–250 KCMIL & 1 #4 (GND.)	2 1/2"	250	⑮
⑯	300	4–350 KCMIL & 1 #4 (GND.)	3–350 KCMIL & 1 #4 (GND.)	3"	300	⑯
⑰	350	4–400 KCMIL & 1 #3 (GND.)	3–400 KCMIL & 1 #3 (GND.)	3"	350	⑰
⑱	400	4–500 KCMIL & 1 #3 (GND.)	3–500 KCMIL & 1 #3 (GND.)	3 1/2"	400	⑱
⑲	500	2 PARALLEL CIRCUITS EACH 4–250 KCMIL & 1 #2 (GND.)	2 PARALLEL CIRCUITS EACH 3–250 KCMIL & 1 #2 (GND.)	2–3"	500	⑲
⑳	600	2 PARALLEL CIRCUITS EACH 4–350 KCMIL & 1 #1/0 (GND.)	2 PARALLEL CIRCUITS EACH 3–350 KCMIL & 1 #1/0 (GND.)	2–3"	600	⑳
㉑	800	3 PARALLEL CIRCUITS EACH 4–300 KCMIL & 1 # 1/0 (GND.)	3 PARALLEL CIRCUITS EACH 3–300 KCMIL & 1 # 1/0 (GND.)	3–3"	800	㉑
㉒	1000	3 PARALLEL CIRCUITS EACH 4–400 KCMIL & 1 #3/0 (GND.)	3 PARALLEL CIRCUITS EACH 3–400 KCMIL & 1 #3/0 (GND.)	3–3 1/2"	1000	㉒
㉓	1200	4 PARALLEL CIRCUITS EACH 4–350 KCMIL & 1 #3/0 (GND.)	4 PARALLEL CIRCUITS EACH 3–350 KCMIL & 1 #3/0 (GND.)	4–3"	1200	㉓
㉔	1400	4 PARALLEL CIRCUITS EACH 4–500 KCMIL & 1 #4/0 (GND.)	4 PARALLEL CIRCUITS EACH 3–500 KCMIL & 1 #4/0 (GND.)	4–3 1/2"	1400	㉔
㉕	1600	5 PARALLEL CIRCUITS EACH 4–400 KCMIL & 1 #4/0 (GND.)	5 PARALLEL CIRCUITS EACH 3–400 KCMIL & 1 #4/0 (GND.)	5–3 1/2"	1600	㉕

* CONDUCTOR SETS MARKED "SE"; REPRESENTS SERVICE ENTRANCE CABLE ASSEMBLY WITH NEUTRAL, BUT WITHOUT GROUNDING CONDUCTOR



ONE LINE DIAGRAM - MODIFICATIONS TO EXISTING SWITCHGEAR
NO SCALE

PANEL MDP DESCRIPTION OF WORK:
1. PERFORM WORK IN ACCORDANCE WITH THE PHASING PLAN.
2. DISCONNECT AND REMOVE CIRCUIT BREAKERS CHILLER CH-2 AND CHILLER CH-1.
3. DISCONNECT AND REMOVE SURGE PROTECTION DEVICE AND CIRCUIT BREAKER.
4. CONFIRM CONNECTIONS TO PANELS FH16 AND H2.
5. CONFIRM CONNECTIONS TO AIR HANDLERS #1, #3 AND #4.
6. INSTALL NEW CIRCUIT BREAKERS FOR NEW CHILLERS
7. INSTALL NEW CIRCUIT BREAKER FOR SCHWP-2.
8. INSTALL NEW CIRCUIT BREAKER AND NEW SPD DEVICE. CONNECT SPD USING 5-#8's, ALL EQUAL LENGTH.
9. REFER TO VARIABLE SPEED DRIVE CABLE CHART FOR FINAL CONNECTION REQUIREMENTS TO VS MOTORS – (V)

LEON COUNTY SCHOOLS

McGinniss & Fleming Engineering, Inc.
Mechanical · Electrical · Fire Protection · Plumbing
1401 Miccosukee Road
Tallahassee, Florida 32308 EB #05990

LIVELY TECHNICAL CENTER
CHILLER PLANT UPGRADES
LCS Project #33017

Tallahassee, Florida

DATE: June 3, 2015

REVISED:
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DESIGNED BY: CKF
DRAWN BY: RET

SUBMITTAL: CONSTRUCTION DOCUMENTS

SHEET TITLE:
ELECTRICAL
LINE DIAGRAM MODIFICATIONS AND PANELBOARD SCHEDULE

SHEET: E500

JOB NUMBER: 2014-33

MOTOR CONTROL CENTER MCC-1
SERVICE VOLTAGE – 480V, 3ø, 3W
BUS BRACING, RMS SYMMETRICAL AMPS 42,000
600A MAIN LUGS ONLY
FEEDER MDP-4 SERVICE NORMAL
BUS RATING – 600A HOR., 200A VER.
LOCATION PLANT

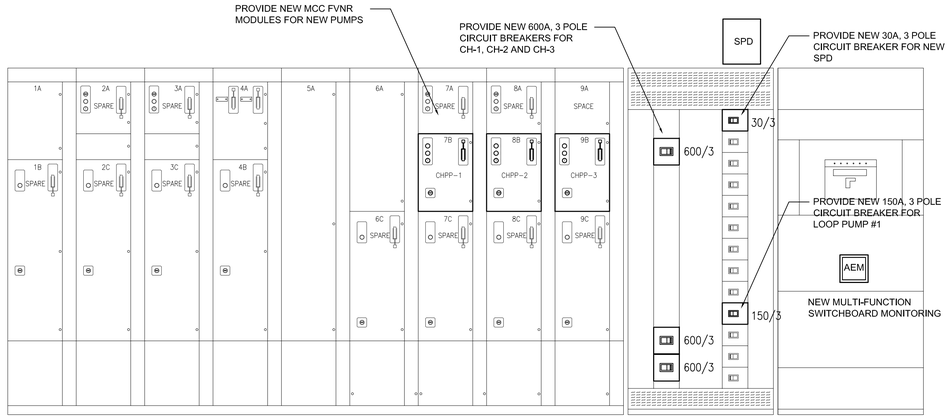
DESIGNATION	H.P.	NEMA SIZE	SPACE UNIT	CIRCUIT BREAKER (M)	CIRCUIT BREAKER (T)	MOTOR FLA	ACCESS. COMPONENTS	
INCOMING LINE			1A					
P-7	20	–	1B	–	–	–	–	RE-LABEL "SPARE"
P-1	10	–	2A	–	–	–	–	RE-LABEL "SPARE"
SPACE	–	–	2B	–	–	–	–	
P-8	20	–	2C	–	–	–	–	RE-LABEL "SPARE"
P-2	10	–	3A	–	–	–	–	RE-LABEL "SPARE"
SPACE	–	–	3B	–	–	–	–	
SPARE	–	–	3C	–	–	–	–	
SHHWP-1,2	–	–	4A	–	(2) 50A-3P	–	–	EXISTING CIRCUITS
SPARE	–	–	4B	–	–	–	–	
SPACE	–	–	5A	–	–	–	–	
CONTROLS	–	–	6A	–	–	–	–	
CT-1	15	–	6B	–	–	–	–	RE-LABEL "SPARE"
P-3	–	–	7A	–	–	–	–	RE-LABEL "SPARE"
CHP-P1	15	2	7B	30	–	–	B	NEW ASSEMBLY
CT-2	15	–	7C	–	–	–	–	RE-LABEL "SPARE"
P-4	–	–	8A	–	–	–	–	RE-LABEL "SPARE"
CHP-P2	15	2	8B	30	–	–	B	NEW ASSEMBLY
CT-3	20	–	8C	–	–	–	–	RE-LABEL "SPARE"
SPACE	–	–	9A	–	–	–	–	
CHP-P3	15	2	9B	30	–	–	B	NEW ASSEMBLY
CT-4	20	–	9C	–	–	–	–	RE-LABEL "SPARE"

ACCESSORY COMPONENTS:
A: RUN/STOPPED LIGHTS, RESET
B: RUN/STOPPED LIGHTS, RESET, HAND-OFF-AUTO SWITCH
C: PF CORRECTION CAPACITOR – SIZE AS NOTED
D: BASIC DRIVE PACKAGE
E: BASIC DRIVE WITH INTEGRATED BYPASS PACKAGE

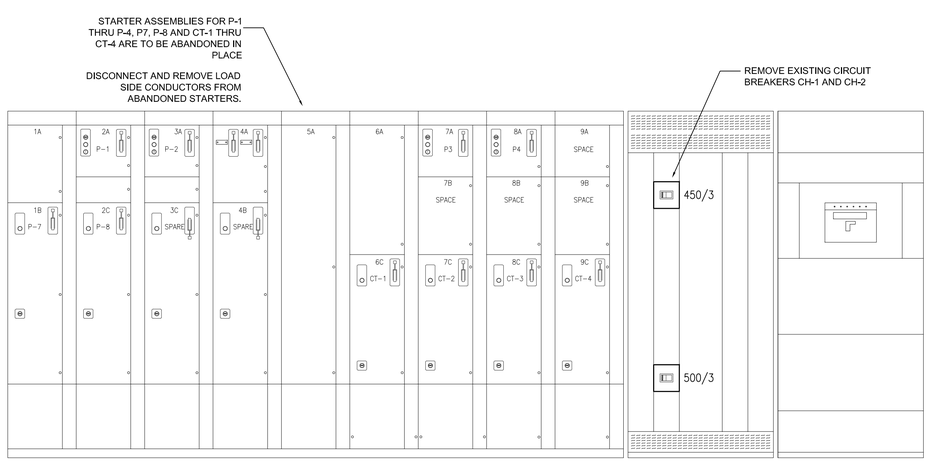
SCHEDULE – 460 VOLT, 3Ø MOTORS

MOTOR DATA			FEEDER (M)			OVERCURRENT PROTECTION CIRCUIT BREAKER AMPS		MOTOR CONTROLLER			480V *** DISC. SW. NEMA TYPE AS REQD.	CAPACITOR ****
						(M)	(T)	NEMA SIZE **		SPACE INCHES		
HP	FULL LOAD AMPS	LETTER FOR DESIGN	PHASE CONDUCT.	GROUND CONDUCT.	CONDUIT, INCHES, TR. SIZE	MAGNETIC TRIP ONLY * 3 P. AMPS	THERMAL MAG. TRIP 3 P. AMPS	INDIV. MTD.	IN MCC	IN MCC	SIZE (3 POLE)	
1/2	1	M	3#12	1#12	3/4	15	15	00	0	6	30A	NO
3/4	1.4	M	3#12	1#12	3/4	15	15	00	0	6	30A	NO
1	1.8	M	3#12	1#12	3/4	15	15	00	0	6	30A	NO
1 1/2	2.6	K	3#12	1#12	3/4	15	15	00	0	6	30A	NO
2	3.4	K	3#12	1#12	3/4	15	15	00	0	6	30A	NO
3	4.8	J	3#12	1#12	3/4	15	15	0	0	6	30A	NO
5	7.6	H	3#12	1#12	3/4	15	15	0	0	6	30A	NO
7 1/2	11	H	3#12	1#12	3/4	15	20	1	1	6	30A	NO
10	14	H	3#10	1#10	3/4	30	30	1	1	6	30A	NO
15	21	G	3#10	1#10	3/4	30	40	2	2	12	30A	NO
20	27	F	3#8	1#10	1	50	60	2	2	12	60A	NO
25	34	F	3#8	1#8	1	50	70	2	2	12	60A	YES
30	40	F	3#6	1#8	1	50	80	3	3R	18	60A	YES
40	52	F	3#4	1#8	1 1/4	100	100	3	3R	18	100A	YES
50	65	F	3#2	1#8	1 1/4	100	100	3	3R	18	100A	YES
60	77	F	3#1/0	1#6	1 1/2	100	110	4R	4R	33	100A	YES
75	96	F	3#1/0	1#6	1 1/2	150	150	4R	4R	33	200A	YES
100	124	F	3#2/0	1#6	2	150	200	4R	4R	72	200A	YES
125	156	F	3#4/0	1#4	2	225	225	5R	5R	72	200A	YES
150	180	F	3-250MCM	1#4	2 1/2	225	250	5R	5R	72	200A	YES
200	240	F	3-350MCM	1#1/0	3	400	400	5R	5R	72	400A	YES

FOR REFERENCE ONLY – STARTERS AND ACCESSORIES MAY NOT APPLY TO ALL INSTALLATIONS
* = ELECTRONIC TRIP UNITS WHEN USED IN MCC'S OR COMBINATION STARTERS ONLY
**R = REDUCED VOLTAGE STARTED – CLOSED TRANSITION AUTO TRANSFORMER TYPE
*** = NO FUSE DISCONNECT SWITCH UNLESS SHOWN OTHERWISE
**** = POWER FACTOR CORRECTIVE CAPACITOR FURNISHED WITH MOTOR STARTER

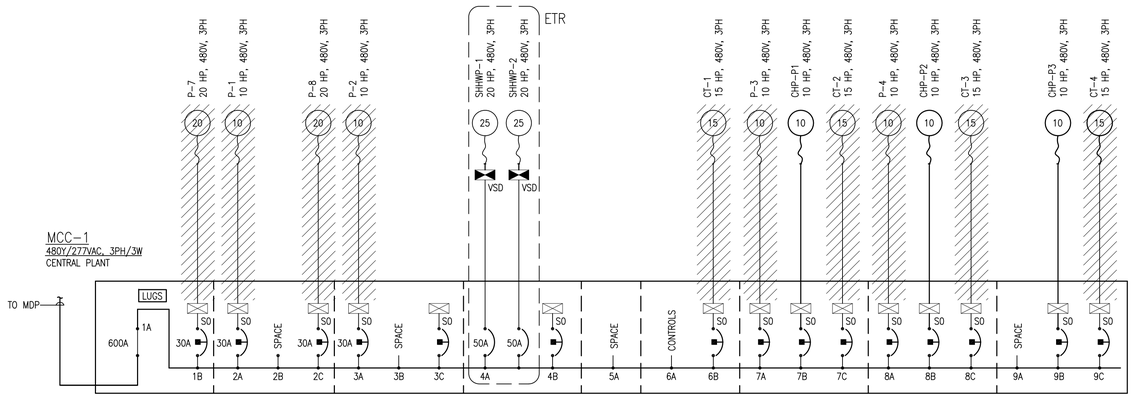


MCC and SWITCHGEAR – NEW CONFIGURATION (B-B)



MCC and SWITCHGEAR – EXISTING (A-A)

SQUARE D MODEL 4 MOTOR CONTROL SYSTEM / POWERSTYLE PA I-LINE SWITCHBOARD
H BUS: 600A, V BUS: 200A, AIC:42K 2000A, AIC:50K



NOTES:
1. MOTOR CIRCUIT BREAKERS WITH STARTERS ARE MAGNETIC SENSING/TRIP ONLY, AND SHALL BE ELECTRONIC TYPE.
2. ALL DISCONNECT SW'S SHALL BE SIZED IN ACCORDANCE WITH REQUIREMENT.
3. PROVIDE PF CAPACITORS FOR ALL INDUCTION MOTORS 25HP AND LARGER. INTERLOCK TO STARTER.
4. ALL OVERLOAD PROTECTION UNITS SHALL BE SOLID STATE TYPE. SEE SPECIFICATIONS FOR COMPLETE REQUIREMENTS.
5. COORDINATE REMOVAL OF FIELD COMPONENTS WITH PHASING; MCC COMPONENTS TO REMAIN IN PLACE (DO NOT DEMOLISH).

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CKF	RET

SUBMITTAL:
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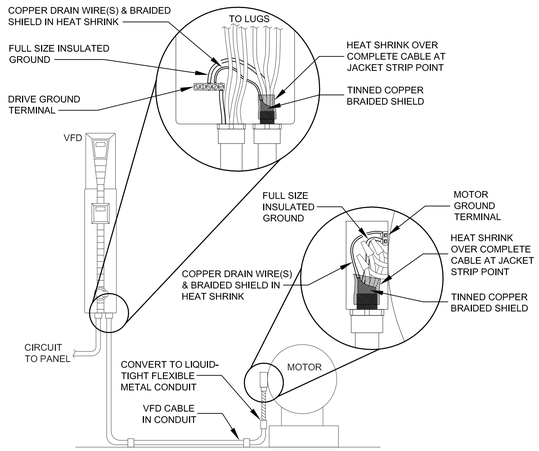
ELECTRICAL
MOTOR CONTROL CENTER AND SWITCHGEAR MODIFICATIONS

SHEET:
E501

JOB NUMBER:
2014-33



VFD CABLE CONNECTION DETAIL

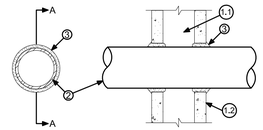
NOT TO SCALE

VFD CABLE SIZING TABLE			
MOTOR SIZE	VOLTAGE / PHASE	CONDUCTOR SIZE (MODEL #)	CONDUIT SIZE
1/2 - 3 HP	208V/3Ø	12 AWG (29502)	1"
5 HP	208V/3Ø	10 AWG (29503)	1¼"
7½ - 10 HP	208V/3Ø	8 AWG (29504)	1¼"
15 HP	208V/3Ø	6 AWG (29505)	1¼"
20 HP	208V/3Ø	4 AWG (29506)	2"
25 - 30 HP	208V/3Ø	2 AWG (29507)	2"
1/2 - 10 HP	480V/3Ø	12 AWG (29502)	1"
15 HP	480V/3Ø	10 AWG (29503)	1¼"
20 - 25 HP	480V/3Ø	8 AWG (29504)	1¼"
30 - 40 HP	480V/3Ø	6 AWG (29505)	1½"
50 HP	480V/3Ø	4 AWG (29506)	2"
60 HP	480V/3Ø	2 AWG (29507)	2"
75 HP	480V/3Ø	1/0 AWG (29509)	2 1/2"

NOTES:
VFD CABLE MODEL # BASIS OF DESIGN: BELDEN TYPE 295XX.
CONDUIT SIZE IS BASED ON RIGID STEEL CONDUIT AND 40% FILL.

* REFER TO VFD CABLE MANUFACTURER STEP-BY-STEP TERMINATION GUIDE FOR TERMINATING VFD CABLES.

SYSTEM NO. W-L-1001
(FORMERLY SYSTEM NO. 147)
F RATINGS - 1, 2, 3 AND 4 HOUR (SEE ITEMS 2 & 3)
T RATING - 0, 1, 2, 3 AND 4 HOUR (SEE ITEM 3)
L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT
L RATING AT 400°F - LESS THAN 1 CFM/SQ FT



SECTION A - A

1. WALL ASSEMBLY - THE 1, 2, 3 OR 4 HOUR FIRE-RATED GYPSUM WALLBOARD / STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL OR PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

   1.1. STUDS - WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS (MAXIMUM 2 HOUR FIRE RATED ASSEMBLIES) OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOMINAL 2"x4" LUMBER SPACED 16" O.C. WITH NOMINAL 2"x4" LUMBER END PLATES AND CROSS BRACES. STEEL STUDS TO BE MINIMUM 3-5/8" WIDE BY 1-3/8" DEEP CHANNELS SPACED MAXIMUM OF 24" O.C.

   1.2. WALLBOARD, GYPSUM - NOMINAL 1/2" OR 5/8" THICK, 4' WIDE WITH SQUARE OR TAPERED EDGES, THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAXIMUM DIAMETER OF OPENING IS 13-1/2".

2. PIPE OR CONDUIT - NOMINAL 12" DIAMETER (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE, NOMINAL 12" DIAMETER (OR SMALLER) SERVICE WEIGHT (OR HEAVIER) CAST IRON SOIL PIPE, NOMINAL 12" DIAMETER (OR SMALLER) CLASS 50 (OR HEAVIER) DUCTILE IRON PRESSURE PIPE, NOMINAL 6" DIAMETER (OR SMALLER) STEEL CONDUIT, NOMINAL 4" DIAMETER (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING, NOMINAL 6" DIAMETER (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING OR NOMINAL 1" DIAMETER (OR SMALLER) FLEXIBLE STEEL CONDUIT. WHEN COPPER PIPE IS USED, MAXIMUM F RATING OF FIRESTOP SYSTEM (ITEM 3) IS 2 HOUR. STEEL PIPES OR CONDUITS LARGER THAN NOMINAL 4" DIAMETER MAY ONLY BE USED IN WALLS CONSTRUCTED USING STEEL CHANNEL STUDS. A MAXIMUM OF ONE PIPE OR CONDUIT IS PERMITTED IN THE FIRESTOP SYSTEM. PIPE OR CONDUIT TO BE INSTALLED NEAR CENTER OF STUD CAVITY WIDTH AND TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY.

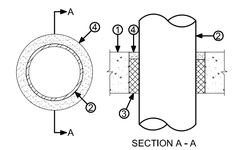
3. FILL, VOID OR CAVITY MATERIAL - CAULK - CAULK FILL MATERIAL INSTALLED TO COMPLETELY FILL ANNULAR SPACE BETWEEN PIPE OR CONDUIT AND GYPSUM WALLBOARD AND WITH A MINIMUM 1/4" DIAMETER BEAD OF CAULK APPLIED TO PERIMETER OF PIPE OR CONDUIT AT ITS EGRESS FROM THE WALL. CAULK INSTALLED SYMMETRICALLY ON BOTH SIDES OF WALL ASSEMBLY. THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS SHOWN IN THE FOLLOWING TABLE. THE HOURLY T RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE TYPE OR SIZE OF THE PIPE OR CONDUIT AND THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS TABULATED BELOW:

MAXIMUM PIPE DIAMETER INCHES	ANNULAR SPACE INCHES	F RATING HOURS	T RATING HOURS
4	0 - 1-1/2	1 OR 2	0

PENETRATION DETAIL - A

NOT TO SCALE

SYSTEM NO. C-AJ-1014
(FORMERLY SYSTEM NO. 133)
F RATING - 2 HOUR
T RATING - 0 HOUR
L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT (SEE ITEM 4)
L RATING AT 400°F - LESS THAN 1 CFM/SQ FT (SEE ITEM 4)



SECTION A - A

1. FLOOR OR WALL ASSEMBLY - MIN 3-1/4" THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAMETER OF CIRCULAR OPENING IS 6". SEE CONCRETE BLOCK (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.

2. THROUGH PENETRANTS - ONE METALLIC PIPE OR CONDUIT TO BE CENTERED WITHIN THE FIRESTOP SYSTEM. A NOMINAL ANNULAR SPACE OF 3/4" IS REQUIRED WITHIN THE FIRESTOP SYSTEM. PIPE OR CONDUIT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR CONDUITS MAY BE USED:

   2.1. STEEL PIPE - NOMINAL 4" DIAMETER (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.

   2.2. CONDUIT - NOMINAL 4" DIAMETER (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR STEEL CONDUIT.

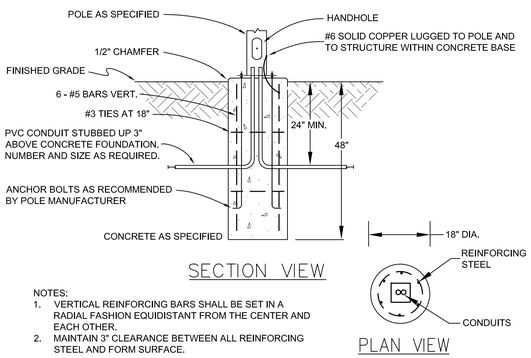
3. PACKING MATERIAL - MINIMUM 4 PCF MINERAL WOOL BATT INSULATION FIRMLY PACKED INTO OPENING AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR FROM BOTH SURFACES OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL. MINIMUM THICKNESS OF PACKING MATERIAL IN FLOORS AND WALLS TO BE 2-3/4" AND 2-1/4", RESPECTIVELY.

4. FILL, VOID OR CAVITY MATERIAL* - SEALANT - MINIMUM 1/2" THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS, FLUSH WITH TOP SURFACE OF FLOOR OR WITH BOTH SURFACES OF WALL AS AN ALTERNATE, THE PERMANENT FORMING MATERIAL (ITEM 3) MAY BE OMITTED IF THE FILL MATERIAL THICKNESS IS INCREASED TO A MINIMUM OF 1-1/2".
   MINNESOTA MINING AND MFG CO - (TYPES FB-2000 OR FB-2000+). (NOTE: L RATINGS APPLY ONLY WHEN FB-2000+ IS USED.)

*BEARING THE UL CLASSIFICATION MARKING.

PENETRATION DETAIL - B

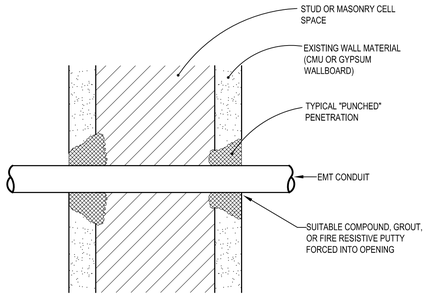
NOT TO SCALE



NOTES:
1. VERTICAL REINFORCING BARS SHALL BE SET IN A RADIAL FASHION EQUIDISTANT FROM THE CENTER AND EACH OTHER.
2. MAINTAIN 3" CLEARANCE BETWEEN ALL REINFORCING STEEL AND FORM SURFACE.

ALUMINUM POLE DETAIL

NOT TO SCALE

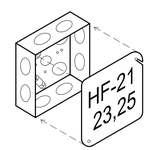


PENETRATION REPAIRS SHALL BE MADE WITH SUITABLE MATERIAL AND SHALL MEET OR EXCEED FIRE RATING OF WALL IN ACCORDANCE WITH SPECIFICATION SECTION 07270.

PENETRATION SHALL BE FREE OF LOOSE GYPSUM MATERIAL, PAPER FACING, INSULATION AND ANY OTHER EXTRANEOUS MATERIAL BEFORE MAKING REPAIR.

DETAIL - PENETRATION REPAIR: CONDUIT THRU EXISTING WALL

NOT TO SCALE



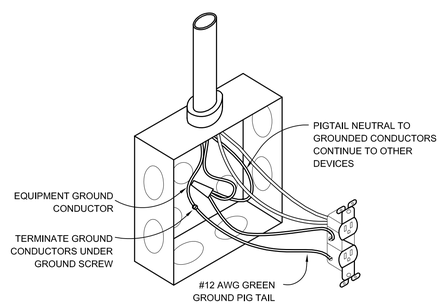
EACH JUNCTION BOX COVER SHALL BE LABELED WITH A PERMANENT "MAGIC" MARKER OR OTHER PERMANENT MEANS TO IDENTIFY THE CIRCUITS OR SYSTEMS CABLES WITHIN. INCLUDE THE PANEL AND CIRCUIT BREAKER NUMBER FOR ALL POWER CIRCUITS WITHIN. FOR EXAMPLE, A JUNCTION BOX CONTAINING LIGHTING CIRCUITS 21, 23, 25 FROM PANEL "HF" WOULD BE LABELED "HF-21,23,25" AS SHOWN.

FIRE ALARM JUNCTION BOXES SHALL BE LABELED "FA" AND PAINTED RED.

SEE SPECIFICATION SECTION 16100 FOR ADDITIONAL REQUIREMENTS.

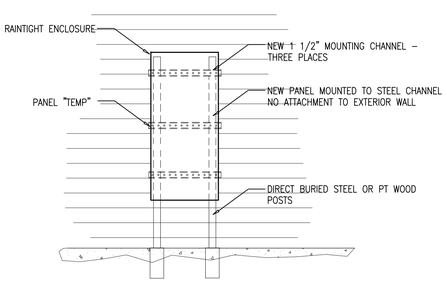
JUNCTION BOX IDENTIFICATION

NOT TO SCALE



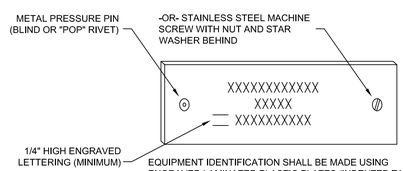
RECEPTACLE WIRING DETAIL

NOT TO SCALE



TEMPORARY FEEDER PANEL

NTS



EQUIPMENT IDENTIFICATION SHALL BE MADE USING ENGRAVED LAMINATED PLASTIC PLATES (INDENTED TAPE LABELS WILL NOT BE PERMITTED). CHARACTERS SHALL BE WHITE ON A BLACK BACKGROUND AND 1/4" HIGH MINIMUM. USE RED ON WHITE BACKGRAOUND FOR EMERGENCY SYSTEM.

PLATES SHALL BE SECURED TO THE PANELS BY MEANS OF SCREWS OR METAL PRESSURE PINS. ADHESIVES FASTENING ALONE WILL NOT BE ACCEPTABLE. ALL NAMEPLATES SHALL BE MOUNTED ON THE OUTSIDE SURFACE OF THE PIECE OF EQUIPMENT.

NAMEPLATE DETAIL

NOT TO SCALE

LEON COUNTY SCHOOLS

McGinniss & Fleming
Engineering, Inc.
Mechanical · Electrical · Fire Protection · Plumbing
1401 Miccosukee Road
Tallahassee, Florida 32308 EB #05990

LIVELY TECHNICAL CENTER
CHILLER PLANT UPGRADES
LCS Project #33017

Tallahassee, Florida

DATE:
June 3, 2015

REVISED:
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DESIGNED BY:	DRAWN BY:
CKF	RET

SUBMITTAL:
CONSTRUCTION DOCUMENTS

SHEET TITLE:
ELECTRICAL DETAILS

SHEET:
E600

JOB NUMBER:
2014-33