

**INVITATION TO BID
2016-I
COURTHOUSE CHILLER BYPASS**

Please be advised that Columbia County desires to accept bids on the above referenced item. Bids will be accepted through 11:00 A.M. on May 10, 2016.

Specifications and bid forms may be obtained from the County's web site at <http://www.columbiacountyfla.com/PurchasingBids.asp>. Sealed proposals will be received in the Columbia County Manager's office until **11:00 A.M.** on **May 10, 2016**, for Columbia County Project No. **2016-I**. This office is located on the second floor of the Courthouse Annex Suite 203, 135 NE Hernando Avenue, Lake City, FL 32055. P. O. Box 1529, Lake City, FL 32056-1529.

There will be a **mandatory** pre-bid meeting at 2:00 P.M. the Columbia County Board Conference Room located in the Columbia County Managers Office on May 3, 2016.

Columbia County reserves the right to reject any and/or all bids and to accept the bid in the County's best interest.

**Columbia County Board of
County Commissioners**

Bucky Nash, Chair

Run: 4/21, 4/28
Chg: BCC

**Columbia County, Florida
Purchasing Department
General Instructions to Bidders**

These instructions will bind bidders and conditions herein set forth, except as specifically qualified in special bid and contract terms issued with any individual bid.

1. The following criteria are used in determining low responsible bidder:
 - A. The ability, capacity and skill of bidder to perform required service.
 - B. Whether the bidder can perform service promptly or within specified time.
 - C. The character, integrity, reputation, judgment, experience and efficiency of bidder.
 - D. The performance of previous contracts with Columbia County.
 - E. The suitability of equipment or material for county use.
 - F. The ability of bidder to provide future maintenance.
2. Payment Terms are net (30) unless otherwise specified. Favorable terms, discounts, may be offered and will be considered in determining low bids if they are deemed by Purchasing Department to be advantageous to the County.
3. All bids should be tabulated, totaled and checked for accuracy. Unit price will prevail in case of errors.
4. All requested information shall be included in the envelope. All desired information must be included for your bid to receive full consideration.
5. If anything on the bid request is not clear, you should contact the Purchasing Director immediately.
6. A bidders list is available at the Purchasing Office.
7. Quote all prices F.O.B. our warehouse or as specified in bid documents.
8. Each proposal shall be clearly marked on the outside of the envelope including Fed Ex, UPS or other delivery service envelopes, as a sealed bid. The name of the item being bid shall be shown on the outside in full.
9. No responsibility shall attach to any County representative or employee for the premature opening of bids not properly addressed or identified.
10. If only one (1) bid is received, the bid may be rejected and re-advertised or excepted if determined to be in the counties best interest.
11. Bids received late will not be accepted, and the County will not be responsible for late mail delivery.
12. Telephone and facsimile bids will not be acceptable in formal bid openings (sealed bids). Should a bid be misplaced by the County and found later, it will be considered. Any bidder may request and shall receive a receipt showing the day and time any bid is delivered to the appropriate office of the County from the personnel thereof.
13. Bids requiring bid bonds will not be accepted if bond is not enclosed. Cash or certified check will be accepted in lieu of bond except on construction projects where cost exceeds \$40,000.

14. All bidders must be recognized dealers in the materials or equipment specified and is qualified to advise in their application or use. A bidder at any time requested must satisfy the Purchasing Office and the County Manager that he has the requisite organization, capital, plant, stock ability and experience to satisfactorily execute the contract in accordance with the provisions of the contract in which he is interested.
15. Any alterations, erasures, additions, or admissions of required information or any changes to specifications or bidding schedule are done at the risk of the bidder. Any bid will be rejected that has a substantial variation, that is; a variation that affects price, quantity, and quality or delivery date (when delivery is required by a specific time).
16. When requested, samples will be furnished to the County free of expense, properly marked for identification and accompanied by a list where there is more than one (1) sample. The County reserves the right to mutilate or destroy any sample submitted whenever it may be to the best interest of the County to do so for the purpose of testing.
17. The County will reject any material, supplies or equipment that did not meet the specifications, even though the bidder lists the trade names or names of such material on the bid or price quotation form.
18. The unauthorized use of patented articles is done entirely at the risk of the successful bidder.
19. The ESTIMATED QUANTITY given in the specifications or advertisements is for the purpose of bidding only. The County may purchase more or less than the estimated quantity and the vendor must not assume that such estimated quantity is part of the contract.
20. Only the latest model equipment as evidenced by the manufacture's current published literature will be considered. Obsolete models of equipment not in production will not be acceptable. The equipment shall be composed of new parts and materials. Any unit containing used parts or having seen any service other than the necessary tests will be rejected. In addition to the equipment specifically called for in the specification, all equipment catalogued by the manufacturer as standard or required by the State of Florida shall be furnished with the equipment. Where required by the State of Florida Motor Vehicle Code, vehicles shall be inspected and bear the latest inspection sticker of the Florida Department of Revenue.
21. The successful bidder on motor vehicle equipment shall be required to furnish with delivery of vehicle, certificate of origin and any other appropriate documentation as required by the Florida Motor Vehicle Department.
22. Prospective bidders are required to examine the location of the proposed work or delivery and determine, in their own way, the difficulties, which are likely to be encountered in the prosecution of the same.
23. All materials, equipment and supplies shall be subject to rigid inspection, under the immediate supervision of the Purchasing Department, its designee and /or the department to which they are delivered. If defective material, equipment, or supplies are discovered, the contractor, upon being instructed by the Purchasing Department or designee, shall remove, or make good such material, equipment, or supplies without extra compensation. It is expressly understood and agreed that the inspection of materials by the County will in no way lessen the responsibility of the Contractor release him from his obligation to perform and deliver to the County Sound and satisfactory materials,

equipment, or supplies. The Contractor agrees to pay the costs of all tests upon defective material, equipment, or supplies or allow the costs to be deducted from any monies due him from the County.

24. Unless otherwise specified by the Purchasing Department all materials, supplies, or equipment quoted herein must be delivered within thirty (30) days from the day of notification or exceptions noted on bid sheets.
25. A contract will not be awarded to any corporation, firm, or individual who is, from any cause, in arrears to the County or who has failed in former contracts with the County to perform work satisfactorily, either to the character of the work, the fulfillment or guarantee, or the time consumed in completing the work.
26. Reasonable grounds for supposing that any bidder is interested in more than one proposal for the same item will be considered sufficient cause for rejection of all proposals in which he is interested.
27. Submitting a proposal when the bidder intends to sublet the contract may be a cause for rejection of bids or cancellation of the contract by the County Manager.
28. Unless otherwise specified the County reserves the right to award each items separately or on a lump sum basis whichever is in the best interest of the County.
29. The County reserves the right to reject any and/or all quotations, to waive any minor discrepancies in the bids for all bidders equally, quotations, or specifications, when deemed to be in the best interest of the County and also to purchase any part, all or none of the materials, supplies, or equipment specified.
30. Failure of the bidder to sign the bid or have the signature of an authorized representative or agent on the bid proposal in the space provided will be cause for rejection of the bid. Signature must be written in ink. Typewritten or printed signatures will not be acceptable.
31. Any bidder may withdraw his bid at any time before the time set for the opening of the bids. No bid may be withdrawn in the thirty- (30) day period after bids are opened.
32. It is mutually understood and agreed that if at any time the Purchasing Department or designee shall be of the opinion that the contract or any part thereof is unnecessarily delayed or that the rate of progress or delivery is unsatisfactory, or that the contractor is willfully violating any of the conditions or covenants of the agreement, or executing the same in bad faith, the Purchasing Department or his designee shall have the power to notify the aforesaid contractor of the nature of the complaint. Notification shall constitute delivery of notice, or letter to address given in the proposal. If after three (3) working days of notification the conditions are not corrected to the satisfaction of the Purchasing Director, he shall thereupon have the power to take whatever action he may deem necessary to complete the work or delivery herein described, or any part thereof, and the expense thereof, so charged, shall be deducted from any paid by the County out of such monies as may become due to the said contractor, under and by virtue of this agreement. In case such expense shall exceed the last said sum, then and in that event, the bondsman or the contractor, his executors, administrators, successors, or assigns, shall pay the amounts of such excess to the County on notice made by the Purchasing Department or his designee of the excess due.
33. If the bidder proposes to furnish any item of foreign make or product, he shall write "foreign" together with the name of the originating country opposite such item on a proposal.

34. Any complaint from bidders relative to the invitation to bid or attached specifications shall be made prior to the time of opening bids; other wise, the bidder waives any such complaint.
35. Contracts may be cancelled by the County with or without cause on thirty- (30) days advance written notice.
36. All contractors submitting bids for road projects in excess of \$150,000 must be pre-qualified with the Florida Department of Transportation and shall provide proof of such qualification upon request.
37. Any bidder affected adversely by an intended decision with respect to the award of any bid, shall file with the Purchasing Department for Columbia County, a written notice of intent to file a protest not later than seventy-two (72) hours (excluding Saturdays, Sundays and legal holidays), after the posting of the bid tabulation. Protest procedures may be obtained in the Purchasing Department.
38. A person or affiliate who has been placed on the convicted vendor's list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to Columbia County, may not submit a bid on a contract with Columbia County for the construction or repair of a public building or public work, may not submit bids on leases of real property to Columbia County, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with Columbia County, and may not transact business with Columbia County for a period of 36 months from the date of being placed on the convicted vendor list.
39. Vendor/Contractor shall utilize the U.S. Department of Homeland Security's E-Verify system, in accordance with the terms governing use of the system, to confirm the employment eligibility of;
 - A. all persons employed by the Vendor/Contractor during the term of the Contract to perform employment duties within Florida; and
 - B. all persons, including subcontractors, assigned by the Vendor/Contractor to perform work pursuant to the contract with the County.

**BID FORM
2016-I
COURTHOUSE CHILLER BYPASS
COLUMBIA COUNTY BOARD OF COUNTY COMMISSIONERS, LAKE CITY, FL**

Bids must be received in the Office of the Board of County Commissioners, Columbia County, 135 NE Hernando Avenue, Room 203, Lake City, FL, 32055 no later than 11:00 A.M., on May 10, 2016.

Columbia County reserves the right to reject any and/or all bids and to accept the bid in the county's best interest, bid F.O.B., Columbia County, Florida.

Lump Sum \$ _____

Any exceptions to the plans and/or specifications must be attached on a separate sheet.

I certify that this bid meets or exceeds the County specifications and that the undersigned bidder declares that I have carefully examined the specifications, term and conditions of this bid and I am thoroughly familiar with its provisions. The undersigned bidder further declares that he/she has not divulged, discussed or compared his bid with any other bidders and has not colluded with any other bidders or parties to a bid whatsoever for any fraudulent purpose.

COMPANY: _____ DATE: _____

ADDRESS: _____

PHONE NO: _____

SIGNATURE: _____

PRINT NAME/TITLE: _____

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COBURN & ASSOCIATES, INC.
CONSULTING ENGINEERS EB-0003687
P. O. Box 577 High Springs, Florida 32655-0577
(386) 454-3748

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Columbia County Courthouse HVAC Modifications
Lake City Florida
April 4, 2016

COBURN AND ASSOCIATES #1457
P.O. Box 577 High Springs, Florida

SECTION 15010

GENERAL MECHANICAL PROVISIONS

PART 1 – GENERAL

DIVISION OF WORK

- A. Division 15 Specifications define the Mechanical and Plumbing Systems. Materials and labor to be performed and furnished as part of the General Construction Contract of which they are a part.
- B. It is not the intent of Division 15 to define a contractual relationship between the General Contractor and Subcontractor ,
- C. It is the responsibility of the General Contractor to provide all materials and labor to perform the work, and subcontractural relationships are his responsibility.

RELATED DOCUMENTS

- A. The Work of this Division affects and is affected by the Work of other Divisions. Review each portion of the Contract Documents including General and Supplementary Conditions, including all special instructions and insurance criteria from Columbia County purchasing, Addenda, Drawings and Division 15 through Divisions 16 Specification Sections to determine the extent of the Work of this Division and the work of the various Division 15 Sections.

WORK INCLUDED

- A. All labor, materials, fixtures, equipment, tools and service necessary for installation, testing and adjusting of all mechanical systems shall be furnished and installed in compliance with the Drawings, Specifications, and any Addenda thereto.
- B. Drawings and Specifications shall be understood to cover, according to their intent and meaning, complete mechanical systems. Work shown and not specified, or work specified and not shown shall be performed as though mentioned in both.
- C. Minor items and accessories reasonably inferred as necessary for the complete and proper operation of any system shall be provided by contractor or subcontractor for such system whether or not they are specifically called for.

MECHANICAL CONTRACTOR QUALIFICATIONS

- A. The Owner intends to award this contract to a Bidder whose subcontractors are competent to perform and complete the work in a satisfactory and timely manner. All Bidders and subcontractors must be qualified at the time of bid opening.
- B. Mechanical Contractor must have a current Florida Mechanical Contractor's license and been in business for a minimum of 5 years.

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- C. The Mechanical Contractor shall demonstrate experience on new construction projects, by submitting three projects completed within the last 3 years each having a minimum mechanical construction value of \$100,000. Submit forms at the end of this section within 24 hours of the bid opening.

DESCRIPTION OF WORK

- A. The work to be performed under this division includes, but is not necessarily limited to, the following:

Chiller Room

1. Furnish and install (2) 8" steel bypass piping loops as shown on drawings
2. Install four(4) new temperature sensor wells furnished by controls contractor
3. Install two (2) new butterfly control valve assemblies provided by controls contractor
4. Incidental 120V electrical work related to this project.

Second Floor Mechanical Room

1. Furnish and install new hot water reheat coil in ductwork
2. Furnish and install new hot water piping and valves as shown on drawings
3. Remove existing fan powered outside air box
4. Install new outside air control damper assembly furnished by the controls contractor
5. Install new air flow monitoring station furnished by the controls contractor.
6. Incidental 120V electrical work related to this project.

- B. The following is the scope of work for the controls contractor. The controls contract is a separate contract between the county and the controls contractor and is not to be included in the mechanical contractors bid. This scope is provided to the mechanical contractor for informational purposes only.

Condenser water loop control.

The controls contractor will furnish the following for installation by the mechanical contractor:

- Two flanged 8" three way bypass control assemblies consisting of 8" TEE with two butterfly valves with all linkages and actuators
- Four thermal wells for condenser water temperature sensors for supply temperature to the condenser

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The controls contractor will furnish and install the following:

- Two relocated thermal sensors for condenser water return from tower
- Two thermal wells for condenser water temperature sensors
- All low voltage wiring and conduit
- All connections to existing control panels
- Re-commission control points in the chiller room
- All programming and modifications to the graphic interface.

Sequence of operation

Proposed sequence is for the chiller loop to always start up in 100% bypass and slowly modulate the bypass closed, bleeding tower water in slowly, trying to maintain 75 deg. F. until the bypass eventually closes completely and the tower valve is 100% open. Carrier will coordinate the final sequence of operation with the engineer.

Second floor mechanical room

The controls contractor will furnish the following for installation by the mechanical contractor:

- Outside air control damper and actuator per drawings
- Ebtron Hybrid Gold Series flow measuring station
- Duct temperature sensor downstream of new hot water coil
- Hot water control valve for reheat coil
- Outdoor temperature sensor in outside air duct

The controls contractor will furnish and install the following:

- All low voltage wiring and conduit
- All connections to existing control panels
- All programming and modifications to the graphic interface.

Public Defender's Office area – first floor

The controls contractor will furnish and install the following:

- Four new space humidity sensors in locations shown on print
- All low voltage wiring and conduit
- All connections to existing control panels
- All programming and modifications to the graphic interface.

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- Measure the air flow from the existing diffusers and re-calibrate the existing VAV boxes
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- C. Work not included in this Division: The following work is specified in other sections of the specifications:
1. Finish painting except as specifically included herein.
 2. Electric work except as specifically included herein.
 3. Masonry and concrete foundations for equipment.
 4. Flashings, but counter flashings shall be included herein.
 5. Cutting and patching except as included herein.

CODES

- A. All work shall be performed or installed in strict accordance with Florida Building Code 2014-Mechanical
1. Code requirements shall be considered as minimum allowable.
 2. Where quantities, sizes, etc., shown on the Drawings or Specifications are in excess of code requirements, the Drawings or Specifications shall take precedence.
 3. Any quantities, size, etc., shown less than code minimum shall be increased to meet code.
- B. Applicable Codes:
1. Plumbing –Florida Building Code 2014 –Plumbing.
 2. HVAC – Florida Building Code 2014- Mechanical
 3. Other - Life Safety Code.
 4. Florida Building Code –Energy Conservations 2014

TECHNICAL DEFINITIONS

- A. Specific items of terminology, as used herein, shall have the following meanings:
1. "Work" includes all materials, labor, equipment and operation required for complete and proper installation.
 2. "Piping" shall mean pipe, fittings, flanges, valves, controls, hangers, traps, drain, insulation, vents, and items customarily required in connection with the transfer of fluids.
 3. "Concealed" shall mean embedded in masonry or other construction, installed behind wall furring, within double partitions or hung ceilings, in crawl spaces, in shafts.
 4. "Exposed" shall mean not concealed.
 5. "By Other Trades" shall mean by persons or parties responsible for work at the project other than the party or parties who have been duly awarded the contract for the work of this trade. In the event that this document is used to acquire work as part of a general construction contract the words "by other

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trades" shall mean by persons or parties who are not anticipated to be the subcontractor for this trade working together with the General Contractor. In this context the words "by other trades" shall not be interpreted to mean not included in the overall contract.

6. "Demolition" shall be the removal of any existing equipment, and the capping or plugging of any existing services to that equipment. Removal shall include the proper evacuation of all environmentally hazardous gases, refrigerants or liquids and proper disposal in accordance with all applicable codes and standards.
7. "OPCI" shall mean the Owner will purchase this equipment and have it delivered to the site. The Contractor is responsible for protection and installation.

INTERPRETATION OF THE DRAWINGS AND SPECIFICATIONS

- A. As used in the drawings and specifications, certain non-technical words shall be understood to have specific meanings as follows:
 1. "Furnish" shall mean purchase and deliver to the project site complete with every necessary appurtenance and support.
 2. "Install" shall mean unload at the delivery point at the site and perform every operation necessary to establish secure mounting and correct operation at the proper location in the project.
 3. "Provide" shall mean "furnish" and "install".
- B. Except where modified by a specific notation to the contrary, it shall be understood that the indication and/or description of any item, in the drawings or specifications or both, carries with it the instruction to furnish and install the item, regardless of whether or not this instruction is explicitly stated as part of the indication or description.
- C. It shall be understood that the specifications and drawings are complementary and are to be taken together for a complete interpretation of the work. Exceptions are those notes on the drawings, which refer to an individual element of work, take precedence over the specifications where they conflict with same.
- D. No exclusions from, or limitations in, the language used in the drawings or specifications shall be interpreted as meaning that the appurtenances or accessories necessary to complete any required system or items of equipment are to be omitted.
- E. The drawings of necessity utilize symbols and schematic diagrams to indicate various items of work. Neither of these items have any dimensional significance nor do they delineate every item required for the intended installations. The work shall be installed, in accordance with the diagrammatic intent expressed on the

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electrical and mechanical drawings, and in conformity with the dimensions indicated on final architectural and structural working drawings and on equipment shop drawings.

- F. No interpretation shall be made from the limitations of symbols and diagrams that any elements necessary for complete work are excluded.
- G. Certain details appear on the drawings that are specific with regard to the dimensioning and positioning of the work. These details are intended only for the purpose of establishing general feasibility. They do not obviate field coordination for the indicated work.
- H. Information as to the general construction shall be derived from structural and architectural drawings and specifications only.
- I. The use of the word in the singular shall not be considered as limiting where other indications denote that more than one item is referred to.
- J. In the event that extra work is authorized, and performed by this trade, work shown on drawings depicting such work, and/or described by addendum is subject to the base building specification in all respects.

DRAWINGS AND SPECIFICATIONS

- A. It is the intent of drawings and specifications to obtain a complete and satisfactory installation.
- B. Separate divisional drawings and specification shall not relieve the contractor from full responsibility of compliance with the work indicated on any of the drawings or in any division of the specification.
- C. Each subcontractor shall carefully examine the architectural, structural, electrical and mechanical drawings and specifications prior to submitting bid.
- D. The subcontractor will be required to furnish, install and connect with appropriate services all items shown on any of the drawings without additional expense to the Owner.
- E. The Architect/Engineer shall be notified of any discrepancies, omissions, conflicts or interferences which occur between drawings or between drawings and specifications. If such notification is received in adequate time additional data or changes will be issued by addendum to all bidders.

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- F. Architectural and structural drawings take precedence over mechanical drawings with reference to building construction.
- G. Mechanical drawings are diagrammatic but shall be followed as closely as actual construction of the building and the work of other trades will permit.

APPROVED MATERIALS

- A. Materials or products specified herein and/or indicated on drawings by trade name, manufacturer's name and/or catalog number shall be provided as specified. Substitutions will not be permitted except as described herein in Supplementary and General Conditions.
- B. For approval of products other than those specified, bidders shall submit to the architect a request in writing at least ten (10) days prior to bid date and hour. Requests received after this time will not be reviewed or considered regardless of cause. Requests shall clearly define and describe the product for which approval is requested. Requests shall be accompanied by manufacturer's literature, specifications, drawings, cuts, and performance data list of references or other information necessary to completely describe the item. Approval will be in the form of an addendum to the specifications issued to all prospective prime contract bidders on record. The addendum will indicate the additional products that are approved for this project.
 - 1. Approval submittal shall be for the exact model to be furnished in the form of a submittal including all relevant accessories.
- C. A list of all materials and equipment that the Contractor proposes to furnish shall be submitted for approval within ten (10) days after the contract has been let. Data shall be complete in all respects.
- D. Where such approved substitution or deviation requires different quantity or arrangement of foundations, supports, ductwork, piping, wiring, conduit, and any other equipment or accessories normal to this equipment, Contractor shall furnish said changes and additions and pay all costs for all changes and additions and pay all costs for the changes to the work and the work of others affected by this substitution or deviation.
- E. Deviations mean the use of any listed Approved Manufacturer other than those on which the drawings are based.

REFERENCES

- A. American Society for Testing and Materials (ASTM)
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- B. American Association of State Highway & Transportation (ASSHT)
- C. American Water Works Association (AWWA)
- D. American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE)

FEES

- A. Fees for permits, inspections, patent use, royalties, etc. shall be paid by the contractor.

IDENTIFICATION

- A. All valves, air handling units, compressors, rooftop equipment, etc. shall be labeled with the same designation shown on the Drawings.
 - 1. Valves shall be tagged with embossed metal tags.
 - 2. Air Handlers and Compressors/Condensing Units shall be labeled with engraved phenolic name plates with letters ¼" high minimum. Plates shall be red with white lettering.

TESTS AND INSPECTIONS

- A. All mechanical system shown on the Drawings.
- B. Call for appropriate inspections during construction as required by local agencies having jurisdiction over mechanical construction.
- C. Costs of inspections shall be paid by the Contractor.
- D. Furnish all equipment and personnel and conduct all tests required to secure approval of the installation.
- E. Any repairs or changes required to secure the approval of the installation shall be done at no additional expense to the Owner.

QUALITY ASSURANCE

Safety Tests

- A. All systems shall be tested for proper operation, rotation air supply, water supply, pressures, flows, balance, vibration, and appropriate interlocks as required by these specifications or manufacturers' recommendations.

Code Tests

- A. All work shall be installed in accordance with the appropriate codes and satisfy the local inspector having jurisdiction.

Operational Testing

- A. Upon completion of each part of the mechanical system, the contractor shall demonstrate to the Engineer that each item on that system is installed with proper covers, safeties, controls, etc., and that all are in proper working order.

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As Built Information

- A. A set of "red-lined" mechanical drawings shall be carefully maintained at the job site. Actual conditions are to be put on the drawings in red on a daily basis so the drawings will continuously show locations and routings of piping, ducts, grilles, equipment, valves, and any equipment specified on the drawings or in these specifications.

Equipment and Materials

- A. Meet or exceed specification requirements.
- B. New, unused, of best quality and grade.
- C. Current model for which replacement parts are available.

Catalog and Model Number

- A. Intended for use as guidelines and are supplied to aid in equipment identification.
- B. Because Catalog Numbers are subject to manufacturers change, it is the contractors responsibility to coordinate the equipment and material with specified capacity, duty rating, voltage, etc.
 - 1. Do not take precedence over specific ratings or duty or written specifications.
- C. Are not intended to give priority of one manufacturer over another providing "or equal" requirements are met.

USE OF EQUIPMENT OTHER THAN BASIS OF DESIGN

- A. The mechanical drawings indicate equipment in the schedules as basis of design. Other manufacturers are listed in the specification sections. All other manufacturers must be submitted to the Engineer for review prior to bid. Any proposed substitution must follow Div 1 requirements.
- B. The drawings (electrical, structural, architectural, etc) are based upon the products listed in the mechanical schedules (basis of design). Any product provided other than the basis of design may impact the requirements of other disciplines. The mechanical contractor is responsible for (and shall include in the base bid price) any and all costs related to the substituted equipment. Coordinate with other sub contractors regarding impact of substituted equipment prior to bid.
- C. The construction documents contain design intent that may or may not be immediately apparent. All other intended physical and aesthetic requirements (stated or not) of the construction documents shall apply to the equipment intended for use. This includes appearance, clearance, access, and concealment requirements.

UNACCEPTABLE EQUIPMENT

- A. Equipment and material may be judged unacceptable for the following reasons.
 - 1. Equipment was not submitted for prior approval ten (10) days in advance

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- of bid date.
2. There is a history of poor performance, poor response to service and/or warranty issues on previous projects.

"Or Equal"

- A. Equipment and material shall be judged "equal" or on the basis of the following:
 1. Meets or exceeds performance specifications for rating duty, etc.
 2. Is of comparable size to specified unit, (dimensions, weight, etc.).
 3. Has similar appearance and is aesthetically acceptable (not applicable to equipment which is concealed in mechanical rooms, etc.).
 4. Has exact voltage and phase characteristics as specified.
 5. Does not exceed power consumption of specified equipment by more than 5%.
 6. Is submitted and approved by Architects /Engineer.
- B. Equipment may be judged "unequal" if:
 1. Installation of such equipment will cause excessive changes in associated equipment, wiring, structures, etc.
 2. Such equipment will require basic design changes with regard to system operation or performance.

MAJOR EQUIPMENT SUBSTITUTION COST

- A. If equipment furnished or substituted differs in physical character from that specified and requires increased services and/or facilities of other trades, and such substitution is acceptable to the Architect, the Contractor shall bear the costs of any or all of the following charges caused by such substitution:
 1. Cost of modifying product to fit conditions.
 2. Cost of modifying building to receive product.
 3. Cost of increased services and/or facilities.
 4. Cost of additional Architectural and/or Engineering Services required to modify such services, facilities, building, etc.
- B. Minor deviations:
 1. Dimensions and ratings of equipment herein specified or indicated on Drawings are intended to establish desired outlines and characteristics of such equipment. Minor deviations will be permitted or allow manufacturers specified to bid on their nearest stock equipment.

COORDINATION OF MECHANICAL WORK

- A. Refer to Division 1 for general coordination requirements. The contract documents are diagrammatic in showing certain physical relationships of the mechanical work and the interface with other work, including utilities and electrical work. Final coordination is the responsibility of the Contractor.

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1. Arrange mechanical work in a neat, well-organized manner. Piping and services shall run parallel to primary lines of the building construction, at a minimum of 7'-0" clearance.
 2. Locate operating and control equipment for ease of access. Arrange mechanical work with required clearances for access for operation and maintenance.
 3. Advise other trades of openings required in their work.
 4. Give right-of-way to piping which requires a slope for drainage.
- B. Coordination Drawings: Provide 1/4" drawings indicating mechanical equipment room showing the position of all equipment, valves, ductwork, piping, access panels, drives, etc.
1. Coordination drawing shall include two elevations or sections showing vertical clearance.
 2. Engineer will make his AutoCADD drawing available as a basis to produce the coordination drawing.
- C. NEC Required Clearances: The Contractor is responsible for all mechanical equipment with serviceable electrical components at 120v and greater (including but not limited to starters, disconnects, fuses, relays, etc.) to be installed with allowable NEC clearances. Refer to NEC for the required clearances (which are often greater than 36"). For cramped mechanical spaced with electrical panels, submit coordination drawings showing mechanical and electrical equipment and their respective service and NEC clearances.
- D. Do not locate anything within the NEC required service areas required by existing electrical components.

QUALITY ASSURANCE, STANDARDS AND SYMBOLS, QUALIFICATIONS

Administration

Refer to Division 1 for administrative/procedural requirements to comply with codes and standards. For the mechanical work, standards are specified in individual sections.

Installation

For fabrication, installation and testing of work of Division 15, use trained, skilled mechanics and experienced workmen familiar with items required and manufacturer's recommended methods of installation. Perform work in the best workmanlike manner. In acceptance of installed work, the Architect/Engineer will make no allowance for lack of skill on the part of the workmen. A competent supervisor shall direct the proper and prompt execution of the work.

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Testing

An independent testing company shall be contracted to witness and sign off on all mechanical pressure tests.

Code And Standard Compliance

Materials or equipment data sheets shall indicate compliance with industry standards, such as the American National Standards Institute (ANSI), Americans with Disabilities Act of 1990 (Public Law 101-336) (ADA), American Society for Testing and Materials (ASTM), Florida Department of Community Affairs Accessibility Requirements Manual (DCAARM), National Electrical Manufacturers Association (NEMA), National Fire Protection Association (NFPA), Underwriters Laboratories (UL), Air Conditioning & Refrigeration Institute (ARI), American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), OSHA "Trench Safety Act" Chapter 90-96, and the Florida Building Code, latest edition, Florida Administrative Code (FAC). Symbols: Except as otherwise indicated, refer to the "ASHRAE Handbook of Fundamentals" for definitions of symbols used on the drawings to show mechanical work.

Minimum Qualifications and License

The Subcontracting Firm for the mechanical installation shall be licensed by the State of Florida and the local authorities, regularly engaged in the installation of mechanical systems and other related equipment. The Subcontracting Firm shall be familiar with all local conditions including interpretations, codes and Standards. Both the Firm and Foreman shall have at least 5 years of successful installation experience on at least 3 successful similar projects of the same or greater magnitude, scope, and monetary value. The Subcontracting Firm shall hold a Florida State Certified Air Conditioning Contractor or State Certified Mechanical Contractor license for this project.

SHOP AND ERECTION DRAWINGS AND SAMPLES

- A. Submit required and/or requested shop drawings and erection drawings, and obtain written approval of same before ordering or installing any equipment or material. Equipment or material ordered or installed without written approval may not be accepted.
- B. Shop drawings shall consist of manufacturer's scale drawings, cuts or catalogs, including descriptive literature, which shall clearly indicate the construction, material, physical dimensions, and complete operating data clearly marked for each item. Data of general nature will not be accepted.

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- C. Submit samples requested for approval. The sample shall be properly tagged and will remain in the Architect's possession until final acceptance of the work.
- D. Indication of "No Exceptions Taken" on the shop drawing review does not relieve the contractor of the responsibility to comply with all requirements of this specification.

SUBMITTAL REQUIREMENTS

- A. Submittal data is required for each Division 15 section.
- B. All data shall be submitted to the Engineer at one time; partial submittals will not be accepted. Submit electronically in pdf format.. The front page shall include the project name and the Coburn & Associates, Inc. job number from the drawings. Index each section using the format from the Project Specifications. Each section of the submittal shall begin with a "Submittal Identification Sheet" (last page of this specification section) with a complete list of all items in that section. Failure to follow this procedure shall result in rejection of the submittal by the Engineer. This list shall also contain the following information:
 - 1. Model numbers and summary descriptions.
 - 2. The number of pages submitted for each item.
 - 3. Space for Engineer's review stamp for each item.
 - 4. Names of Project, Contractor, Sub-Contractors and Suppliers of Equipment.

The submittal shall be formatted in this manner in order to facilitate timely review by the Engineer. Engineer shall review submittal data no more than two times. Additional submittal review time shall be paid by Contractor.

- C. Refer to Division 1 for administration of submittals. For mechanical work, the following quantities are required for each category of submittal, unless otherwise indicated in Division 1 or individual work sections. Refer to architects submittal procedures for format and hard copies required. Submittal of hard copies shall be AFTER final approval of electronic submittals and shall be a minimum of two copies for maintenance manuals.
 - 1. Shop Drawings: 2 for maintenance manuals.
 - 2. Product Data: 2 for maintenance manuals.
 - 3. Test and Balance Reports: including 2 for maintenance manuals.
 - 4. Warranties (Guarantees): 2 for maintenance manuals.
 - 5. Manuals: 2 final copies, including flow diagrams, maintenance instructions, operating instructions, parts listings, and copies of other submittals indicated for inclusion.

Maintenance Manuals

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Thirty days prior to Substantial completion, furnish two operation and maintenance manuals with index and thumb-tab marker for each section of information; bind in 3-ring, vinyl-covered binder. Label binder with "OPERATION AND MAINTENANCE MANUAL," the name and location of the project, the name of the Contractor, and the contract number. Include the names, addresses, and telephone numbers of each subcontractor installing the equipment. Include a list of all equipment and the supplier with address and telephone number. Include a table of contents and assemble to conform to the Project Manual (specifications) with the tab sheets before instructions covering the subject. Instructions shall be legible and easily read, fold large sheets of drawings. The manual shall include: wiring and control diagrams, detailed explanation of operation and control of each item of equipment; description of the function of each principal item of equipment; installation instructions; maintenance instructions; lubrication schedule including type, grade, temperature range and frequency; safety precautions, diagrams and illustrations; test procedures; performance data; and parts lists. The manual shall be complete, including all equipment, controls, accessories and associated appurtenances.

RECORD DRAWINGS

- A. Subcontractor is instructed to refer to section covering General Conditions of this specification.
- B. During the course of construction the subcontractor shall keep an accurate record of all deviations and changes of the work as indicated on the drawings and its actual installation.
- C. Prepare one set of "as-built" reproducible drawings indicating a record of construction revisions and changes from the contract drawings.
- D. Upon completion of the work and within 30 days after acceptance by the Architect, the subcontractor shall furnish to the Owner a revised and final set of reproducibles and a set of CADD diskette and prints showing all work as installed.
- E.

REGULATORY REQUIREMENTS

- A. All work shall be performed in compliance with OSHA regulations.
- B. All work shall be performed in accordance with applicable School Board Policies as outlined in Architectural Specifications.

CERTIFICATES

- A. Upon completion of the work and before making the final request for payment,

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submit a "Final Certificate of Approval" or its equivalent stating that:

1. All work has been inspected and approved.
2. All work has been completed.
3. No further inspections will be required.
4. As built drawings are complete and on site.

PART 2 - PRODUCTS AND MATERIALS

GENERAL

When a specified or indicated item has been superseded or is no longer available, the manufacturer's latest equivalent type or model of material or equipment as approved by the Engineers shall be furnished and installed at no additional cost to the Owner.

MECHANICAL SYSTEM IDENTIFICATION

- A. Provide a system of identification of all equipment, including dampers, and other appurtenances, to permit recognition of all components.
- B. Piping System: Mark piping which is exposed, including concealed piping in accessible spaces i.e. lay-in ceilings, etc. Provide either pre-printed, color-coded plastic, self-sticking pipe markers; or color-coded stencil painted markers. Indicate each pipe system by its generic name (abbreviated) as shown/scheduled/specified.

C.

Duct System

Provide stencil-painted identification on ductwork, with lettering size sufficient for reading but not less than 3/4-inch and including arrows to show direction of flow. Indicate flow direction at fan housings, remote coils, fire and smoke dampers, control dampers, dehumidifiers, and VAV boxes. On access doors, indicate service and equipment being accessed. Where ducts are concealed behind access doors or removable ceilings, identification may be by plasticized tags in lieu of stencil-painted markers.

Manual Volume Dampers

Spray paint a continuous minimum 6" wide fluorescent orange band around entire perimeter of the outside surface of the duct or when externally insulated, on the surface of the duct insulation, at all locations where manual volume air dampers are installed.

1. Equipment: Provide tag identification with the equipment unit tag as indicated on the drawings for every piece of equipment. Tag identification shall be laminated phenolic plastic, chamfer edges, black

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front with white core, with lettering etched through the outer covering. White engraved ¼" letters on black background.

2. Operational Tags: Where needed for proper and adequate information on operation and maintenance of mechanical equipment, provide tags of plasticized cardstock, pre-printed to convey messages such as: "DO NOT CLOSE THIS VALVE EXCEPT WHEN BURNER IS OFF".

3. Nameplates: Each unit of equipment shall be identified by a permanently factory attached nameplate bearing information pertaining specifically to the unit installed.

4. Dampers: At each access door, provide a label with letters at least 1/2" high stating the damper number and purpose. Identify fire dampers with red letters on a white background. Identify all other dampers with black letters on a white background.

5. Miscellaneous: All switches, starters, pilot lights, remote gauges, and control panels shall have attached or mounted adjacent thereto a black surface, white core Bakelite nameplate indicating which equipment it controls. Nomenclature shall be in accordance with a schedule submitted to and approved by the Owner.

6. Ceiling Tags: Provide a ½" x 3" laminated phenolic coated plastic nameplate, black letters on white background for each VAV box, power ventilator, motorized damper, AHU or other equipment located in the ceiling space. If the equipment is located above a hard ceiling, locate nameplate on access door. If located above a ceiling, tile ceiling, locate on the T-bar next to the access tile.

EMERGENCY AND SERVICE ACCESS

A. General: Where floors, walls, ceilings or ductwork must be penetrated for emergency or service access to mechanical work, provide types of access doors indicated, including floor doors if any. Furnish sizes indicated or, where not otherwise indicated, furnish adequate size for intended and necessary access. Furnish manufacturer's complete units, of type recommended for application in indicated substrate construction, in each case, complete with anchorages and hardware. Access doors required in walls, ceilings, or other areas of the structure are furnished as a part of Division 15. Installation shall be by other divisions of the Contract Specifications.

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- B. Duct Access Doors: Access doors shall be complete with steel butt hinges window type sashlock and sheet metal reinforcing plate. Access door shall be insulated and have sheet metal on both sides.
- C. Wall/Ceiling Access Door Construction: Fabricate wall/ceiling door unit of stainless steel Type 304 construction with welds ground smooth; 16-gauge frames and 14-gauge flush panel doors; 175° swing with concealed spring hinges; flush screwdriver-operated cam locks; factory applied rust-inhibitive prime-coat paint finish.
- D. Removable Access Plates: Where valves, control devices, cleanouts and similar elements of mechanical work are located within or behind wall, ceiling or floor construction or finishes, or below grade, and are not (cannot be) provided with integral removable access plates as specified in other Division 15 sections, provide manufacturer's standard frameless round formed stainless steel plate cover, with single exposed flush screen anchor, with bright finish.

INSPECTION

- A. Job conditions shall be determined prior to bidding in the following manner:
 - 1. Site visit to determine:
 - a. Existing conditions.
 - b. How and where materials will be delivered and stored.
 - c. Special problems encountered during construction.
 - 2. Examine all Contract Drawings and Specifications to determine:
 - a. Type of construction to be used.
 - b. How construction or work will affect the work of this Section.
 - c. Nature and extent of work of other trades.
- B. Failure to determine existing conditions or nature of construction will not be considered as a basis for granting additional compensation.

INSTALLATION

- A. General:
 - 1. Contract Drawings show the arrangements and sizes of principal apparatus and devices to be provided under this Contract and connection thereto. These shall be followed as closely as actual building construction will permit.
 - 2. Dimensions of work as indicated on Plans are not guaranteed to be as-built dimensions.
 - 3. No measurements shall be scaled from Drawings and used as definite dimensions for layout or fitting work in place.
 - 4. Layout of equipment, as shown on the plans, shall be checked and exact location determined by dimension if equipment approved by the Architect.
 - 5. Consult the Drawings for all dimensions, locations of partitions, sizes of

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- 6. structural member, foundations, etc.
 - 6. Do not make final layouts until shop or equipment drawings are approved and job conditions verified.
 - 7. Mechanical reference symbols are given on the mechanical legend on the drawings.
- B. Rough-in:
- 1. Work included:
 - a. Contractor shall rough-in for all equipment, fixtures, etc., in building whether or not such equipment is furnished by this Contractor or by Owner.
 - 2. Method:
 - a. Determine in advance the location and size of all openings and chases necessary for proper installation of all work and have openings and chases provided during construction.
 - b. Install all inserts for hangers and supports of mechanical work and equipment work as general construction progresses.
 - c. Rough-in openings in masonry or stud walls shall be cut, not broken or chiseled.
 - d. Sleeves shall be required at all points where piping passes through concrete walls, slabs or masonry walls.
 - e. Sleeves installed below grade or where subject to high water conditions shall be installed watertight.

PART 3 - EXECUTION

CUTTING AND PATCHING

Comply with required Divisions of the Contract Specifications for the cutting and patching of other work to accommodate the installation of mechanical work. Except as individually authorized by the Architect/Engineer, cutting and patching of mechanical work to accommodate the installation of other work is not permitted, other than necessary penetrations of mechanical sheet metal work for electrical conduit and similar purposes.

COORDINATION WITH OTHER TRADES

- A. This subcontractor shall coordinate his/her work with other trades to avoid interferences and delays. He/she shall assist in working out space requirements to make a satisfactory installation.
- B. If the subcontractor installs his/her work before coordinating with other trades, or so as to cause any interference with work of other trades, he/she shall make the necessary changes in his/her work to correct the condition without extra charge.

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- C. This subcontractor shall furnish to other trades, as required, all necessary templates, patterns, settings plans, and shop details for the proper installation of work and for the purpose of coordinating adjacent work.

PAINTING

- A. Refer to individual sections for painting of mechanical work.

CLEANING

- A. Ductwork and Equipment: Every possible precaution shall be taken to keep the interior of the duct system and equipment throughout free from dirt and rubbish and other foreign matter. All fan motors, switches, etc., shall also be protected from dirt, rubbish and other foreign matter during building construction. Thoroughly clean all components of the duct work and remove all dirt, scale, oil and other foreign substances which may have accumulated during the installation process. All ductwork openings shall be temporarily capped or sealed with Visqueen immediately after installation and shall be covered with Visqueen while it is stored on the jobsite.
- B. Water Piping Systems: After the piping systems have been pressure tested and proved tight, thoroughly flush out and clean the various piping systems, using boiler cleaning compound so as to remove all dirt, scale, oil, grease and other foreign substances which may have accumulated during the installation process.
- C. Equipment: All air handling units, power ventilators, pumps, boilers, plumbing equipment, and any and all other mechanical equipment provided shall be thoroughly cleaned of all dirt, oil concrete, etc. Any dents, scratches or other visible blemishes shall be corrected and the appearance of the equipment made "like new" and to the satisfaction of the Architect/Engineer.
- D. Upon completion, and before final acceptance of the work, all debris, rubbish, leftover materials, tools and equipment shall be removed from the site.

DISCREPANCIES

- A. In the event of discrepancy, work shall cease and the Architect/Engineer shall be notified immediately.

CLOSING-IN OF UNINSPECTED WORK

- A. Do not allow or cause any of the work in this Section to be covered up or enclosed until it has been inspected, tested, and approved by the Architect/Engineer and by all authorities having jurisdiction.

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MECHANICAL WORK CLOSEOUT

- A. Refer to the Division 1 sections for general closeout requirements. Maintain a daily log of operational data on mechanical equipment and systems through the closeout period; record hours of operation, assigned personnel, fuel consumption and similar information; submit copy to Owner.
- B. Closeout Equipment/Systems Operations: Sequence operations properly so that work of project will not be damaged or endangered. Coordinate with seasonal requirements. Operate each item of equipment and each system in a test run of appropriate duration (with the Architect/ Engineer and the Owner's operating personnel present) to demonstrate sustained, satisfactory performance. Adjust and correct operations as required for proper performance. Clean and lubricate each system, and replace dirty filters excessively worn parts and similar expendable items of the work.
- C. Operating Instructions: Conduct a walk-through instruction seminar for the Owner's personnel to be involved in the continued operation and maintenance of mechanical equipment and systems. Explain the identification system, operational diagrams, emergency and alarm provisions, sequencing requirements, seasonal provisions, security, safety, efficiency and similar features of the systems. Provide a copy of the written sequence of control of all mechanical equipment and review with Owner's personnel at time of walk-through.
- D. Turn-Over of Operation: At the time of final completion, turn over the prime responsibility for operation of the mechanical equipment and systems to the Owner's operating personnel.

GUARANTEES AND CERTIFICATIONS

- A. All work shall be guaranteed to be free from leaks or defects. Any defective materials or workmanship as well as damage to the work of all trades resulting from same shall be replaced or repaired as directed for the duration of stipulated guarantee periods.
- B. The duration of guarantee periods following the date of beneficial use of the system shall be one year, and five years warranty shall be on all compressors. Beneficial use is defined as operation of the system to obtain its intended use.
- C. The date of acceptance shall be the date of final payment for the work or the date of a formal notice of acceptance, whichever is earlier.
- D. Certification shall be submitted attesting to the fact that specified performance criteria are met by all items of heating and air conditioning equipment.

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MECHANICAL SUBSTANTIAL COMPLETION OBSERVATION

- A. Mechanical Substantial Completion shall be done at the same time as the General contractors substantial completion inspection.
 - 1. **ALL** Mechanical work shall be completed including but not limited to All piping and valves installed, all ductwork revisions complete, dampers installed and all equipment furnished by others is installed.
 - 2. The mechanical contractor may call for substantial completion prior to the Completion of the controls contractor's work.
 - 3. All Mechanical Systems will be operated and checked including, fans, motors, dampers, pumps, controls, cooling tower, safety devices, including Fire Alarm Shutdown.
- B. The Contractor shall walk the site with the Engineer and assist in providing ladders, flashlights, and access to equipment.
- C. Documents: The Contractor shall have a red lined set of AS-BUILT information that has been edited as equipment is installed.
- D. At the successful conclusion of the walk-through, the Contractor and Architect/Engineer shall sign the observation form on the AS-BUILT drawings. It is the Contractor's sole responsibility to plan for and schedule this observation.

FINAL ACCEPTANCE OBSERVATION

- A. Contractor shall carefully read all applicable sections of these specifications and prepare and assemble necessary test reports, maintenance manuals, certificates, guarantees, letters of instruction, etc. that are required.
- B. These documents shall be delivered to the Architect's / Engineer's office at least 48 hours before requesting final acceptance observation for work covered under this division of the specifications.
- C. Contractor's representatives responsible for work under this division shall be present at time of acceptance observations and shall furnish required mechanics, tools and ladders to assist in the inspection.
- D. A list of items to be corrected as a result of acceptance observation will be furnished to the contractor. Notify Architect / Engineer in writing of any items appearing on list of correction that are disputed by Contractor. When ready, request in writing a re-observation of work.

PROTECTION

- A. In addition to provisions and stipulations set forth in other Sections of these Specifications provide various types of protection as follows:

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1. Protect finished floors from chips and cutting oil by use of metal chip receiving pan and oil-proof floor cover.
 2. Protect equipment and finished surfaces from welding and cutting spatters with baffles and spatter blankets.
 3. Protect equipment and finished surfaces from paint droppings, insulation adhesive, etc., by use of drop cloths.
- B. All pumps, motors, fans and other rotating equipment shall be stored at Site with openings, bearing, etc., covered to exclude dust and moisture; all stockpiled conduit shall be placed on dunnage, and protected from weather, from entry of foreign materials.

END OF SECTION

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SECTION 15060

PIPING SYSTEMS

PART 1 - GENERAL

SYSTEM DESCRIPTION

- A. SYSTEMS TO BE FURNISHED IN THIS PROJECT
 - 1. Hot water and condenser water piping
- B. Piping Description
 - 1. Hot water and condenser water piping – steel- See section 15061

QUALITY ASSURANCE

- A. Hot water and condenser water
 - 1. Install in accordance with applicable code.
 - 2. All installers shall be licensed or certified as required by the State or local government having jurisdiction over the work.
 - 3. All welders must be certified

REFERENCES

- A. American Society for Testing and Materials. (ASTM)

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS

- A. Any manufacturer engaged in the production of pipe, fittings and associated materials and who test, inspect and certify that said materials meet or exceed the ASTM designation for that material shall be acceptable.

MATERIALS

- A. Refer to individual specification section.
 - 1. 15061 Steel Pipe and Fittings
 - 2. 15094 Pipe Hangers and Supports
 - 3. 15099 Unions
 - 4. 15100 Valves, Cocks and Faucets

PART 3 - EXECUTION

GENERAL PIPING INSTALLATION – ALL SYSTEMS

- A. Above-Ground Piping:

1. Examine areas to receive piping for:
 - a. Obstructions.
 - b. Work to be done prior to other construction.
 - c. Work of other trades in other areas.
2. NOTIFY THE ENGINEER 72 HOURS PRIOR TO COMMENCING
ENGINEER WILL VISIT SITE TO DETERMINE WITH THE CONTRATOR
THE EXACT LAYOUT AND ROUTING OF THE PIPING PRIOR TO
COMMENCING WORK.

C. General Preparation and installation

1. Ream pipes and tubes.
2. Clean off scale and dirt, inside and outside, before assembly.
3. Remove welding slag or other foreign matter from piping.
4. Keep piping capped while stored on site and during installation when piping will be open for more than 2 hours.

HOT WATER AND CONDENSER WATER SYSTEMS

A. General

1. All piping shall be supported on hangers and supports as specified in Section 15094.
2. Pipe shall be adequately supported during construction with blocking or slings to prevent injury to personnel or damage to equipment or materials.
3. Run exposed piping true and level except where slopes are specified.
4. Run vertical exposed piping plumb.
5. Run exposed piping with as few elbows and bends as possible.
6. Drawings are diagrammatic showing piping to be installed and systems to be run. Actual piping locations shall determined in the field to closely match the drawings, however, coordination with structure and other trades is the responsibility of the contractor.
7. Slope water piping 1 inch in 40 feet and arrange to drain at low points.
 - a. On closed systems, equip low points with 3/4 inch drain valves and hose nipples.
8. All isolation valves shall be in an accessible location or have an access panel installed at the valve location.
9. Furnish and install unions in accordance with Section 15099 at location shown on drawings.

END OF SECTION

15060.2

SECTION 15061

STEEL PIPE AND FITTINGS

PART 1 - GENERAL

SYSTEM DESCRIPTION

- C. Hot and condenser water piping
 - 1. Two inch and smaller
 - a. Carbon steel, black
 - b. Schedule ASTM A-106
 - c. Joints
 - 1. Threaded
 - d. Fittings
 - 1. 150# threaded fittings, conforming to A-105
 - 2. Larger than 2-1/2 inch
 - a. Carbon steel, ASTM A-106
 - b. Schedule 40
 - c. Joints
 - 1. Welded or welded flanged
 - d. Fittings, 150#, welded, conforming to ASTM-A105
 - e. Flanges, welded 150# conforming to ASTM-A105

END OF SECTION

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April 4, 2016

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SECTION 15094

PIPE HANGERS AND SUPPORTS

PART 1 - GENERAL

WORK INCLUDED

- A. All piping shall be supported by pipe hangers, clamps, clips or supports as specified in this Section.

SYSTEM DESCRIPTION

- A. All clevis type hangers shall have a minimum of 1 1/2 inches of vertical adjustment by using turnbuckles and/or threaded rods.
- B. All adjustments shall be positively secured by a locknut or setscrew.
- C. Hangers shall support the pipe size for which they are manufactured.

SHOP DRAWINGS AND PRODUCT DATA

- A. Submit Shop Drawings and/or product data sheets in accordance with the General Conditions for all pipe hangers to be used.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS

- A. Grinell
- B. Fee and Mason

MATERIALS

- A. All clamps, hangers, clevis, etc. shall be steel.
- B. Pipe hangers in direct contact with copper shall be copper or lead plated, or of an approved dielectric material.

PART 3 - EXECUTION

INSTALLATION

- A. General:
 - 1. All piping shall be supported from structural building members, i.e. block, beams, columns, purlines, floor joists, etc.
 - 2. Piping shall not be supported from ceiling tile or grids, conduit, mechanical equipment, ductwork or non-structural steel.
 - 3. Perforated strapping may be used only for piping 3/4 in. or smaller and only when concealed in walls or ceilings.
 - 4. Hangers for piping run flush along the walls shall be stamped steel straps similar to conduit straps for pipe sizes two (2) inches and smaller.
 - 5. Hangers for piping run flush along the walls shall be steel wall brackets with

15094.1

steel clevis type hangers and threaded rod supports for pipe over two (2) inches.

6. Hangers for piping not run along walls shall be clevis type hangers with threaded rod supports for all piping over 3/4 inches.

B. Spacing:

1. Vertical runs of piping not over 15 feet long shall be supported by hangers placed not over one foot from elbows or connecting horizontal run.
2. Hangers shall be placed so as to prevent sag and permit proper drainage.
3. Hangers shall not be placed at more than the maximum distances shown on the Table below

Pipe Size	Max. Span - Ft.
1/2 and 3/4	6
1 and 1-1/4	8
1-1/2, 2, 2-1/2	10
3 and 4	10
5 and 6	10
8 and larger	10

4. Concentrations of valves and fittings will require closer spacing.

C. Hanger Attachments:

1. Pipe hangers shall be attached to structural steel by heavy steel clamps.
 - a. Clamps shall be bolted to steel or welded.
2. Pipe hangers or clamps shall be attached to walls by means of expansion bolts (shields).

END OF SECTION

SECTION 15099

UNIONS

PART 1 - GENERAL

SYSTEM DESCRIPTION

- A. Size
 - 1. All unions shall be the same size as the line in which they are installed unless noted otherwise.
- B. Location
 - 1. Unions shall be located between the shut-off valve and each of the following:
 - a. Inlet and outlet to all coils

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS

- A. Crane
- B. Jenkins
- C. Vogt

MATERIALS

- A. Unions for 2-1/2 inches and smaller CPVC
 - 1. Ground joints, Cast Iron Body body
 - 2. 150# rated
 - 3. Threaded

PART 3 - EXECUTION

GENERAL

- A. Install in locations where wrenches can be used on each half of the union with enough clearance for at least 180 degrees of rotation on a 6" pipe wrench.

END OF SECTION

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SECTION 15100

VALVES, COCKS AND FAUCETS

PART 1 - GENERAL

WORK INCLUDED

- A. Gate Valves
- B. Check Valves
- C. Plug Cocks
- D. Drain Valves
- E. Hose Bibbs

RELATED WORK

- A. Section 15122 Pressure Relief Valve

SYSTEM DESCRIPTION

- A. Use and Type
 1. Hot water – 2-1/2" and smaller – bronze ball valves.
 2. Condenser water – Larger than 2-1/2" – Butterfly valves

SHOP DRAWINGS AND PRODUCT DATA

- A. Submit copies of valve ordering schedule for approval before ordering valves.
- B. Submit detailed Shop Drawings in accordance with General and Special Conditions.
- C. Clearly indicate make, model, location, type size and pressure rating.

PART 2 PRODUCTS

GENERAL

- A. Provide valves of same manufacturer throughout where possible
- B. Provide valves with manufacturer's name and pressure rating clearly marked on outside of body

ACCEPTABLE MANUFACTURERS

- A. Crane
- B. Vogt
- C. Sterling
- D. Nibco

MATERIALS

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- A. Bronze ball valves
 - 1. Size ½" – thru 2"
 - 2. 600 psi – WOG – non shock
 - 3. Full port, ¼ turn
 - 4. PTFE Seats, O-ring stem, and thrust washer
 - 5. Chrome plated brass ball
 - 6. Threaded or soldered ends
 - 7. Brass body
 - 8. Jenkins Model 1969F or 1999

- B. Butterfly valve
 - 1. 8 inch and larger
 - a. Cast iron body lug style
 - b. 200 psi, water, oil, gas
 - c. Stainless steel stem, copper bushing,
 - d. Lever operated with lever lock,
 - e. Meets MSS SP-67
 - f. Equal to NIBCO LC-2000

END OF SECTION

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SECTION 15180

INSULATION

PART 1 - GENERAL

WORK INCLUDED

- A. Provide piping insulation on all piping designated below,
 - 1. Hot Water – 2” Fiberglass above grade
 - 2. Condenser water piping – no insulation required

SYSTEM DESCRIPTION

- A. See Section 15060 and 15061

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS

- A. Johns-Manville
- B. Certainteed

MATERIALS

- A. Fiberglass Insulation
 - 1. Rigid lightweight heavy density fiberglass with jacket, min R4 per inch.
 - 2. Temperature applications to 650 F.
 - 3. Insulation, jacket, and adhesive shall be tested under procedure ASTM E-84, NFPA 255, and UL 723, not exceeding
 - a. Flame spread - 25.
 - b. Smoke developed - 50.
 - 4. Equal to Johns-Manville Micro-Lok 650 AP-T.

PART 3 - EXECUTION

INSPECTION

- A. Install insulation only after pipe has been thoroughly inspected and tested and accepted by the Architect, Engineer and State or local inspectors.

PREPARATION

- A. All surfaces to receive insulation shall be cleaned of all dirt, grease, and moisture prior to installing any insulation.

INSTALLATION

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Columbia County Courthouse HVAC Modifications
Lake City Florida
April 4, 2016

COBURN AND ASSOCIATES #1457
P.O. Box 577 High Springs, Florida

- A. Fiberglass Insulation:
1. All insulation shall be continuous through wall and ceiling openings.
 2. Vapor barrier jackets shall be used on piping except domestic hot water.
 3. Hangers, supports, anchors, etc., that are secured directly to cold surfaces must be adequately insulated and vapor sealed to prevent condensation.
 4. Metal shields shall be applied between hangers or supports and the pipe insulation.
 5. Shields shall be formed to fit the insulation and shall extend up to the centerline of the pipe and a minimum of 9 inches long.
 6. Shields shall be 16 gauge aluminum.
 7. Fittings shall be covered equivalent density insulation and covered with preformed PVC insulation fitting covers.
 - a. Wrap fittings with insulation.
 - b. Pop the preformed cover in place, tape or tack.

END OF SECTION

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Columbia County Courthouse HVAC Modifications
Lake City Florida
April 4, 2016

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P.O. Box 577 High Springs, Florida

SECTION 15829

EXHAUST FANS

PART 1 - GENERAL

WORK INCLUDED

- A. All exhaust fans mounted in the ceiling inside the building and ducted to the outside.

SYSTEM DESCRIPTION

- A. Exhaust fans shall be located as shown on the drawings.
- B. Meet the specification for air delivery at static pressure as specified on the Equipment Schedule.
- C. Meet the noise criteria (if specified on Schedule).
- D. Be of the manufacture and model number specified in the Equipment Schedule or equal.
- E. Shall be UL listed.

SHOP DRAWINGS AND/OR PRODUCT DATA

- A. Submit Shop Drawings and/or Product Data for all exhaust fans listed on the Equipment Schedule.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS

- A. Penn ventilator
- B. Carnes
- C. Properly submitted or approved equal

MATERIALS

- A. General
 - 1. Acoustically insulated steel housing
 - 2. Baked enamel finish on housing
 - 3. Adjustable mounting brackets
 - 4. Automatic backdraft damper at the discharge duct
 - 5. Lifetime lubricated motor
 - 6. Terminal box on housing with cord, plug and receptacle inside the housing.
 - 7. Fan motor and wheel shall be removable without removing entire fan housing.

END OF SECTION

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SECTION 15841

DUCTWORK AND ACCESSORIES

PART 1 GENERAL

SYSTEM DESCRIPTION

- A. Ductwork from HVAC from AH-2 shall be medium pressure sheetmetal ductwork.
 - 1. Repair ductwork to same quality as existing ductwork
 - 1. External insulation shall be installed on all duct, 2" fiberglass

- B. Outdoor air ductwork in both buildings shall be low-pressure metal.
 - 1. Insulation not required

REFERENCES

- A. General
 - 1. Ductwork installation shall conform to latest publications of the Sheet Metal and Air Conditioning Contractor's National Association (SMACNA)
 - 2. Ductwork shall be installed in accordance with all applicable codes.

RELATED WORK

- A. 15848 - Duct Insulation
- B. 15849 - Duct Hangers
- C. 15860 - Duct Accessories

LOW - PRESSURE SHEETMETAL DUCTWORK

- A. General:
 - 1. Except as otherwise specified or detailed on the Drawings, all ductwork shall be constructed in accordance with the Sheet Metal and Air Conditioning Contractor's National Association (SMACNA)
 - 2. Duct systems shall be complete, including all duct fittings, turning vaness, transverse reinforcing hangers, supports, etc., as detailed on the Drawings or in the standards.

 - 3. Dimensions shown are net inside dimensions (including insulation).
 - 4. Galvanized sheetmetal duct shall conform to the following thicknesses

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a.	Largest dimension	Gauge
	0-30 inches	24
	30-54 inches	22
	55-84 inches	20
	over 84 inches	18

- B. These references shall be used by the Engineer for required sheet metal thicknesses and final acceptance of methods of fabricating, hanging, accessories, etc. All equipment furnished by manufacturers shall be installed in strict accord with their recommended methods.

MEDIUM PRESSURE DUCTWORK

- A. All duct and fittings shall be of ASTM-A-527 galvanized steel and constructed to SMACNA 1995 HVAC duct construction standards for 3" and 4" W.G. and seal class A (air-tight).
- B.. All fitting construction to be lapped spot welded and sealed or bonded airtight.
- C. Duct connections, if necessary, will be made using beaded slip couplings
- E. Elbows will be BHV "LV" low velocity or "HV" high velocity air tight elbows. Seams shall be lapped spot welded and sealed or BHV "BETA SEAM" standing seam construction.

PART 3 EXECUTION

INSTALLATION

- A. Where construction methods for various items are not indicated on the Drawings or specified herein, all such work shall be fabricated and installed in strict accordance with the recommended methods, metal gauges, hanging procedures, access door and accessory installation, etc., as outlined, the latest edition of SMACNA'S Duct Manual and Sheet Metal Construction for Ventilating and Air Conditioning System.
- B. Install all ductwork generally as shown on the drawings and as required by SMACNA Manual.
- C. Sheetmetal
1. Low pressure ductwork and fittings shall be made tight for minimum air leakage.
 2. All ductwork joints shall be sealed with pressure tape and coated with mastic
 3. All ductwork, except in equipment rooms shall be concealed in construction spaces above ceilings, in partitions, chases, etc.
 4. Ducts shall be constructed to provide specified air

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through building without adding noises to the air stream by sudden contractions as sharp edges.

5. Ducts shall be securely fastened to the structure with hangers..
 6. Connections:
 - a. Ducts shall be air tight braced and reinforced to prevent vibration and breathing
 - b. Seal supply, return, exhaust and outside air ductwork with adhesive sealing compound
 - c. Exterior ductwork to be housed with metal cover, galvanized or aluminum, or weather proofed using felt and AB 20 and asphalt mastic (bull).
 - d. Rectangular duct connections shall be made with pocket slip or Bar-s slip not more than 8 ft. apart up to 24 in. largest dimension and not more than 4 ft. apart above 24 in. largest dimension
- D. Leakage:
1. Contractor shall make necessary repair and shall make duct system ready for a leakage test.
 2. Test shall be performed by Test and Balance Contractor.
 3. Leakage shall not exceed 1% leakage for high pressure duct and 5% for low pressure duct construction.

END OF SECTION

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Lake City Florida
April 4, 2016
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SECTION 15848

EXTERIOR WRAP

INSULATION FOR DUCTWORK

GENERAL

- A Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-15 Specification sections, apply to work of this section.
- B Division-15 Basic Mechanical Materials and Methods Sections apply to work of this section.
- C Acceptable Producers: Certainteed, Owens-Corning, Manville.
- D Submittals: Producer's data sheet on each product.
- E Flame/Smoke Ratings: Provide composite mechanical insulation (insulation, coverings, sealers, mastics, and adhesive) with a flame-spread rating of 25 or less, and a smoke-developed rating of 50 or less, as tested by ANSI/ASTM E84.

PRODUCTS

- A Flexible Fiberglass Insulation: ASTM C553, Type 100, Class B-3 (temperature less than 350 °F). Duct wrap shall be 1 pcf density with UL rated aluminum foil vapor barrier (FSK).
 - 1. Minimum thickness = 2"
 - 2. Minimum installed R value = 6.0
 - 3. Equal to Johns-Manville Microlite Type 100
- B Insulation Finish Cement: Manville No. 301 or Baldwin Ehert Hill No. 1.
- C General Purpose Mastic: Benjamin Foster 35-00 Series, Insulcoustic VIAC Mastic or Childers CP-10.
- D Vapor Barrier Sealant: Benjamin Foster 30-35, Insulcoustic IC-SOL, 3M EC-1378, or Childers CP-30.
- E Adhesive: Benjamin Foster 85-20, Insulcoustic IC-205, 3M EC-35, or Childers CP-89.
- F Fiber Glass Mesh: IOxIO mesh. Foster Mast-A-Fab.

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EXECUTION

A Insulate the following ductwork with 2” thick fiberglass blanket insulation with vapor barrier.

- 1 Stackheads for grilles, registers, and ceiling outlets.
- 2 Supply, return, and fresh air ducts for air conditioning units.
- 3 Flexible joint connections at inlets and outlets of air handling units.

B Installation of Flexible Insulation:

1. Insulate round elbows and fittings with blanket secured in place with steel wire. Apply a smoothing coat of insulating cement and finish with a heavy coat of vapor barrier sealant. Thickness shall be equal to adjoining duct covering.
2. Clean and dry ductwork prior to insulating. Adhere insulation to ducts with 100 percent coverage using approved insulation adhesive. Lap all joints 2 inches and vapor seal with glass fiber mesh embedded with 2 coats of vapor barrier sealant. For ducts 30 inches wide and over, additionally support insulation on bottom of duct with rows of welded or adhered clips and washers on 18 inch centers.
3. Seal all punctures and breaks in aluminum vapor barrier with glass fiber mesh and vapor barrier sealant.

END OF SECTION

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SECTION 15849

DUCT HANGERS AND SUPPORTS

PART 1 - GENERAL

WORK INCLUDED

- A. All ductwork for air supply, return, fresh air or exhaust shall be supported by duct hangers, clamps, clips or supports.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS

- A. Duct hangers may be a manufactured item or field fabricated as required.

MATERIALS

- A. Galvanized steel straps
 - 1. Minimum 16 gauge and one inch wide
- B. Trapeze hangers
 - 1. Ducts 20 inches to 40 inches largest dimension.
 - a. Minimum 1 inch x 1 inch x 1/4 inch steel angles.
 - b. Minimum 1/4 inch threaded rod
 - 2. Ducts above 40 inches largest dimension and plenums
 - a. Minimum 1-1/2 inch x 1-1/2 inch x 1/4 inch steel angles.
 - b. Minimum 3/8 inch threaded rod.

PART 3 - EXECUTION

INSTALLATION

- A. Supports
 - 1. All ductwork shall be supported from structural building members, i.e. block, beams, columns, purlins, joists, etc.
 - 2. Ductwork shall not be supported from ceiling tile or grids, conduit, mechanical equipment, piping or non-structural steel.
 - 3. Ductwork hangers shall be attached to building steel by bolts, screws, clamps or welding.
- B. Hanger Bands
 - 1. Horizontal concealed ductwork up to 20 inches largest dimension shall be supported by one (1) inch x 16 gauge galvanized steel straps

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- at a maximum spacing of 10 ft. and at each elbow or branch takeoff.
2. Bands and spacing shall be at a maximum spacing of 10 feet on horizontal runs and at each elbow or branch takeoff.
 - a. No nails shall be driven through any ductwork and into floor joists, trusses, etc.
 3. Vertical ductwork, all sizes, shall be supported by bands bolted or screwed to walls, studs, etc.
 4. Hanger bands shall be bent over one (1) inch from end and turned under corners of rectangular duct.
 5. Duct hanger bands shall be fastened with sheet metal screws at six (6) inch intervals up sides and into bottom.
 - a. Sheet metal screws shall be 3/4 inch so as not to penetrate duct liner completely.
- C. Trapeze Hangers
1. Horizontal ductwork larger than 20 inches largest dimension and all exposed ductwork shall be supported by trapeze type hangers.
 2. Trapeze hangers shall be at a maximum spacing of 10 feet and at each elbow or branch takeoff.
 3. Hanger rods shall be secured to bottom bracing angles with nuts and locknuts.
- D. Flexible Duct
1. Support flexible duct at intervals not exceeding five (5) feet in length and as required to not allow duct to sag more than 1/2" per foot of length.
 2. Hanger bands shall be minimum of 1 – 1/2" in contact with flexible duct work.
 3. Hanger bands must be galvanized sheet metal, flexible woven fabric is NOT ALLOWED.

END OF SECTION

SECTION 15863

VOLUME DAMPERS

PART 1 - GENERAL

WORK INCLUDED

- A. Return Air Dampers
- B. Fresh Air Intake Dampers

RELATED WORK

- A. Section 15860: Duct Accessories

SYSTEMS DESCRIPTION

- A. All return air and fresh air dampers shall be parallel blade pivot dampers with motorized control.
- B. All balancing dampers shall have manual control dampers with positive position locking.

SHOP DRAWINGS AND PRODUCT DATA

- A. Submit Shop Drawings and/or product data sheets in accordance with the General Conditions for each type of damper to be supplied.
 - 1. Submittals shall include air leakage and pressure drop tables for substituted equipment.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS

- A. Prefco Manufacturing Co.
- B. Properly submitted and approved equal

MATERIALS

- A. Parallel Blade Pivot Dampers:
 - 1. Low leakage non-degradable
 - 2. Friction free metal to metal seals incorporated into the blade and frame shapes
 - 3. Galvanized steel frame, 16 gauge
 - 4. Galvanized steel blades, 22 gauge with double-wrapped center and edge forming
 - 5. Maximum leakage - 11 CFM per sq. ft. @ 1 inch S.P.
 - 6. The static pressure loss shall not exceed 0.7" W.G. @ 2000 FPM and 50% modulation
 - 7. Model Number
 - a. Equal to Prefco Model 5150

END OF SECTION

15863.1

SECTION 15901

CONTROLS AND INSTRUMENTATION

PART 1 - GENERAL

GENERAL

- A. The control system shall be furnished and modified by Carrier Controls.
- B. The control contract is a separate contract and is NOT to be included in the mechanical contractors bid.
- B. The mechanical contractor shall coordinate with and install items supplied by the controls contractor as previously outlined in Section 15010.

SCOPE OF WORK

Condenser water loop control.

The controls contractor will furnish the following for installation by the mechanical contractor:

- Two flanged 8" three way bypass control assemblies consisting of 8" TEE with two butterfly valves with all linkages and actuators
- Four thermal wells for condenser water temperature sensors for supply temperature to the condenser

The controls contractor will furnish and install the following:

- Two relocated thermal sensors for condenser water return from tower
- Two thermal wells for condenser water temperature sensors
- All low voltage wiring and conduit
- All connections to existing control panels
- Re-commission control points in the chiller room
- All programming and modifications to the graphic interface.

Sequence of operation

Proposed sequence is for the chiller loop to always start up in 100% bypass and slowly modulate the bypass closed, bleeding tower water in slowly, trying to maintain 75 deg. F. until the bypass eventually closes completely and the tower valve is 100% open. Carrier will coordinate the final sequence of operation with the engineer.

Second floor mechanical room

The controls contractor will furnish the following for installation by the mechanical contractor:

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- Outside air control damper and actuator per drawings
- Ebtron Hybrid Gold Series flow measuring station
- Duct temperature sensor downstream of new hot water coil
- Hot water control valve for reheat coil
- Outdoor temperature sensor in outside air duct

The controls contractor will furnish and install the following:

- All low voltage wiring and conduit
- All connections to existing control panels
- All programming and modifications to the graphic interface.

Public Defender's Office area – first floor

The controls contractor will furnish and install the following:

- Four new space humidity sensors in locations shown on print
- All low voltage wiring and conduit
- All connections to existing control panels
- All programming and modifications to the graphic interface.
- Measure the air flow from the existing diffusers and re-calibrate the existing VAV boxes
-

Proposed sequence of operation for positive humidity control of public defender's office

New space humidistats in the public defenders space will signal the control system that set point has been exceeded. Control system shall poll the VAV boxes for position. If the majority of the boxes are below 50% set point, the control system shall engage the reheat coil and modulate the supply air temperature to 70 degrees F. If the remainder of the system is not modified, this change in temperature will cause the VAV boxes to modulate open, increasing the air flow from the air handler and providing a greater flow of dry air to the space. Space temperature sensors shall be reset to 75 deg. The intent is to provide neutral dry air to the space, thus maintaining a lower humidity and allowing a higher temperature set point. Note that the intent is to maintain 55 deg. F leaving air temperature from the cooling coil.

PART 2 - PRODUCTS

END OF SECTION

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SECTION 16100

BASIC MATERIALS & METHODS

PART 1 - GENERAL

SCOPE

- A. Conduit for power, telephone, fire alarm, communication, control, and miscellaneous functions which are shown on the drawings or described in these specifications.
1. All boxes for wiring and devices and special systems.
 2. Wiring for all power, communication, fire alarm and auxiliary equipment, controls and other devices.
 3. All panels for power, lighting, and distribution of electricity as shown on the Drawings and panel schedules.
 4. All circuit breakers shown on lighting, power, distribution and main distribution panels.
 5. All disconnects and starters as described herein.
 6. All fuses as shown and specified.

DESCRIPTION

- A. Conduit:
1. All conduit and fittings shall be in new, unused condition free from rust, excessive dirt and moisture, kinks, flats, cuts, or other distortions of shape caused by impact, crushing or bending.
 2. Concealed conduit in building, above slab shall be EMT conduit with "set-screw" or compression fittings.
 3. Exposed conduit in building, above slab shall be EMT conduit with "set-screw" or compression fittings.

BOXES

- A. All wiring devices shall be installed in metallic boxes. Provide outlet boxes, receptacle boxes, junction boxes, etc., where shown on the drawings and/or required by the National Electrical Code.
- B. Provide pull boxes as shown on the Drawings, as required by code or as needed for ease of construction.

WIRES AND CABLES

- A. All wiring shall be installed in conduit.
- B. Conductors shall be sized according to the National Electrical Code or as shown on the drawings whichever is greater.
- C. Minimum size for 20A receptacle and lighting circuits shall be No. 12 AWG-where

16100.1

distance from panelboard to load exceeds 65 feet, use No. 10 AWG minimum; over 100 feet, use No. 8 AWG.

CIRCUIT BREAKERS –

- A. Furnish and install all circuit breakers as noted on the drawings to match the panel into which they are being installed.

PART 2 - PRODUCTS

CONDUIT

- A. Electrical Metallic Tubing (EMT) shall be steel, electro or hot dip galvanized.

BOXES

- A. Pullboxes inside buildings shall be code gauge and size, galvanized steel with screw type cover.
- B. Wall boxes in four inch block shall be galvanized steel 2 1/2 inch deep.

WIRE AND CABLES

- A. All wire used throughout work shall be soft drawn copper of not less than 98% conductivity.
- B. Wire and cable shall be new; and manufacturer's name permanently marked on the outer covering at regular intervals.
- C. Conductors AWG No. 8 or smaller may be solid or stranded; larger sizes shall be stranded.
- D. All conductors for general wiring shall be insulated with THWN insulation. Unless otherwise noted.
- E. Conductor markings and color coding shall be in accordance with the latest edition of the N.E.C.
- F. Green color coding is required by the N.E.C. for conductors used for grounding.

PART 3 - GENERAL

CONDUIT

- A. All conduit shall be installed in a first-class workmanship manner.
- B. All conductors shall be installed in conduit.
- C. Fittings or symmetrical bends shall be required wherever right angle turns are made in exposed work.

16100.2

- D. Bends and offsets shall be avoided wherever possible, but where necessary, they shall be made with an approved conduit bending machine.
- E. All conduit joints shall be cut square, reamed smooth and drawn up tight.
- F. Conduit shall be installed in horizontal and vertical runs in such a manner as to insure against trouble from the collection of trapped condensation and shall be arranged so as to be devoid of traps.
- G. Special care shall be used in insuring that exposed conduit runs are parallel or perpendicular to walls, structural members, or intersections of vertical planes and ceiling.
- H. During construction, all conduit work shall be protected to prevent lodgment of dirt, plaster or trash in conduits, fittings or boxes.
- I. Conduits which have been plugged shall be entirely freed of accumulations or be replaced.
- J. All conduits in floors or below grade shall be swabbed free of debris and moisture before wires are pulled.
- K. Conduit shall be properly supported as specified elsewhere in this Section.
- L. Expansion fittings or other approved devices shall be used to provide for expansion and contraction where conduits cross building expansion joints.
- M. A flexible rounding strap shall bridge expansion joints and shall be bonded to conduit.
- N. Conduit, boxes, devices, lights, etc., shall be located so that they will not interfere with intended use of eyebolts monorails, or other lifting equipment.
- O. Conduit above slab shall be run concealed in the walls or ceilings unless specifically noted to be exposed.
- P. Conduit under ground and/or slab shall be buried 24 inches minimum.
- Q. Exact routing of conduit shall be determined in the field for ease of installation provided that the following criteria is met:
 - 1. All conduit, home runs, and circuits are made to the panel specified on the drawings and/or panel schedule. Any deviation in this regard shall be done only with written approval of the Architect.
 - 2. Conduits shall be run so as not to conflict with ductwork, diffusers, mechanical equipment and piping.
 - 3. Conduit is not noted or detailed to be

16100.3

- specifically run in a particular location.
- 4. Hangers and supports shall be attached to stud walls with wood screws.
- R. Final connection to motors, etc., shall be made with either:
 - 1. The same type of conduit which leads up to the equipment or;
 - 2. Armored flexible conduit which shall be waterproof for any locations outside, in kitchens, or any inside area subject to water, heavy moisture, condensation, etc.

SUPPORTS AND HANGERS

- A. All conduit shall be supported on structural building members, i.e. columns, beams, purlins, block, studs, etc.
- B. Conduit shall be supported on galvanized or aluminum brackets, clamps, or straps.
- C. Conduit hangers shall be attached to building steel by beam clamps or welding.
- D. Hangers and supports shall be attached to stud walls with wood screws.
- E. Hangers and supports shall be attached to masonry with expansion type anchors (shield).
- F. Supports shall be channel type supports such as manufactured by Uni-Strut, Globe, Kindorf, or equal.

OUTLET BOXES

- A. Outlet shall be installed in the location shown on the drawings.
- B. Contractor shall study the general building plans in relation to the space surrounding each outlet, in order that his work may fit all other work required by these Specifications.
- C. All steel supports for outlet boxes shall be furnished and installed.
- D. Outlets boxes for use with exposed steel conduit shall be cast steel. Cast metal fittings shall be cast steel. Cast metal fittings shall be Crouse-Hinds, Square D, Bryant, or equal.

OPENINGS IN ELECTRICAL BOXES

- A. All openings in electrical equipment, enclosures, cabinet, outlet and junction boxes shall be by means of welded bosses, standard knockouts, or shall be

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drilled, or punched with tools specially made for the purpose. The use of a cutting torch is prohibited.

CONNECTIONS TO ELECTRICAL BOXES

- A. All conduit connections to electrical boxes shall be made with locknuts and nonmetallic bushings.
- B. Locknuts shall be drawn down tight to make ground connection between the conduit and box.

CONDUCTORS

- A. All wiring shall be fully polarized throughout using white wires for neutral and making all switching connections in colored hot wires.
- B. No conductors shall be drawn into conduits until all work which may cause damage is completed; only approved cable lubricants shall be used.
- C. As far as practical, all feeder cables shall be continuous from origin to panel termination without running splices in intermediate pull boxes.
- D. All cable terminals, taps and splices shall be made with solderless, pressure type connectors; connectors shall be Type QA-B or Q2A as manufactured by Burndy, Okonite, McJunkin or equal.
- E. The minimum free length of conductor at each box for the connection of a fixture, switch or receptacle shall be 8".

END OF SECTION

16100.5

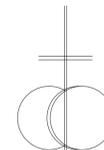
COLUMBIA COUNTY COURTHOUSE
 CHILLER BYPASS & PUBLIC DEFENDER HUMIDITY ISSUES
 LAKE CITY, FLORIDA

APRIL 4, 2016

DESIGNED FOR:
 COLUMBIA COUNTY BOARD OF COMMISSIONERS



North Florida Professional Services, Inc.
 P.O. BOX 3823 P.O. BOX 180998
 Lake City, FL 32025 Tallahassee, FL 32318
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INDEX OF DRAWINGS		
INDEX No.	SHEET No.	DESCRIPTION
1	G001	TITLE PAGE AND INDEX OF DRAWINGS
2	M1	CHILLER ROOM
3	M2	2ND FLOOR MECHANICAL ROOM
4	M3	HOT WATER COIL & CONTROL SEQUENCE
5	M4	PUBLIC DEFENDER OFFICES HUMIDITY SENSORS

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 CERTIFICATE OF AUTHORIZATION 3687



COLUMBIA COUNTY COURTHOUSE
 CHILLER BYPASS MODIFICATIONS
 LAKE CITY, FLORIDA

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 RICHARD E. COBURN PE
 CA. LIC. NO. 1547

TITLE PAGE AND INDEX OF DRAWINGS

DATE
4 APRIL 2016

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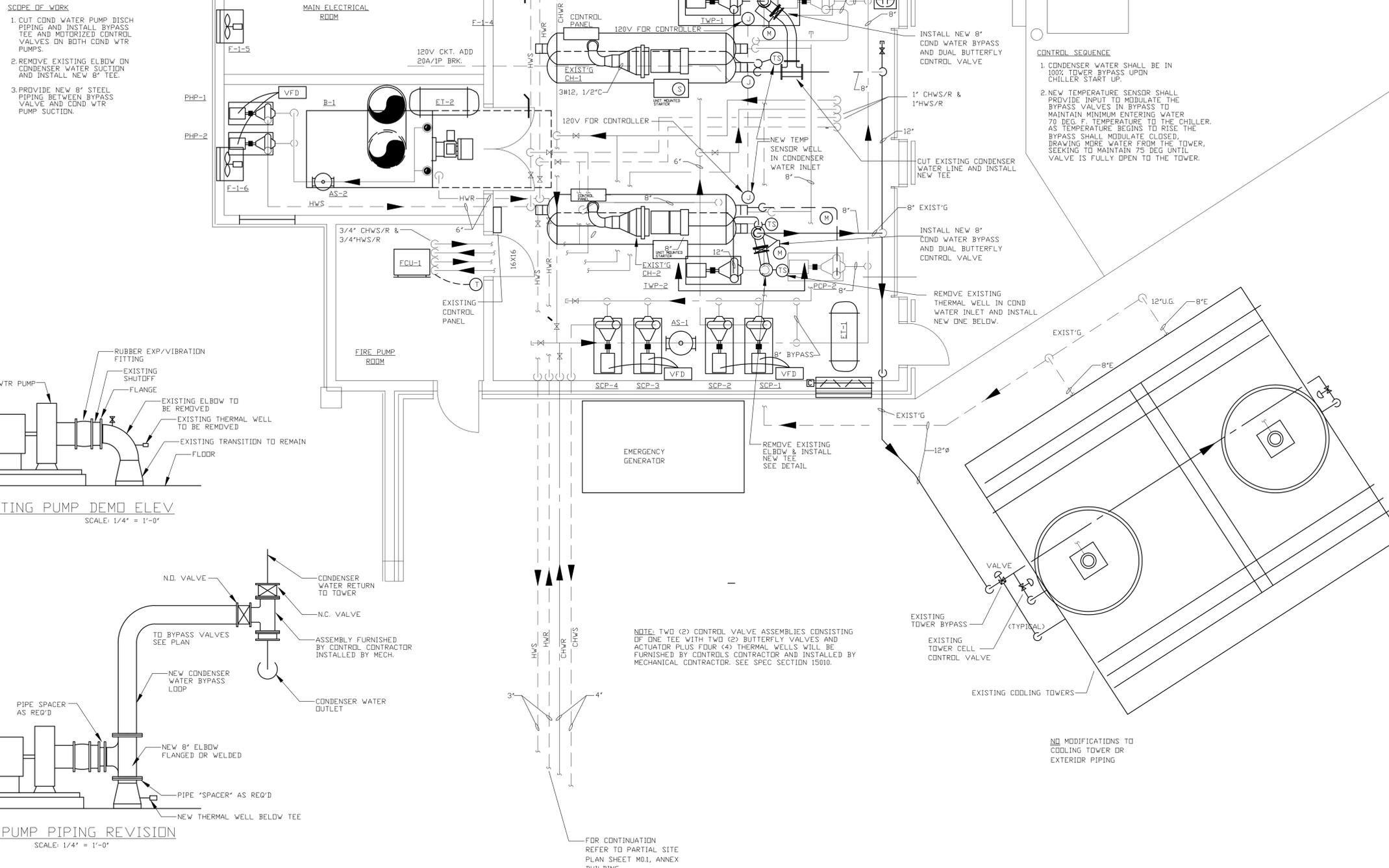
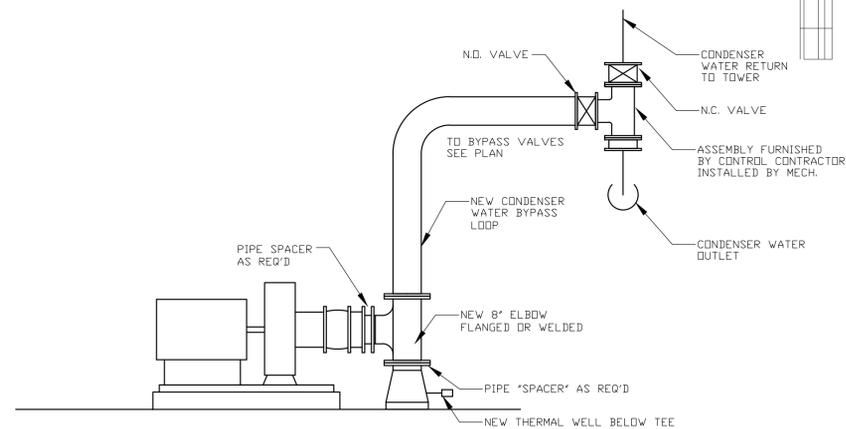
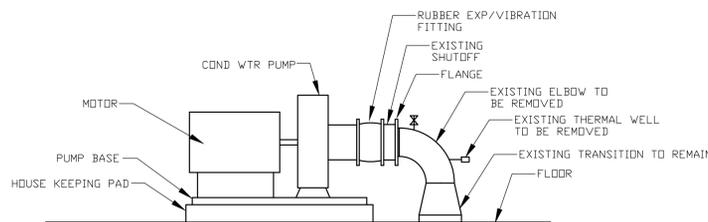
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OF
SHEETS

FOR BIDDING

5441190

SCOPE OF WORK

1. CUT COND WATER PUMP DISCH PIPING AND INSTALL BYPASS TEE AND MOTORIZED CONTROL VALVES ON BOTH COND WTR PUMPS.
2. REMOVE EXISTING ELBOW ON CONDENSER WATER SUCTION AND INSTALL NEW 8" TEE.
3. PROVIDE NEW 8" STEEL PIPING BETWEEN BYPASS VALVE AND COND WTR PUMP SUCTION.



CONTROL SEQUENCE

1. CONDENSER WATER SHALL BE IN 100% TOWER BYPASS UPON CHILLER START UP.
2. NEW TEMPERATURE SENSOR SHALL PROVIDE INPUT TO MODULATE THE BYPASS VALVES IN BYPASS TO MAINTAIN MINIMUM ENTERING WATER 70 DEG. F. TEMPERATURE TO THE CHILLER. AS TEMPERATURE BEGINS TO RISE THE BYPASS SHALL MODULATE CLOSED, DRAWING MORE WATER FROM THE TOWER, SEEKING TO MAINTAIN 75 DEG UNTIL VALVE IS FULLY OPEN TO THE TOWER.

NOTE: TWO (2) CONTROL VALVE ASSEMBLIES CONSISTING OF ONE TEE, WITH TWO (2) BUTTERFLY VALVES AND ACTUATOR PLUS FOUR (4) THERMAL WELLS WILL BE FURNISHED BY CONTROL CONTRACTOR AND INSTALLED BY MECHANICAL CONTRACTOR. SEE SPEC SECTION 15101.



**COLUMBIA COUNTY COURTHOUSE
CHILLER BYPASS MODIFICATIONS
LAKE CITY, FLORIDA**

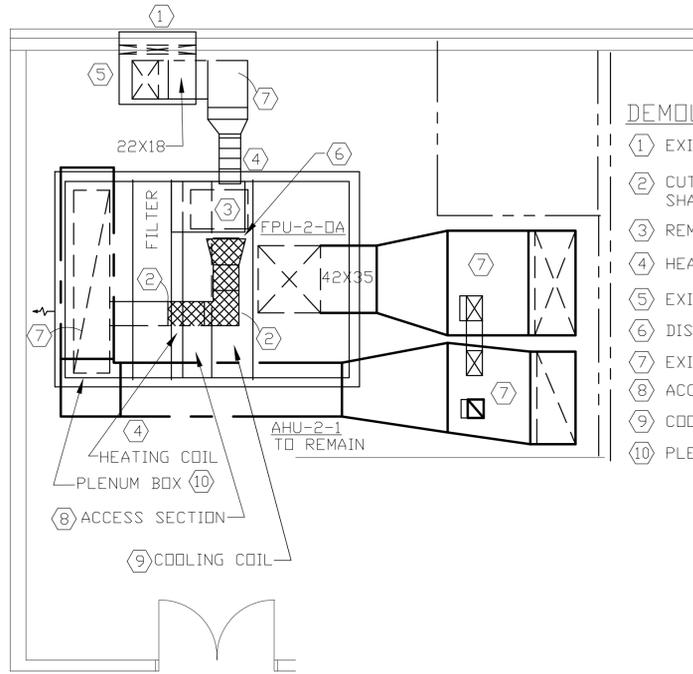
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ENGINEER
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RICHARD E. COBURN PE
CA LIC# NO 1547

DATE
4 APRIL 2016
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APPROVED
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M1

OF 1 SHEETS

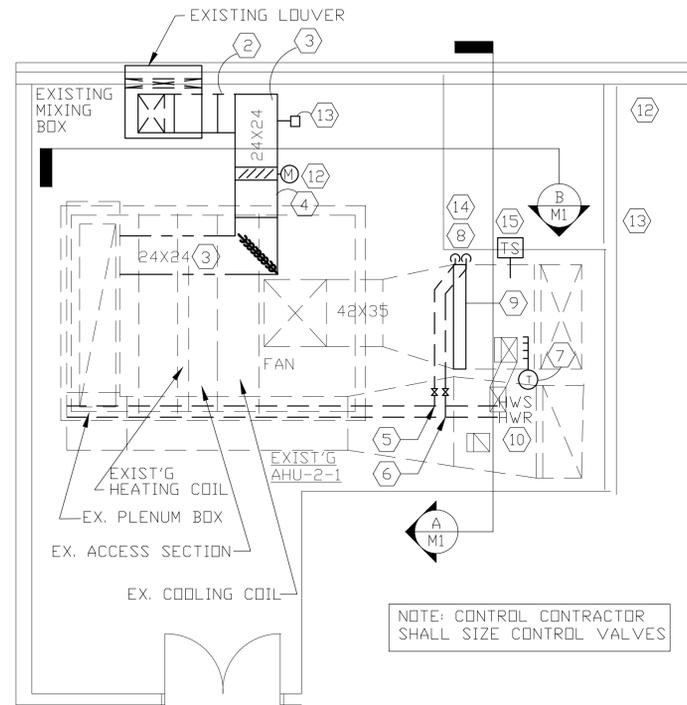
FOR BIDDING



DEMOLITION PLAN NOTES:

- ① EXISTING OUTSIDE AIR LOUVER TO REMAIN.
- ② CUT EXISTING FRESH AIR DUCT & REMOVE SHADED PORTION.
- ③ REMOVE EXISTING FPU-2-0A. GIVE TO OWNER.
- ④ HEATING COIL TO REMAIN.
- ⑤ EXISTING FILTER BOX TO REMAIN.
- ⑥ DISCONNECT ELECTRICAL POWER FROM FCU-2 O.A.
- ⑦ EXISTING DUCTWORK CONNECTION TO BE RELOCATED.
- ⑧ ACCESS SECTION TO REMAIN.
- ⑨ COOLING COIL TO REMAIN.
- ⑩ PLENUM BOX TO REMAIN.

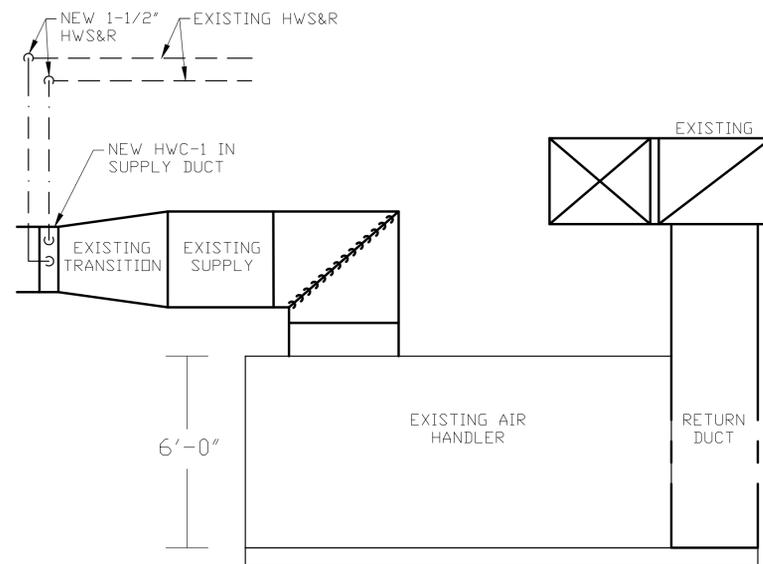
PARTIAL DEMOLITION PLAN - 2ND FLOOR MECH ROOM
1/4" = 1'-0"



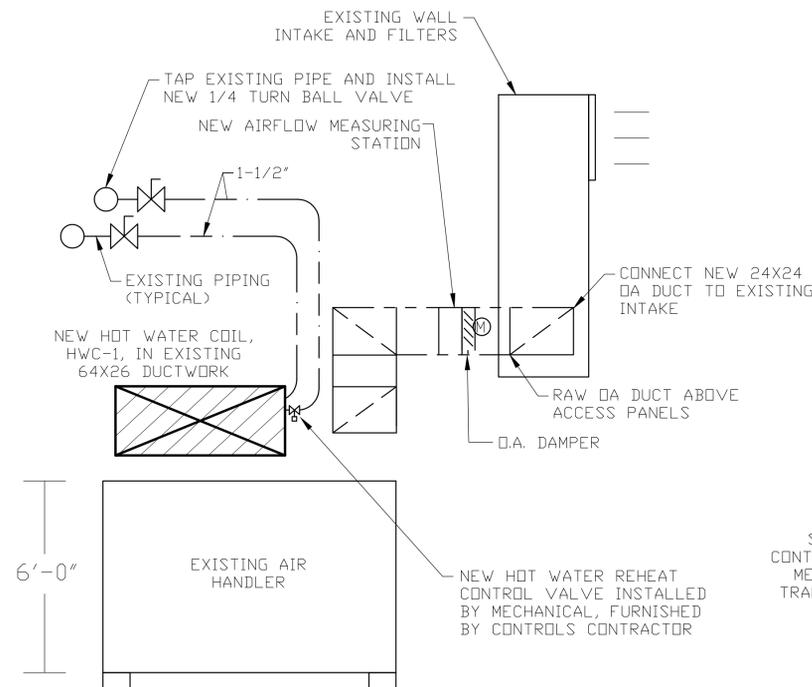
NEW PLAN NOTES:

- ① RELOCATE DUCT CONNECTION FORWARD OF NEW REHEAT COIL.
- ② CONNECT NEW 22X24 O.A. DUCTWORK TO EXISTING FILTER BOX DUCT STUB.
- ③ NEW 24X24 RAW O.A. DUCTWORK.
- ④ NEW AIR FLOW MONITORING STATION WITH CONTROL EQUAL TO A JOHNSON CONTROL MODEL ADI250. SET POINT 3000 CFM ON-OFF DURING UNOCCUPIED MODE.
- ⑤ TAP NEW 1-1/2" HOT WATER SUPPLY INTO EXISTING HWS & ADD VALVE.
- ⑥ TAP NEW 1-1/2" HOT WATER RETURN INTO EXISTING HWR & ADD VALVE.
- ⑦ REHEAT COIL/UNIT DISCHARGE AIR TEMPERATURE SENSOR.
- ⑧ SEE COIL CONNECTION DETAIL - REHEAT COIL CONNECTIONS 1-1/2".
- ⑨ NEW HW COIL IN EXISTING SUPPLY DUCT SEE SCHEDULE COIL CONNECTIONS - 1-1/2" (20.2 GPM)
- ⑩ EXISTING HWS, HWR.
- ⑪ NOT USED
- ⑫ TIGHT SEALING O.A INTAKE DAMPER SUPPLIED BY CONTROLS INSTALLED BY MECH CONTRACTOR
- ⑬ O.A TEMP SENSOR
- ⑭ PROVIDE FITTINGS FOR AND INSTALL CONTROL VALVES PROVIDED BY CONTROLS CONTRACTOR
- ⑮ NEW DUCT TEMPERATURE SENSOR SUPPLIED BY CONTROLS CONTRACTOR INSTALLED BY MECHANICAL CONTRACTOR.

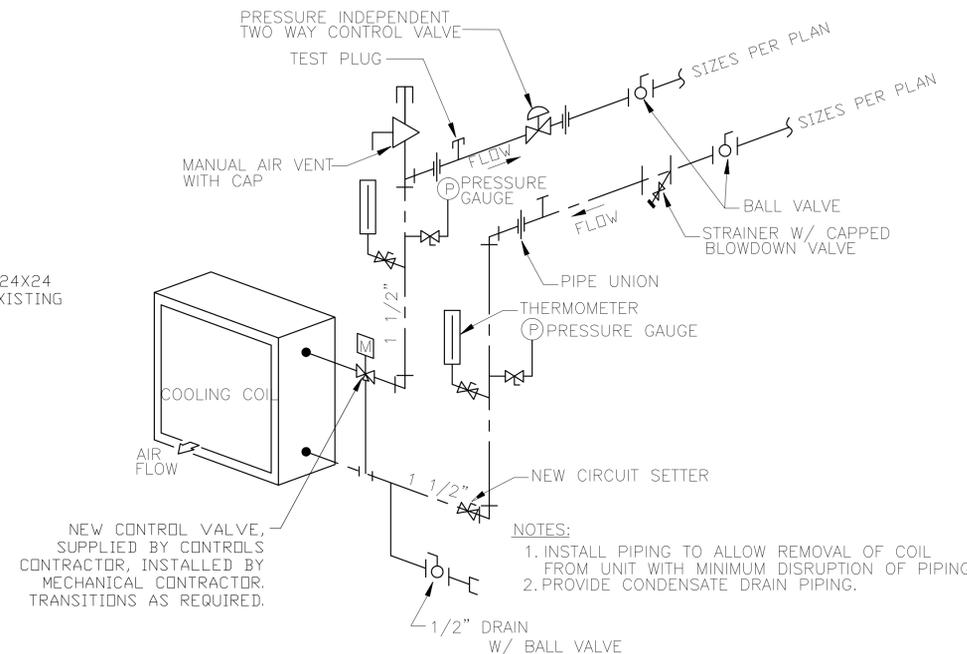
NEW AIR FLOW STATION AND O.A. DAMPER INSTALLATION PLAN
1/4" = 1'-0"
SECOND FLOOR MECHANICAL ROOM



SECTION B/M1
NTS



SECTION A/M1
NTS



TYPICAL COIL CONNECTION DETAIL
NTS

- NOTES:**
- 1. INSTALL PIPING TO ALLOW REMOVAL OF COIL FROM UNIT WITH MINIMUM DISRUPTION OF PIPING.
 - 2. PROVIDE CONDENSATE DRAIN PIPING.



CONTROLS AND SEQUENCE OF OPERATION OF NEW HOT WATER REHEAT COIL.

HARDWARE

Furnish and install new electronic control valve in new chilled water coil
 Furnish and install new electronic temperature sensor in the new unit downstream of the chilled water coil.

Furnish and install new electronic control valve in new hot water coil
 Furnish and install new electronic temperature sensor in the new unit downstream of the reheat coil

Furnish and install intake temperature sensor upstream of the preheat coil.

Furnish and install relay start and stop the unit.
 Provide motorized damper in the fresh air intake upstream of the new unit and the preheat thermostat.

SEQUENCE OF OPERATION

Control system shall be reprogrammed to accept inputs from the chilled water coil discharge temperature sensor, the reheat coil discharge temperature sensor, and the preheat coil outdoor air temperature sensor.

Control system shall be programmed to provide outputs to the chilled water coil control valve, the reheat coil control valve, the preheat coil control valve, the outdoor air intake damper, and the unit start stop relay.

The new outdoor air unit shall start and stop based on time of day time clock function, as determined by the building maintenance staff.

When the outdoor air unit starts, the outdoor air damper shall open to the position required to balance with the amount of outside air shown on the drawings.

The chilled water cooling coil valve shall modulate to maintain 55°.

The preheat hot water coil valve shall modulate to maintain 45°F discharge air temperature from the coil.

The reheat coil valve shall modulate to maintain 70°F discharge air temperature.

CONTROLS AND SEQUENCE OF OPERATION OF NEW HOT WATER REHEAT COIL.

HARDWARE

Furnish and install new duct mounted humidity sensor in the return air duct air hand

Furnish and install new electronic control valve in new hot water coil

Furnish and install a duct mounted temperature sensor in the ductwork downstream new reheat coil.

Furnish and install new control module and communications wiring to the existing control system AND sequence of operation

SEQUENCE OF OPERATION

Control system shall be reprogrammed to accept input from the humidity sensor and an output to the new hot water control valve.

When the humidity sensor is BELOW setpoint, the system shall operate as it is operating to any modifications, specifically the discharge air temperature downstream of the coil is set to modulate and the VFD shall control the fan speed based on duct velocity the static air pressure.

When the humidity sensor is ABOVE setpoint, the system shall operate as follows:

The reheat coil control valve shall be modulated to provide discharge air at the setpoint by the discharge air sensor downstream of the reheat coil, 65°F (adjustable).

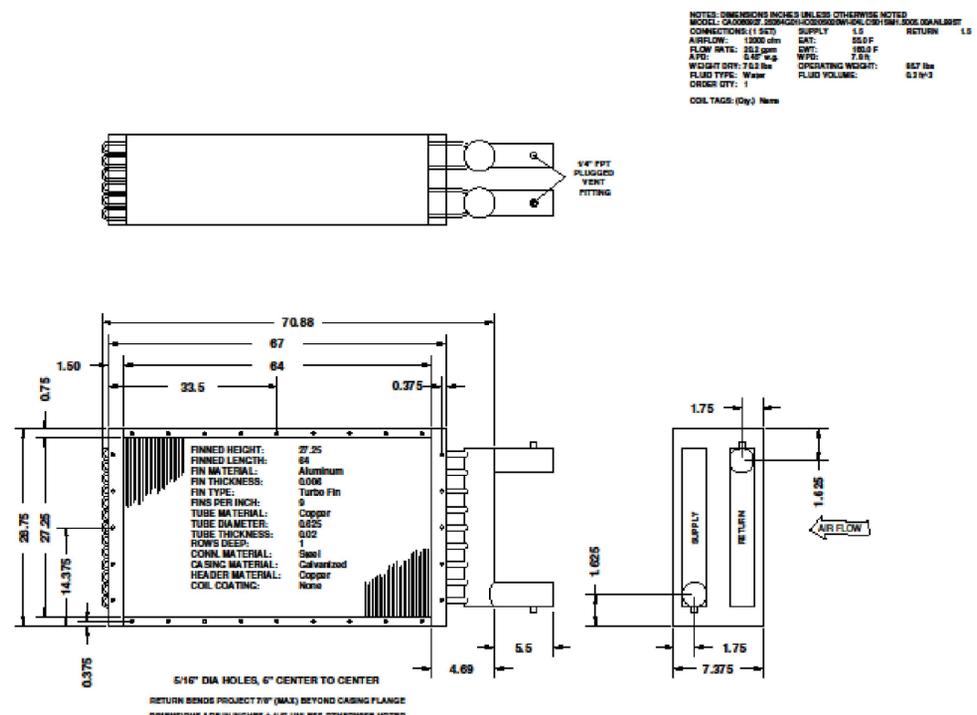
The chilled water control valve shall modulate to maintain 55°F discharge air temperature the cooling coil.

The VFD drive shall modulate air flow as per the original control schematic.

HOT WATER COIL SCHEDULE

Hot Water Heating Coil (Loose)	
Tag	HWC-1
Manufacturer	York
Airflow (CFM)	12000
Fin Height (in.)	27.25
Fin Length (in.)	64.00
EAT-DB (°F)	55.0
LAT-DB (°F)	70.4
MBH	197.8
Max. F.V. (ft/min)	991
Max. A.P.D. (in. w.g.)	0.45
EWT (°F)	160.0
LWT (°F)	140.0
Flow Rate (gpm)	20.2
Max. W.P.D. (ft/w.c.)	7.8
Min. Rows	1
FPI	9

Hot Water Heating Coil (Loose)



PRODUCT DRAWING
 LOOSE COIL DRAWINGS
 MODEL: DRAINABLE WATER COILS
 NOT FOR CONSTRUCTION

Project Name: Columbia Co Courthouse
 Location:
 Engineer:
 Contractor:
 For:

Sold To:
 Cust. Purch Order#:
 Contract#:
 UNIT:
 TAG: HWC-1

Date: 2/11/2015 8:33:13
 Rev. Date:
 Form No.:
 Dwg. Lev.:
 Dwg. Scale: NTS



HOT WATER COIL DETAIL
 NTS

FOR BIDDING

COBURN AND ASSOCIATES, INC
 MECHANICAL • ELECTRICAL • CONSULTING ENGINEERS
 P.O. BOX 577 • HIGH SPRINGS, FLORIDA • PH. 386-454-3748 • FAX 386-454-2652
 CERTIFICATE OF AUTHORIZATION 3687



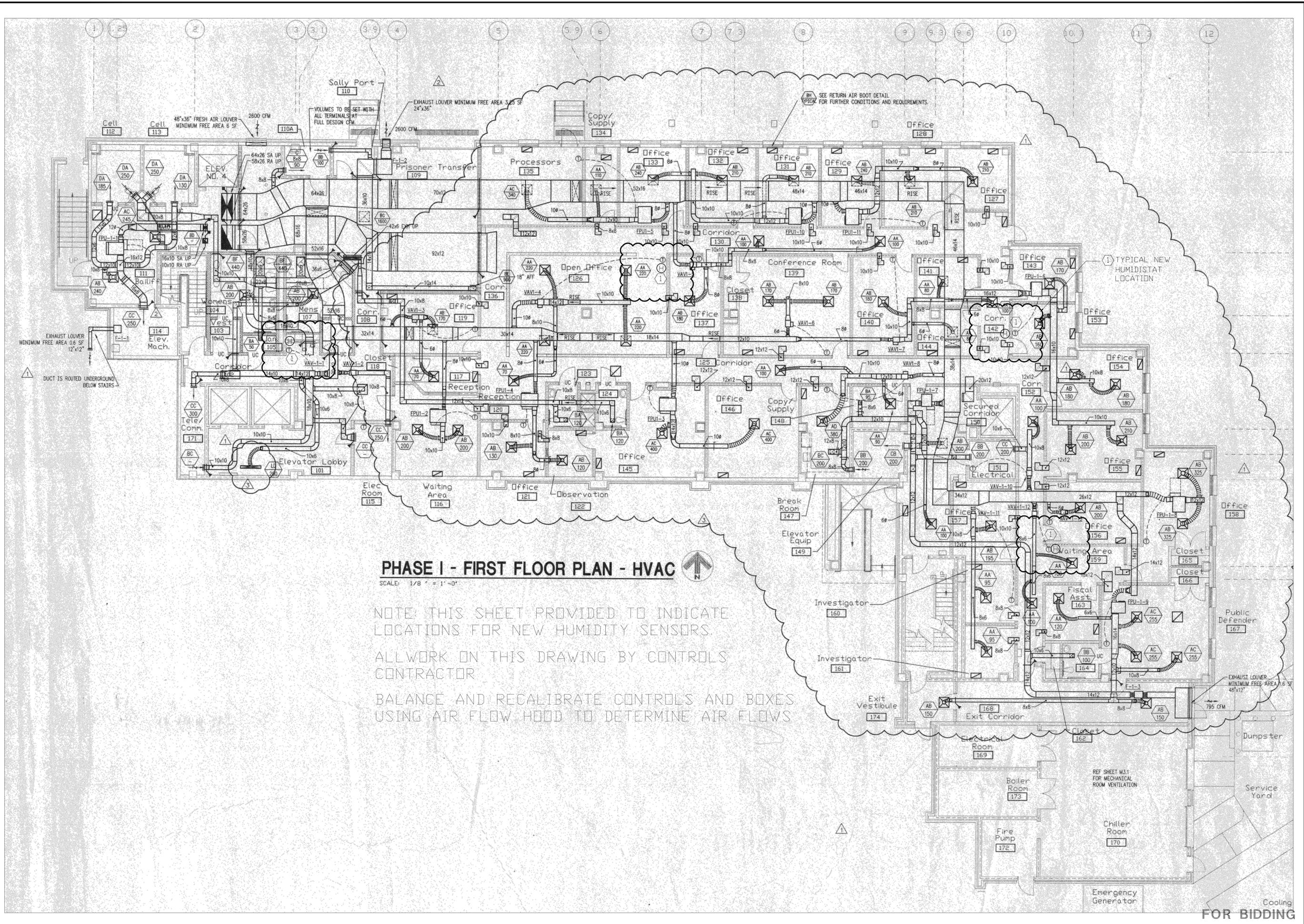
COLUMBIA COUNTY COURTHOUSE
 CHILLER BYPASS MODIFICATIONS
 LAKE CITY, FLORIDA

COBURN & ASSOCIATES
 ENGINEERS EB 000867
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OF 1 SHEETS



PHASE I - FIRST FLOOR PLAN - HVAC

SCALE: 1/8" = 1'-0"



NOTE: THIS SHEET PROVIDED TO INDICATE LOCATIONS FOR NEW HUMIDITY SENSORS.

ALLWORK ON THIS DRAWING BY CONTROLS CONTRACTOR

BALANCE AND RECALIBRATE CONTROLS AND BOXES USING AIR FLOW HOOD TO DETERMINE AIR FLOWS

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