REQUEST FOR BIDS

Department of Administration
Purchasing Division

BID NUMBER	109054
RFB TITLE	Public Safety Communications Center Infrastructure Upgrades - Air Handling Equipment
PURPOSE	This RFB is soliciting bids from responsive and responsible bidders to furnish and deliver new air handling units. Complete description and technical specifications are included. This Work is considered Bid Package No. 1. A later Bid Package No. 2 will include installation of equipment furnished in Bid Package No. 1.
BID OPENING	April 23, 2009 2:00 P.M. Central Time Late bids, faxed bid, electronic mail bids or unsigned bid will be rejected.
SUBMIT BID TO	Dane County Purchasing Division Room 425 City County Building 210 Martin Luther King Jr. Blvd. Madison, WI 53703-3345
PLEASE DIRECT ALL INQUIRES TO **NAME** **TITLE** **PHONE NO.** **FAX NO.** **EMAIL** **WEB SITE**	Francisco Silva Purchasing Agent 608/267-3523 608/266-4425 silva@co.dane.wi.us www.danepurchasing.com

THIS RFB IS COMPRISED OF:

Part 1 - General Guidelines & Information

Part 2 - Bid Forms

Part 3 - Detailed Specifications

RESPONSE CHECKLIST:

☐ Submit one (1) original of all Part 2 - Bid Forms

Request for Bids Issued: April 2, 2009

DOCUMENT INDEX FOR RFB NO. 109054

To be printed to correct scale or size, plot sheets on 30” x 42” (E1) paper.

LEGAL NOTICE

INVITATION TO BID

Dane County Purchasing Division, Room 425, City-County Building, 210 Martin Luther King, Jr. Blvd., Madison, WI 53703-3345, will receive sealed Bids until:

2:00 P.M., THURSDAY, APRIL 23, 2009

REQUEST FOR BIDS NO. 109054

PUBLIC SAFETY COMMUNICATIONS CENTER

INFRASTRUCTURE UPGRADES - AIR HANDLING EQUIPMENT

Dane County is inviting Bids for two air handling units for a facility upgrade project.

Request for Bids package may be obtained at Dane County Public Works, Highway & Transportation Dept., 1919 Alliant Energy Center Way, Madison, WI 53713, by calling 608/266-4018, or downloading it from www.countyofdane.com/pwht/bid/logon.aspx. Please call Francisco Silva, Purchasing Agent, at 608/267-3523, for any questions or additional information.

All Bidders wishing to submit Bids must be a registered vendor with Dane County & pay an annual registration fee. Complete Vendor Registration Form at www.danepurchasing.com or obtain one by calling 608/266-4131.

PUBLISH: APRIL 2 & 9, 2009 - WISCONSIN STATE JOURNAL

APRIL 6 & 13, 2009 - WESTERN BUILDER

PART 1 - GENERAL GUIDELINES AND INFORMATION

1. INTRODUCTION:

A. Dane County invites and will accept bids for item(s) outlined in Part 3 - Detail Specifications. The County as represented by Purchasing Division, intends to use the results of this process to purchase item(s).

2. CLARIFICATION / QUESTIONS:

A. Any questions concerning this Bid must be submitted in writing by mail, fax or email at least FIVE (5) WORKING DAYS prior to the bid opening. Requests submitted after that time WILL NOT be considered. All inquiries must be directed to the person indicated on the cover page.

B. A bidders facility tour will be held on April 15, 2009 at 1:30 PM at the City-County Building, 210 Martin Luther King Jr. Blvd., Madison, starting in Room 111. This tour will go until approximately 2:00 PM. Bidders are strongly encouraged to attend this tour, however attendance is optional.

3. ADDENDUMS:

A. In the event that it becomes necessary to provide additional clarifying data or information, or to revise any part of this Request for Bids (RFB), revisions / amendments and / or supplements will be posted on the Purchasing Division web site at www.danepurchasing.com. Bidders are reminded to regularly monitor the web site for any such postings. Bidders must acknowledge the receipt / review of any addendum(s) on the bottom of the Signature Affidavit.

B. The Purchasing Division has the sole authority for modifications of these specifications and / or bid.

4. VENDOR REGISTRATION PROGRAM:

A. All bidders wishing to submit a bid must be a paid registered vendor with Dane County. Prior to the bid opening, you can complete a registration form online by visiting our web site at www.danepurchasing.com or you can obtain a Vendor Registration Form by calling 608/266-4131. Your completed Vendor Registration Form and Registration Fee must be received for your bid to be considered for an award.

5. ACCEPTANCE:

A. Bid shall remain fixed and valid for acceptance for sixty (60) calendar days starting on the due date of the Bid.

B. Dane County reserves the right to accept any part of this Bid deemed to be in the best interest of the County. The County also retains the right to accept or reject any or all bids.

6. PAYMENT TERMS AND INVOICING:

A. Unless otherwise agreed, Dane County will pay properly submitted vendor invoices within thirty (30) days of receipt of goods or services, or combination of both. Payment will not be made until goods or services are delivered, installed (if required), and accepted as specified. Invoices presented for payment must be submitted in accordance with instructions contained on the Purchase Order.

B. State Sales Tax / Federal Excise Tax: Bids should not include Federal Excise and Wisconsin Sales Taxes, as Dane County is exempt from payment of such taxes (Wisconsin Statute 77.54(9a)). The Dane County's CES number is ES 41279.

7. DELIVERY:

A. Quote price FOB destination. Price must include shipping. If there is a freight or transportation increase prior to delivery of the unit, the additional increase must be at the dealer / manufacturer's expense.

8. AWARD:

A. The County will award the bid to the responsive and responsible bidder whose bid is most advantageous to the County. In determining the most advantageous bid, the County will consider criteria such as, but not limited to, cost, bidder's past performance and / or service reputation, and service capability, quality of the bidder's staff or services, customer satisfaction, references, the extent to which the bidder's staff or services meet the County's needs, bidder's past relationship with the County, total long term cost to the County, fleet continuity and any other relevant criteria listed elsewhere in this solicitation. The County may opt to establish alternate selection criteria to protect its best interest or meet performance or operational standards.

9. ORDERING / ACCEPTANCE:

A. Written notice of award to a vendor in the form of a purchase order or other document, mailed or delivered to the address shown on the Bid will be considered sufficient notice of acceptance of Bid.

10. GOVERNMENT STANDARDS:

A. All materials, equipment, and supplies provided to the County must fully comply with all safety requirements as set forth by the Wisconsin Department of Commerce and all applicable OSHA Standards. Bidders shall comply with all local, state and federal regulations, directives and laws.

11. WARRANTY:

A. The length, time, and conditions of warranty must be attached to or stated in the bid document. In such cases where the location of the successful bidder makes it impractical to perform subsequent warranty and check-up service, it shall be the successful bidder's responsibility to make arrangements with an authorized dealer acceptable to Dane

County. Generally a dealer over 50 miles from the delivery site will need to make other warranty arrangement.

B. The seller and / or manufacturer warrants that the goods sold hereunder will be merchantable quality, will conform to applicable specifications, and will be free from defects in material and workmanship and will be fit for the particular purpose intended.

C. Warranty does not commence until after the complete unit has been accepted and placed into service by the user agency.

STANDARD TERMS AND CONDITIONS

(Request for Bids / Proposals & Agreements / Contracts)
DCO CHS 19.25 Rev. 07/07

1.0 APPLICABILITY: The terms and conditions set forth in this document apply to Requests for Proposals (RFP), Bids and all other transactions whereby the County of Dane acquires goods or services, or both.

1.1 ENTIRE AGREEMENT: These Standard Terms and Conditions shall apply to any contract, including any purchase order, awarded as a result of this request. Special requirements of a resulting contract may also apply. Said written contract with referenced parts and attachments shall constitute the entire agreement, and no other terms and conditions in any document, acceptance, or acknowledgment shall be effective or binding unless expressly agreed to in writing by the County.

1.2 DEFINITIONS: As used herein, "vendor" includes a provider of goods or services, or both, who is responding to an RFP or a bid, and "bid" includes a response to either an RFP or a bid.

2.0 SPECIFICATIONS: The specifications in this request are the minimum acceptable. When specific manufacturer and model numbers are used, they are to establish a design, type of construction, quality, functional capability or performance level, or any combination thereof, desired. When alternates are proposed, they must be identified by manufacturer, stock number, and such other information necessary to establish equivalency. Dane County shall be the sole judge of equivalency. Vendors are cautioned to avoid proposing alternates to the specifications which may result in rejection of their bid.

3.0 DEVIATIONS AND EXCEPTIONS: Deviations and exceptions from terms, conditions, or specifications shall be described fully, on the vendor's letterhead, signed, and attached to the bid. In the absence of such statement, the bid shall be accepted as in strict compliance with all terms, conditions, and specifications and vendor shall be held liable for injury resulting from any deviation.

4.0 QUALITY: Unless otherwise indicated in the request, all material shall be first quality. No pre-owned, obsolete, discontinued or defective materials may be used.

5.0 QUANTITIES: The quantities shown on this request are based on estimated needs. The County reserves the right to increase or decrease quantities to meet actual needs.

6.0 DELIVERY: Deliveries shall be FOB destination freight prepaid and included unless otherwise specified. County will reject shipments sent C.O.D. or freight collect.

7.0 PRICING: Unit prices shown on the bid shall be the price per unit of sale, e.g., gal., cs., doz., ea., etc., as stated on the request or contract. For any given item, the quantity multiplied by the unit price shall establish the extended price; the unit price shall govern in the bid evaluation and contract administration.

7.1 Prices established in continuing agreements and term contracts may be lowered due to market conditions, but prices shall not be subject to increase for the term specified in the award. Vendor shall submit proposed increases to the contracting department thirty (30) calendar days before the proposed effective date of the price increase. Proposed increases shall be limited to fully documented cost increases to the vendor that are demonstrated to be industry wide. Price increases may not be granted unless they are expressed in bid documents and contracts or agreements.

7.2 Submission of a bid constitutes bidder's certification that no financial or personal relationship exists between the bidder and any county official or employee except as specially set forth in writing attached to and made a part of the bid. The successful bidder shall disclose any such relationship which develops during the term of the contract.

8.0 ACCEPTANCE-REJECTION: Dane County reserves the right to accept or reject any or all bids, to waive any technicality in any bid submitted and to accept any part of a bid as deemed to be in the best interests of the County. Submission of a proposal or a bid constitutes the making of an offer to contract and gives the County an option valid for 60 days after the date of submission to the County.

8.1 Bids **MUST** be dated and time stamped by the Dane County Purchasing Division Office on or before the date and time that the bid is due. Bids deposited or time stamped in another office will be rejected. Actual receipt in the office of the purchasing division is necessary; timely deposit in the mail system is not sufficient. THERE WILL BE NO EXCEPTIONS TO THIS POLICY.

9.0 METHOD OF AWARD: Award shall be made to the lowest responsible, responsive

vendor conforming to specifications, terms, and conditions, or to the most advantageous bid submitted to the County on a quality versus price basis. Among other things, quantities, time of delivery, purpose for which required, competency of vendor, the ability to render satisfactory service and past performance will be considered in determining responsibility.

10.0 ORDERING/ACCEPTANCE: Written notice of award to a vendor in the form of a purchase order or other document, mailed or delivered to the address shown on the bid will be considered sufficient notice of acceptance of bid. A formal contract containing all provisions of the contract signed by both parties shall be used when required by the Dane County Purchasing Division.

11.0 PAYMENT TERMS AND INVOICING: Unless otherwise agreed, Dane County will pay properly submitted vendor invoices within thirty (30) days of receipt of goods or services, or combination of both. Payment will not be made until goods or services are delivered, installed (if required), and accepted as specified. Invoices presented for payment must be submitted in accordance with instructions contained on the purchase order.

11.1 NO WAIVER OF DEFAULT: In no event shall the making of any payment or acceptance of any service or product required by this Agreement constitute or be construed as a waiver by County of any breach of the covenants of the Agreement or a waiver of any default of the successful vendor, and the making of any such payment or acceptance of any such service or product by County while any such default or breach shall exist shall in no way impair or prejudice the right of County with respect to recovery of damages or other remedy as a result of such breach or default.

12.0 TAXES: The County and its departments are exempt from payment of all federal tax and Wisconsin state and local taxes on its purchases except Wisconsin excise taxes as described below. The State of Wisconsin Department of Revenue has issued tax exempt number ES41279 to Dane County.

12.1 The County is required to pay the Wisconsin excise or occupation tax on its purchase of beer, liquor, wine, cigarettes, tobacco products, motor vehicle fuel and general aviation fuel. The County is exempt from Wisconsin sales or use tax on these purchases. The County may be subject to other states' taxes on its purchases in that state depending on the laws of that state. Vendors performing construction activities are required to pay state use tax on the cost of materials.

13.0 GUARANTEED DELIVERY: Failure of the vendor to adhere to delivery schedules as specified or to promptly replace rejected materials shall render the vendor liable for all costs in excess of the contract price when alternate procurement is necessary. Excess costs shall include administrative costs.

14.0 APPLICABLE LAW AND VENUE: This contract shall be governed under the laws of the State of Wisconsin, and venue for any legal action between the parties shall be in Dane County Circuit Court. The vendor shall at all times comply with and observe all federal and state laws, local laws, ordinances, and regulations which are in effect during the period of this contract and which in any manner affect the work or its conduct.

15.0 ASSIGNMENT: No right or duty in whole or in part of the vendor under this contract may be assigned or delegated without the prior written consent of Dane County.

16.0 NONDISCRIMINATION / AFFIRMATIVE ACTION: During the term of this Agreement the vendor agrees, in accordance with Wisconsin Statutes 111.321 and Chapter 19 of the Dane County Ordinances, not to discriminate against any person, whether an applicant or recipient of services, an employee or applicant for employment, on the basis of age, race, ethnicity, religion, color, gender, disability, marital status, sexual orientation, national origin, cultural differences, ancestry, physical appearance, arrest record or conviction record, military participation or membership in the national guard, state defense force or any other reserve component of the military forces of the United States, or political beliefs. The vendor shall provide a harassment-free work environment. These provisions shall include, but not be limited to, the following: employment, upgrading, demotion, transfer, recruitment, advertising, layoff, termination, training, including apprenticeships, rates of pay or other forms of compensation.

16.1 Vendors who have twenty (20) or more employees and a contract of twenty thousand dollars ($20,000) or more must submit a written affirmative action plan to the County's Contract Compliance Officer within fifteen (15) working days of the effective date of the contract. The County may elect to accept a copy of the current affirmative action plan filed with and approved by a federal, state or local government unit.

16.2 The vendor agrees to post in conspicuous places, available for employees and applicants for employment, notices setting forth the provisions of this Agreement as they relate to affirmative action and nondiscrimination.

16.3 Failure to comply with these Terms and Conditions may result in the vendor being debarred, termination of the contract and/or withholding of payment.

16.4 The vendor agrees to furnish all information and reports required by Dane County's Contract Compliance Officer as the same relate to affirmative action and nondiscrimination, which may include any books, records, or accounts deemed appropriate to determine compliance with Chapter 19, Dane County Ordinances, and the provisions of this Agreement.

16.5 *Americans with Disabilities Act:* The vendor agrees to the requirements of the ADA, providing for physical and programmatic access to service delivery and treatment in all programs and activities.

17.0 PATENT, COPYRIGHT AND TRADEMARK INFRINGEMENT: The vendor guarantees goods sold to the County were manufactured or produced in accordance with applicable federal labor laws, and that the sale or use of the articles described herein do not infringe any patent, copyright or trademark. The vendor covenants that it will, at its own expense, defend every suit which shall be brought against the County (provided that such vendor is promptly notified of such suit, and all papers therein are delivered to it) for any alleged infringement of any patent, copyright or trademark by reason of the sale or use of such articles, and agrees that it will pay all costs, damages, and profits recoverable in any such suit.

18.0 SAFETY REQUIREMENTS: All materials, equipment, and supplies provided to the County must fully comply with all safety requirements as set forth by the Wisconsin Department of Commerce and all applicable OSHA Standards.

18.1 MATERIAL SAFETY DATA SHEET: If any item(s) on an order(s) resulting from this award(s) is a hazardous chemical, as defined under OSHA Standards - 29 CFR 1910.1200, provide one (1) copy of the Material Safety Data Sheet for each item with the shipped container(s) and one (1) copy with the invoice(s).

19.0 WARRANTY: Unless specifically expressed otherwise in writing, goods and equipment purchased as a result of this request shall be warranted against defects by the vendor for one (1) year from date of receipt. An equipment manufacturer's standard warranty shall apply as a minimum and must be honored by the vendor. The time limitation in this paragraph does not apply to the warranty provided in paragraph 27.0.

20.0 INSURANCE RESPONSIBILITY: The successful vendor shall:

20.1 Maintain worker's compensation coverage as required by Wisconsin Statutes, for all employees engaged in the work. The successful vendor shall furnish evidence of adequate worker's compensation insurance.

20.2 Indemnify, hold harmless and defend County, its boards, commissions, agencies, officers, employees and representatives against any and all liability, loss (including, but not limited to, property damage, bodily injury and loss of life), damages, costs or expenses which County, its officers, employees, agencies, boards, commissions and representatives may sustain, incur or be required to pay by reason of the successful vendor furnishing the services or goods required to be provided under the contract with the County, provided, however, that the provisions of this paragraph shall not apply to liabilities, losses, charges, costs, or expenses caused by or resulting from the acts or omissions of County, its agencies, boards, commissions, officers, employees or representatives. The obligations of the successful vendor under this paragraph shall survive the expiration or termination of any contract resulting from the successful vendor's bid.

20.3 At all times during the term of this Agreement, keep in full force and effect comprehensive general liability and auto liability insurance policies (as well as professional malpractice or errors and omissions coverage, if the services being provided are professional services) issued by a company or companies authorized to do business in the State of Wisconsin and licensed by the Wisconsin Insurance Department, with liability coverage provided for therein in the amount of at least $1,000,000 CSL (Combined Single Limits). Coverage afforded shall apply as primary. County shall be given ten (10) days advance notice of cancellation or non-renewal. Upon execution of this Agreement, the successful vendor shall furnish County with a certificate of insurance listing County as an additional insured and, upon request, certified copies of the required insurance policies. If the successful vendor's insurance is underwritten on a Claims-Made basis, the Retroactive Date shall be prior to or coincide with the date of this Agreement, the Certificate of Insurance shall state that coverage is Claims-Made and indicate the Retroactive Date, the successful vendor shall maintain coverage for the duration of this Agreement and for two years following the completion of this Agreement. The successful vendor shall furnish County, annually on the policy renewal date, a Certificate of Insurance as evidence of coverage. It is further agreed that the successful vendor shall furnish the County with a 30-day notice of

aggregate erosion, in advance of the Retroactive Date, cancellation, or renewal. It is also agreed that on Claims-Made policies, either the successful vendor or County may invoke the tail option on behalf of the other party and that the Extended Reporting Period premium shall be paid by the successful vendor. In the event any action, suit or other proceeding is brought against County upon any matter herein indemnified against, County shall give reasonable notice thereof to the successful vendor and shall cooperate with the successful vendor's attorneys in the defense of the action, suit or other proceeding.

20.4 The County reserves the right to require higher or lower insurance limits where County deems necessary.

20.5 In case of any sublet of work under this Agreement, the successful vendor shall furnish evidence that each and every sub-vendor has in force and effect insurance policies providing coverage identical to that required of the successful vendor.

21.0 CANCELLATION: County reserves the right to terminate any Agreement due to non-appropriation of funds or failure of performance by the vendor. This paragraph shall not relieve County of its responsibility to pay for services or goods provided or furnished to County prior to the effective date of termination.

22.0 PUBLIC RECORDS ACCESS: It is the intention of the County to maintain an open and public process in the solicitation, submission, review, and approval of procurement activities. Bid openings are public unless otherwise specified. Records are not available for public inspection prior to issuance of the notice of intent to award or the award of the contract. Bid results may be obtained by visiting the Dane County Purchasing Office Monday – Friday, between 8:00 a.m. and 4:00 p.m. Prior appointment is advisable.

22.1 PROPRIETARY INFORMATION: If the vendor asserts any of its books and records of its business practices and other matters collectively constitute a trade secret as that term is defined in Wisconsin Statutes 134.90(1)(c), County will not release such records to the public without first notifying the vendor of the request for the records and affording the vendor an opportunity to challenge in a court of competent jurisdiction the requester's right to access such records. The entire burden of maintaining and defending the trade secret designation shall be upon the vendor. The vendor acknowledges and agrees that if the vendor shall fail, in a timely manner, to initiate legal action to defend the trade secret designation or be unsuccessful in its defense of that designation, County shall be obligated to and will release the records.

22.2 Data contained in a bid, all documentation provided therein, and innovations developed as a result of the contracted commodities or services cannot be copyrighted or patented. All data, documentation, and innovations shall be the property of the County.

22.3 Any material submitted by the vendor in response to this request that the vendor considers confidential and proprietary information and which vendor believes qualifies as a trade secret, as provided in Wisconsin Statutes 19.36(5), must be identified on a designation of Confidential and Proprietary Information form. In any event, bid prices will not be held confidential after award of contract.

23.0 RECYCLED MATERIALS: Dane County is required to purchase products incorporating recycled materials whenever technically and economically feasible. Vendors are encouraged to bid products with recycled content which meet specifications.

24.0 PROMOTIONAL ADVERTISING: Reference to or use of Dane County, any of its departments or sub-units, or any county official or employee for commercial promotion is prohibited.

25.0 ANTITRUST ASSIGNMENT: The vendor and the County of Dane recognize that in actual economic practice, overcharges resulting from antitrust violation are in fact usually borne by the County of Dane (purchaser). Therefore, the successful vendor hereby assigns to the County of Dane any and all claims for such overcharges as to goods, materials or services purchased in connection with this contract.

26.0 RECORDKEEPING AND RECORD RETENTION-PUBLIC WORKS CONTRACTS: The successful bidder on a public works contract shall comply with the State of Wisconsin prevailing wage scale and shall establish and maintain adequate payroll records for all labor utilized as well as records for expenditures relating to all subcontracts, materialmen and suppliers. All records must be kept in accordance with generally accepted accounting procedures. The County shall have the right to audit, review, examine, copy, and transcribe any such records or documents. The vendor will retain all documents applicable to the contract for a period of not less than three (3) years after final payment is made.

26.1 RECORDKEEPING AND RECORD RETENTION-COST REIMBURSEMENT CONTRACTS: Where payment to the vendor is based on the vendor's costs, vendor shall establish and maintain adequate records of all

expenditures incurred under the contract. All records must be kept in accordance with generally accepted accounting procedures. The County contracting agency shall have the right to audit, review, examine, copy, and transcribe any pertinent records or documents relating to any contract resulting from this bid/proposal held by the vendor. The vendor will retain all documents applicable to the contract for a period of not less than three (3) years after final payment is made.

27.0 YEAR 2000 COMPLIANT: Vendor warrants that: a) all goods, services and licenses sold otherwise provided pursuant to this procurement have been tested for and are fully year 2000 compliant, which means they are capable of correctly and consistently handling all date-based functions before, during and after the year 2000; b) the date change from 1999 to 2000, or any other date changes, will not prevent such goods, services or licenses from operating in a merchantable manner, for the purposes intended and in accordance with all applicable plans and specifications and without interruption before, during and after the year 2000; and c) vendor's internal systems, and those of vendor's vendors, are year 2000 compliant, such that vendor will be able to deliver such goods, services and licenses as required by this procurement.

28.0 LIVING WAGE REQUIREMENT: The vendor shall, where appropriate, comply with the County's Living Wage Requirement as set forth in Dane County Ordinances, Chapter 25.015.

28.01 In the event its payroll records contain any false, misleading or fraudulent information, or if the vendor fails to comply with the provisions of Chapter 25.015, Dane County Ordinances, the County may withhold payments on the contract, terminate, cancel or suspend the contract in whole or in part, or, after a due process hearing, deny the vendor the right to participate in bidding on future County contracts for a period of one (1) year after the first violation is found and for a period of three (3) years after a second violation is found.

28.02 Bidders are exempt from the above requirements if:

- The maximum value of services to be provided is less than $5,000;
- The bid involves only the sale of goods to the County;
- The bid is for professional services;
- The bid is for a public works contract where wages are regulated under Wisconsin Statutes 62.293;
- The bidder is a school district, a municipality, or other unit of government;
- The service to be provided is residential services at an established per bed rate;
- The bidder's employees are persons with disabilities working in employment programs and the successful bidder holds a current sub-minimum wage certificate issued by the U.S. Department of Labor or where such a certificate could be issued but for the fact that the employer is paying a wage higher than the minimum wage;
- The bidder is an individual providing services to a family member; or
- The bidder's employees are student interns.

28.03 COMPLIANCE WITH FAIR LABOR STANDARDS. During the term of this Agreement, PROVIDER shall report to the County Contract Compliance Officer, within ten (10) days, any allegations to, or findings by the National Labor Relations Board (NLRB) or Wisconsin Employment Relations commission (WERC) that PROVIDER has violated a statute or regulation regarding labor standards or relations within the seven years prior to entering this Agreement. If an investigation by the Contract Compliance Officer results in a final determination that the matter adversely affects PROVIDER'S responsibilities under this Agreement, and which recommends termination, suspension or cancellation of this agreement, the County may take such action.

28.04 PROVIDER may appeal any adverse finding by the Contract Compliance Officer as set forth in Dane County Ordinances, Chapter 25.015(11)(c) through (e).

28.05 PROVIDER shall post the following statement in a prominent place visible to employees: "As a condition of receiving and maintaining a contract with Dane County, this employer shall comply with federal, state and all other applicable laws prohibiting retaliation or union organizing."

BID COVER PAGE **SIGNATURE AFFIDAVIT**	
Name of Firm:	
Street Address:	
City, State, Zip:	
Contact Person:	
Telephone No.:	
Fax No.:	
Email Address:	

In signing this Bid, we also certify that we have not, either directly or indirectly, entered into any agreement or participated in any collusion or otherwise taken any action in restraint of free competition; that no attempt has been made to induce any other person or firm to submit or not to submit a Bid; that this Bid has been independently arrived at without collusion with any other bidder, competitor or potential competitor; that this Bid has not been knowingly disclosed prior to the opening of bids to any other bidder or competitor; that the above statement is accurate under penalty of perjury.

The undersigned, submitting this Bid, hereby agrees with all the terms, conditions, and specifications required by the County in this Request for Bids, and declares that the attached Bid and pricing are in conformity therewith.

_____ _____

Signature Date

_____

Printed or Typed Name and Title

This firm herby acknowledges receipt / review of the following Addendum(s):

Addendum No. _____ Addendum No. _____ Addendum No. _____ Addendum No. _____

BID PRICE	
Name of Firm:	

LUMP SUM
For the price listed below, our firm hereby offers to furnish the following item(s) in accordance with the specifications of this Request for Bids. Pricing includes delivery.

Year / Make / Model: _____

Terms of Warranty: _____

_____

Nearest service / parts location: _____

_____

Delivery date & time: _____

Indicate no. of days for delivery after receipt of order: _____

Total Delivered Price: $ _____

SALES TAX
Bids should not include Federal Excise and Wisconsin Sales Taxes, as Dane County is exempt from payment of such taxes. Wisconsin Statute 77.54(9a). The Dane County's CES number is ES 41279.

Payment terms: net 30 days

DELIVERY
Deliver item(s) to:
Department of Public Safety Communications
210 Martin Luther King Jr Blvd.
Madison, WI 53703-3345
Attention: Scott Carlson

FAIR LABOR PRACTICES CERTIFICATION

The undersigned, for and on behalf of the BIDDER, APPLICANT or PROPOSER named herein, certifies as follows:

A. That he or she is an officer or duly authorized agent of the above-referenced BIDDER, APPLICANT or PROPOSER, which has a submitted a proposal, bid or application for a contract with the County of Dane.

B. That BIDDER, APPLICANT or PROPOSER has (check one):

___ not been found by the National Labor Relations Board (NLRB) or the Wisconsin Employment Relations Commission (WERC) to have violated any statute or regulation regarding labor standards or relations in the seven years prior to the signature date of this Certification.

___ been found by the National Labor Relations Board (NLRB) or the Wisconsin Employment Relations Commission (WERC) to have violated any statute or regulation regarding labor standards or relations in the seven years prior to the signature date of this Certification.

_____ _____

Officer or Authorized Agent Signature Date

_____

Printed or Typed Name and Title

_____

Printed or Typed Business Name

NOTE: You can find information regarding the violations described above at: www.nlrb.gov and werc.wi.gov.

For reference, Dane County Ordinance 25.11(28)(a) is as follows:

(28) BIDDER RESPONSIBILITY. (a) Any bid, application or proposal for any contract with the county, including public works contracts regulated under chapter 40, shall include a certification indicating whether the bidder has been found by the National Labor Relations Board (NLRB) or the Wisconsin Employment Relations Committee (WERC) to have violated any statute or regulation regarding labor standards or relations within the last seven years. The purchasing manager shall investigate any such finding and make a recommendation to the committee, which shall determine whether the conduct resulting in the finding affects the bidder's responsibility to perform the contract.

If you indicated that the NLRB or WERC have found you to have such a violation, you must include copies of any relevant information regarding such violation with your proposal, bid or application.

SPECIFICATIONS OVERVIEW:

A. Dane County, as represented by the Purchasing Division, will accept bids for the purchase of specified item(s) as described further in this document.

B. The intended user agency is Dept. of Public Safety Communications.

TECHNICAL SPECIFICATIONS:

A. The following technical specifications describe an acceptable unit(s) / item(s). Dane County reserves the right to accept or reject any and all Bids, to waive informalities and to choose the Bid that best meets the specifications and needs of the County.

SECTION 01 00 00
BASIC REQUIREMENTS

P A R T 1 - G E N E R A L

SECTION SUMMARY

PART 1 - GENERAL
- Section Summary
- Summary of the Work
- Submittal Procedures
- Proposed Products List
- Shop Drawings
- Product Data
- Manufacturers' Instructions
- Manufacturers' Certificates
- References
- Staging Areas
- Protection
- Transportation, Handling, Storage and Protection
- Substitutions
- Starting Systems
- Demonstration and Instructions
- Contract Closeout Procedures
- Adjusting
- Operation and Maintenance Data
- Spare Parts and Maintenance Materials

PART 2 - PRODUCTS
- Not Used

PART 3 - EXECUTION
- Not Used

SUMMARY OF THE WORK

Project Description: Perform the Work as specified and detailed in Request for Bids package. Bidders to furnish and deliver new air handling units. Complete description, specifications and drawings are included. This Work is considered Bid Package No. 1. Bid Package No. 2 is not a part of this Work and will be implemented soon. Bid Package No. 2 will install equipment furnished in Bid Package No. 1 as well as providing other equipment, materials and labor.

Work by Owner: Not applicable.

Permits: Not applicable.

SUBMITTAL PROCEDURES

Submittal form to identify Project, Contractor, Subcontractor or supplier; and pertinent Construction Documents references.

Apply Contractor's stamp, signed or initialed, certifying that review, verification of Products required, field dimensions, adjacent construction work, and coordination of information is in accordance with requirements of the Work and Construction Documents.

Identify variations from Construction Documents and Product or system limitations that may be detrimental to successful performance of completing the Work.

Revise and resubmit submittals as required; identify all changes made since previous submittal.

PROPOSED PRODUCTS LIST

Within fifteen (15) days after date of Award of Contract, submit complete list of major Products proposed for use, with name of manufacturer, trade name, and model number of each Product.

SHOP DRAWINGS

Submit number of copies that Contractor requires, plus two (2) copies that shall be retained by Public Works Project Engineer.

PRODUCT DATA

Submit number of copies that Contractor requires, plus two (2) copies that shall be retained by Public Works Project Engineer.

Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to this Project.

MANUFACTURERS' INSTRUCTIONS

When specified in individual Specification sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.

MANUFACTURERS' CERTIFICATES

When specified in individual Specification sections, submit manufacturers' certificate to Public Works Project Engineer for review, in quantities specified for Product Data.

Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

REFERENCES

Conform to reference standard by date of issue current as of date for receiving bids.

Should specified reference standard conflict with Construction Documents, request clarification from Public Works Project Engineer before proceeding.

STAGING AREAS

Coordinate staging areas with Public Works Project Engineer prior to starting the Work.

On-site space for use as staging areas and storage of materials is limited and will be apportioned among the various Contractors as their needs dictate with due regard for storage requirements of each Contractor. Each Contractor shall be responsible for safety of equipment and materials that are stored on site.

PROTECTION

Contractor shall protect from injury all trees, shrubs, hedges, walks and driveways and pay for any damage to same resulting from insufficient or improper protection.

TRANSPORTATION, HANDLING, STORAGE AND PROTECTION

Transport, handle, store and protect Products in accordance with manufacturer's instructions.

SUBSTITUTIONS

Public Works Project Engineer shall consider requests for Substitutions only up to seven (7) days prior to date of Bid Opening.

Document each request with complete data substantiating compliance of proposed Substitution with

Construction Documents.

Submit three (3) copies of requests for Substitution for consideration. Limit each request to one (1) proposed Substitution.

Substitutions shall not change contract price established at Bid Opening.

STARTING SYSTEMS

Provide written notification prior to start-up of each equipment item or system.

Ensure that each piece of equipment or system is ready for operation.

Execute start-up under supervision of responsible persons in accordance with manufacturers' instructions.

Submit written report that equipment or system has been properly installed and is functioning correctly.

DEMONSTRATION AND INSTRUCTIONS

Demonstrate operation and maintenance of Products to Owner's personnel prior to date of final inspection.

Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed-upon times, at designated location.

Owner may choose to videotape demonstration session; demonstration and demonstrator shall be to level of satisfaction of Owner.

CONTRACT CLOSEOUT PROCEDURES

Submit written certification that Construction Documents have been reviewed, the Work has been inspected, and the Work is complete in accordance with Construction Documents and ready for Public Works Project Engineer's inspection.

Submit final Application for Payment identifying total adjusted Contract Sum / Price, previous payments, and amount remaining due.

ADJUSTING

Adjust operating Products and equipment to ensure smooth and unhindered operation.

OPERATION AND MAINTENANCE DATA

Provide operation and maintenance data for all mechanical and electrical equipment supplied and installed in project.

SPARE PARTS AND MAINTENANCE MATERIALS

Provide Products, spare parts, maintenance and extra materials in quantities specified in individual Specification Sections.

Deliver to the Work site and place in location as directed.

P A R T 2 - P R O D U C T S

NOT USED

P A R T 3 - E X E C U T I O N

NOT USED

END OF SECTION

SECTION 23 05 13
COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

P A R T 1 - G E N E R A L

SCOPE

This section includes requirements for single and three phase motors for pre-purchase that are used with equipment specified in other sections. Contractor shall be responsible for installation. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work
- Reference
- Reference Standards
- Quality Assurance
- Shop Drawings
- Operating and Maintenance Data
- Electrical Coordination
- Product Criteria

PART 2 - PRODUCTS
- Three Phase, Single Speed Motors

PART 3 - EXECUTION
- Installation

REFERENCE

Applicable provisions of Basic Requirements Section 01 00 00 govern work under this section.

REFERENCE STANDARDS

ANSI/IEEE 112	Test Procedure for Polyphase Induction Motors and Generators
ANSI/NEMA MG-1	Motors and Generators
ANSI/NFPA 70	National Electrical Code

QUALITY ASSURANCE

Refer to Basic Requirements Section 01 00 00.

SHOP DRAWINGS

Refer to Basic Requirements Section 01 00 00, Submittal Procedures, Shop Drawings.

Include with the equipment which the motor drives the following motor information: motor manufacturer, horsepower, voltage, phase, hertz, rpm, full load efficiency. Include project wiring diagrams prepared by the contractor specifically for this work.

OPERATION AND MAINTENANCE DATA

All operations and maintenance data shall comply with the submission and content requirements specified under section Basic Requirements.

In addition to the general content specified under Basic Requirements supply the following additional documentation:

1. Lubrication instructions, including list/frequency of lubrication
2. Table noting full load power factor, service factor, NEMA design designation, insulation class and frame type for each motor provided

ELECTRICAL COORDINATION

All starters, overload relay heater coils, disconnect switches and fuses, relays, wire, conduit, pushbuttons, pilot lights, and other devices required for the control of motors or electrical equipment are furnished and installed by the Electrical Contractor, except as specifically noted elsewhere in this division of specifications.

Electrical Contractor will provide all power wiring and control wiring, except temperature control wiring.

Furnish project specific wiring diagrams to Electrical Contractor for all equipment and devices furnished by this Contractor and indicated to be wired by the Electrical Contractor.

PRODUCT CRITERIA

Motors to conform to all applicable requirements of NEMA, IEEE, ANSI, and NEC standards and shall be listed by U.L. for the service specified.

Select motors for conditions in which they will be required to perform; i.e., general purpose, splashproof, explosion proof, standard duty, high torque or any other special type as required by the equipment or motor manufacturer's recommendations.

Furnish motors for starting in accordance with utility requirements and compatible with starters as specified.

P A R T 2 - P R O D U C T S

THREE PHASE, SINGLE SPEED MOTORS

Use NEMA rated 460 volt, three phase, 60 hertz motors for all motors 1/2 HP and larger unless specifically indicated.

Use NEMA general purpose, continuous duty, Design B , normal starting torque, T-frame or U-frame motors with Class B or better insulation unless the manufacturer of the equipment on which the motor is being used has different requirements.

Use grease lubricated anti-friction ball bearings with housings equipped with plugged/capped provision for relubrication, rated for minimum AFBMA 9, L-10 life of 20,000 hours. Calculate bearing load with NEMA minimum V-belt pulley with belt center line at the end of NEMA standard shaft extension. Stamp bearing sizes on nameplate.

All open drip-proof motors to have a 1.15 service factor.

All motors 1 HP and larger to be high efficiency design with full load efficiencies which meet or exceed the values listed below when tested in accordance with NEMA MG 1.

FULL LOAD NOMINAL MOTOR EFFICIENCY BY MOTOR SIZE AND SPEED

	-----Open Drip-Proof Motors------		
MOTOR	-------Nominal Motor Speed-------		
HP	1200 rpm	1800 rpm	3600 rpm
1	82.5	85.5	77.0
1-1/2	86.5	86.5	84.0
2	87.5	86.5	85.5
3	88.5	89.5	85.5
5	89.5	89.5	86.5
7-1/2	90.2	91.0	88.5
10	91.7	91.7	89.5
15	91.7	93.0	90.2
20	92.4	93.0	91.0

Fan motors shall be manufacturer provided and installed, Open Drip Proof, premium efficiency designed for VFD drive, 1750 RPM, single speed, 460 volt, three phase, 60 hertz. Complete electrical characteristics for each fan motor shall be as shown in schedule.

Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclosed terminal lugs in terminal box sized to NFPA 70.

All electrical connection components shall be field provided and mounted as shown on project schedule.

PART 3 - EXECUTION

INSTALLATION

Mount motors on a rigid base designed to accept a motor, using shims if required under each mounting foot to get a secure installation.

When motor will be flexible coupled to the driven device, mount coupling to the shafts in accordance with the coupling manufacturer's recommendations. Using a dial indicator, check angular misalignment of the two shafts; adjust motor position as necessary so that the angular misalignment of the shafts does not exceed 0.002 inches per inch diameter of the coupling hub. Again using the dial indicator, check the shaft for run-out to assure concentricity of the shafts; adjust as necessary so that run-out does not exceed 0.002 inch.

When motor will be connected to the driven device by means of a belt drive, mount sheaves on the appropriate shafts in accordance with the manufacturer's instructions. Use a straight edge to check alignment of the sheaves; reposition sheaves as necessary so that the straight edge contacts both sheave faces squarely. After sheaves are aligned, loosen the adjustable motor base so that the belt(s) can be added and tighten the base so that the belt tension is in accordance with the drive manufacturer's recommendations. Frequently recheck belt tension and adjust if necessary during the first day of operation and again after 80 hours of operation.

Verify the proper rotation of each three-phase motor as it is being wired or before the motor is energized for any reason.

Lubricate all motors requiring lubrication. Record lubrication material used and the frequency of use. Include this information in the maintenance manuals.

END OF SECTION

SECTION 23 05 48
VIBRATION CONTROLS FOR HVAC PIPING AND EQUIPMENT

P A R T 1 - G E N E R A L

SCOPE
This section includes specifications for vibration isolation material for equipment for pre-purchase. Contractor shall be responsible for installation. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work
- Reference
- Quality Assurance
- Design Criteria
- Shop Drawings

PART 2 - PRODUCTS
- Materials
- Vibration Isolation Manufacturers
- Type S: Steel Base
- Performance
- Blower Minimum Deflection Guide

PART 3 - EXECUTION
- Installation
- Packaged Air Handling Units and Centrifugal Fans

RELATED WORK
Section 23 73 13 - Modular Indoor Central-Station Air Handling Units

REFERENCE
Applicable provisions of Basic Requirements Section 01 00 00 govern work under this section.

QUALITY ASSURANCE
Refer to Basic Requirements Section 01 00 00.

DESIGN CRITERIA
Isolate all motor driven mechanical equipment from the building structure and from the systems which they serve to prevent equipment vibrations from being transmitted to the structure. Consider equipment weight distribution to provide uniform isolator deflections.

For equipment with variable speed capability, select vibration isolation devices based on the lowest speed.

Credit will be given for the inherent flexibility and vibration absorption characteristics of mechanical grooved pipe connections providing that supporting calculations are submitted for approval.

Coordinate the selection of devices with the isolator and equipment manufacturers.

SHOP DRAWINGS
Refer to Basic Requirements Section 01 00 00, Submittal Procedures, Shop Drawings.

Include isolator type, materials of construction, isolator free and operating heights, and isolation efficiency based on the lowest operating speed of the equipment supported.

P A R T 2 - P R O D U C T S

MATERIALS
Use materials that will retain their isolation characteristics for the life of the equipment served.
Treat all isolators to resist corrosion.

Use isolators with a ratio of lateral to vertical stiffness not less than 1.0 or greater than 2.0.

VIBRATION ISOLATOR MANUFACTURERS
Mason Industries, Amber/Booth Co., Vibration Mounting & Controls, Peabody Noise Control, or approved equal.

TYPE S: STEEL BASE
Structural steel base, rectangular in shape for all equipment other than centrifugal refrigeration machines and pump bases which may be "T" or "L" shaped. Include support for suction and discharge base ells for split case pump bases. Use perimeter steel members with a minimum depth equal to 1/10 of the longest dimension of the base. Base depth need not exceed 14" provided that the deflection and misalignment is kept within acceptable limits as determined by the manufacturer. Use height saving brackets in all mounting locations to provide a base clearance of at least one inch above the floor or housekeeping pad.

PERFORMANCE
Select vibration isolation devices as indicated below or to provide not less than 95% isolation efficiency, whichever is greater.

	Floor Span or Column Spacing							
	On Grade		20 Feet		30 Feet		40 Feet	
TYPE OF EQUIPMENT	Iso. Type	Min. Static Defl. In.	Iso. Type	Min. Static Defl. In.	Iso. Type	Min. Static Defl. In.	Iso. Type	Min. Static Defl. In.
PACKAGED AIR HANDLING UNITS:								
Floor mounted								
Thru 5 hp	3	0.35	3	0.75	3	0.75	3	0.75
7-1/2 hp and over								
Thru 400 rpm	3	0.35	3-S	1.50	3-S	1.50	3-S	1.50
7-1/2 hp thru 40 hp								
401 rpm and over	3	0.35	3	0.75	3	0.75	3-S	1.50

BLOWER MINIMUM DEFLECTION GUIDE

	Required Deflection (Inches)			
Fan Speed (RPM)	On Grade	20' Floor Span	30' Floor Span	40' Floor Span
175-224	0.35	3.50	4.50	4.50
225-299	0.35	3.50	3.50	3.50
300-374	0.35	2.50	2.50	3.50
375-499	0.35	1.50	2.50	3.50
500 and over	0.35	0.75	1.50	2.50

P A R T 3 - E X E C U T I O N

INSTALLATION
Install vibration isolation devices for motor driven equipment in accordance with the manufacturer's installation instructions.

Set steel and inertia bases for one inch clearance between the concrete floor or housekeeping pad and the base.

Do not allow installation practices to short circuit any isolation device.

PACKAGED AIR HANDLING

Attach horizontal thrust restraints at the centerline of thrust and symmetrically on either side of the unit. Thrust restraints are not required when the fan section in not isolated from the remainder of the air handling unit by means of duct flexible connections.

END OF SECTION

SECTION 23 41 00
PARTICULATE AIR FILTRATION

P A R T 1 - G E N E R A L

SCOPE
This section includes specifications for air system filters for pre-purchase equipment. Contractor shall be responsible for installation. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work
- Reference
- Reference Standards
- Quality Assurance
- Shop Drawings
- Operation and Maintenance Data
- Design Criteria

PART 2 - PRODUCTS
- Manufacturers
- MERV 8 Filters
- MERV 11 Filters
- Housings for MERV 8 Filters
- Side Access Filter Housings
- Filter Holding Frames
- Filter Gauges

PART 3 - EXECUTION
- Installation
- Filter Gauges
- Construction Verification Items
- Agency Training

RELATED WORK
01 91 01 or 01 91 02 – Commissioning Process
Section 23 73 13 - Modular Indoor Central-Station Air-Handling Units

REFERENCE
Applicable provisions of Basic Requirements Section 01 00 00 govern work under this section.

REFERENCE STANDARDS
ASHRAE Standard 52
UL 181 – Standard for Factory-Made Air Ducts and Air Connectors
UL 586 – Standard for High Efficiency Particulate Air Filter Units
UL 900 – Standard for Air Filter Units

QUALITY ASSURANCE
Refer to Basic Requirements Section 01 00 00, Substitutions.

SHOP DRAWINGS
Refer to Basic Requirements Section 01 00 00, Submittal Procedures, Shop Drawings.

Include data concerning dimensions, materials, efficiencies, installation instructions and appropriate identification.

Independent test reports verifying filter performance, test procedures and ratings.

OPERATION AND MAINTENANCE DATA
All operations and maintenance data shall comply with the submission and content requirements specified under section Basic Requirements.

DESIGN CRITERIA

Use UL Class 1 or Class 2 filters unless noted otherwise.(Reference applicable UL standard referenced).

Efficiencies indicated in this section are based on ASHRAE Standard 52.

Fan motors have been selected to operate against the resistance of dirty filters as specified in this section.

P A R T 2 - P R O D U C T S

MANUFACTURERS

American Air Filter, Barnebey-Cheney, Cambridge, Continental, Flanders, Camil-Farr, Mine Safety Appliances, Research Products, or approved equal.

MERV 8 FILTERS

Use 2" thick, pleated panels, 100% synthetic, self supported media fully bonded and sealed in cardboard frame.

Media nominal rating to be 500 FPM face velocity, 0.20 inch WG initial resistance, 1.0 inches WG recommended final resistance, Average arrestance of filter media shall be 90-92%
Furnish a side access housing or holding frame as scheduled.
Filter tracks shall be constructed to provide a minimum clearance of 2 inches between the pre-filter and final-filter media to facilitate the installation of static pressure tips.

MERV 11 FILTERS

Use 2" thick, pleated panels, 100% synthetic, self supported media fully bonded and sealed in cardboard frame.

Media nominal rating to be 500 FPM face velocity, 0.35 inch WG initial resistance, 1.0 inches WG recommended final resistance,.

Furnish a side access filter housing or holding frame as scheduled. Filter tracks shall be constructed to provide a minimum clearance of 2 inches between the pre-filter and final-filter media to facilitate the installation of static pressure tips.

HOUSINGS FOR MERV 8 FILTERS

Housing or holding frame to be of the same manufacturer as filter media or provided by the air handling unit manufacturer. Contractor fabricated housings or filter racks will not be accepted. Casing and tracks constructed of galvanized or enameled steel or aluminum. Provide access to the media tracks from outside the casing so media and be readily changed. Filter tracks shall be constructed to provide a minimum clearance of 2 inches between the pre-filter and final-filter media to facilitate the installation of static pressure tips.

SIDE ACCESS FILTER HOUSINGS

Galvanized steel housing with aluminum or galvanized steel filter mounting tracks. Mounting tracks and access doors to have gaskets to minimize air bypass around the filters. Housing assembly to be suitable for use in duct systems with 1.0-2.5 inches of water static pressure.

Standard filter sections provided by air handling unit manufacturers may be used for MERV 11 filters.

Insulate housings where adjacent duct or air handling apparatus is insulated. Insulation to be contained within a 2” thick, double wall steel panel and meet the requirements specified for adjacent duct or apparatus.

Furnish a door on each end of the housing to facilitate filter changing. Doors to be hinged and provided with lever handle latches to secure the door. Doors shall not be secured with nuts, bolts, wing nuts, or sheet metal screws.

Furnish housings for MERV 11 filters with a lever action sealing mechanism to secure media in tracks.
Filter bypass shall be less than 0.5% of design cfm.

Include an integral prefilter track for installation of MERV 8 prefilters. Filter tracks shall be constructed to provide a minimum clearance of 2 inches between the pre-filter and final-filter media to facilitate the installation of static pressure tips.

FILTER GAUGES
Manufacturers: Dwyer, or approved equal.

Direct reading, 3-1/2 inch dial type, diaphragm actuated, in a metal case. Lettering shall be black figures on white background. Provide front recalibration adjustment.

Provide gauges with the following ranges:

Filter Type	Scale Range (inch W.G.)
MERV 8	0.0 to 1.0
MERV 11	0.0 to 2.0

Provide one gauge for each filter bank, suitable for flush or surface mounting. Include an air filter gauge accessory package consisting of mounting bracket, aluminum tubing, two static pressure tips, and vent valves for each gauge

P A R T 3 - E X E C U T I O N

INSTALLATION
Where air handling equipment is to be used for temporary heating or ventilation of a facility, do not operate the equipment until specified filter media has been installed. Contractor shall be responsible for maintaining the cleanliness of air handling apparatus and air distribution systems during construction through regular inspection and changing of filter media throughout the construction period.

Where air handling apparatus is used during the construction period, install new filter media prior to start of air balancing. Additionally, deliver one new set of media to the owner prior to substantial completion.

Install units as shown on drawings and details according to manufacturer's instructions.

Reinforce filter holding frames per manufacturer's instructions.

Maintain necessary clearance for changing filters.

ULPA FILTER MEDIA
The filter assembly shall be leak tested and factory certified per referenced ASME and IES standards.

FILTER GAUGES
Install filter gauge static pressure tips upstream and downstream of filters. Mount gauge on outside of filter housing or filter plenum in accessible position outside of the unit housing; install tubing and gauge valves between gauge and sensor tips. Adjust and level each gauge.

CONSTRUCTION VERIFICATION ITEMS
Contractor is responsible for utilizing the construction verification checklists supplied under specification Section 01 91 01 in accordance with the procedures defined for construction verification checklists.

AGENCY TRAINING
All training provided for agency shall comply with the format, general content requirements and submission guidelines specified under Section 01 91 01.

END OF SECTION

SECTION 23 73 12
AIR HANDLING UNIT COILS

P A R T 1 - G E N E R A L

SCOPE
This section contains specifications for the air handling unit coils used in all central station air handling units for pre-purchase. Contractor shall be responsible for installation. Included are the following topics:

RELATED WORK
Section 23 73 13 - Modular Indoor Central-Station Air-Handling Units

REFERENCE
Applicable provisions of Basic Requirements Section 01 00 00 govern work under this section.

REFERENCE STANDARDS
ARI 410 Forced Circulation Air-Cooling and Air Heating Coils

QUALITY ASSURANCE
Refer to Basic Requirements Section 01 00 00, Substitutions.

SUBMITTALS
Refer to Basic Requirements Section 01 00 00, Submittal Procedures, Shop Drawings.

Including data concerning dimensions, capacities, flow rate, pressure drop, materials of construction, ratings, weights, and appropriate identification at the same time that the air handling equipment in which the coils will be located are submitted.

OPERATION AND MAINTENANCE DATA
All operations and maintenance data shall comply with the submission and content requirements specified under section Basic Requirements.

DESIGN CRITERIA
Select coil sizes, capacities, configuration, and operating characteristics as shown on the plans and/or as scheduled. Coil capacity ratings shall be ARI 410 certified.

P A R T 2 - P R O D U C T S

MANUFACTURERS
Aerofin, Carrier, McQuay, RAE Corporation, Trane, York, Marlo, Wing or Control Air.

CHILLED/HOT WATER COILS
Use galvanized steel casing, end supports, top channel, and bottom channel to produce a rigid frame with

allowance for expansion and contraction of the finned tube section.

Construct coils of 0.025 inch tube wall seamless copper tubes of 5/8 inch maximum outside diameter with maximum of 8 aluminum fins per inch suitable for working pressures to 125 psig and temperatures to 250°F. Coil fins may be the continuous serpentine or plate fin type.

Coil headers may be constructed of cast iron, steel, or seamless copper. Where cast iron headers are used, expand tubes into the headers. Where steel or copper headers are used braze tubes to header. Coils shall be drainable type with drain and vent plugs for each header.

PART 3 - EXECUTION

CHILLED/HOT WATER COILS

Install in central station air handling unit casings or on structural support frames for field erected units, making allowance for pitching as recommended by the manufacturer. Mount coils in field erected units to allow for individual removal.

Comb bent or crushed fins after installation. Clean dust and debris from each coil to ensure its cleanliness.

Install a separate air vent and drain valve for each coil header in such a manner that the vent and drain valves are located outside of air handling unit casing. Provide offsets in piping to facilitate coil removal.

Unless otherwise specified, pipe coils for counter flow arrangement.

Install condensate drain trap with proper depth from each cooling coil condensate drain to the nearest drain location.

CONSTRUCTION VERIFICATION ITEMS

Contractor is responsible for utilizing the construction verification checklists supplied under specification Section 01 91 01 in accordance with the procedures defined for construction verification checklists.

AGENCY TRAINING

All training provided for agency shall comply with the format, general content requirements and submission guidelines specified under Section 01 91 01.

END OF SECTION

SECTION 23 73 13
MODULAR INDOOR CENTRAL-STATION AIR-HANDLING UNITS

P A R T 1 - G E N E R A L

SCOPE

This section includes specifications for indoor central station package air handling units for pre-purchase. The manufacturer is responsible to provide all air handler unit scheduled equipment specified for this bid. This includes, but not limited to; fans, motors, belts, filters, humidifiers, coils, drain pans, access doors for each section, and dampers in and adjacent to the air handler. The manufacturer is responsible for the shipping of the equipment to the project site or storage location at the request of the General Contractor. The carbon filters, and variable frequency drives are provided by the Mechanical Contactor. The mechanical contactor is responsible for the installation of all equipment. The General Contractor is responsible for rigging and setting the air handling units. The manufacturer shall provide written document indicating the air handlers can structurally withstand the weight of the second air handler as indicated on drawing H1.1 detail C. Each air handling unit shall break down in order to fit all components through the existing louver. The louver openings are approximately 60" by 80". The manufacturer shall visit the site to verify the louver openings refer to front end documents for date and time. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work
- Reference
- Reference Standards
- Quality Assurance
- Submittals
- Operation and Maintenance Data
- Design Criteria
- Warranty

PART 2 - PRODUCTS
- Manufacturers
- Casings
- Fans
- Coils
- Filter Section
- Access Sections
- Filter/Mixing Box Section
- Damper Section

PART 3 - EXECUTION
- Installation
- Construction Verification Items
- Functional Performance Testing
- Agency Training

RELATED WORK

Section 23 05 13 - Common Motor Requirements for HVAC Equipment
Section 23 05 48 - Vibration and Seismic Controls for HVAC Piping and Equipment
Section 23 73 12 - Air Handling Unit Coils
Section 23 41 00 - Particulate Air Filtration

REFERENCE

Applicable provisions of Basic Requirements Section 01 00 00 govern work under this section.

REFERENCE STANDARDS

ARI 430 (latest edition)	Standard for Central Station Air Handling Units
NFPA 90A	Standard for Installation of Air Conditioning and Ventilation Systems

QUALITY ASSURANCE

Refer to Basic Requirements Section 01 00 00, Substitutions.

SUBMITTALS

Refer to Basic Requirements Section 01 00 00, Submittal Procedures, Shop Drawings.

Submit shop drawings including the following information: specific manufacturer and model numbers, submittal equipment identification corresponding to project drawings and schedules, unit dimensional and weight data, materials of construction, capacities and ratings, fan curves, fan type, drive and motor information (ref. 23 05 13), vibration isolation, coil performance data, sound power levels, filter information (ref. 23 41 00), information for all accessories.

OPERATION AND MAINTENANCE DATA

All operations and maintenance data shall comply with the submission and content requirements specified under section BASIC REQUIREMENTS.

DESIGN CRITERIA

Furnish factory fabricated packaged air handling units complete with fans, motors, drives, coils, drain pans, filter sections, access sections, damper sections, meeting the configuration shown on drawings and/or as scheduled.

Units to be tested, rated and certified in accordance with ARI Standard 430 and bear ARI certification label.

All material shall meet NFPA 90A flame spread and smoke develop rating requirements.

Each fan and motor combination shall be capable of delivering 110% of air quantity scheduled at scheduled static pressure. The motor furnished with the fan shall not operate into the motor service factor when operating under these conditions.

Consider drive efficiency in motor selection according to manufacturer's published recommendation or according to AMCA Publication 203, Appendix L.

Where inlet and outlet ductwork at any fan is changed from that shown on the drawings, provide any motor, drive and/or wiring changes required due to increased static pressure or baffling necessary to prevent uneven airflow or improve mixing.

WARRANTY

Provide a one year all-inclusive parts and labor warranty to begin upon operation of the air handler and close out of the project by the owner. The warranty shall include cost for the repair or replacement of defects in material or workmanship. The acceptance of the owner shall be after manufacturer’s equipment start-up. Disassembly and reassembly of air handler shall not affect warranties.

P A R T 2 - P R O D U C T S

MANUFACTURERS

Carrier, McQuay, Trane, York.

CASING

Double wall construction with heavy gauge steel framework and panels throughout mounted on an integral base rail. Casing shall have 2" thick, non-compressed, 1-1/2 lb./cu.ft. fiberglass thermal insulation between solid exterior and solid interior steel panels for all sections. Panels shall be gasketed and removable without affecting integrity of casing structure. Casing shall be airtight, watertight, rust inhibited with baked enamel or mill galvanized finish.

Access doors shall be double wall, of same construction and thickness as casing, hinged, continuously gasketed, with reinforced nylon handles. Door swing shall open in direction against pressure of unit. Provide access doors on both sides of casing for fan section, access sections, filter sections, damper sections and upstream and downstream of every coil.

Double wall, insulated drain pans shall be located below cooling coil section. Pans shall be sloped for removal of condensate.

FANS

Fans shall be double width, double inlet, forward curved centrifugal type, statically and dynamically balanced through entire range of operation.

Fans to be fastened to hollow or solid steel shafts and designed for continuous operation at maximum rated static pressure.

Fan bearings shall be self-aligning, pillow block, regreasable ball type selected for a minimum average L-50 life of 200,000 hours. Furnish extended grease lines from bearings to allow servicing from exterior of unit.

Furnish fixed pitch sheaves for drives 5 hp and larger. Drives shall be designed for 150% of motor rating.

Fan, drive and motor assembly shall be mounted inside fan casing section and integrally isolated within unit. Vibration isolation shall be in compliance with section 23 05 48. Provide flexible connection and thrust restraints at fan discharge connection to casing.

COILS

Coils furnished with package air handling unit in accordance with section 23 73 12.

Air handling unit coils mounted in casing shall be accessible for removal from either side of unit casing without disturbing adjacent sections.

Entire coil frame, headers and U-bends shall be enclosed within air handling unit casing. Extend coil piping connections, air vent and drain connections to exterior of casing. Provide sealing collars to prevent leakage where coil connections, air and drain connections penetrate air handling unit casing.

Support coils along entire length within casing and pitch coil for proper drainage.

Blank off space between coil frames and air handling unit casing.

FILTER SECTION

Filters shall be provided in accordance with section 23 41 00.

Filter box section may be furnished by air handling unit manufacturer in accordance with specification requirements of section 23 41 00. Filter box sections furnished by air handling unit manufacturer shall be of same construction as casing specified above. Provide static pressure tips that are arranged to prevent damage to the filter elements during replacement. Provide minimum 2” gap between final and prefilters for static pressure probes.

ACCESS SECTIONS

Same construction as casing with access doors as specified above on both sides of access section.

Provide access sections where shown on drawings.

MIXING BOX SECTION

Same construction as casing with access doors as specified above on both sides of mixing box section.

Outside air and return air dampers shall be parallel blade type with interconnecting linkage. Dampers shall be low leakage, not exceeding 5 cfm/sq. ft. at 1.0" w.g. Damper blades shall be double-skin airfoil type, with blade edge seals and metal compressible jamb seals. The damper blades shall be arranged so that the air streams are directed at one another to facilitate mixing. Damper linkage shall be extended outside the unit for external actuator mounting. Internal actuator mounting is not acceptable.

Reference drawings for damper arrangement.

DAMPER SECTION

Same construction as casing with access doors as specified above on both sides of damper section.

Outside air and return air dampers shall be parallel blade type with interconnecting linkage. Dampers shall be low leakage, not exceeding 5 cfm/sq. ft. at 1.0" w.g. Damper blades shall be double-skin airfoil type, with blade edge seals and metal compressible jamb seals. Damper linkage shall be extended outside the unit for external actuator mounting. Internal actuator mounting is not acceptable.

Reference drawings for damper arrangement top, rear, and bottom.

Unit shall be arranged in a stacked configuration with two redundant AHU's. A common outside air inlet shall service both AHU's. Outside air shall enter the upper AHU at the top and side. Air shall pass through the bottom of this unit into the lower AHU. A damper section shall be located at this transition between AHU's. Another damper shall be located at the leaving end of the upper AHU's mixing box to allow for isolation of this AHU when the lower unit is running.

P A R T 3 - E X E C U T I O N

INSTALLATION

Install all air handling units and accessories as indicated on drawings and/or as scheduled and according to manufacturer's installation instructions.

Mount units at appropriate height above floor to insure proper condensate trap depth and condensate drainage.

Install air-handling unit to provide for adequate service access. Coordinate with other trades to assure air handling unit does not infringe upon access or service clearances of other equipment.

Lubricate fan bearings. Verify fan isolators have proper deflection.

Upon completion of installation of air handling units, start-up and operate equipment to demonstrate capability and compliance with requirements. Field correct malfunctioning components, then retest to demonstrate compliance.

Furnish one spare set of fan drive belts and three reinforced nylon access door handles.

CONSTRUCTION VERIFICATION ITEMS

Contractor is responsible for utilizing the construction verification checklists supplied under specification Section 01 91 01 in accordance with the procedures defined for construction verification checklists.

FUNCTIONAL PERFORMANCE TESTING

Contractor is responsible for utilizing the functional performance test procedures supplied under specification Section 01 91 01 in accordance with the procedures defined for functional performance test procedures.

AGENCY TRAINING

All training provided for agency shall comply with the format, general content requirements and submission guidelines specified under Section 01 91 01.

END OF SECTION

AIR HANDLING UNIT SCHEDULE

			AHU-1	AHU-2
TAG			AHU-1	AHU-2
TYPE			VAV	VAV
SERVICE			STANDBY	PRIMARY
LOCATION			MECHANICAL ROOM	MECHANICAL ROOM
ARRANGEMENT			DRAW-THRU	DRAW-THRU
SYSTEM AIRFLOW	TOTAL AIRFLOW (CFM)		10,000	10,000
	MIN. OUTDOOR AIRFLOW (CFM)		1500	1500
SUPPLY FAN	FAN	QUANTITY	1	1
		FAN TYPE / WHEEL DIAM (IN)	AF/22	AF/22
		AIRFLOW (CFM)	10,000	10,000
		FAN SPEED (RPM)	2211	2211
		E.S.P. (IN WG)	2.50	2.50
		T.S.P. (IN WG)	4.26	4.26
	MOTOR	QUANTITY	1	1
		FAN HORSEPOWER (BHP)	12	12
		MOTOR HORSEPOWER (HP)	20	20
		SPEED (RPM)	1750	1750
		DRIVE	VFD	VFD
		VOLTS / PHASE / HERTZ	460/3/60	460/3/60
RETURN FAN	FAN	QUANTITY	1	1
		FAN TYPE / WHEEL DIAM (IN)	FC/18	FC/18
		AIRFLOW (CFM)	10,000	10,000
		FAN SPEED (RPM)	1155	1155
		E.S.P. (IN WG)	1.50	1.50
	MOTOR	QUANTITY	1	1
		FAN HORSEPOWER (BHP)	6.0	6.0
		MOTOR HORSEPOWER (HP)	10	10
		SPEED (RPM)	1,750	1,750
		DRIVE	VFD	VFD
		VOLTS / PHASE / HERTZ	460/3/60	460/3/60
COIL DATA	TYPE		STANDARD	STANDARD
	COIL	MIN. FACE AREA (SQ FT)	20.12	20.12
		MAX. FACE VELOCITY (FPM)	497	497
		ROWS	6	6
		QUANTITY / ARRANGEMENT	1	1
COOLING DATA	CAPACITY	NET TOTAL (MBH)	350	350
		NET SENSIBLE (MBH)	270	270
	FLUID	PERCENT GLYCOL & TYPE	0% / WATER	0% / WATER
		E.W.T. / L.W.T. (°F)	44/54	44/54
		FLOW RATE (GPM)	71	71
		MAX. P.D. (FT WG)	9.4	9.4
	AIR	UNIT E.A.T. DB / WB (°F)	77.4/64.2	77.4/64.2
		UNIT L.A.T. DB / WB (°F)	52.9/52.3	52.9/52.3
		MAX. A.P.D. (IN WG)	0.70	0.70
HEATING DATA	NET TOTAL CAPACITY (MBH)		260	260
	FLUID	PERCENT GLYCOL & TYPE	0% / WATER	0% / WATER
		E.W.T. / L.W.T. (°F)	80/59.3	80/59.3
		FLOW RATE (GPM)	25	25
		MAX. P.D. (FT WG)	1.5	1.5
	AIR	UNIT E.A.T. / L.A.T. (°F)	42/65	42/65
		MAX. A.P.D. (IN WG)	0.60	0.60
HUMIDIFIER DATA	STEAM CAPACITY (LBS/HR)		54	54
		CURRENT DRAW	25.3	25.3
		ABSORBTION DISTANCE (IN)	24	24
		VOLTS/PHASE/HERTZ	460/3/60	460/3/60
FILTERS	PRE	THICKNESS & TYPE	2" FLAT	2" FLAT
		MIN. EFF. RATING VALUE	30%	30%
		MIN. FACE AREA (SQ FT)	23.0	23.0
		MAX. FACE VELOCITY (FPM)	435	435
		DESIGN A.P.D. (DIRTY) (IN WG)	1.0	1.0
		CLEAN A.P.D. (IN WG)	0.6	0.6
	FINAL	THICKNESS & TYPE	2" FLAT	2" FLAT
		MIN. EFF. RATING VALUE	65%	65%
		MIN. FACE AREA (SQ FT)	23.0	23.0
		MAX. FACE VELOCITY (FPM)	435	435
		DESIGN A.P.D. (DIRTY) (IN WG)	1.0	1.0
		CLEAN A.P.D. (IN WG)	0.6	0.6
MAX. UNIT DIMENSIONS	LENGTH (IN)		244	244
	WIDTH (IN)		84	84
	HEIGHT (IN)		64	64
	WEIGHT (LBS)		4788	4788
DESIGN SPACE TEMPERATURE	SUMMER, DB / %RH		68/50	68/50
	WINTER, DB		72	72

REMARKS

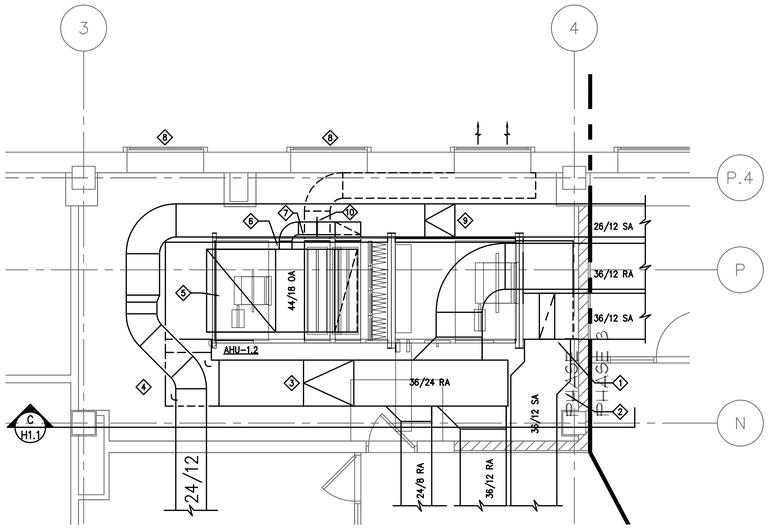
1. PROVIDE UNIT WITH VARIABLE SPEED FANS. VARIABLE FREQUENCY DRIVE BY MECHANICAL CONTRACTOR.
2. DISCONNECTS SHALL BE PROVIDED BY VENDOR.
3. DIRTY FILTER STATIC PRESSURE SHALL BE UTILIZED TO DETERMINE FAN TOTAL STATIC PRESSURE.
4. FAN MUST BE STABLE DOWN TO 30% OF CFM.
5. COIL SHALL BE CAPABLE OF BEING REMOVED FROM WITHIN THE UNIT ENCLOSURE.
6. COIL FRAMES SHALL HAVE MOUNTING ANGLES FOR SHEET-METAL
7. PROVIDE PREMANUFACTURED CURB.
8. CONTRACTOR TO VERIFY ACCESS TO MECHANICAL ROOM FOR COORDINATION.
9. ALL CONTROL DAMPERS, INCLUDING BUT NOT LIMITED TO ALL AHU ISOLATION DAMPERS, ALL RELIEF AIR DAMPERS, ALL RETURN AIR DAMPERS, THE MINIMUM OA DAMPER, THE ECONOMIZER DAMPER, AND THE OA PASS THROUGH DAMPER SHALL BE PROVIDED BY THE AIR HANDLING UNIT MANUFACTURER. REFER TO SHEET H6.1.
10. AHU HAS ONE COIL TO BE UTILIZED AS BOTH A HEATING OR COOLING COIL AS REQUIRED.

GENERAL NOTES:

1. CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS.
2. CONTRACTOR TO ENSURE AREAS REMAIN OPERATIONAL DURING CONSTRUCTION.
3.

KEYED NOTES:

1. 36/12 SUPPLY AIR DOWN TO TOP OF SUPPLY AIR PLENUM.
2. OFFSET SUPPLY AIR DUCT AROUND COLUMN AS SHOWN.
3. SLOPE 36/24 RETURN AIR DUCT DOWN 1'-9". SEE C/H3.1.
4. MAINTAIN 3'-0" CLEARANCE BETWEEN FRONT OF ELECTRICAL EQUIPMENT AND EDGE OF RETURN AIR PLENUM. SEE C/H1.1.
5. 54/66 OA DOWN FROM INTAKE ON LOW ROOF. SEE C/H1.1.
6. TAP 18/10 OA DUCT TO SIDE OF OA PLENUM AND CONNECT FULL SIZE ON AHU-1 AND AHU-2 SIDE OA INTAKE AS SHOWN.
7. ROUTE RELIEF AIR FULL SIZE OF AHU-1 AND AHU-2 OUT THROUGH NEW LOUVER AS SHOWN.
8. BLANK OFF AND INSULATE UNUSED LOUVER AS SHOWN.
9. SLOPE ENGINEERING SUPPLY AIR DUCT UP APPROXIMATELY 1'-2" AS REQUIRED TO AVOID OA INTAKE DUCT. SEE C/H1.1.
10. AIRFLOW MEASURING STATION. MAINTAIN 1'-8" CLEAR FROM TAPS, BENDS, OR TRANSITIONS, BEFORE AND AFTER TO MAINTAIN ACCURACY.



A H1.1 HVAC NEW WORK PLAN – DUCTWORK

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

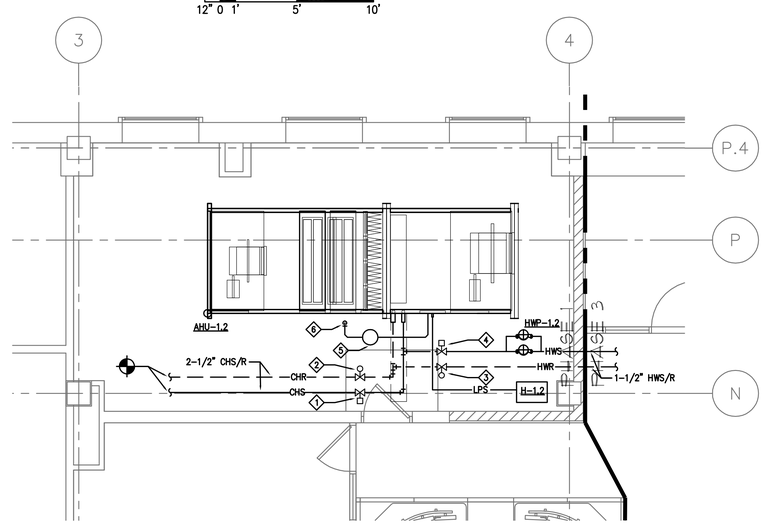
12" 0 1' 5' 10'

GENERAL NOTES:

1. CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS.
2. CONTRACTOR TO ENSURE AREAS REMAIN OPERATIONAL DURING CONSTRUCTION.
3.

KEYED NOTES:

1. CHILLED WATER ISOLATION VALVE. SEE A/H1.2
2. CHILLED WATER CONTROL VALVE. SEE A/H1.2
3. HEATING WATER ISOLATION VALVE. SEE A/H1.2
4. HEATING WATER CONTROL VALVE. SEE A/H1.2
5. DRAIN COOLER.
6. ROUTE STEAM CONDENSATE OPEN SITE TO FLOOR DRAIN.



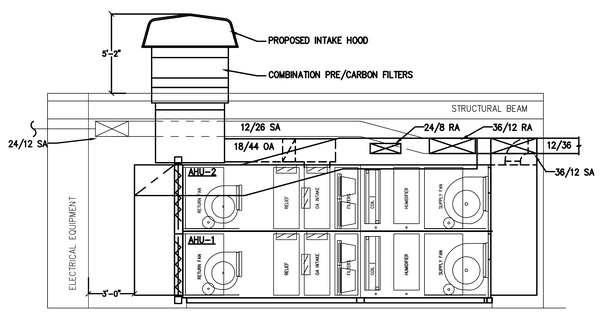
B H1.1 HVAC NEW WORK PLAN – PIPING

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

12" 0 1' 5' 10'

GENERAL NOTE:

THE MANUFACTURER IS RESPONSIBLE TO PROVIDE ALL AIR HANDLER UNIT SCHEDULED EQUIPMENT AND SPECIFIED FOR THIS BID. THIS INCLUDES, BUT NOT LIMITED TO; FANS, MOTORS, BELTS, FILTERS, HUMIDIFIERS, COILS, DRAIN PANS, ACCESS DOORS FOR EACH SECTION, AND DAMPERS IN AND ADJACENT TO THE AIR HANDLER. THE MANUFACTURER IS RESPONSIBLE FOR THE SHIPPING OF THE EQUIPMENT TO THE PROJECT SITE OR STORAGE LOCATION AT THE REQUEST OF THE GENERAL CONTRACTOR. THE CARBON FILTERS AND VARIABLE FREQUENCY DRIVES ARE PROVIDED BY THE MECHANICAL CONTRACTOR. THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF ALL EQUIPMENT. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR RIGGING AND SETTING THE AIR HANDLING UNITS. THE MANUFACTURER SHALL PROVIDE WRITTEN DOCUMENT INDICATING THE AIR HANDLERS CAN STRUCTURALLY WITHSTAND THE WEIGHT OF THE SECOND AIR HANDLER AS INDICATED ON DRAWING H1.1 DETAIL C. THE AIR HANDLING UNIT SHALL BREAK DOWN IN ORDER TO FIT ALL COMPONENTS THROUGH THE LOUVER. THE LOUVER OPENINGS ARE APPROXIMATELY 60" BY 80". THE MANUFACTURER SHALL VISIT THE SITE TO VERIFY THE LOUVER OPENINGS REFER TO FRONT END DOCUMENTS FOR DATE AND TIME.



C H1.1 SECTION A – MECHANICAL ROOM

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

12" 0 1' 5' 10'

PRELIMINARY NOT FOR CONSTRUCTION

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Date of Issue 04/02/09

No.	Description	Date

Reference Diagram

Reference Plan

Dane County
Public Safety
Communications
Center Infrastructure
Upgrades

1st Floor
City County Building
210 Martin Luther
King Jr. Blvd.
Madison, Wisconsin

/Venture/Architects

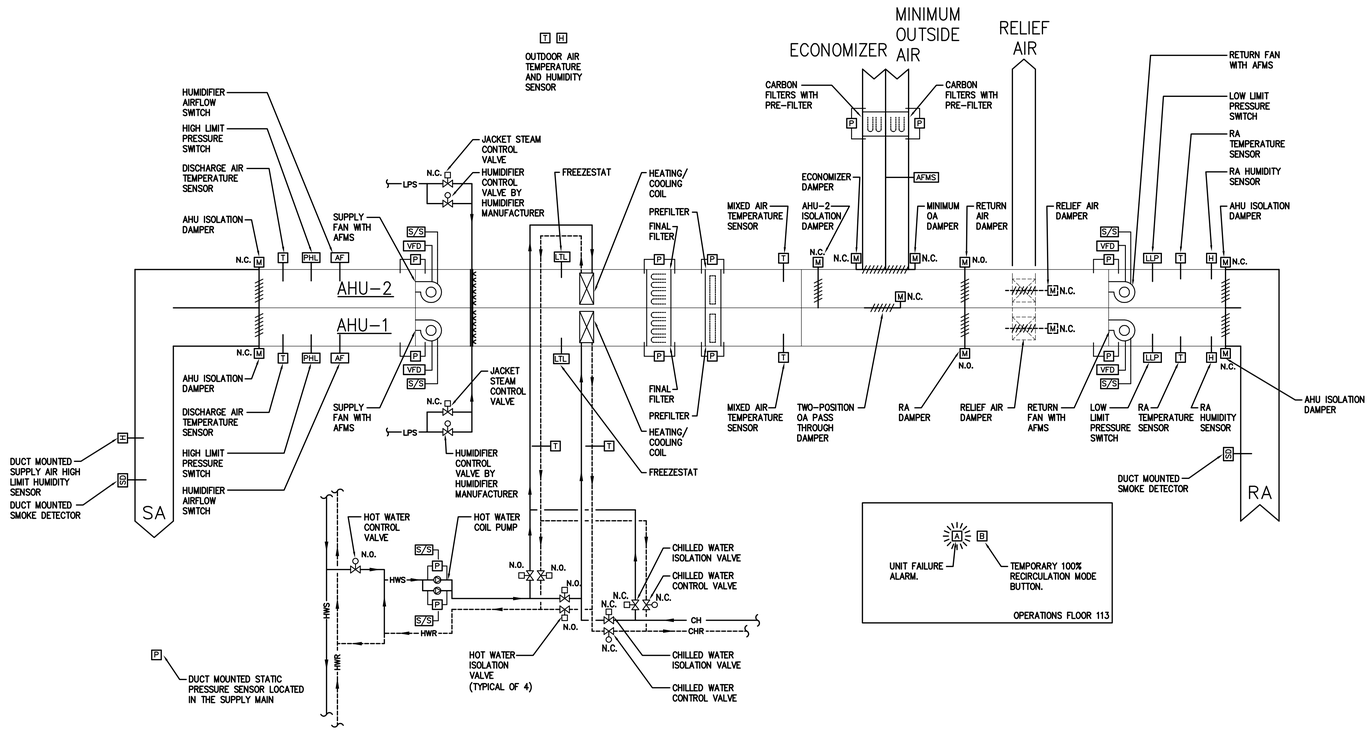
Venture Architects
2089 E. Highland
Milwaukee, WI 53203
Telephone: 414-271-3399

COUNTY BID # 109054

VA PROJECT # 208006

Sheet Name
HVAC NEW WORK PLAN - DUCTWORK AND PIPING

Sheet No.
H1.1



CONTROL SEQUENCE

PROVIDE AND INSTALL ALL CONTROLS NECESSARY TO PERFORM THE FUNCTIONS LISTED.

ALL CONTROLS SHALL BE PERFORMED BY DIRECT DIGITAL CONTROL (DDC) SYSTEMS WITH ELECTRIC ACTUATION, UNLESS NOTED OTHERWISE.

PROVIDE ALL CONTROL DAMPERS WITH ELECTRIC OPERATORS AND LINKAGES, UNLESS NOTED OTHERWISE. WHENEVER FANS ARE OFF, RELATED CONTROL AIR DAMPERS SHALL MOVE TO FAIL POSITIONS.

PROVIDE ALL TEMPERATURE CONTROL VALVES WITH ELECTRIC OPERATORS, UNLESS NOTED OTHERWISE.

ALL CONTROL DAMPERS, UNIT ISOLATION DAMPERS, AND DAMPER ACTUATORS ARE PROVIDED BY THE AIR HANDLING UNIT MANUFACTURER. SMOKE DETECTORS ARE PROVIDED AND WIRED BY THE ELECTRICAL CONTRACTOR BUT INSTALLED BY THE MECHANICAL CONTRACTOR.

AHU OPERATION: AHU RUNS CONTINUOUSLY. AHU-1 AND AHU-2 ARE REDUNDANT SYSTEMS FOR 100% BACKUP. DDC SYSTEM SHALL DESIGNATE ONE UNIT AS PRIMARY AND ONE UNIT AS STANDBY. PRIMARY UNIT SHALL RUN CONTINUOUSLY. UNIT ISOLATION DAMPERS OF PRIMARY UNIT SHALL REMAIN FULLY OPEN. STANDBY UNIT SHALL REMAIN SHUT DOWN CONTINUOUSLY. HOT WATER ISOLATION VALVES, CHILLED WATER ISOLATION VALVE, CHILLED WATER CONTROL VALVE, UNIT ISOLATION DAMPERS, AND RELIEF AIR DAMPER OF STANDBY UNIT SHALL REMAIN FULLY CLOSED. WHENEVER AHU-1 IS DESIGNATED THE PRIMARY UNIT, THE OA PASS THROUGH DAMPER SHALL BE OPEN. WHENEVER AHU-1 IS DESIGNATED AS THE STANDBY UNIT, THE OA PASS THOUGH DAMPER SHALL BE CLOSED. UPON FAILURE OF PRIMARY UNIT FOR ANY REASON STANDBY UNIT SHALL BECOME PRIMARY UNIT, ALARM SHALL BE SENT TO DDC SYSTEM, AND UNIT FAILURE ALARM SHALL SOUND IN SPACE. STANDBY AND PRIMARY UNIT DESIGNATIONS SHALL BE AUTOMATICALLY ROTATED BY DDC SYSTEM ON AN ADJUSTABLE, PERIODIC BASIS.

ECONOMIZER: DDC SYSTEM SHALL INDEX THE SYSTEM INTO ECONOMIZER MODE WHEN OUTSIDE AIR ENTHALPY IS BELOW RETURN AIR ENTHALPY. WHEN RETURN AIR ENTHALPY IS ABOVE OUTSIDE AIR ENTHALPY, DDC SYSTEM SHALL INDEX THE SYSTEM INTO MINIMUM OUTSIDE AIR MODE. WHEN IN ECONOMIZER MODE, ECONOMIZER DAMPER SHALL BE FULLY OPEN, RETURN AIR DAMPER SHALL BE FULLY CLOSED, AND RELIEF AIR DAMPER SHALL BE FULLY OPEN. IF THE MIXED AIR TEMPERATURE FALLS BELOW 55°F (ADJUSTABLE), ECONOMIZER DAMPER, RETURN AIR DAMPER, AND RELIEF AIR DAMPER SHALL MODULATE TO MAINTAIN THE MIXED AIR TEMPERATURE AT 55°F (ADJUSTABLE). WHEN IN MINIMUM OUTSIDE AIR MODE, ECONOMIZER DAMPER SHALL BE FULLY CLOSED AND RETURN AIR DAMPER AND RELIEF AIR DAMPER SHALL BE IN MIN OA POSITION.

MINIMUM OUTSIDE AIR: WHEN SUPPLY FAN IS ON, THE MINIMUM OA DAMPER, THE RA DAMPER OF THE PRIMARY UNIT, AND THE RELIEF AIR DAMPER OF THE PRIMARY UNIT SHALL BE POSITIONED BY DDC SYSTEM TO FURNISH MINIMUM OUTSIDE AIR QUANTITY, AS SCHEDULED AND AS MEASURED BY MINIMUM OA AFMS.

DURING NORMAL OPERATION THE ECONOMIZER AND MINIMUM OA SHALL FUNCTION AS DETAILED ABOVE. DURING TEMPORARY 100% RECIRCULATION MODE, THE RELIEF AIR DAMPER, THE MINIMUM OA DAMPER, THE ECONOMIZER DAMPER, AND THE OA PASS THROUGH DAMPER SHALL CLOSE AND THE RETURN AIR DAMPER SHALL OPEN FULLY. WHEN THE TEMPORARY 100% RECIRCULATION MODE BUTTON IS PRESSED DURING NORMAL MODE, THE DDC SYSTEM SHALL OPERATE THE PRIMARY AIR HANDLING UNIT IN TEMPORARY 100% RECIRCULATION MODE FOR 15 MINUTES (ADJUSTABLE). WHEN THE TEMPORARY 100% RECIRCULATION MODE BUTTON IS PRESSED DURING TEMPORARY 100% RECIRCULATION MODE, THE DDC SYSTEM SHALL OPERATE THE PRIMARY AIR HANDLING UNIT IN TEMPORARY 100% RECIRCULATION MODE FOR 4 HOURS (ADJUSTABLE). THE PRIMARY AIR HANDLING UNIT SHALL RETURN TO NORMAL MODE FOLLOWING THE TEMPORARY 100% RECIRCULATION MODE.

HEATING/COOLING COIL: WHEN THE DISCHARGE AIR TEMPERATURE FALLS BELOW 53°F (ADJUSTABLE), THE CHILLED WATER ISOLATION VALVES AND THE CHILLED WATER CONTROL VALVE SHALL CLOSE, THE HOT WATER ISOLATION VALVES SHALL OPEN, AND THE HOT WATER CONTROL VALVE SHALL MODULATE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE AT 55°F (ADJUSTABLE). PRIMARY HOT WATER COIL PUMP SHALL RUN CONTINUOUSLY WHENEVER THE HOT WATER ISOLATION VALVES ARE OPEN. WHEN THE DISCHARGE AIR TEMPERATURE RISES ABOVE 57°F (ADJUSTABLE), THE HOT WATER CONTROL VALVE AND THE HOT WATER ISOLATION VALVES SHALL CLOSE, THE CHILLED WATER ISOLATION VALVE SHALL OPEN, AND THE CHILLED WATER CONTROL VALVE SHALL MODULATE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE AT 55°F (ADJUSTABLE). THE DDC SYSTEM SHALL SWITCH THE PRIMARY/STANDBY PUMP DESIGNATIONS AND INITIATE ALARM ON FAILURE OF THE PRIMARY PUMP. STANDBY AND PRIMARY PUMP DESIGNATIONS SHALL BE AUTOMATICALLY ROTATED BY DDC SYSTEM ON AN ADJUSTABLE, PERIODIC BASIS. PROVIDE LOW LEAVING WATER TEMPERATURE ALARM AND SHUT DOWN.

WHENEVER THE SUPPLY FAN OF EITHER UNIT IS OFF, THE CORRESPONDING HOT WATER ISOLATION VALVES, CHILLED WATER ISOLATION VALVE, AND CHILLED WATER CONTROL VALVE SHALL CLOSE.

AHU SYSTEM SMOKE CONTROL: ELECTRONIC SMOKE DETECTOR PROVIDED AND WIRED BY E.C. BUT INSTALLED BY MECHANICAL CONTRACTOR IN AHU SUPPLY AIR PLENUM SHALL SENSE SMOKE IN AIRSTREAM, SEND ALARM TO FIRE ALARM SYSTEM (BY E.C.) AND PROVIDE SIGNAL TO DDC TO SHUT DOWN AHU SUPPLY FAN AND RETURN FAN AND MOVE ALL ASSOCIATED CONTROL VALVES AND CONTROL DAMPERS TO FAIL POSITIONS. DUCT SMOKE DETECTOR(S) LOCATED IN THE RETURN AIR DUCT SHALL PROVIDE A SIGNAL TO THE FIRE ALARM SYSTEM WHICH SHALL CLOSE ALL SUPPLY AND RETURN SMOKE DAMPERS SERVED BY THE UNIT, TRANSMIT A SIGNAL TO THE DDC SYSTEM, AND THE UNIT FAILURE ALARM SHALL SOUND.

FILTERS: MONITOR DIRT LOADING OF FILTERS VIA MEASUREMENT OF PRESSURE DIFFERENTIAL ACROSS PREFILTER, CARBON FILTERS, AND FINAL FILTER BANKS. INDICATE ALARM THROUGH THE DDC WHEN DIFFERENTIAL PRESSURE EXCEEDS (ADJUSTABLE) SETPOINT.

SUPPLY FAN: MODULATE SUPPLY FAN SPEED THROUGH VFD. PROVIDE STATIC PRESSURE SENSOR IN THE DISTRIBUTION DUCTWORK AT THE END OF THE SYSTEM. VFD SHALL MODULATE TO MAINTAIN STATIC PRESSURE SETPOINT. LIMIT FAN DISCHARGE STATIC PRESSURE; WHEN EXCEEDED, ALARM INDICATION SHALL BE INDICATED THROUGH THE DDC, SUPPLY AND RETURN FANS SHALL SHUT DOWN, AND ALL VALVES AND DAMPERS SHALL MOVE TO FAIL POSITIONS. DESIRED DISCHARGE STATIC PRESSURE AND DISCHARGE STATIC PRESSURE HIGH LIMIT TO BE DETERMINED DURING TESTING, ADJUSTING, AND BALANCING BY TAB CONTRACTOR.

RETURN FAN: AN AIR FLOW MONITOR LOCATED AT THE RETURN FAN INLET SHALL MODULATE THE VARIABLE FREQUENCY DRIVE ON THE RETURN FAN TO MAINTAIN A CONSTANT (RETURN CFM) = (SUPPLY CFM) – (EXHAUST CFM).

HUMIDIFIER STEAM VALVE SHALL BE ENABLED TO OPERATE WHEN AIR HANDLING UNIT SUPPLY FAN IS ON AND CHILLED WATER CONTROL VALVE IS CLOSED. HUMIDIFIER JACKET 2-POSITION STEAM VALVE SHALL OPEN WHEN HUMIDIFIER IS ENABLED AND SHALL CLOSE WHEN HUMIDIFIER IS DISABLED. HUMIDIFIER CAPACITY SHALL BE MODULATED VIA HUMIDIFIER STEAM VALVE TO MAINTAIN CONSTANT DISCHARGE AIR HUMIDITY SETPOINT AT HUMIDITY SENSOR LOCATED IN SUPPLY DUCT AT LEAST 6 FEET DOWNSTREAM OF HUMIDIFIER. DISCHARGE AIR HUMIDITY SETPOINT SHALL BE RESET BY CONTROLLING HUMIDITY SENSOR BETWEEN ZERO AND 90% RH (MAX.). HUMIDIFIER STEAM VALVE SHALL BE DISABLED WHEN DISCHARGE AIR HUMIDITY EXCEEDS 90% AT 55°F. CONTROLLING HUMIDITY SENSOR SHALL BE LOCATED IN MAIN RETURN AIR DUCTWORK BEFORE MIXING WITH OUTSIDE AIR. CONTROLLING HUMIDITY SETPOINT SHALL BE RESET FROM 25% RH TO 45% RH (ADJUSTABLE) AS OUTSIDE AIR TEMPERATURE VARIES FROM –10 TO 50°F. INTERLOCK HUMIDIFIER MODULATING STEAM VALVE WITH TEMPERATURE SWITCH FURNISHED WITH HUMIDIFIER AND LOCATED IN HUMIDIFIER SEPARATOR CONDENSATE LINE TO PREVENT HUMIDIFIER OPERATION UNTIL CONDENSATE HAS REACHED TEMPERATURE OF APPROXIMATELY 205°F, NOT ADJUSTABLE. INSTALL RESTRICTING ELEMENT ACCORDING TO HUMIDIFIER MANUFACTURER'S INSTRUCTIONS.

INTERLOCKS: REFER TO SPECIFIC EQUIPMENT CONTROL SEQUENCES SUCH AS EXHAUST FANS FOR INTERLOCK REQUIREMENTS WITH THIS UNIT.
THE FOLLOWING SAFETY INTERLOCKS SHALL BE ACCOMPLISHED THROUGH HARDWIRED RELAY CONNECTIONS OR AUXILIARY CONTACTS AND SHALL ENABLE EQUIPMENT OR SYSTEMS TO OPERATE WHEN AIR HANDLING UNIT SUPPLY FAN IS ON.
- SMOKE DETECTORS
- HIGH AND LOW PRESSURE SWITCHES
- LOW TEMPERATURE LIMIT SWITCH (FREEZESTAT)

INTERLOCK THE FOLLOWING AUXILIARY EQUIPMENT
- HUMIDIFIER VIA AIR FLOW SWITCH.

LOW TEMPERATURE LIMIT SWITCH (FREEZESTAT) SHALL BE DIRECTLY WIRED THROUGH MOTOR CONTROL CIRCUIT TO STOP AIR HANDLING UNIT AND CLOSE UNIT ISOLATION DAMPERS UPON SENSING AIR TEMPERATURE BELOW 38°F (ADJUSTABLE). STATUS OF TEMPERATURE SWITCH SHALL BE REPORTED TO THE DDC SYSTEM. TEMPERATURE SWITCH MUST BE MANUALLY RESET BEFORE AIR HANDLING UNIT CAN BE STARTED.

HIGH STATIC PRESSURE SAFETY SWITCH (2" WG, ADJUSTABLE) ON SUPPLY FAN DISCHARGE AIR AND LOW STATIC PRESSURE SAFETY SWITCH (–1" WG, ADJUSTABLE) ON RETURN FAN SUCTION SHALL BE DIRECTLY WIRED THROUGH MOTOR CONTROL CIRCUIT TO SHUT DOWN UNIT IMMEDIATELY TO PREVENT OVER PRESSURIZING OR COLLAPSING DUCTWORK IF CONTROL SYSTEM FAILS. STATUS OF EACH PRESSURE SWITCH SHALL BE REPORTED TO HVAC CONTROL DDC SYSTEM. PRESSURE SWTCHES MUST BE MANUALLY RESET BEFORE AIR HANDLING UNIT CAN BE STARTED.

FAILURE MODE: FAN FAILURE ALARM SHALL BE GENERATED IF SUPPLY FAN DOES NOT START WITHIN 2 MINUTES. FAILURE SHALL BE RESET MANUALLY THROUGH DDC SYSTEM SOFTWARE. FAILURE MODE SHALL BE INITIATED WHEN UNIT IS SHUTDOWN DUE TO ONE OF SAFETY CONTROLS OR FROM LOSS OF SIGNAL. UPON VFD FAILURE, FAN SHALL SHUT DOWN PER STOP SEQUENCE AND DDC SYSTEM SHALL ANNUNCIATE ALARM CONDITION FOR RESPECTIVE VFD ALARM STATUS RELAY.

A / H6.1 AIR HANDLING UNIT CONTROL (AHU-1 AND AHU-2)

NO SCALE

THIS DRAWING IS FOR REFERENCE ONLY

PRELIMINARY NOT FOR CONSTRUCTION

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Date of Issue 04/02/09

No.	Description	Date

Reference Diagram

Reference Plan

Dane County Public Safety Communications Center Infrastructure Upgrades

1st Floor
City County Building
210 Martin Luther King Jr. Blvd.
Madison, Wisconsin

VentureArchitects

Venture Architects
309 E Highland
Milwaukee, WI 53202
Telephone 414-271-3355

COUNTY BID # 109054

VA PROJECT # 208006

Sheet Name
HVAC CONTROL SEQUENCES

Sheet No.
H1.2