Solicitation 01111-12

Services, Energy Management Integration

Collin County

Bid 01111-12
Services, Energy Management Integration

Bid Number	**01111-12**
Bid Title	**Services, Energy Management Integration**
Bid Start Date	**In Held**
Bid End Date	**Apr 19, 2012 2:00:00 PM CDT**
Question & Answer End Date	**Apr 13, 2012 5:00:00 PM CDT**
Bid Contact	**Sara Hoglund CPPB** **Contract Administrator** **Purchasing Department** **972-548-4104** **shoglund@co.collin.tx.us**
Contract Duration	**One Time Purchase**
Contract Renewal	**Not Applicable**
Prices Good for	**30 days**
Standard Disclaimer	*****Note to Bidders/Offerors~The following standard disclaimer applies to Invitation to Bid (IFB), Competitive Sealed Proposal (CSP), and Request for Proposal (RFP) ONLY, not applicable to Request for Qualifications (RFQ) or Request for Information (RFI).***** **Mailing Address:** **Collin County Purchasing** **2300 Bloomdale Rd., Ste 3160** **McKinney, TX 75071** **Prices bid/proposed shall only be considered if they are provided in the appropriate space (s) on the Collin County bid form(s). For consideration, any additions or deductions to the bid/proposal prices offered must be shown under the exceptions section of the bid/proposal in the case of electronic submittal, ONLY in the case of a hard copy submittal will an additional attachment be allowed. Extraneous numbers, prices, comments, etc. or bidder/offeror generated documents appearing elsewhere on the bid or as an additional attachment shall be deemed to have no effect on the prices offered in the designated locations.** **All delivery and freight charges (F.O.B. inside delivery at Collin County designated locations) are to be included as part of the bid/quote/proposal price. All components required to render the item complete, installed and operational shall be included in the total bid/quote/proposal price. Collin County will pay no additional freight/delivery/installation/setup fees.**

Item Response Form

Item	**01111-12--01-01 - Provide price for Phase 1 Courthouse Addition**
Quantity	**1 each**
Unit Price	
Delivery Location	**Collin County** Collin County- See P.O. See P.O. for Delivery Location 2300 Bloomdale Rd. Ste. 3160 McKinney TX 75071 **Qty** 1

Description
Provide price for Phase 1 Courthouse Addition

Item	**01111-12--01-02 - Provide price for Phase 2 Courthouse Renovation**
Quantity	**1 each**
Unit Price	
Delivery Location	**Collin County** Collin County- See P.O. See P.O. for Delivery Location 2300 Bloomdale Rd. Ste. 3160 McKinney TX 75071 **Qty** 1

Description
Provide price for Phase 2 Courthouse Renovation

COLLIN COUNTY, TEXAS
TERMS AND CONDITIONS

1.0 GENERAL INSTRUCTIONS

1.0.1 Definitions

1.0.1.1 Bidder/Quoter/Offeror: refers to submitter.

1.0.1.2 Vendor/Contractor/Provider: refers to a Successful Bidder/Quoter/Contractor/Service Provider.

1.0.1.3 Submittal: refers to those documents required to be submitted to Collin County, by a Bidder/Quoter/Offeror.

1.0.1.4 IFB: refers to Invitation For Bid.

1.0.1.5 RFQ: refers to Request For Qualifications

1.0.1.6 RFP: refers to Request For Proposal.

1.0.1.7 RFI: refers to Request For Information.

1.0.1.8 CSP: refers to Competitive Sealed Proposal

1.0.1.9 Quotation: refers to Request for Quotation

1.1 If Bidder/Quoter/Offeror do not wish to submit an offer at this time, please submit a No Bid Form.

1.2 Awards shall be made not more than ninety (90) days after the time set for opening of submittals.

1.3 Collin County is always conscious and extremely appreciative of your time and effort in preparing your submittal.

1.4 Collin County exclusively uses BidSync for the notification and dissemination of all solicitations. The receipt of solicitations through any other company may result in your receipt of incomplete specifications and/or addendums which could ultimately render your bid non-compliant. Collin County accepts no responsibility for the receipt and/or notification of solicitations through any other company.

1.5 A bid/quote/submittal may not be withdrawn or canceled by the bidder/quoter/offeror prior to the ninety-first (91st) day following public opening of submittals and only prior to award.

1.6 It is understood that Collin County, Texas reserves the right to accept or reject any and/or all Bids/Quotes/Proposals/Submittals for any or all products and/or services covered in an Invitation For Bid (IFB), Request For Qualifications (RFQ), Request For Proposal (RFP), Request For Information (RFI), Competitive Sealed Proposal (CSP), and Quotation, and to waive informalities or defects in submittals or to accept such submittals as it shall deem to be in the best interest of Collin County.

1.7 All IFB's, RFP's, CSP's, RFQ's, and RFI's submitted in hard copy paper form shall be submitted in a sealed envelope, plainly marked on the outside with the IFB/RFP/RFQ/RFI/CSP/Quotation number and name. A hard copy paper form submittal shall be manually signed in ink by a person having the authority to bind the firm in a contract. Submittals shall be mailed or hand delivered to the Collin County Purchasing Department.

1.8 No oral, telegraphic or telephonic submittals will be accepted. IFB's, RFP's, RFQ's, CSP's, and RFI's, may be submitted in electronic format via **BidSync**.

1.9 All Invitation For Bids (IFB), Request For Proposals (RFP), Request For Qualifications (RFQ), Competitive Sealed Proposals (CSP), and Request For Information (RFI), submitted electronically via **BidSync** shall remain locked until official date and time of opening as stated in the Special Terms and Conditions of the IFB, RFP, RFQ, CSP, and/or RFI.

1.10 Time/date stamp clock in Collin County Purchasing Department shall be the official time of receipt for all Invitation For Bids (IFB), Request For Proposals (RFP), Request For Qualifications (RFQ), Competitive Sealed Proposals (CSP), Request For Information (RFI), submitted in hard copy paper form. IFB's, RFP's, RFQ's, CSP's, RFI's, received in County Purchasing Department after submission deadline shall be considered void and unacceptable. Absolutely no late submittals will be considered. Collin County accepts no responsibility for technical difficulties related to electronic submittals.

1.11 For hard copy paper form submittals, any alterations made prior to opening date and time must be initialed by the signer of the IFB/RFQ/RFP/CSP/RFI/, guaranteeing authenticity. Submittals cannot be altered or amended after submission deadline.

1.12 Collin County is by statute exempt from the State Sales Tax and Federal Excise Tax; therefore, the prices submitted shall not include taxes.

1.13 Any interpretations, corrections and/or changes to an Invitation For Bid/Request For Qualifications/Request For Proposal/Request for Information/Competitive Sealed Proposal, and related Specifications or extensions to the opening/receipt date will be made by addenda to the respective document by the Collin County Purchasing Department. Questions and/or clarification requests must be submitted no later than seven (7) days prior to the opening/receipt date. Those received at a later date may not be addressed prior to the public opening. Sole authority to authorize addenda shall be vested in Collin County Purchasing Agent as entrusted by the Collin County Commissioners' Court. Addenda may be transmitted electronically via **BidSync**, by facsimile, E-mail transmission or mailed via the US Postal Service.

1.13.1 Addenda will be transmitted to all that are known to have received a copy of the IFB/RFQ/RFP/RFI/CSP and related Specifications. However, it shall be the sole responsibility of the Bidder/Quoter/Offeror to verify issuance/non-issuance of addenda and to check all avenues of document availability (i.e. **BidSync at www.bidsync.com** , telephoning Purchasing Department directly, etc.) prior to opening/receipt date and time to insure Bidder/Quoter/Offeror's receipt of any addenda issued. Bidder/Quoter/Offeror shall acknowledge receipt of all addenda.

1.14 All materials and services shall be subject to Collin County approval.

1.15 Collin County reserves the right to make award in whole or in part as it deems to be in the best interest of the County.

1.16 The Bidder/Quoter/Offeror shall comply with Commissioners' Court Order No. 96-680-10-28, Establishment of Guidelines & Restrictions Regarding the Acceptance of Gifts by County Officials & County

Employees.

1.17 Any reference to model/make and/or manufacturer used in specifications is for descriptive purposes only. Products/materials of like quality will be considered.

1.18 Bidders/Quoters/Offerors taking exception to the specifications shall do so at their own risk. By offering substitutions, Bidder/Quoter/Offeror shall state these exceptions in the section provided in the IFB/RFQ/RFP/CSP/Quotation or by attachment. Exception/substitution, if accepted, must meet or exceed specifications stated therein. Collin County reserves the right to accept or reject any and/or all of the exception (s)/substitution(s) deemed to be in the best interest of the County.

1.19 Minimum Standards for Responsible Prospective Bidders/Quoters/Offerors: A prospective Bidder/ Quoter/Offeror must meet the following minimum requirements:

1.19.1 have adequate financial resources, or the ability to obtain such resources as required;

1.19.2 be able to comply with the required or proposed delivery/completion schedule;

1.19.3 have a satisfactory record of performance;

1.19.4 have a satisfactory record of integrity and ethics;

1.19.5 be otherwise qualified and eligible to receive an award.

Collin County may request documentation and other information sufficient to determine Bidder's/Quoter's/ Offeror's ability to meet these minimum standards listed above.

1.20 Vendor shall bear any/all costs associated with it's preparation of an RFI/IFB/RFQ/RFP/CSP/Quotation submittal.

1.21 Public Information Act: Collin County is governed by the Texas Public Information Act, Chapter 552 of the Texas Government Code. All information submitted by prospective bidders during the bidding process is subject to release under the Act.

1.22 The Bidder/Quoter/Offeror shall comply with Commissioners' Court Order No. 2004-167-03-11, County Logo Policy.

1.23 Interlocal Agreement: Successful bidder agrees to extend prices and terms to all entities that has entered into or will enter into joint purchasing interlocal cooperation agreements with Collin County.

1.24 Bid Openings: All bids submitted will be read at the county's regularly scheduled bid opening for the designated project. However, the reading of a bid at bid opening should be not construed as a comment on the responsiveness of such bid or as any indication that the county accepts such bid as responsive.

The county will make a determination as to the responsiveness of bids submitted based upon compliance with all applicable laws, Collin County Purchasing Guidelines, and project documents, including but not limited to the project specifications and contract documents. The county will notify the successful bidder upon award of the contract and, according to state law; all bids received will be available for inspection at that time.

2.0 TERMS OF CONTRACT

2.1 A bid/quote/proposal, when properly accepted by Collin County, shall constitute a contract equally binding between the Vendor/Contractor/Provider and Collin County. No different or additional terms will become part of this contract with the exception of an Amendment and/or a Change Order.

2.2 No oral statement of any person shall modify or otherwise change, or affect the terms, conditions or specifications stated in the resulting contract. All Amendments and/or Change Orders to the contract will be made in writing by Collin County Purchasing Agent.

2.3 No public official shall have interest in the contract, in accordance with Vernon's Texas Codes Annotated, Local Government Code Title 5, Subtitle C, Chapter 171.

2.4 The Vendor/Contractor/Provider shall comply with Commissioners' Court Order No. 96-680-10-28, Establishment of Guidelines & Restrictions Regarding the Acceptance of Gifts by County Officials & County Employees.

2.5 Design, strength, quality of materials and workmanship must conform to the highest standards of manufacturing and engineering practice.

2.6 Bids/Quotes/Proposals must comply with all federal, state, county and local laws concerning the type(s) of product(s)/service(s)/equipment/project(s) contracted for, and the fulfillment of all ADA (Americans with Disabilities Act) requirements.

2.7 All products must be new and unused, unless otherwise specified, in first-class condition and of current manufacture. Obsolete products, including products or any parts not compatible with existing hardware/software configurations will not be accepted.

2.8 Vendor/Contractor/Provider shall provide any and all notices as may be required under the Drug-Free Work Place Act of 1988, 28 CFR Part 67, Subpart F, to its employees and all sub-contractors to insure that Collin County maintains a drug-free work place.

2.9 Vendor/Contractor/Provider shall defend, indemnify and save harmless Collin County and all its officers, agents and employees and all entities, their officers, agents and employees who are participating in this contract from all suits, claims, actions, damages (including personal injury and or property damages), or demands of any character, name and description, (including attorneys' fees, expenses and other defense costs of any nature) brought for or on account of any injuries or damages received or sustained by any person, persons, or property on account of Vendor/Contractor/Provider's breach of the contract arising from an award, and/or any negligent act, error, omission or fault of the Vendor/Contractor/Provider, or of any agent, employee, subcontractor or supplier of Vendor/Contractor/Provider in the execution of, or performance under, any contract which may result from an award. Vendor/Contractor/Provider shall pay in full any judgment with costs, including attorneys' fees and expenses which are rendered against Collin County and/or participating entities arising out of such breach, act, error, omission and/or fault.

2.10 If a contract, resulting from a Collin County IFB, RFP, RFQ, CSP, Quotation is for the execution of a public work, the following shall apply:

2.10.1 In accordance with V.T.C.A. 2253.021, a governmental agency that makes a public work contract with a prime contractor shall require the contractor, before beginning work, to execute to the governmental entity a Payment Bond if the contract is in excess of $25,000.00. Such bond shall be in the amount of the contract payable to the governmental entity and must be executed by a corporate surety in accordance with Section 1, Chapter 87, Acts of the 56th Legislature, Regular Session, 1959 (Article 7.19-1 Vernon's Texas Insurance Code).

2.10.2 In accordance with V.T.C.A. 2253.021, a governmental agency that makes a public work contract with a prime contractor shall require the contractor, before beginning work, to execute to the governmental entity a Performance Bond if the contract is in excess of $100,000.00. Such bond shall be in the amount of the contract payable to the governmental entity and must be executed by a corporate surety in accordance with Section 1, Chapter 87, Acts of the 56th Legislature, Regular Session, 1959 (Article 7.19-1 Vernon's Texas Insurance Code).

2.11 Purchase Order(s) shall be generated by Collin County to the vendor. Collin County will not be responsible for any orders placed/delivered without a valid purchase order number.

2.12 The contract shall remain in effect until any of the following occurs: delivery of product(s) and/or completion and acceptance by Collin County of product(s) and/or service(s), contract expires or is terminated by either party with thirty (30) days written notice prior to cancellation and notice must state therein the reasons for such cancellation. Collin County reserves the right to terminate the contract immediately in the event the Vendor/Contractor/Provider fails to meet delivery or completion schedules, or otherwise perform in accordance with the specifications. Breach of contract or default authorizes the County to purchase elsewhere and charge the full increase in cost and handling to the defaulting Vendor/Contractor/Provider.

2.13 Collin County Purchasing Department shall serve as Contract Administrator or shall supervise agents designated by Collin County.

2.14 All delivery and freight charges (FOB Inside delivery at Collin County designated locations) are to be included as part of the bid/quote/proposal price. All components required to render the item complete, installed and operational shall be included in the total bid/quote/proposal price. Collin County will pay no additional freight/delivery/installation/setup fees.

2.15 Vendor/Contractor/Provider shall notify the Purchasing Department immediately if delivery/completion schedule cannot be met. If delay is foreseen, the Vendor/Contractor/Provider shall give written notice to the Purchasing Agent. The County has the right to extend delivery/completion time if reason appears valid.

2.16 The title and risk of loss of the product(s) shall not pass to Collin County until Collin County actually receives and takes possession of the product(s) at the point or points of delivery. Collin County shall generate a purchase order(s) to the Vendor/Contractor/Provider and the purchase order number must appear on all itemized invoices.

2.17 Invoices shall be mailed directly to the Collin County Auditor's Office, 2300 Bloomdale Road, Suite 3100, McKinney, Texas 75071. All invoices shall show:

2.17.1 Collin County Purchase Order Number;

2.17.2 Vendor's/Contractor's/Provider's Name, Address and Tax Identification Number;

2.17.3 Detailed breakdown of all charges for the product(s) and/or service(s) including applicable time frames.

2.18 Payment will be made in accordance with V.T.C.A., Government Code, Title 10, Subtitle F, Chapter 2251.

2.19 All warranties shall be stated as required in the Uniform Commercial Code.

2.20 The Vendor/Contractor/Provider and Collin County agree that both parties have all rights, duties, and remedies available as stated in the Uniform Commercial Code.

2.21 The Vendor/Contractor/Provider agree to protect Collin County from any claims involving infringements of patents and/or copyrights.

2.22 The contract will be governed by the laws of the State of Texas. Should any portion of the contract be in conflict with the laws of the State of Texas, the State laws shall invalidate only that portion. The remaining portion of the contract shall remain in effect. The contract is performable in Collin County, Texas.

2.23 The Vendor/Contractor/Provider shall not sell, assign, transfer or convey the contract, in whole or in part, without the prior written approval from Collin County.

2.24 The apparent silence of any part of the specification as to any detail or to the apparent omission from it of a detailed description concerning any point, shall be regarded as meaning that only the best commercial practices are to prevail. All interpretations of the specification shall be made on the basis of this statement.

2.25 Vendor/Contractor/Provider shall not fraudulently advertise, publish or otherwise make reference to the existence of a contract between Collin County and Vendor/Contractor/Provider for purposes of solicitation. As exception, Vendor/Contractor/Provider may refer to Collin County as an evaluating reference for purposes of establishing a contract with other entities.

2.26 The Vendor/Contractor/Provider understands, acknowledges and agrees that if the Vendor/Contractor/Provider subcontracts with a third party for services and/or material, the primary Vendor/Contractor/Provider (awardee) accepts responsibility for full and prompt payment to the third party. Any dispute between the primary Vendor/Contractor/Provider and the third party, including any payment dispute, will be promptly remedied by the primary vendor. Failure to promptly render a remedy or to make prompt payment to the third party (subcontractor) may result in the withholding of funds from the primary Vendor/Contractor/Provider by Collin County for any payments owed to the third party.

2.27 Vendor/Contractor/Provider shall provide Collin County with diagnostic access tools at no additional cost to Collin County, for all Electrical and Mechanical systems, components, etc., procured through this contract.

2.28 Criminal History Background Check: If required, ALL individuals may be subject to a criminal history background check performed by the Collin County's Sheriff's Office prior to access being granted to Collin County. Upon request, Vendor/Contractor/Provider shall provide list of individuals to Collin County Purchasing Department within five (5) working days.

2.29 Non-Disclosure Agreement: Where applicable, vendor shall be required to sign a non-disclosure agreement acknowledging that all information to be furnished is in all respects confidential in nature, other than information which is in the public domain through other means and that any disclosure or use of same by vendor, except as provided in the contract/agreement, may cause serious harm or damage to Collin County. Therefore, Vendor agrees that Vendor will not use the information furnished for any purpose other than that stated in contract/agreement, and agrees that Vendor will not either directly or indirectly by agent, employee, or representative disclose this information, either in whole or in part, to any third party, except on a need to know basis for the purpose of evaluating any possible transaction. This agreement shall be binding upon Collin County and Vendor, and upon the directors, officers, employees and agents of each.

2.30 Vendors/Contractors/Providers must be in compliance with the Immigration and Reform Act of 1986 and all employees specific to this solicitation must be legally eligible to work in the United States of America.

2.31 Certification of Eligibility: This provision applies if the anticipated Contract exceeds $100,000.00 and as it relates to the expenditure of federal grant funds. By submitting a bid or proposal in response to this solicitation, the Bidder/Quoter/Offeror certifies that at the time of submission, he/she is not on the Federal Government's list of suspended, ineligible, or debarred contractors. In the event of placement on the list between the time of bid/proposal submission and time of award, the Bidder/Quoter/Offeror will notify the Collin County Purchasing Agent. Failure to do so may result in terminating this contract for default.

2.32 Notice to Vendors/Contractors/Providers delivering goods or performing services within the Collin County Detention Facility: The Collin County Detention Facility houses persons who have been charged with and/or convicted of serious criminal offenses. When entering the Detention Facility, you could: (1) hear obscene or graphic language; (2) view partially clothed male inmates; (3) be subjected to verbal abuse or taunting; (4) risk physical altercations or physical contact, which could be minimal or possibly serious; (5) be exposed to communicable or infectious diseases; (6) be temporarily detained or prevented from immediately leaving the Detention Facility in the case of an emergency or "lockdown"; and (7) subjected to a search of your person or property. While the Collin County Sheriff's Office takes every reasonable precaution to protect the safety of visitors to the Detention Facility, because of the inherently dangerous nature of a Detention Facility and the type of the persons incarcerated therein, please be advised of the possibility of such situations exist and you should carefully consider such risks when entering the Detention Facility. By entering the Collin County Detention

Facility, you acknowledge that you are aware of such potential risks and willingly and knowingly choose to enter the Collin County Detention Facility.

2.33 Delays and Extensions of Time when applicable:

2.33.1 If the Vendor/Contractor/Provider is delayed at any time in the commence or progress of the Work by an act or neglect of the Owner or Architect/Engineer, or of an employee of either, or of a separate contractor employed by the Owner, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Vendor/Contractor/Provider's control, or by delay authorized by the Owner pending mediation and arbitration, or by other causes which the Owner or Architect/Engineer determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Owner/Architect may determine.

2.33.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time and could not have been reasonably anticipated, and that the weather conditions had an adverse effect on the scheduled construction.

NOTE: All other terms and conditions (i.e. Insurance Requirements, Bond Requirements, etc.) shall be stated in the individual IFB/RFQ/RFP/RFI/CSP/Quotation Solicitation documents as Special Terms, Conditions and Specifications.

3.0 INSURANCE REQUIREMENTS

3.1 Before commencing work, the vendor shall be required, at its own expense, to furnish the Collin County Purchasing Agent with certified copies of all insurance certificate(s) indicating the coverage to remain in force throughout the term of this contract.

3.1.1 Commercial General Liability insurance at minimum combined single limits of ($500,000 per-occurrence and $1,000,000 general aggregate) for bodily injury and property damage, which coverage shall include products/completed operations, independent contractors, and contractual liability each at $500,000 per occurrence. Coverage must be written on an occurrence form.

3.1.2 Workers Compensation insurance at statutory limits, including employers liability coverage at minimum limits. In addition to these, the contractor must meet each stipulation below as required by the Texas Workers Compensation Commission; (Note: If you have questions concerning these requirements, you are instructed to contact the TWCC at (512)440-3789).

3.1.3 Commercial Automobile Liability insurance shall be no less than $500,000 combined single limits per accident for bodily injury and property damage, including owned, non-owned, and hired vehicle coverage.

3.1.4 Professional Liability Insurance at minimum limits of $2,000,000. This policy must have a two (2) year extended period of coverage, (i.e. tail coverage). If you choose to have project coverage endorsed onto your base policy, this would be acceptable.

3.2 The required limits may be satisfied by any combination of primary, excess or umbrella liability insurances, provided the primary policy complies with the above requirements and the excess umbrella is following form. The vendor may maintain reasonable and customary deductibles, subject to approval by Collin County.

3.3 With reference to the foregoing insurance requirement, the vendor shall endorse applicable insurance policies as follows:

3.3.1 A waiver of subrogation in favor of Collin County, its officials, employees, volunteers and officers shall be contained in the workers compensation coverage.

3.3.2 The vendor's insurance coverage shall name Collin County as additional insured under the General Liability policy.

3.3.3 All insurance policies shall be endorsed to require the insurer to immediately notify Collin County of any decrease in the insurance coverage limits.

3.3.4 All insurance policies shall be endorsed to the effect that Collin County will receive at least thirty (30) days notice prior to cancellation, non-renewal or termination of the policy.

3.3.5 All copies of Certificates of Insurance shall reference the project/contract number.

3.4 All insurance shall be purchased from an insurance company that meets the following requirements:

3.4.1 A financial rating of B+VI or better as assigned by the BEST Rating Company or equivalent.

3.5 Certificates of Insurance shall be prepared and executed by the insurance company or its authorized agent, and shall contain provisions representing and warranting the following:

3.5.1 Sets forth all endorsements and insurance coverages according to requirements and instructions contained herein.

3.5.2 Sets forth the notice of cancellation or termination to Collin County.

4.0 EVALUATION CRITERIA AND FACTORS

4.1 The award of the contract shall be made to the responsible offeror whose proposal is determined to be the lowest and best evaluated offer resulting from negotiation, taking into consideration the relative importance of price and other factors set forth in the Request For Proposals in accordance with Vernon's Texas Code Annotated, Local Government.

4.1.1 The evaluation criteria will be grouped into percentage factors as follows:

25% QUALITY ASSURANCE, (See Section 5.11)
20% REFERENCES/EXPERIENCE
15% WORK PLAN & SCHEDULE (See Section 6.2 & 6.5)
40% TOTAL PROPOSED PRICE

5.0 SPECIAL CONDITIONS AND SCOPE OF SERVICES

5.1 Authorization: By order of the Commissioners' Court of Collin County, Texas sealed proposals will be received for **Energy Management Integration** for the Collin County Courthouse Addition and Courthouse Renovation.

5.2. Intent of Request for Proposal: Collin County's intent of this Request For Proposal (RFP) and resulting contract is to provide offerors with sufficient information to prepare a proposal for **Energy Management Integration**.

5.3 Term: Provide for a term contract commencing on the date of the award and continuing project is complete.

5.4 Funding: Funds for payment have been provided through the Collin County budget approved by the Commissioners' Court for this fiscal year only. State of Texas statutes prohibit the County from any obligation of public funds beyond the fiscal year for which a budget has been approved. Therefore, anticipated orders or other obligations that arise past the end of the current Collin County fiscal year shall be subject to budget approval.

5.5 Completion/Response Time: Vendor shall place product(s) and/or complete services at the County's designated location within the number of calendar days according to the schedule proposed by offeror in section 6.5.

5.6 Delivery/Setup/Installation Location: Locations for delivery and installation will be stated on the Collin County Purchase Order(s). Delivery shall include assembly, setup and installation and shall be included in proposal.

5.7 Samples/Demos: When requested, samples/demos shall be furnished free of expense to Collin County.

5.8 Approximate Usage: The scope of work is stated below.

5.9 Scope of Work

5.9.1 Furnish all labor, materials, tools, equipment and services for a front end integration of an existing (new construction) direct digital control, energy

management system (EMS) that controls the building space conditioning systems and other ancillary systems.

5.9.2 The existing (new construction) EMS is a Lon Works-based Energy Management System. The current EMS contractor will extend the LonWorks network to the Lower Level IT room of this current building being constructed in location as directed by Owner. The EMS integrator shall provide systems integration platform and communications to County LAN. The existing EMS servicer is a Dell Optiplex GX745 Core 2 4300, 1.8 GHz, 2 GB RAM, MS XP Pro Vers 2002 Service Pack 2, rack mounted and located in the IT Data Center (lower level of existing Courthouse). Currently loaded software includes: Webstation AX 3.3.16, Easy LON OPC Server, Care-XL 500 7.01.03. The EMS Integrator shall update AX Supervisor to version 3.5.35 or later. The EMS integrator shall upgrade any supporting software to latest version as required to accomplish scope of work.

5.9.3 The EMS Integrator shall refer to specification 15793 for understanding the scope of work included in the EMS Controls Contractor (hardware, controls, LON network) (Attachment A).

5.9.4 The EMS Integrator shall include interface of power monitoring data points, see Attachment B – Controller. This is providing communications network wiring between switchboard power meter and where directed by owner for connection and data server provided by EMS Integrator.

5.9.5 The EMS Integrator shall provide 4 NiagaraAX Framework servers (JACE web services) to assimilate subordinate building control system into the countywide automation network, consistent with the existing web servers provided for other buildings. Integrator shall provide suitable models of NiagaraAX Framework JACE sufficient to manage control point inventory of this building.

5.9.5.1 Acceptable NiagaraAX Framework servers (JACE web servers) shall be available in the open market from authorized wholesalers to factory-certified integrators. Products exclusively sold by franchised contractors or factory branch offices shall be unacceptable.

5.9.5.2 Integrator shall provide open system JACE that allows connectivity for engineering, data base construction, interactive graphical user interface and routine operations.

5.9.5.3 Integration JACE web servers shall be capable of concurrently supporting the following protocols, seamlessly creating a uniform software environment across all layers of the device-to enterprise stack. Integrator shall provide appropriate protocol drivers and communication ports, as needed to implement successful communication between JACE web service and subordinate controller network.

5.9.5.3.1 LonMark
5.9.5.3.2 BACnet
5.9.5.3.3 Sedona Framework
5.9.5.3.4 MODBUS
5.9.5.3.5 JCI N2
5.9.5.3.6 Honeywell C-Bus
5.9.5.3.7 OPC

5.9.5.2 EMS Integrator shall coordinate with Collin County IT for location of all Network Communication devices. Collin County IT will provide a static IP address for each Controller.

5.9.6 The EMS Integrator shall provide a temporary local area network (LAN) to facilitate commissioning of controls by all necessary contractors without the need to be connected to the Collin County IT network. All commissioning tools necessary for this phase shall be provided in scope of work.

5.9.7 The EMS Integrator will create the required Tridium Database from LNS database provided by EMS Contractor (Specification 15973 Scope of Work).

5.9.8 The EMS Integrator will be responsible for any coordination between EMS Controls Contractor (Specification 15973 Scope of Work) as required for completing the scope of work on schedule.

5.9.9 The EMS Integrator will create user interface graphics for all new systems. The EMS Integrator shall provide a line item add to update existing courthouse systems to the new graphic standard. Attachments C-H includes screen shoots that represent quality of graphics required in scope of work.

5.9.10 Access to the system and graphics shall be internet based. This capability requires Collin County IT to provide VPN access to the network for approved users.

5.9.11 The EMS Integrator shall provide Messaging and Alarm Notification. Messaging and Alarm notification shall include: 1. Direct to operators interface screen, 2. E-mail

5.9.12 The EMS Integrator shall provide the capability to provide trending and reporting of all points. A list of specific reports to be generated to be supplied by Collin County. Creation of trend logs to be covered in owners training as part of this contract.

5.9.13 The EMS Integrator shall provide 32 hours of on-site operator training. The training shall be in four (4) individual sessions. The training shall be videotaped on DVD and provided to the owner.

5.9.14 The EMS Integrator shall provide 1 year warranty on parts and labor

5.9.15 The EMS Integrator shall provide as-built drawings, O&M documentation, and database archives to the owner upon completion.

5.9.16 Any and all licenses provided for this project shall be completely open. All licenses jar files, and other necessary components will be property of Collin County.

5.9.17 Any existing licenses required to complete this project will be provided to the EMS Integrator as completely open by Collin County.

5.9.18 Specific Graphic Features Requested by Collin County: In addition to construction document requirements that all points included shall be represented on the graphics screens, the following is a list of specific features:

5.9.18.1 The floorplan graphics shall include a room number for each room. When this room number is "double clicked" the appropriate VAV or fan coil page shall open.

5.9.18.2 The VAV box screen shall display the design cooling flow (CFM) and current (actual) flow (CFM). The design cooling flow shall be what is reported from the VAV box controller. The VAV screen shall also display the maximum flow capability of the VAV box (from submittal data).

5.9.18.3 The VAV box screen shall show if the temperature setpoint is overridden, either by slider on the tstat or by operator override.

5.9.18.4 The operator shall the ability to disable the slider offset available at the tstat (+/- 2 deg offset). This capability to be available at the VAV box graphics screen.

5.9.18.5 The VAV box screen shall show the time remaining on the afterhours override timer.

5.9.18.6 The VAV box screen shall show the number of stages of heat engaged.

5.9.18.7 The VAV box screen shall display: space temperature, occupied setpoint, unoccupied setpoint, actual setpoint if overridden, unoccupied/occupied schedule, and 24 hour space temperature graph.

5.9.18.8 The VAV box screen shall identify which air handler it is served by.

5.9.18.9 There shall be single screens provided that provides all room setpoints and temperatures. This shall be one, two, or three screens (as required) to allow a quick glance to see if any setpoints are overridden. This screen would also allow changing of those setpoints (or removal of override).

5.9.18.10 The air handler screen shall convert VFD output (supply and return fans) to horsepower for display and trending.

5.9.19 The scope of this work shall provide and install a new 50" flat screen monitor in the central plant control room. The monitor will be used to display building automation graphics.

5.10 RELATED WORK

5.12.1 See related sections

5.10.1.1 Related mechanical work: See drawings – Attachment I.

5.10.2 Attachment A to this specification includes the EMS Controls Contractor (Specification 15973 Scope of Work) submitted for this project (expansion of existing courthouse.

5.11 QUALITY ASSURANCE

5.11.1 The EMS shall be installed by competent mechanics and checked out by competent technicians, factory trained by the manufacturer of the equipment.

5.11.2 Single source responsibility of the EMS Contractor shall include installation, calibration, and check-out of the stand-alone sub-systems.

5.11.3 The EMS Contractor shall have an in-place, local support facility with technical staff, spare parts inventory, and all necessary test diagnostic equipment.

5.12 REFERENCED STANDARDS, CODES AND ORDINANCES

5.12.1 It is the responsibility of the EMS Contractor to be familiar with all codes, rules, ordinances, and regulations of the Authority having jurisdiction and their interpretations which are in effect at the site of the work.

5.12.2 All systems equipment, components, accessories, and installation hardware shall be new and free from defects and shall be UL listed where applicable. All components shall be in current production and shall be a standard product of the system or device manufacturer. Refurbished or reconditioned components are unacceptable. Each component shall bear the make, model number, device tag number (if any), and the UL label as applicable. All systems components of a given type shall be the product of the same manufacturer.

5.13 SUBMITTALS

5.13.1 Provide sufficient copies of submittal data requested by the Owner for coordination with other trades.

5.13.2 Submittals shall consist of:

5.13.2.1 Data sheets of all products

5.13.2.2 Wiring and piping interconnection diagrams including panel and device power and sources

5.13.2.3 List of materials of all proposed devices and equipment

5.13.2.4 Software Documentation:

5.13.2.4.1 Application programs

5.13.2.5 System Diagrams

5.13.2.6 Sample graphics for owner to review and approve

5.14 PRODUCTS

5.14.1 General Description

5.14.1.1 All hardware shall be compatible with existing equipment as outlined in these specifications and outlined in specification section 15973.

5.15 NETWORKING/COMMUNICATIONS

5.15.1 The design shall be the ability to expand or modify the network.

5.16 SYSTEM SOFTWARE FEATURES

5.16.1 All necessary software to form a complete operating system shall be provided.

5.16.2 Energy Management Applications

5.16.2.1 User Interface shall have the ability to perform any or all of the following energy management routines:

5.16.2.1.1 Time of day scheduling
5.16.2.1.2 Calendar based scheduling
5.16.2.1.3 Holiday Scheduling
5.16.2.1.4 Temporary schedule overrides
5.16.2.1.5 Optimal start/stop of all mechanical equipment
5.16.2.1.6 Automatic daylight savings time switchover
5.16.2.1.7 Night setback controls
5.16.2.1.8 Peak demand limiting
5.16.2.1.9 Fan speed/CFM control
5.16.2.1.10 Heating/Cooling Interlock
5.16.2.1.11 Supply air reset
5.16.2.1.12 Chilled water reset

5.17 EXECUTION

5.17.1 Installation: All wiring shall be properly supported and run in a neat and workmanlike manner.

5.18.1.1 All wiring exposed in equipment rooms with exposed ceilings shall run parallel to or at right angles to the building structure. Exposed wiring subject to damage shall be run in conduit.

5.18.1.2 All piping and wiring within enclosures shall be neatly bundled and anchored to prevent restriction to devices and terminals

5.18.1.3 Control wiring above accessible ceilings shall be plenum rated cable.

5.18.2 Power Wiring:

5.18.2.1 120V power will be provided by Owner for final connection to Application Specific Controller by the EMS Contractor.

5.18.3 Enclosures

5.18.3.1 Provide a means of disconnecting the panel from the supply power without affecting the supply power to other panels or devices.

5.18.3.2 Construct and locate panels in the manner that facilitates easy access and maintenance.

5.18.3.3 Meet or exceed NEMA 1 requirements for panels in indoor environments.

5.18.3.4 Meet or exceed NEMA 4X requirements for panels in outdoor and penthouse applications.

5.18.3.5 Surface-mount panels on walls or framing channel. Provide framing channel and hardware as needed. Coordinate location with Owner prior to installation.

5.18.3.6 Provide a pocket on the inside of the panel to hold wiring diagrams, schematics, and termination schedules.

5.19 COMMISSIONING

5.19.1 Control system to be set up and checked out by factory trained competent technicians skilled in the setting and adjustment of EMS equipment used in this project. This technician to be experienced in the type of systems associated with this EMS.

5.19.2 At the time of final observation, demonstrate all sequence of operation for each system and graphic display to Owner. Provide schedule for this event at least three (3) weeks in advance.

5.20 TRAINING

5.20.1 Provide four (4) eight (8) hour instruction periods to Owner's personnel in the operation and maintenance of the control system. Provide training after the system has been installed and checked out. Training sessions shall be digitally videotaped by the EMS contractor. Digital data shall be turned over to Owner at completion of training.

5.21 WARRANTY

5.21.1 At completion of final test of installation and acceptance by Owner, provide any service incidental to proper performance for a period of one (1) year.

5.21.2 Equipment shall be warranted for one (1) year (including defects in workmanship and material) under normal use and service. During warranty period, supplier shall also replace or repair, free of charge, any equipment proven to be defective in workmanship or material.

5.21.3 Certain electronic devices not manufactured by EMS supplier shall carry the original manufacturer's warranty. Pass any registration and warranty documents and warranty rights to the Owner.

6.0 PROPOSAL FORMAT

6.1 The proposal shall be submitted in either electronic format via www.bidsync.com or hard copy in according to the following requirements. At a minimum, include a Table of Contents detailing sections and corresponding page numbers, and shall be printed on letter-size (8-1/2"x 11") paper and assembled with spiral-type bindings or staples. DO NOT USE METAL-RING HARD COVER BINDERS. Proposal shall include but not be limited to information on each of the following:

6.1.1 FIRM OVERVIEW
Offeror is requested to define the overall structure of the Firm to include the following

6.1.1.1 A descriptive background of your company's history.
6.1.1.2 State your principal business location and any other service locations.
6.1.1.3 What is your primary line of business?
6.1.1.4 How long have you been selling product(s) and/or providing service(s)?
6.1.1.5 State how many and the locations where your product/services are in use.

6.2 PROPOSED PROJECT TEAM/STAFF QUALIFICATIONS/EXPERIENCE/CREDENTIALS

6.2.1 Offeror is requested to provide qualifications as well as experience information on Offeror's key personnel.

6.3 PROPOSED PROJECT

6.3.1 Offeror is requested to identify the proposed product(s)/service(s) to include but not limited to the following areas:

6.3.1.1 Project to include all necessary components to render it complete and operational;
6.3.1.2 Work Plan to include:

6.3.1.2.1 Installation
6.3.1.2.2 Education and Training
6.3.1.2.3. Testing and Support
6.3.1.2.4 Impact on current system
6.3.1.2.5 Warranty
6.3.1.2.6 Maintenance
6.3.1.2.7 Documentation
6.3.1.2.8 Conversion

6.4 REFERENCES

6.4.1 Offeror is requested to include at least five (5) references with names, addresses and telephone numbers.

6.5 TIME SCHEDULE

6.5.1 There are two (2) phases for this project. Phase 1, Courthouse Addition phase will be ready to begin upon contract award. Phase 2, Courthouse Renovation will have an approximate start date of late Fall 2012.

Provide a schedule on each phase of the proposed project beginning with program development and ending with the date of operation. The schedule must include all tasks that will require time in the process, such as County review (identify amount of time assumed for each task).

6.6 PRICING/FEES

6.6.1 Provide an explanation of the total cost of the project showing a breakdown by item. Be sure to include all items necessary to render project complete and operational. Note: Both phases will be awarded to the same vendor.

6.6.1.1 Provide price for Phase 1 Courthouse Addition.
6.6.1.2 Provide price for Phase 2 Courthouse Renovation.

6.7 FINANCIAL STATEMENTS

6.7.1 Offeror is requested to submit recent financial statements with their proposal. Audited financial statements are not mandatory. Unaudited financial statements will be accepted. If offeror's firm does, however, have audited statements, please include a copy with your proposal.

6.8 OTHER PROJECTS INVOLVED WITH

6.8.1 Offeror is requested to provide a list of other projects that you are currently involved with or will be involved with.

SECTION 15973

ENERGY MANAGEMENT SYSTEM (EMS)

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Furnish all labor, materials, tools, equipment, and services for a direct digital control, energy management system (EMS) to control the building space conditioning systems and other ancillary systems. EMS contractor shall furnish controls to air terminal manufacturer for complete control and monitoring of individual zones. The fire alarm system will be provided by others and function as an independent system, but will send a notifying signal to be monitored by the EMS. Refer to SEQUENCE OF OPERATIONS in Paragraph 1.2 for a complete scope of control for each system.

B. EMS Contractor shall provide a LonWorks-based Energy Management System. EMS Contactor shall provide and extend LonWorks network to the Lower Level IT room of this building being constructed in location as directed by the Owner. System Integrator **(Refer to section 15974)** shall provide systems integration platform and communications to County LAN under a separate Contract.

C. Energy Management system shall operate fully independently of Central Plant operator console.

D. EMS Contractor shall provide system configuration and commissioning software on a notebook computer with all necessary hardware (serial port, serial cable, connectors, and converters) and licensed system development software. This notebook computer and software to be provided to Test and Balance contractor prior to commencement of Test and Balance services for the project. The laptop shall be returned to the owner following completion of Test and Balance services.

E. Provide as-built documentation, CARE files, and LNS data base to Owner.

F. For reference, examine recent Collin County projects for system model include:
   1. New Courthouse

G. Scope NOT included:
   1. The work station monitor, graphics, trends and alarm reports are not be provided under this contract. This scope is provided by **System Integrator (Refer to section 15974)** under a separate contract.

H. Specific Equipment NOT controlled by the EMS:
   1. Security System
   2. Fire Alarm System

I. The EMS Contractor shall deliver the following features, hardware, and functions as a minimum:
   1. Application Specific controller for each major piece of equipment.
   2. Application software per the SEQUENCE OF OPERATIONS.
   3. Network Architecture.
   4. Furnish and install all sensors, transducers, actuators, and control valves per this specification.

1.2 SEQUENCE OF OPERATIONS

A. Sequences of Operations for equipment are shown on plans.

B. Fire Alarm
   1. Monitor status only for fire alarm system.

C. Power Monitoring
1. Division 16 is providing communications network wiring between switchboard power meter and where directed by owner for connection with data server provided by **System Integrator (Refer to section 15974)** under separate Contract.

1.3 RELATED WORK

A. See related sections:
1. General requirements: Division 1.
2. Related mechanical work: Division 15.
3. Related electrical work: Division 16.

1.4 QUALITY ASSURANCE

A. The EMS shall be installed by competent mechanics and checked out by competent technicians factory trained by the manufacturer of the equipment.

B. Single source responsibility of the EMS Contractor shall include installation, calibration, and check-out of the stand-alone subsystems.

C. The EMS Contractor shall have an in-place, local support facility with technical staff, spare parts inventory, and all necessary test diagnostic equipment.

1.5 TECHNICAL PROPOSALS

A. Technical proposals shall be prepared in accordance with these specifications. Three copies of the proposal shall be submitted. The technical proposal shall include the following data/information as a minimum. The order of listing here is not intended to indicate, nor should it be construed to indicate, the relative importance of the data/information:
1. Information on organizational capability to handle this project (management, personnel, manufacturing, single source responsibility, etc.).
2. Information on training program to demonstrate specification compliance.
3. System configuration as proposed:
a. Describe system operation, functions and control techniques.
b. Modularity.
c. Provisions against obsolescence due to technological advancement. Include in this section a description of the upgrade paths necessary so that previous generations of equipment can seamlessly communicate with the most recent generation of controllers.
4. A signed certificate stating the Contractor has read the performance and functional requirements, understands them and his technical proposal will comply with all parts of the specification.
5. Other requirements for inclusion in the technical proposal are located throughout this specification.

B. Submit technical proposals with pricing in accordance with Instructions to Bidders.

1.6 REFERENCED STANDARDS, CODES AND ORDINANCES

A. It is the responsibility of the EMS Contractor to be familiar with all codes, rules, ordinances, and regulations of the Authority Having Jurisdiction and their interpretations which are in effect at the site of the work.

B. All systems equipment, components, accessories, and installation hardware shall be new and free from defects and shall be UL listed where applicable. All components shall be in current production and shall be a standard product of the system or device manufacturer. Refurbished or reconditioned components are unacceptable. Each component shall bear

the make, model number, device tag number (if any), and the UL label as applicable. All systems components of a given type shall be the product of the same manufacturer.

1.7 SUBMITTALS

A. **Contractor shall submit with bid a narrative of scope and a complete points list for verification during the bid review process**.

B. Provide sufficient copies of submittal data, as required in Division 1 and requested by the General Contractor for coordination with other trades.

C. Submittals shall consist of:
1. Data sheets of all products.
2. Wiring and piping interconnection diagrams including panel and device power, and sources.
3. List of materials of all proposed devices and equipment.
4. Software documentation:
   a. Sequence of operation, in text form.
   b. Application programs.
5. Point schedules.
6. Controls schematics and system diagrams.
7. Valve and damper schedules.

1.8 WORK BY OTHERS

A. Automatic control valves shall be furnished by the EMS contractor and installed by the Mechanical Contractor. **Provide globe style valve body for hydronic applications.** All reducers and fittings necessary to install smaller than pipe size valves shall be furnished and installed by the Mechanical Contractor.

B. Automatic dampers and actuators shall be furnished by the EMS contractor and installed by the Mechanical Contractor.

C. Piping: Water pressure and differential sensors, valve manifolds, flow switches, thermal sensors shall be furnished and installed by the EMS contractor. All piping taps and wells shall be provided by the mechanical contractor in locations shown on plans and/or locations directed by the EMS contractor for optimal performance.

D. Duct air flow monitors shall be furnished by the EMS contractor and installed by the Mechanical Contractor.

E. Smoke Detectors: All smoke detectors, including duct mounted smoke detectors, will be provided and wired to the Fire Alarm Panel by the Fire Alarm Contractor. Duct smoke detectors will be installed by the Mechanical Contractor. Shutdown interlock wiring between starters/variable frequency drives and the Fire Alarm system shutdown contacts shall be installed by the EMS Contractor.

F. Dedicated 120VAC to all control panels will be provided by the Electrical Contractor.

G. Terminal Box DDC controllers will be furnished by the EMS Contractor to the Terminal Box Manufacturer for installation.

H. 24V power for fan powered box DDC controllers will be derived from factory provided 24V transformer in the fan powered boxes. Transformer shall be oversized to serve three (3) adjacent VAV (cooling only) box controllers. All 24V wiring shall be extended from fan powered box to the VAV box by the EMS contractor.

PART 2 - PRODUCTS

2.1 GENERAL DESCRIPTION

A. The Energy Management System shall be LonWorks based system.

B. The system shall be modular in nature, and shall permit expansion of both capacity and functionality through the addition of sensors, actuators, standalone DDC panels, and operator devices.

C. System architectural design shall eliminate dependence upon any single device for alarm reporting and control execution. Each DDC panel shall operate independently by performing its own specified control, alarm management, operator I/O, and historical data collection. The failure of any single component or network connection shall not interrupt the execution of control strategies at other operational devices.

D. Standalone DDC panels shall be able to access any data from, or send control commands and alarm reports directly to any other DDC panel or combination of panels on the network without dependence upon a central processing device, such as a central file server. Standalone DDC panels shall also be able to send alarm reports to multiple operator workstations, terminals, and printers without dependence upon a central processing device or File Server.

2.2 NETWORKING/COMMUNICATIONS

A. The design of the EMS shall network Standalone DDC Panels. Inherent in the system's design shall be the ability to expand or modify the network.

2.3 STANDALONE DDC PANELS

A. General: Standalone DDC panels shall be microprocessor based, multi-tasking, multi-user, real-time digital control processors. Each standalone DDC panel shall consist of modular hardware with plug-in enclosed processors, communication controllers, power supplies, and input/output modules. A sufficient number of controllers shall be supplied to fully meet the requirements of this specification and the attached point list.

B. Expandability: The system shall be modular in nature, and shall permit easy expansion through the addition of software applications, workstation hardware, field controllers, sensors, and actuators. The system architecture shall support expansion capacity of all types of DDC panels, and all point types included in the initial installation for tenant finish-out and future buildings.

C. Serial Communication Ports: Standalone DDC panels shall provide at least two RS-232C serial data communication ports for simultaneous operation of operator I/O devices such as industry standard printers, laptop workstations, PC workstations, and panel mounted or portable DDC panel Operator's Terminals.

D. Surge and Transient Protection: Isolation shall be provided at all network terminations, as well as all field point terminations to suppress induced voltage transients consistent with IEEE Standard 587-1980.

E. Power-Fail Restart: In the event of the loss of normal power, there shall be an orderly shutdown of all standalone DDC panels to prevent the loss of database or operating system software. Non-volatile memory shall be incorporated for all critical controller configuration data, and battery back-up shall be provided to support the real-time clock and all volatile memory for a minimum of 72 hours.

F. Upon restoration of normal power, the DDC panel shall automatically resume full operation without manual intervention.

2.4 SYSTEM SOFTWARE FEATURES

A. General:
1. All necessary software to form a complete operating system shall be provided.
2. The software programs shall be provided as an integral part of the DDC panel and shall not be dependent upon any higher level computer for execution.

B. Control Software Description:
1. Pre-Tested Control Algorithms: The DDC panels shall have the ability to perform the following pre-tested control algorithms:
a. Two Position Control
b. Proportional Control
c. Proportional plus Integral Control
d. Proportional, Integral, plus Derivative Control
e. Automatic Control Loop Tuning
2. Equipment Cycling Protection: Control software shall include a provision for limiting the number of times each piece of equipment may be cycled within any one-hour period.
3. Heavy Equipment Delays: The system shall provide protection against excessive demand situations during start-up periods by automatically introducing time delays between successive start commands to heavy electrical loads.
4. Power-Fail Motor Restart: Upon the resumption of normal power, the DDC panel shall analyze the status of all controlled equipment, compare it with normal occupancy scheduling, and turn equipment on or off as necessary to resume normal operation.

C. Energy Management Applications:
1. DDC Panels shall have the ability to perform any or all of the following energy management routines:
- Time of Day Scheduling
- Calendar Based Scheduling
- Holiday Scheduling
- Temporary Schedule Overrides
- Optimal Start/Stop of all mechanical equipment
- Automatic Daylight Savings Time switchover
- Night Setback Control
- Peak Demand Limiting
- Fan Speed/CFM Control
- Heating/Cooling Interlock
- Supply Air Reset
- Chilled Water Reset

2.5 APPLICATION SPECIFIC CONTROLLERS (ASC)

A. Each DDC controller shall be able to extend its performance and capacity through the use of remote application specific controllers (ASCs).
1. Each ASC shall operate as a stand-alone controller capable of performing its specified control responsibilities independently of other controllers in the network. Each ASC shall be a microprocessor-based, multi-tasking, real-time digital control processor.

B. Terminal Equipment Controllers
1. DDC controllers for VAV/CAV boxes shall be LonMark compliant 8010 products.
2. The controls contractor shall furnish the terminal equipment controller (controller, damper motor, flow transducer) to the terminal unit manufacturer, for factory mounting. Costs associated with factory mounting of terminal equipment controller shall be covered by terminal unit manufacturer. The terminal box manufacturer shall provide an averaging air velocity sensor suitable for interfacing with the TEC's differential pressure transducer.
3. Each TEC shall be accessible for purposes of control and monitoring from a central or remote operator's terminals.

4. TEC damper actuator shall be of the 24V AC floating point type. Upon power loss, the actuator maintains its current damper position. Position status is shown in percentage open notation.
5. TEC room temperature sensor shall come complete with a terminal jack and programmable override switch integral to the sensor assembly, temperature sensor shall have ability for temperature adjustment. The terminal jack shall be used to connect a portable operator's terminal to control and monitor all hardware and software points associated with the terminal unit. An override switch shall initiate override of the night setback or unoccupied mode to normal operation when activated. The switch function may be locked out, cancelled, or limited as to time or temperature in software. The TEC room temperature sensor shall have aluminum silk screened graphic with the box designation.
6. TEC differential pressure transducer shall accept an overage air flow measurement signal from the terminal box averaging air velocity sensor. The value is converted through a square root function to average air flow by the TEC.

2.6 FIELD EQUIPMENT

A. Dampers, Valves and Operators:
1. Dampers shall be provided in 2-inch size increments from 8 inches (horizontal and vertical) to 48 inches. Individual damper panels shall not exceed 48 inches in width (blade length).
2. Dampers shall be of the special low-leakage type, with opposed-acting blades not exceeding 6 inches in width. Each damper panel shall be not more than 48 inches in width (damper blade length), and each panel shall be provided with a separate, independent electric operator.
3. Dampers shall have continuous extruded vinyl seals on the edges of each damper blade where blade edges meet when the damper is closed, and flexible stainless steel or aluminum compression seals at the jambs.
4. Blades and frames shall be constructed of 6063-T5 aluminum, with frames extruded in the form of channels, and blades extruded in the form of airfoils.
5. Blades shall be operated by glass-filled nylon gears, or the equivalent, located outside of the air stream.
6. Dampers shall be designed so that the maximum air leakage does not exceed 6.2 CFM/sq. ft. of damper area when the damper is subjected to a 4-inch water column pressure differential, with a maximum torque of 210 inch-pounds applied to the damper operator.
7. Dampers shall be tested in accordance with AMCA-500 with calculations of leakage based on a 48-inch by 48-inch damper. Test data shall be included with shop drawings.
8. Dampers shall be Ruskin low leakage Model CD-50 or approved equal.

B. Valves:
1. Water valves shall be sized by the temperature controls manufacturer to produce the required capacity at a pressure loss of not more than 5 psi. Nominal body rating shall be not less than 150 psig. However, the valve body and packing selected shall be designed and rated for the maximum system operating pressure and temperature at the point of installation. Each valve shall be equipped with proper packing to assure that there will be no leakage at the valve stem. Valves shall be fully proportioning with modulating plugs for equal percentage of linear flow characteristics. Water valves 2" and smaller shall be constructed with a cast brass body and screwed ends. Trim shall consist of a removable cage providing valve plug guiding throughout the entire travel range. A stainless steel stem shall be provided. Bonnet, cage and the stem and plug assembly shall be removable for servicing. Body rating shall be 400 psi at 150 degrees F. Body rating shall also meet or exceed ANSI B16.5 Class 250. All

chilled water valves shall be normally open (open to coil if 3-way). Water valves 2-1/2" and larger shall be ANSI B-16.1, Class 125 with cast iron body, flanged connections, stainless steel stem and brass plug and seats. **Provide globe style valve body for hydronic applications.**

C. Electronic actuators shall be direct-coupled type which requires no crankarm or linkage. Actuators shall be modulating or two-position type as required by the application, and shall be spring-return type where indicated. Actuators shall be sized to provide sufficient torque to smoothly modulate the controlled device over the entire span of travel. All actuators shall incorporate current limiting circuitry to protect the motor from overload and damage at all angles of rotation. Actuators shall incorporate integral position indication switches where indicated in the sequence of operation to confirm the open/closed status of the controlled device. Actuators shall be UL listed and CSI certified, shall have a two-year manufacturer's warranty, and shall be manufactured under ISO 9001 International Quality Controls Standards. Actuators shall be manufactured by Belimo Aircontrols, Inc. or approved equal.
1. Spring return actuators shall be provided on all outside air dampers.

D. Air Terminal Units: Electric actuators, DDC controllers, and transducers shall be furnished under this Section. The terminal unit manufacturer shall factory mount the devices and connect all wiring and tubing in accordance with drawings furnished under this Section. The terminal unit manufacturer shall furnish and install on fan powered boxes a properly sized 24V transformer and toggle switch on a 4 x 4 electrical box securely fastened to the terminal unit. The terminal unit manufacturer shall furnish and install a flow cross in the inlets of the unit to measure the differential between the total and static pressures. Manufacturer shall extend the tubing from the flow cross and connect to the differential pressure transducer furnished by the EMS contractor. The control sequences shall be as described within this Section and the terminal unit shall be shipped from the manufacturer with all the necessary control devices to accomplish each sequence. 24 volt power wiring for VAV cooling only boxes shall be provided by the EMS contractor from fan powered box 24V transformer. Room space temperature sensors and associated cabling shall be furnished and installed by the EMS contractor.

E. Temperature Elements:
1. Room, duct and immersion temperature elements shall be of the precision nickel wire wound type or platinum or Thermistor type sensors. Where the element is used for sensing mixed air temperature or coil discharge temperatures and/or the duct area is in excess of 14 square feet, the element shall be of the averaging type. This element shall be a minimum of 96 inches long.
2. Temperature elements shall have a minimum accuracy of .1% for room and insertion elements and 1% for averaging type.
3. Where temperature elements are used for sensing liquid temperatures, they shall be furnished with separable brass wells.
4. Room temperature sensors shall incorporate integral pushbutton for after-hours HVAC zone operation. Depressing the button shall place the associated equipment into occupied operation for a period from 1 - 12 hours (adjustable at the Operator Workstation). Depressing the after-hours request button prior to expiration of the after-hours timer shall re-initialize the timer. All after-hours requests shall be recorded at the Operator Workstation, indicating the time, date, duration, and the zone sensor from which the request was made. After hours operation shall be enabled/disabled for each individual zone sensor from the Operator Workstation.
5. Provide low temperature protection thermostats of manual reset type with sensing elements 8'-0" or 20' in length. Provide thermostat designed to operate in response to coldest l' -0" length of sensing element, regardless of temperature at other parts of element. Support element properly to cover entire duct or

equipment width. Provide separate thermostats for each 25 sq. ft. of coil face area or fraction thereof.

F. Water Flow Meters:
1. Onicon dual paddle flow meter, 4-20 ma output, calibrated for installed conditions

G. Static Pressure Transducer:
1. Static pressure transducers shall be of the low differential type for use in air and similar non-conducting gases. The transducer shall produce an output voltage that varies proportionally with a change in static pressure.
2. The range for the static pressure sensor shall be matched to the static pressure of the system being sensed, 0 to .5 inches, 0 to 2 inches, 0 to 5 inches, or 0 to 10 inches.
3. Accuracy shall be plus or minus 2% of the full range being sensed.

H. Humidity Sensor/Transmitter
1. System Accuracy: +/-2% RH @ 77°F from 20-95% RH
2. Output Signal: Two wire 4-20 ma linear, proportional to 5-95% RH.

I. Current Switches:
1. Provide a solid state switch which when the current level sensed by the internal current transformer exceeds the adjustable trip point. Internal circuits are to be totally powered by induction from the line being monitored.

J. Air Flow Monitors:
1. Ruskin AMS 50 with integral control damper

PART 3 - EXECUTION

3.1 INSTALLATION

A. EMS Contractor shall review the SEQUENCE OF OPERATIONS and coordinate any interface requirements with the appropriate sub-contractor as soon as possible. EMS Contractor is responsible for verifying that all equipment is provided with interface modules capable of communicating with this specific EMS system, or providing the proper communication modules to communicate with the equipment to achieve the SEQUENCE OF OPERATIONS.

B. All wiring and tubing shall be properly supported and run in a neat and workmanlike manner.
1. All wiring and tubing exposed in equipment rooms and office areas with exposed ceilings shall run parallel to or at right angles to the building structure. Exposed wiring (including wiring in exposed areas in office areas) and tubing subject to damage shall be run in conduit.
2. All piping and wiring within enclosures shall be neatly bundled and anchored to prevent restriction to devices and terminals.
3. Control wiring above accessible ceilings shall be plenum rated cable.

C. Power wiring:
1. 120V power will be provided by Division 16 for final connection to Application Specific Controller panels by the EMS contractor.

D. Enclosures
1. Provide a means of disconnecting the panel from the supply power without affecting the supply power to other panels or devices.
2. Construct and locate panels in the manner that facilitates easy access and maintenance.
3. Meet or exceed NEMA 1 requirements for panels in indoor environments.

4. Meet or exceed NEMA 4X requirements for panels in outdoor and penthouse applications.
5. Surface-mount panels on walls or framing channel. Provide framing channel and hardware as needed. Coordinate location with Owner and Architect prior to installation.
6. Provide a pocket on the inside of the panel to hold wiring diagrams, schematics, and termination schedules.

E. Equipment
1. Temperature sensing wells:
   a. Provide list with shop drawing of well locations to Mechanical Contractor.
2. In general, locate temperature sensors and temperature sensors for room control immediately inside of door, adjacent to light switch, or where directed by Architect.
   a. Where light switch is in an entryway to room, locate sensor and/or stat on wall within room so it is capable of sensing true space conditions.
   b. Prior to installation, coordinate sensor and/or thermostat locations with Architect.
3. Mount local control panels at convenient locations adjacent to equipment served.
   a. Mount all relays, PE switches, pressure switches, etc., internal to the temperature control panels.
   b. Tag each instrument corresponding to symbols used on control diagrams.
   c. Make fully compensated capillaries connected to instruments of sufficient length to allow them to be run in neat and workmanlike manner and placed in such position so that they will not obstruct service on equipment controlled.
4. Mounting of field microprocessors on air handling units, rooftop units, etc. shall not be allowed.

3.2 COMMISSIONING

A. Control system to be set up and checked out by factory trained competent technicians skilled in the setting and adjustment of EMS equipment used in this project. This technician to be experienced in the type of systems associated with this EMS.

B. At time of final observation, demonstrate all sequence of operation for each system and graphic display to Engineer.

3.3 TRAINING

A. Provide 5 four hour instruction periods to Owner's personnel in the operation and maintenance of the control system. Provide training after the system has been installed and checked out. Training sessions shall be digitally videotaped by the EMS contractor. Digital data shall be turned over to Owner at completion of training.

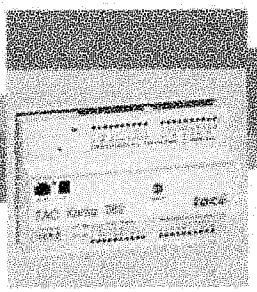
3.4 WARRANTY

A. At completion of final test of installation and acceptance by Owner, provide any service incidental to proper performance for a period of one year.

B. Equipment shall be warranted for one year (including defects in workmanship and material) under normal use and service. During warranty period supplier shall also replace or repair, free of charge, any equipment proven to be defective in workmanship or material.

C. Certain electronic devices not manufactured by the EMS supplier shall carry the original manufacturers warranty. Pass any registration and warranty documents and warranty rights to the Owner.

END OF SECTION 15973



TAC Xenta® 280
Controller, Freely Programmable

The TAC Xenta 280 is a family of freely programmable controllers designed for zone control or small-sized heating and air handling systems.

A TAC Xenta 280 controller contains basic HVAC functionality including control loops, curves, time control, alarm handling etc. The TAC Xenta 283 has a LonMark Real Time Keeper object.

The Xenta 280 controller is available with three different I/O configurations, the TAC Xenta 281, 282, and 283. The controllers are designed for cabinet mounting. The connector can be removed/inserted from/to the terminal part without disconnecting the power supply. When adding or replacing a controller it is also possible to pre-configure it in order to achieve Plug and Play functionality without any on-site configurations. They are simple to program and put into operation, using the TAC Menta graphical software tool.

The controller communicates on a LonTalk TP/FT-10 network via a twisted-pair, unpolarized cable. It is able to operate as a stand-alone unit and can be easily connected to a large LonWorks based network.

For local use, the TAC Xenta OP (Operator Panel) can be connected. The operator panel has a display and push buttons for navigating and altering settings. The operator panel can be snapped onto the TAC Xenta controller unit, mounted on the front of the cabinet, or used as a portable terminal.

SYSTEM CONFIGURATIONS

The TAC Xenta 280 controller can be used in different configurations:

- as a stand-alone unit
- as a controller (with operator panel) in a small network
- as a controller (with operator panel) and other equipment in a flat network with suitable adapters, possibly connected to a TAC Vista Building Management System

Fig. 1 shows an example of a networked TAC Xenta configuration.

Sensors and actuators on the field level are mainly connected to the conventional inputs/outputs of the controllers.

Some external units, however, may connect directly to the network to communicate input/output data, using Standard Network Variable Types (SNVTs).

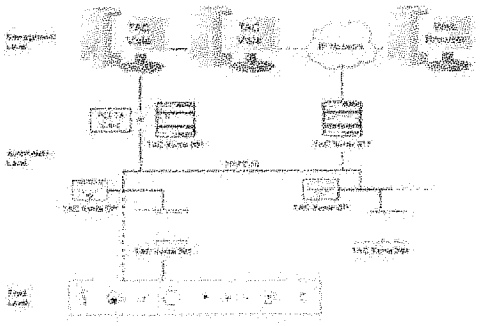


Figure 1

DESIGN

The TAC Xenta 280 controller has been designed as a general purpose unitary (one-to-one) controller. Thus it can be mounted in close proximity to the controlled equipment, minimizing the wiring required.

The TAC Xenta 280 is microprocessor based. It consists of a terminal and electronics mounted together (Fig. 2).

The Xenta 280 can be interfaced with a wide variety of field sensors/transducers and controlled devices. All terminations of field wires are done on the terminal part only. Thus the electronics part may be removed for service without affecting the field wire connections.

Local Operator Panel
The TAC Xenta OP (Operator Panel) is a small operator panel which can be connected to the unit through its enclosure. The operator can read the point status, perform manual override, read measured values, alter set points etc. from the operator panel.

The functions are selected from menus. Access to the unit is enabled by using an access code. It is possible to access other TAC Xenta units on the same network.

Real Time Clock
The clock provides data such as the year, month, date, day, hour, minute and second.

A built-in capacitor guarantees operation of the clock for at least 72 hours in the event of a power outage.

The TAC Xenta 283 is intended to be used as a Real Time Keeper. Real time is exported as an output network variable, SNVT_time_stamp, which can be bound to other LonWorks devices.

Daylight Saving Time:
European, Australian or USA/Canada
Once set, Daylight Saving Time (DST) is fully automatic. The change-over date and the number of hours for change are programmable. This function can also be disabled.

Digital Inputs
The digital inputs are used to sense alarm contacts, status indications, pulse counting, etc.

Each digital input can be used as a pulse counter (e.g. for flow measurement).

Another application available when using the digital inputs is for alarm monitoring. Each time an alarm is tripped, the corresponding counter can be incremented, providing data for operating statistics.

The digital inputs circuits are internally powered.

Universal Inputs
The universal inputs can be individually configured as analog or digital inputs.

A high and a low limit can be set for each universal input. If configured as digital inputs, the universal inputs may be used, for example, for sensing switch positions.

The universal input types are selected via the application program.

Thermistor Inputs
The TAC Xenta 282 and 283 have thermistor inputs, 1.8 kΩ at 25 °C (77 °F).

In the Xenta 281, these inputs are also individually configurable for 10 kΩ at 25 °C (77 °F).

Digital Outputs
There are digital outputs for the control of equipment such as fans, pumps or similar devices. The output signal can be

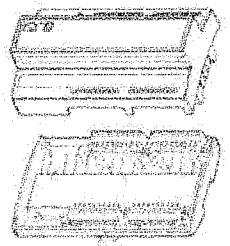


Figure 2

pulse width modulated and can be used to control increase/decrease actuators.

In the TAC Xenta 283, the digital outputs are designed as TRIAC outputs.

Analog Outputs
There are analog outputs for controlling actuators or other analog equipment.

LonWorks SNVT Support
The use of Standard Network Variable Types (SNVT), in accordance with the Echelon specifications, makes it possible to communicate with nodes made by other manufacturers.

Power Outage Protection
Using non-volatile (flash) memory, the unit will start up with user settings and work normally after a power outage.

COMMUNICATION

Communication Capabilities
The TAC Xenta 280 has several communication capabilities within a network with a TAC Vista Building Management System and/or a hand-held operator panel.

LonWorks Connection
TAC Xenta controllers communicate with each other using a common network, LonWorks TP/FT-10, 78 kbps. A number of controllers can form a network and exchange data.

The LonTalk protocol makes it possible to use network variables defined in equipment from third party manufacturers.

The functional block applications are modeled as LonMark controller objects.

The network variable interface (including the Standard Network Variable Types, SNVTs) can be customized, and external interface files (XIFs) can be generated with the TAC Menta programming tool.

TAC Vista Building Management System
When connected to a TAC Vista Building Management System (version 4.0 or higher, for Xenta 282 version 4.10 or higher), the operating conditions of the tank, pumps, heat exchangers etc. can be monitored in color graphics or printed reports.

Temperatures and alarms can be read, while setpoints and time settings may be altered as required.

TAC Xenta controllers can be reached from TAC Vista in one of the following ways:

1. Any controller in the network via a PCLTA card.
2. A specific controller via the RS-232 connection.
3. Any controller in the network via the TAC Xenta 901 LonTalk adapter.

Application program generated in TAC Menta may be downloaded from TAC Vista via the network.

TAC Xenta Operator Panel Port
The TAC Xenta OP (Operator Panel) is also connected to the network and can thus act as an operator panel for other units in the network. The connection is made via the modular jack on the front of the controller or directly, using the network cable.

RS-232 Port
The TAC Xenta 280 controller has an RS-232 port. This port is intended for connection to a PC using the TAC Menta programming tool for loading and commissioning the application program.

The port can also be used for connection between TAC Vista and specific TAC Xenta 280 units (see "Under TAC Vista Building Management System" above). Connection via a modem is not supported.

TECHNICAL DATA

Supply voltage .... 24 V AC ±20%, 50/60 Hz or 19–40 V DC
Power consumption .... max. 5 W
Transformer sizing .... 10 VA

Ambient Temperature
Storage .... −20 °C to +50 °C (−4 °F to +122 °F)
Operation .... ±0 °C to +50 °C (+32 °F to +122 °F)
Humidity .... max. 90% RH non-condensing

Mechanical
Enclosure .... ABS/PC
Enclosure rating .... IP 20
Flammability class, materials .... UL 94-5VB
Dimensions .... see Fig. 3
Weight .... 1.0 kg (2.2 lb)

CPU
CPU .... 32 bit, 10 MHz, 512 kB flash memory, 128 kB SRAM

Real Time Clock
Accuracy at +25 °C (77 °F) .... ±12 minutes per year
Power outage protection .... 72 h

Digital Inputs (Xenta 281, 282, 283: X1–X2)
Voltage across open contact .... 33 V DC
Current through closed contact .... 4 mA
Pulse input duration .... min. 20 ms

Universal Inputs (Xenta 281, 282: U1–U4)
– Digital inputs:
Voltage across open contact .... 26 V DC
Current through closed contact .... 4 mA
Pulse input duration .... min. 20 ms
– Thermistor inputs:
TAC thermistor sensor .... 1.8 kΩ at 25 °C (77 °F)
Measuring range .... −50 °C to +150 °C (−58 °F to +302 °F)
– Voltage inputs:
Input signal .... 0–10 V DC
Input resistance .... 100 kΩ accuracy within 1% of full scale

Sensor Inputs (B1–B2, only TAC Xenta 282)
TAC thermistor sensor .... 1.8 kΩ at 25 °C (+77 °F)
Measuring range .... −50 °C to +150 °C (−58 °F to +302 °F)

Sensor Inputs (B1–B4, only TAC Xenta 283)
TAC thermistor sensor .... 1.8 kΩ at 25 °C (+77 °F)
.... or (individually selectable) 10 kΩ at 25 °C (+77 °F)
Measuring range .... −20 °C to +120 °C (−4 °F to +248 °F)

Digital Outputs (relays: Xenta 281: K1–K3, Xenta 282: K1–K4)
Control voltage, relay outputs .... up to 230 V AC
Control current, to be protected by max. 10 A fuse .... max. 2 A

Outputs V1–V6 (TRIAC: TAC Xenta 283 only)
Control voltage .... max. 30 V AC
Control current .... max. 0.8 A
Total control current .... max. 3 A

Analog Outputs (Xenta 281: Y1–Y3, Xenta 282: Y1–Y4)
Control voltage .... 0–10 V DC
Control current, short-circuit proof .... max. 2 mA
Deviation .... max ±1%

Communication
TAC Menta, modem .... 9600 bps, RS-232, RJ-45
TAC Vista .... TP/FT-10, screw terminal
(also for application program download)
TAC Xenta OP .... TP/FT-10, modular jack

LonMark Standard
TAC Xenta 281, 282
– Interoperability .... LonMark Interop. Guidelines v 3.0
– Application .... LonMark Functional Profile: Plant Controller
TAC Xenta 283
– Interoperability .... LonMark Interop. Guidelines v 3.4
– Application .... LonMark Funct. Profile: Real Time Keeper

Agency Compliances
Emission, CE .... EN 61000-6-3, C-Tick, FCC Part 15
Immunity, CE .... EN 61000-6-2

Safety:
CE .... EN 61010-1
UL 916, C-UL US, Energy Management Equipment
Open: TAC Xenta 281, 282
Enclosed, TAC Xenta 283
Approved for plenum installations
ETL listing (TAC Xenta 280/230) .... UL 3111-1, first edition
.... CAN/CSA C22.2 No. 1010.1-92

Part Numbers
Electronics part TAC Xenta 281/N/P 007300300
Electronics part TAC Xenta 282/N/P 007300310
Electronics part TAC Xenta 283/N/P 007300320
Terminal part TAC Xenta 280/300 007309010
Operator panel TAC Xenta OP 007309072
TAC Xenta, Programming Serial Kit 007309200

TAC XENTA NETWORK AND UNIT PERFORMANCE

No. of TAC Xenta controllers 400
No. of I/O modules 200
No. of operator panels 100
No. of TAC Xenta groups 30
No. of Xenta controllers per group 30
No. of subscriptions*
In .... max. 15
Out .... max. 30
No. of STR350/351 (non-SNVT mode) 2

Trend Logging in the TAC Xenta 280
Channels 1–50
Interval .... 10 s – 930 weeks
Total logging capacity .... approx. 650 floating point numbers
.... or approx. 1,300 integers
.... or approx. 10,000 digital values
Optimized storage .... Yes

Time Channels
Time Channels 1

Application Size
Program and data .... max. 56 kB
Parameters .... max. 64 kB

* Subscriptions can utilize Standard Network Variable Types (SNVTs) or TAC Network Variables (TACNVs). These can be combined if the following restrictions are observed: the sum of the TACNV subscriptions and the number of SNVT members (no. of values in structured SNVTs) does not exceed the stated figures.

MOUNTING

The TAC Xenta 280 is cabinet mounted on a TS 35 mm Norm rail EN 50 022.

The controller unit consists of two parts: a terminal part with screw terminals, and electronics with the circuit boards.

To simplify installation, the terminal can be pre-mounted in the cabinet (see Fig. 3).

If the TAC Xenta 280 controller is wall mounted, a wide range of standardized boxes are available.

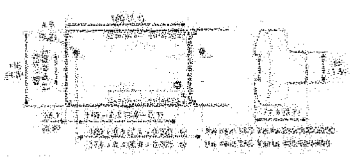


Figure 3

MAINTENANCE

The only care needed is to keep the controller dry and to clean it externally with a dry cloth when needed.

SOFTWARE FEATURES

With the assistance of TAC Menta (4.0 or higher, for Xenta 283 4.10 or higher), a graphical programming tool using Functional Block Diagrams (FBDs), the TAC Xenta 280 may be easily adapted to different control and monitoring tasks.

The basic software includes pre-programmed routines for:

- reading of digital inputs (alarms, pulse counting, interlocks)
- reading of universal inputs (individually selectable as analog or digital)
- control of digital outputs
- control of analog outputs
- on and off delays
- pulse counting (digital inputs only)
- alarm handling, alarm conditions may be detected via the digital or analog inputs
- equipment run time totals on selected objects
- one-time schedule block with 16 entries (start and stop times in hours and minutes), weekly and/or holidays
- programs for optimum start/stop
- control characteristic curves
- outdoor temperature compensating control curves
- PID control loops (loops may be connected in cascade)
- trend logging (max. 5 kB)
- local level operator interface via TAC Xenta OP (Operator Panel)
- network communication according to the LonTalk protocol
- communication with the TAC Vista Building Management System via modem

The basic software is adapted to the current application by connecting pre-programmed functional blocks and by adjusting the relevant parameters. These connections and parameters are stored in non-volatile memory.

The parameters may be changed during ongoing operation either from the TAC Vista Building Management System or locally from the TAC Xenta OP (Operator Panel).

CABLES

G and G0
Min. area 0.75–1.5 mm² (19–16 AWG).
Cable with modular jack for RS-232 serial communication port. Max. 10 m (32 ft).

Terminals X
Min. area 0.25 mm² (23 AWG).
Max. cable length 200 m (650 ft).

Terminals U, B, Y
Min. area 0.25–0.75 mm² (23–19 AWG).
Max. cable length 20–200 m (65–650 ft).
For more details, see the TAC Xenta 280/300/401 Handbook (part no. 0-004-7268).

Terminals K, V
Min. area 0.75–1.5 mm² (19–16 AWG).
Max. cable length 200 m (650 ft).

C1 and C2
TP/FT-10 allows the user to wire the control devices with virtually no topology restrictions. The max. wire distance in one segment depends on the type of wire and the topology, see the table below.

The TAC Xenta Network guide (part no. 0-004-7460) gives a more detailed description.

[illegible]	[illegible]	[illegible]	[illegible]
Belden 85102, single twisted pair	2,700 (9,000)	500 (1,600)	500 (1,600)
Belden 8471, single twisted pair	2,700 (9,000)	400 (1,300)	500 (1,600)
UL Level IV 22AWG, twisted pair	1,400 (4,600)	400 (1,300)	500 (1,600)
Connect-Air 22AWG, one or two pairs	1,400 (4,600)	400 (1,300)	500 (1,600)
Siemens J-Y(St)Y 2x2x0.8 4-wire helical twist, solid, shielded	900 (3,000)	320 (1,000)	500 (1,600)
TIA568A Cat. 5 24AWG, twisted pair	900 (3,000)	250 (820)	450 (1,500)

I/O CONFIGURATIONS

The Xenta 280 controller is available with three different I/O configurations, the TAC Xenta 281, 282, and 283.

No external I/O modules are used with the TAC Xenta 280.

The table gives an overview of the different numbers of inputs and outputs.

DI, DO: Digital input, output
UI: Universal input
TI: Thermistor input
AO: Analog output

[illegible]					
TAC Xenta 281	2	3	4	–	3
TAC Xenta 282	2	4	4	2	4
TAC Xenta 283	2	6	–	4	–

Air Handling Unit

Air Handler	Northwest	Courthouse

Schedule Occupied
Zone Loads Call False
Zone Controller Occupied
System Enable

Min Outdoor Damper Open
Status Open
Max Outdoor Damper 0 %
Position 1 %
Outdoor Iso Damper 0 %
Position -0 %

Supply Temperature 55.0 °F | Log
Supply Temperature Setpoint 55.0 °F | Set

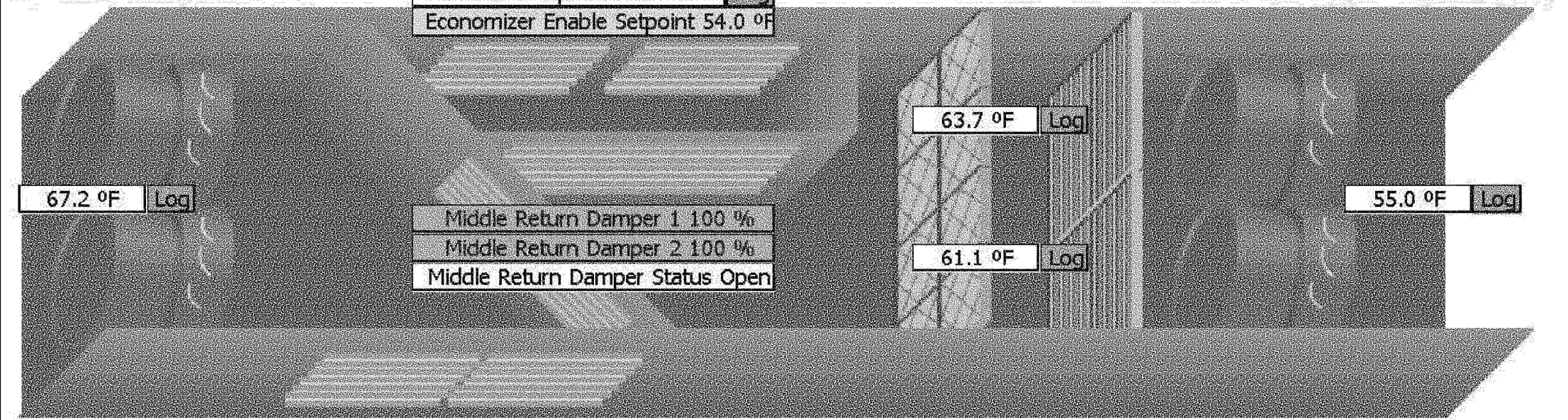
Valve Details | Air Flow Details

Return Air Damper 2 Open
Isolation Damper 2 Open

Outdoor Temperature 57.1 °F | Log
Economizer Enable Setpoint 54.0 °F

Chilled Water Valve 2 0 %

Supply Air Damper 2 Open



63.7 °F | Log

67.2 °F | Log

55.0 °F | Log

Middle Return Damper 1 100 %
Middle Return Damper 2 100 %
Middle Return Damper Status Open

61.1 °F | Log

Return Air Damper 1 Open
Isolation Damper 1 Open

Relief Air Damper 0 %
Status Closed

Chilled Water Valve 1 0 %

Supply Air Damper 1 Open

Valve Details | Air Flow Details

Filter Status Clean

Indoor Air Quality

Outdoor Air CO2 1992 ppm	Log
Return Air CO2 553 ppm	Log
Return Air CO2 Setpoint 800 ppm	

Air Handler Fans

Fan	Command	Emergency	Status	Speed	VSD	Flow
Supply 1	Enable	Permit	On	45 %	Normal	13900 cfm
Supply 2	Enable	Permit	On	45 %	Normal	16833 cfm
Return 1	Enable	Permit	On	27 %	Normal	0 cfm
Return 2	Enable	Permit	On	27 %	Normal	541 cfm

Morning Warmup

Building Warmup Cycle False	
Return Temperature 67.2 °F	Log
Warmup Return Setpoint 60.0 °F	
Outdoor Temperature 57.1 °F	Log
Warmup Outdoor Setpoint 45.0 °F	

Duct Pressure

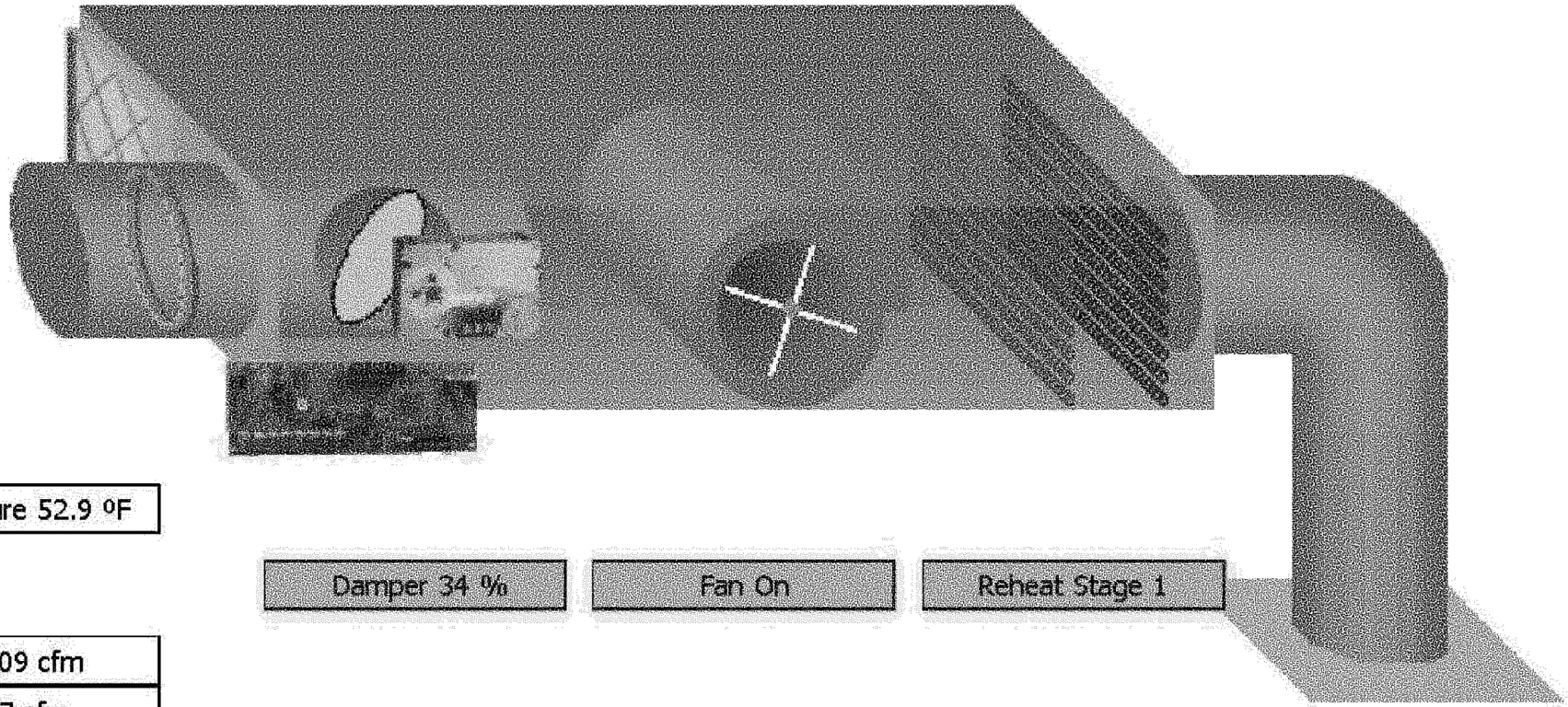
Duct Static Press L3 1.31 in/wc	Log
Duct Static Press L2 1.41 in/wc	Log
Duct Static Press L1 1.44 in/wc	Log
Duct Static Press L0 1.44 in/wc	Log
Duct Static Pressure Setpoint 1.00 in/wc	

Courtroom

FpVav 12	First Floor	Northwest	Courthouse

Room Number 10174
Schedule
Bypass Timer 0 min

Occupied Status Occupied
Status Mode Reheat
Terminal Load -19 %



Air Handler Supply Temperature 52.9 ºF

Damper 34 %

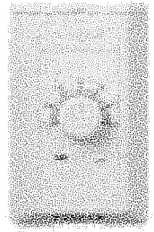
Fan On

Reheat Stage 1

Measured Inlet Air Flow 309 cfm
Desired Inlet Air Flow 297 cfm

Temperature Setpoints	Cooling	Heating
Occupant Dial	73.3 ºF	
Occupied	74.0 ºF	72.0 ºF
Unoccupied	79.0 ºF	71.0 ºF
Effective Setpoint	72.1 ºF	

If setpoint dial is used, occupied setpoints are ignored

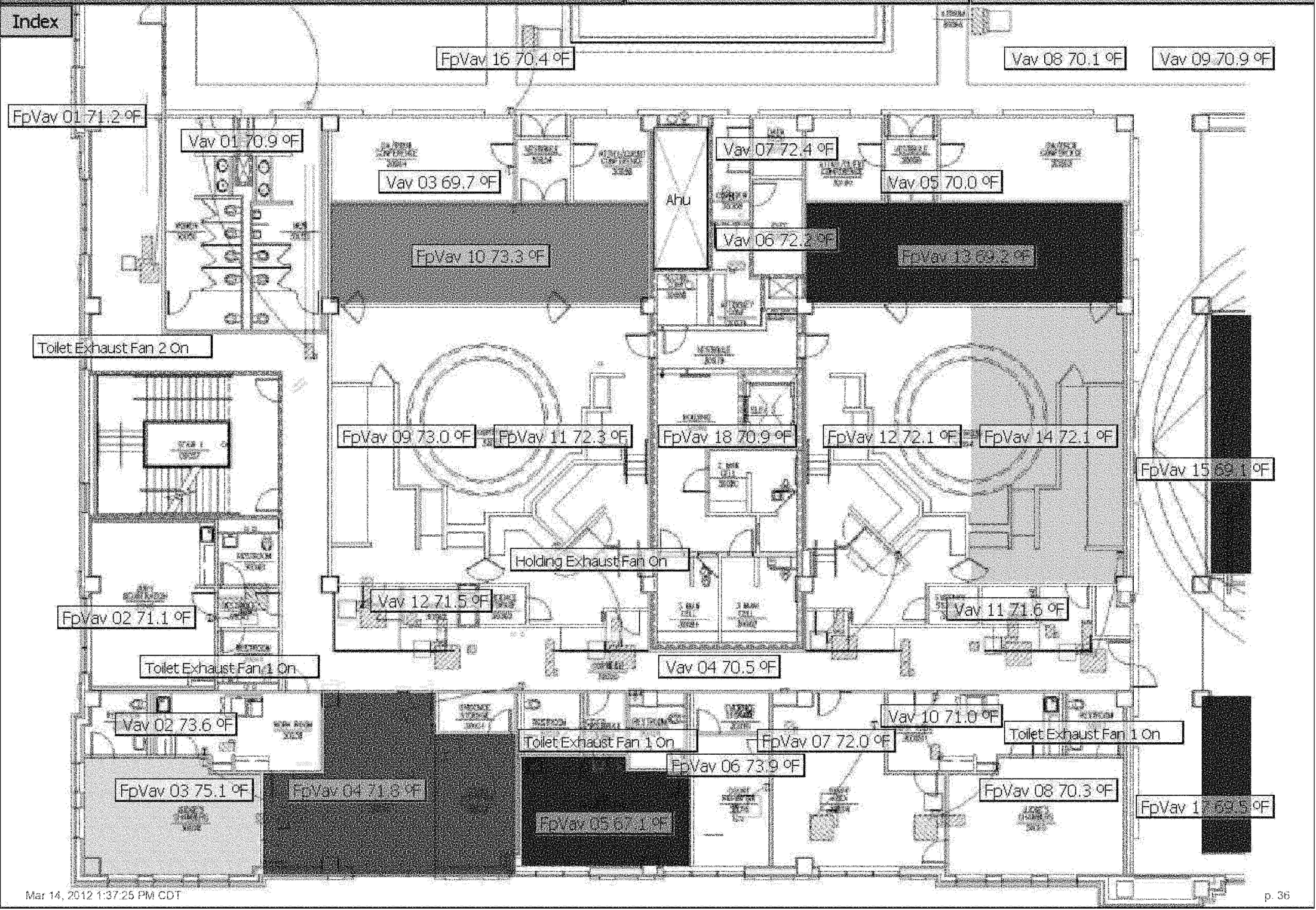


Zone Temperature 70.6 ºF | Log

Network Status Normal

Floorplan

Third Floor | **Southwest** | **Courthouse**



Floorplan

Third Floor | Southwest | Courthouse

Vav Terminal Boxes

Id	Room #	Description	Zone Temp	Inlet Flow
Vav 01	30050	Women's Restroom	70.9 °F	70 cfm
Vav 02	30036	Work Room	73.7 °F	61 cfm
Vav 03	30064	DA/Prob Conference	69.7 °F	123 cfm
Vav 04	30020	Corridor	70.6 °F	201 cfm
Vav 05	30092	DA/Prob Conference	70.2 °F	123 cfm
Vav 06	30072	Electrical Room	72.3 °F	216 cfm
Vav 07	30070	Data Room	72.4 °F	218 cfm
Vav 08	30066	Atrium	70.3 °F	237 cfm
Vav 09	30066	Atrium	70.9 °F	0 cfm
Vav 10	30008	Work Room	70.8 °F	0 cfm
Vav 11	30096	Audio	71.6 °F	0 cfm
Vav 12	30062	Audio	71.5 °F	53 cfm

Fan-Powered Vav Terminal Boxes

Id	Room #	Description	Zone Temp	Inlet Flow
FpVav 01	30102	Corridor	71.5 °F	159 cfm
FpVav 02	30046	Jury Deliberation	71.2 °F	174 cfm
FpVav 03	30038	Judge's Chambers	75.2 °F	210 cfm
FpVav 04	30030	Staff Room	72.0 °F	1081 cfm
FpVav 05	30026	Jury Deliberation	67.2 °F	176 cfm
FpVav 06	30016	Court Reporter	73.8 °F	74 cfm
FpVav 07	30014	Staff Area	71.8 °F	148 cfm
FpVav 08	30010	Judge's Chambers	69.9 °F	131 cfm
FpVav 09	30058	Courtroom	73.1 °F	167 cfm
FpVav 10	30058	Courtroom Antechamber	73.2 °F	216 cfm
FpVav 11	30058	Courtroom	72.3 °F	167 cfm
FpVav 12	30094	Courtroom	72.3 °F	150 cfm
FpVav 13	30094	Courtroom Antechamber	69.4 °F	203 cfm
FpVav 14	30094	Courtroom	72.2 °F	150 cfm
FpVav 15	30002	Atrium	69.1 °F	367 cfm
FpVav 16	30066	Atrium	70.5 °F	237 cfm
FpVav 17	30002	Atrium	69.5 °F	242 cfm
FpVav 18	30086	Holding	70.8 °F	191 cfm

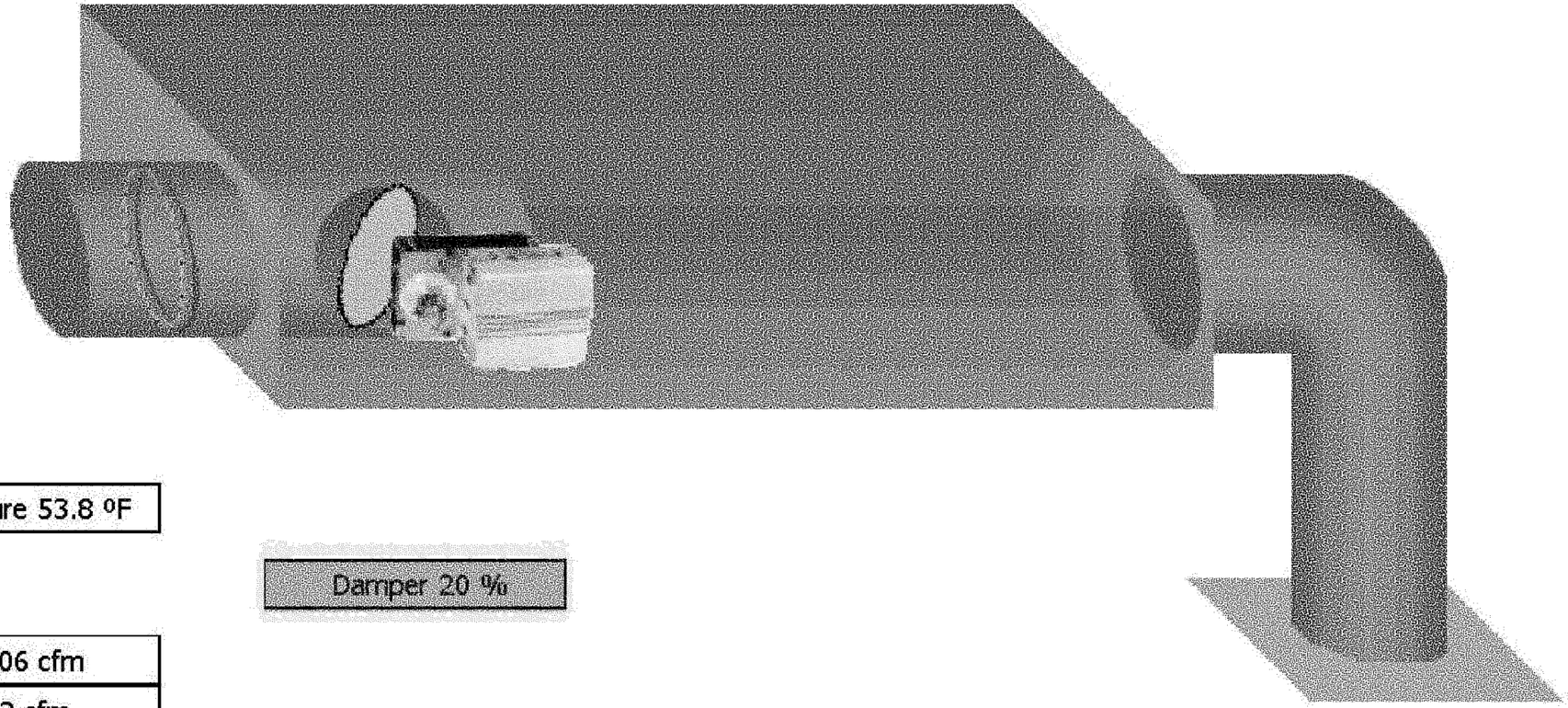
Utility Exhaust Fans								
Fan	Serves	Control Location	Command	Status		Damper Command	Damper Status	
Toilet Exhaust Fan 1	NW Restrooms	Southwest	On	On	Log			
Toilet Exhaust Fan 2	NW Restrooms	Southwest	On	On	Log			
Toilet Exhaust Fan 3	NW Restrooms	Northwest	On	On	Log			
Toilet Exhaust Fan 4	NW Restrooms	Northwest	On	On	Log			
Toilet Exhaust Fan 5	NW Restrooms	Northeast	On	On	Log			
Toilet Exhaust Fan 6	NW Restrooms	Northeast	On	On	Log			
Toilet Exhaust Fan 7	NW Restrooms	Southeast	On	On	Log			
Toilet Exhaust Fan 8	NW Restrooms	Southeast	Off	Off	Log			
Toilet Exhaust Fan 9	Lower Level Restroom	Pump Room	On	Off	Log	Close	Closed	Log
Holding Exhaust Fan	NW 1st thru 3rd holding	Northwest	On	On	Log			
Holding Exhaust Fan	NW 1st thru 3rd holding	Northeast	On	On	Log			
Holding Exhaust Fan	NW 1st thru 3rd holding	Southwest	On	On	Log			
Holding Exhaust Fan	NW 1st thru 3rd holding	Southeast	Off	Off	Log			
NW Exhaust Fan 0-1	Sally Port	Pump Room		On	Log	Open	Closed	Log
NW Exhaust Fan 0-2	UPS	Pump Room		Off	Log	Open	Closed	Log
NE Exhaust Fan 0-1	Truck Dock	Pump Room	On			Open	Open	Log
NE Exhaust Fan 0-2	Juvenile Holding	Pump Room	On			Open	Open	Log
Toilet Exhaust Fan 0-1	Unknown	Pump Room	Off					
Toilet Exhaust Fan 0-2	Unknown	Pump Room	On					

Courtroom

Vav 03	First Floor	Northwest	Courthouse

Room Number 10174
Schedule
Bypass Timer 0 min

Occupied Status Occupied
Status Mode Cool
Terminal Load 0 %



Air Handler Supply Temperature 53.8 °F

Damper 20 %

Measured Inlet Air Flow 106 cfm
Desired Inlet Air Flow 102 cfm

Temperature Setpoints	Cooling	Heating
Occupant Dial	70.0 °F	
Occupied	72.0 °F	70.0 °F
Unoccupied	85.0 °F	60.0 °F
Effective Setpoint	71.0 °F	

If setpoint dial is used, occupied setpoints are ignored

Network Status Normal

Zone Temperature 70.8 °F | Log

MECHANICAL SYMBOLS AND ABBREVIATIONS

NOTE: ALL SYMBOLS AND ABBREVIATIONS SHOWN ARE NOT NECESSARILY USED ON THE DRAWINGS

GENERAL NOTES

1. PERFORM ALL WORK IN ACCORDANCE WITH ALL APPLICABLE CODES AND AUTHORITIES HAVING JURISDICTION. PROVIDE ALL PERMITS, INSPECTIONS, LICENSES AND FEES. FURNISH ALL LABOR, EQUIPMENT, SUPPLIES AND MATERIALS NECESSARY TO PROVIDE COMPLETE AND OPERATIONAL SYSTEMS.

2. THE DRAWINGS AND SPECIFICATIONS INDICATE THE GENERAL DESIGN AND ARRANGEMENT OF PIPES, FIXTURES, EQUIPMENT, SYSTEMS, ETC. INFORMATION SHOWN IS DIAGRAMMATIC IN CHARACTER AND DOES NOT NECESSARILY INDICATE EVERY REQUIRED OFFSET, FITTING, ETC. DO NOT SCALE THE DRAWINGS FOR DIMENSIONS. TAKE ALL DIMENSIONS, MEASUREMENTS, EQUIPMENT LOCATIONS, LEVELS, ETC FROM THE ARCHITECTURAL DRAWINGS AND FROM THE EQUIPMENT TO BE FURNISHED. PIPING MAY BE RELOCATED OR OFFSET FOR PROPER CLEARANCES OR TO AVOID CONFLICTS WITH OTHER TRADES. THE DESIGN INTENT (I.E. PITCHES, VELOCITIES, PRESSURE DROPS, VOLTAGE DROPS, ETC) CANNOT BE GREATLY ALTERED WITHOUT THE APPROVAL OF THE ARCHITECT. THE COST OF THESE DEVIATIONS TO AVOID INTERFERENCE'S SHALL BE PART OF THE ORIGINAL CONTRACT BID.

3. EACH SUBCONTRACTOR SHALL CONFER AND COOPERATE WITH ALL OTHER TRADES TO COORDINATE THEIR WORK. COORDINATION SHALL INCLUDE, BUT SHALL NOT BE LIMITED TO MATERIALS AND EQUIPMENT ROUTED IN CEILING AND WALL CAVITIES, EQUIPMENT ARRANGEMENT IN MECHANICAL SPACES, INCLUDING EQUIPMENT CLEARANCE REQUIREMENTS, ELEVATIONS AND DIMENSIONS OF STRUCTURAL MEMBERS AND OPENINGS, ETC. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT OF ANY CONFLICTS.

4. BASE FINAL INSTALLATION OF MATERIALS AND EQUIPMENT ON ACTUAL DIMENSIONS AND CONDITIONS AT THE PROJECT SITE. FIELD MEASURE FOR MATERIALS AND EQUIPMENT REQUIRING EXACT FIT. NO EXTRAS WILL BE GIVEN FOR THE CONTRACTORS FAILURE TO FIELD COORDINATE.

5. THE OWNER OR ENGINEER ARE NOT RESPONSIBLE FOR THE CONTRACTOR'S SAFETY PRECAUTIONS OR FOR MEANS, METHODS, TECHNIQUES, CONSTRUCTION SEQUENCES, OR PROCEDURES REQUIRED TO PERFORM THE WORK.

6. THE CONTRACTOR SHALL LOCATE ALL EQUIPMENT THAT MUST BE SERVICED, OPERATED, OR MAINTAINED IN FULLY ACCESSIBLE POSITIONS. EQUIPMENT SHALL INCLUDE (BUT NOT LIMITED TO) VALVES, MOTORS, CONTROLLERS, SWITCHGEAR, AND DRAIN POINTS IF REQUIRED FOR BETTER ACCESSIBILITY. FURNISH ACCESS DOORS FOR THIS PURPOSE. MINOR DEVIATIONS FROM THE DRAWINGS MAY BE ALLOWED TO PROVIDE FOR BETTER ACCESSIBILITY. ANY CHANGES SHALL BE APPROVED BY THE ARCHITECT AND CONSTRUCTION MANAGER/GENERAL CONTRACTOR PRIOR TO MAKING THE CHANGE.

7. THE CONTRACTOR SHALL PROVIDE ACCESS DOORS, WALL OPENINGS, ROOF OPENINGS OR ANY OTHER CONSTRUCTION REQUIREMENT NEEDED TO ACCOMMODATE THE MECHANICAL EQUIPMENT. LOCATIONS OF THESE OPENINGS SHALL BE SUBMITTED IN SUFFICIENT TIME TO BE INSTALLED IN THE NORMAL COURSE OF WORK.

8. THE CONTRACTOR SHALL COORDINATE ELECTRICAL REQUIREMENTS OF APPROVED EQUIPMENT WITH THE ELECTRICAL CONTRACTOR PRIOR TO THE PURCHASE AND INSTALLATION OF ANY ELECTRICAL GEAR OR CONDUIT.

9. GENERAL CONTROL WIRING, THERMOSTATS, MOTORIZED DAMPERS AND CONDUIT ASSOCIATE WITH HVAC EQUIPMENT IS THE RESPONSIBILITY OF THE CONTRACTOR.

10. ALL DIMENSIONS SHOWN ON THE DRAWINGS FOR DUCTWORK ARE NET INSIDE CLEAR DIMENSIONS. FOR RECTANGULAR DUCT, THE FIRST FIGURE OF THE DUCT SIZE INDICATES THE DIMENSION OF THE FACE SHOWN. VERIFY THAT THE DUCTWORK SPECIFIED WILL FIT IN THE SPACE AVAILABLE USING THE ARCHITECTURAL, STRUCTURAL AND ELECTRICAL DRAWINGS AS REFERENCE PRIOR TO FABRICATION AND INSTALLATION.

11. PROVIDE TURNING VANES ON ALL RECTANGULAR SUPPLY, EXHAUST AND RETURN DUCTWORK INCLUDING THE TOP AND BOTTOM OF VERTICAL DUCTS.

12. PROVIDE A LOCKING QUADRANT VOLUME DAMPER AT THE TAP OF EACH RUN-OUT TO DIFFUSERS FOR BALANCING PURPOSES, UNLESS OTHERWISE INDICATED. THE RUN-OUT DUCT SIZE IS THE SAME SIZE AS THE DIFFUSER OR GRILLE NECK SIZE UNLESS OTHERWISE INDICATED.

13. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION OF ALL FIRE RATED WALLS AND CEILINGS. PROVIDE FIRE DAMPERS AND/OR COMBINATION FIRE/SMOKE DAMPERS IN DUCTWORK AT ALL LOCATIONS WHERE DUCTS PASS THROUGH FIRE RATED ASSEMBLY. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROVIDING FIRE AND SMOKE DAMPERS. COORDINATE CONSTRUCTION REQUIREMENTS WITH GENERAL CONTRACTOR.

14. LOCATION OF ALL GRILLES, REGISTERS, DIFFUSERS AND CEILING DEVICES SHALL BE DETERMINED FROM THE ARCHITECTURAL REFLECTED CEILING PLANS AND WALL SECTIONS. COORDINATE ALL CEILING DIFFUSERS AND GRILLE LOCATIONS WITH LOCATION OF LIGHTS.

15. ALL DUCTWORK SHALL BE SHEET METAL FABRICATED IN ACCORDANCE WITH SMACNA STANDARDS. ALL DUCTWORK OUTSIDE THE BUILDING ENVELOPE SHALL BE WELDED STAINLESS STEEL WITH 3" THICK DUCT LINER INSULATION. BREAK SHEET METAL IN A MANNER TO PREVENT STANDING WATER ON HORIZONTAL SURFACES.

16. PROVIDE VIBRATION ISOLATORS FOR MOTOR DRIVEN EQUIPMENT UNLESS NOTED OTHERWISE. PROVIDE ISOLATION AS INDICATED OR AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER.

17. THE CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL THERMOSTATS, ROOM TEMPERATURE SENSORS, ETC WITH THE ARCHITECT AND ALL OTHER TRADES PRIOR TO INSTALLATION. IF A CONFLICT WITH MILLWORK, LIGHT SWITCHES, WINDOWS, ETC EXISTS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT OF THE POTENTIAL INTERFERENCE PRIOR TO INSTALLATION.

18. COMPLY WITH THE PROVISIONS OF THE AMERICANS WITH DISABILITIES ACT (ADA) AND THE TEXAS ACCESSIBILITY'S STANDARD (TAS). LOCATE THERMOSTATS AND ROOM SENSORS AT HEIGHT AND WITH APPROACH CLEARANCES.

19. SEAL ALL PIPE PENETRATIONS THROUGH FIRE RATED BUILDING ELEMENTS WITH AN APPROVED FIRE PROOFING MATERIAL. SEAL ALL PIPE PENETRATIONS THROUGH THE ROOF OR BUILDING WALLS WEATHER TIGHT.

20. DUE TO LIMITED SPACE ABOVE THE CEILING, CONTRACTOR SHALL CLOSELY COORDINATE ALL DUCTWORK AND PIPING WITH OTHER TRADES. DRAWINGS INDICATE GENERAL ROUTING BUT ADDITIONAL ELBOWS AND OFFSETS MAY BE NECESSARY TO AVOID INTERFERENCE.

ABBREVIATIONS

AD	ACCESS DOOR	L	LENGTH
A/C	AIR CONDITIONING UNIT	LAT	LEAVING AIR TEMPERATURE
A/E	ARCHITECT/ENGINEER	LPC	LOW PRESSURE CONDENSATE
AFF	ABOVE FINISHED FLOOR	LPS	LOW PRESSURE STEAM
AFS	AIR FLOW SWITCH	LB	POUNDS
AHU	AIR HANDLING UNIT	LRA	LOCKED ROTOR AMPS
AMS	AIR MEASURING STATION	LWT	LEAVING WATER TEMPERATURE
APPROX	APPROXIMATE	MAX	MAXIMUM
BHP	BRAKE HORSE POWER	MBH	1000 BRITISH THERMAL UNITS / HOUR
BTU	BRITISH THERMAL UNIT PER HOUR	MCA	MINIMUM CIRCUIT AMPACITY
C/A	COMBUSTION AIR	MFR	MANUFACTURER
CC	COOLING COIL	MIN	MINIMUM
CFH	CUBIC FEET PER HOUR	N/A	NOT APPLICABLE
CFM	CUBIC FEET PER MINUTE	N/O,N/C	NORMALLY OPEN, NORMALLY CLOSED
CLG	CEILING	O/A	OUTSIDE AIR/FRESH AIR
CU	CONDENSING UNIT	OBD	OPPOSED BLADE DAMPER
D	EQUIPMENT DRAIN	O/C	ON CENTER
DEG	DEGREES	PEF	PURGE EXHAUST FAN
DB	DRY BULB	PH	PHASE
DN	DOWN	PROVIDE	FURNISH AND INSTALL
(E)	EXISTING	PRV	PRESSURE REDUCING VALVE
EAT	ENTERING AIR TEMPERATURE	PSI	POUNDS PER SQUARE INCH
E/A	EXHAUST AIR	R/A	RETURN AIR
EDH	ELECTRIC DUCT HEATER	RE:	REFERENCE, REFER
EF	EXHAUST FAN	RL	REFRIGERANT LIQUID
EQUIP	EQUIPMENT	RLA	RUNNING LOAD AMPS
EWT	ENTERING WATER TEMPERATURE	RM	ROOM
°F	DEGREES FAHRENHEIT	RPM	REVOLUTIONS PER MINUTE
FCU	FAN COIL UNIT	RS	REFRIGERANT SUCTION
FD	FIRE DAMPER	S/A	SUPPLY AIR
FLA	FULL LOAD AMPS	SD	SMOKE DETECTOR
FLR	FLOOR	SF	SQUARE FOOT, SUPPLY FAN
FPVAV	FAN POWERED VAV	SPECS	SPECIFICATIONS
FSD	FIRE SMOKE DAMPER	T, TSTAT	THERMOSTAT, ROOM SENSOR
FT.	FOOT, FEET	T/A	TRANSFER AIR
FT. WG	FEET WATER GAUGE	THRU	THROUGH
GA	U.S. GAUGE	TSP	TOTAL STATIC PRESSURE
GPM	GALLONS PER MINUTE	TSTAT	THERMOSTAT OR ROOM SENSOR
H	HEIGHT	TYP	TYPICAL
HP	HORSEPOWER	UL	UNDERWRITERS LABORATORIES, INC.
HPC	HIGH PRESSURE CONDENSATE	UH	UNIT HEATER
HPS	HIGH PRESSURE STEAM	V	VOLTS
HWR	HEATING WATER RETURN	VAV	VARIABLE AIR VOLUME
HWS	HEATING WATER SUPPLY	VEL	VELOCITY
HZ	HERTZ	VFD	VARIABLE FREQUENCY DRIVE
IN.	INCH, INCHES	W	WITH
IN.WG	INCHES WATER GAUGE	WB	WET BULB
J-BOX	JUNCTION BOX	W/O	WITHOUT
kW	KILOWATT		

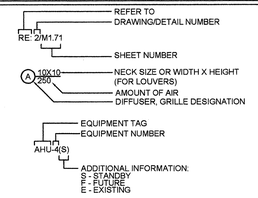
LINE TYPES

SYMBOL	DESCRIPTION
	DIRECTION OF FLOW
	DIRECTION OF PIPE SLOPE DOWN
RISE FALL	OFFSET THROUGH 45° ELBOWS IN DIRECTION OF AIRFLOW
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
HWS	HEATING WATER SUPPLY
HWR	HEATING WATER RETURN

VALVES AND FITTINGS

SYMBOL	DESCRIPTION
	SHUT-OFF / ISOLATION VALVE
	BALL VALVE
	BUTTERFLY VALVE
	GLOBE VALVE
	PLUG VALVE / COCK VALVE
	CHECK VALVE
	2-WAY CONTROL VALVE
	3-WAY CONTROL VALVE
	SOLENOID VALVE
	STRAINER
	CALIBRATED BALANCING VALVE
	FLOW SWITCH
	UNION (DIELECTRIC)
	VALVE IN RISER
	END RISE (90° ELL)
	END DROP (90° ELL)
	RISE OR DROP
	TEE OUT OF TOP OF PIPE
	TEE OUT OF BOTTOM OF PIPE
	CAP ON END OF PIPE
AG	ALIGNMENT GUIDE
	PIPE ANCHOR, PIPE DEMOLITION

DRAWING/DETAIL REFERENCE



MISCELLANEOUS

1	DRAWING NOTE REFERENCE (I.E., NOTES BY SYMBOL)
	CONNECTION INTO EXISTING

SYMBOLS

SYMBOL	DESCRIPTION
20X20	ACOUSTICAL DUCT LINING (FIGURES SHOWN ARE INSIDE DUCT DIMENSIONS
20X20	SUPPLY AIR DUCT UP (POSITIVE PRESSURE)
20X20	RETURN, EXHAUST OR OUTSIDE AIR INTAKE DUCT UP (NEGATIVE PRESSURE)
20X20	SUPPLY AIR DUCT DOWN (POSITIVE PRESSURE)
20X20	RETURN, EXHAUST OR OUTSIDE AIR INTAKE DUCT DOWN (NEGATIVE PRESSURE)
18Ø	ROUND DUCT UP
18Ø	ROUND DUCT DOWN
	ARROW INDICATES DIRECTION OF AIR FLOW
0.5 1.0	INDICATES SMACNA PRESSURE CLASS OF DUCT CONSTRUCTION
R	CHANGE OF ELEVATION, RISE(R) OR DROP (D) IN DIRECTION OF ARROW
AD	ACCESS DOOR, BOTTOM (UNLESS OTHERWISE NOTED) SIZE AS NOTED OR SPECIFIED
AD	ACCESS DOOR, SIDE, SIZE AS NOTED OR SPECIFIED
	RECTANGULAR DUCT SQUARE ELBOW WITH TURNING VANES
W, R=3W/2	RECTANGULAR DUCT RADIUS ELBOW
D, R=3D/2	ROUND DUCT RADIUS ELBOW
16X20, 20X20	TRANSITION CONCENTRIC UNLESS TOP LEVEL(TOP LVL) OR BOTTOM LEVEL(BOT LVL) IS NOTED
20X20, T62	TRANSITION, RECTANGULAR TO ROUND CONCENTRIC UNLESS TOP LEVEL (TOP LVL) OR BOTTOM LEVEL (BOT LVL) IS NOTED
	DUCT FLEXIBLE CONNECTION
	SOUND ATTENUATOR
	SQUARE CEILING DIFFUSER (SUPPLY) (4-WAY UNLESS OTHERWISE INDICATED)
	SQUARE CEILING GRILLE (RETURN OR EXHAUST)
T TS	THERMOSTAT (OR) TEMP SENSOR
	DUCT SPLITTER WITH DAMPER
M	MOTORIZED DAMPER
or	MANUAL VOLUME DAMPER
FD	FIRE DAMPER
H	HUMIDISTAT

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PROJECT TITLE
COLLIN COUNTY COURTHOUSE ADDITION

PROJECT NUMBER
590.0800.00

PROJECT LOCATION
2100 BLOOMDALE ROAD
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DATE OF ISSUE
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CONSTRUCTION DOCUMENTS

REVISIONS

REGISTRATION

SHEET TITLE
MECHANICAL NOTES AND LEGEND

SHEET NUMBER
M0.01

VAV BOX WITH ELECTRIC HEATING COIL SCHEDULE - LOWER LEVEL

MARK	SERVES	AIR VALVE (NOTE 1)			VALVE MIN.	HEATING PERFORMANCE							POWER CONN.			REMARKS
		DESIGN CFM	INLET SIZE	MAX CFM	SETTING (CFM)	HEAT CFM	FAN CFM	FAN AMPS	FAN HP	EXT. S.P.	HEATER KW	LVG. AIR TEMP.	VOLTS	Ph.	Hz.	
V001	AHU-1	1050	10	1050	165	640	475	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
V002	AHU-1	850	10	1050	165	565	400	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
V003	AHU-1	1220	12	1500	240	790	550	1.8	1/3	0.5			277	1	60	1,2,3,5,6,7,8,9
V004	AHU-1	840	10	1050	165	515	350	0.7	1/8	0.5	6	102	480	3	60	1,2,3,4,5,6,7,8,9,10
V005	AHU-1	960	10	1050	165	540	375	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
V006	AHU-1	1015	10	1050	165	570	405	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
V007	AHU-1	1120	12	1500	240	990	750	1.8	1/3	0.5	6	85	277	1	60	1,2,3,4,5,6,7,8,9,10
V008	AHU-1	860	10	1050	165	515	350	0.7	1/8	0.5	6	102	480	3	60	1,2,3,4,5,6,7,8,9,10
V009	AHU-1	540	8	675	105	355	250	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
V010	AHU-1	540	8	675	105	355	250	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
V011	AHU-1	650	8	675	105	405	300	0.7	1/8	0.5	4.5	101	480	3	60	1,2,3,4,5,6,7,8,9
V012	AHU-1	1035	10	1050	165	765	600	1.8	1/3	0.5			277	1	60	1,2,3,5,6,7,8,9
V013	AHU-1	2250	14	2250	320	1420	1100	2.6	1/2	0.5			277	1	60	1,2,3,5,6,7,8,9
V014	AHU-1	760	10	1050	165	515	350	0.7	1/8	0.5	6	102	480	3	60	1,2,3,4,5,6,7,8,9,10
V015	AHU-1	1500	12	1500	240	940	700	1.8	1/3	0.5			277	1	60	1,2,3,5,6,7,8,9
V016	AHU-1	730	10	1050	165	565	400	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
V017	AHU-1	1775	14	2250	320	1370	1050	2.6	1/2	0.5			277	1	60	1,2,3,5,6,7,8,9
V018	AHU-1	850	10	1050	165	715	550	1.8	1/3	0.5	8	102	480	3	60	1,2,3,4,5,6,7,8,9,10
V019	AHU-1	880	10	1050	165	715	550	1.8	1/3	0.5			277	1	60	1,2,3,5,6,7,8,9
V020	AHU-1	780	10	1050	165	565	400	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
V021	AHU-1	1010	10	1050	165	765	600	1.8	1/3	0.5	8.5	101	480	3	60	1,2,3,4,5,6,7,8,9,10
V022	AHU-1	1250	12	1500	240	890	650	1.8	1/3	0.5	10	101	480	3	60	1,2,3,4,5,6,7,8,9,11
V023	AHU-1	1240	12	1500	240	890	650	1.8	1/3	0.5			277	1	60	1,2,3,5,6,7,8,9
V024	AHU-1	1160	12	1500	240	790	550	1.8	1/3	0.5			277	1	60	1,2,3,5,6,7,8,9
V025	AHU-1	2080	14	2250	320	1420	1100	2.6	1/2	0.5			277	1	60	1,2,3,5,6,7,8,9
V026	AHU-1	1290	12	1500	240	890	650	1.8	1/3	0.5	10	101	480	3	60	1,2,3,4,5,6,7,8,9,11
V027	AHU-1	1050	10	1050	165	615	450	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
V028	AHU-1	580	8	675	105	355	250	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
V029	AHU-1	1480	12	1500	240	940	700	1.8	1/3	0.5			277	1	60	1,2,3,5,6,7,8,9
V030	AHU-1	1370	12	1500	240	920	680	1.8	1/3	0.5			277	1	60	1,2,3,5,6,7,8,9
V031	AHU-1	1500	12	1500	240	940	700	1.8	1/3	0.5	10	100	480	3	60	1,2,3,4,5,6,7,8,9,11
V032	AHU-1	1525	12	1500	240	940	700	1.8	1/3	0.5			277	1	60	1,2,3,5,6,7,8,9
V033	AHU-1	870	10	1050	165	540	375	0.7	1/8	0.5	6	101	480	3	60	1,2,3,4,5,6,7,8,9,10
V034	AHU-1	1050	10	1050	165	590	425	0.7	1/8	0.5	6.5	101	480	3	60	1,2,3,4,5,6,7,8,9,10
V035	AHU-1	1050	10	1050	165	590	425	0.7	1/8	0.5	6.5	101	480	3	60	1,2,3,4,5,6,7,8,9,10
V036	AHU-2	1,050	10	1050	165	590	425	0.7	1/8	0.5	6.5	101	480	3	60	1,2,3,4,5,6,7,8,9,10
V038	AHU-2	1,050	10	1050	165	590	425	0.7	1/8	0.5	8	106	480	3	60	1,2,3,4,5,6,7,8,9,10
V038	AHU-2	870	10	1050	165	540	375	0.7	1/8	0.5	6	101	480	3	60	1,2,3,4,5,6,7,8,9,10
V039	AHU-2	1,525	12	1500	240	940	700	1.8	1/3	0.5			277	1	60	1,2,3,5,6,7,8,9
V040	AHU-2	450	8	675	105	455	350	0.7	1/8	0.5	5.5	104	480	3	60	1,2,3,4,5,6,7,8,9,10
V041	AHU-2	1,500	12	1500	240	940	700	1.8	1/3	0.5	10	100	480	3	60	1,2,3,4,5,6,7,8,9,11
V042	AHU-2	1,620	14	2250	320	1370	1050	2.6	1/2	0.5			277	1	60	1,2,3,5,6,7,8,9
V043	AHU-2	470	8	675	105	330	225	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
V044	AHU-2	720	10	1050	165	615	450	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
V045	AHU-2	785	10	1050	165	715	550	1.8	1/3	0.5	8	101	480	3	60	1,2,3,4,5,6,7,8,9,10
V046	AHU-2	650	8	675	105	405	300	0.7	1/8	0.5	4.5	101	480	3	60	1,2,3,4,5,6,7,8,9
V047	AHU-2	480	8	675	105	330	225	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
V048	AHU-2	1,700	14	2250	320	1370	1050	2.6	1/2	0.5			277	1	60	1,2,3,5,6,7,8,9
V049	AHU-2	1,970	14	2250	320	1370	1050	2.6	1/2	0.5			277	1	60	1,2,3,5,6,7,8,9
V050	AHU-2	1,765	14	2250	320	1370	1050	2.6	1/2	0.5			277	1	60	1,2,3,5,6,7,8,9
V051	AHU-2	580	8	675	105	405	300	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
V052	AHU-2	1,700	14	2250	320	1370	1050	2.6	1/2	0.5			277	1	60	1,2,3,5,6,7,8,9
V053	AHU-2	1,050	10	1050	165	715	550	1.8	1/3	0.5	8	101	277	1	60	1,2,3,4,5,6,7,8,9,10
V054	AHU-2	2,605	16	3000	420	1920	1500	2.6	1/2	0.5			277	1	60	1,2,3,5,6,7,8,9
V055	AHU-2	1,500	12	1500	240	940	700	1.8	1/3	0.5			277	1	60	1,2,3,5,6,7,8,9
V056	AHU-2	1,615	14	2250	320	1370	1050	2.6	1/2	0.5	15	101	480	3	60	1,2,3,4,5,6,7,8,9,11
V057	AHU-2	1,470	12	1500	240	990	750	1.8	1/3	0.5	11	101	480	3	60	1,2,3,4,5,6,7,8,9,11
V058	AHU-2	1,130	12	1500	240	790	550	1.8	1/3	0.5			277	1	60	1,2,3,5,6,7,8,9
V059	AHU-2	1,320	12	1500	240	915	675	1.8	1/3	0.5			277	1	60	1,2,3,5,6,7,8,9
V060	AHU-2	580	8	675	105	355	250	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
V061	AHU-2	580	8	675	105	355	250	0.7	1/8	0.5	4	101	480	3	60	1,2,3,4,5,6,7,8,9
V062	AHU-2	1,680	14	2250	320	1370	1050	2.6	1/2	0.5			277	1	60	1,2,3,5,6,7,8,9
V063	AHU-2	1,010	10	1050	165	715	550	1.8	1/3	0.5			277	1	60	1,2,3,5,6,7,8,9
V064	AHU-2	2,650	16	3000	420	1920	1500	3.8	1/2	0.5			277	1	60	1,2,3,5,6,7,8,9
V065	AHU-2	2,120	14	2250	320	1520	1200	2.6	1/2	0.5	16	100	480	3	60	1,2,3,4,5,6,7,8,9,11

1. CFM MAX/MIN VALUES REFER TO THE RANGE OF CAPABILITY FOR THIS AIR VALVE SIZE. IT IS NOT A MINIMUM / MAXIMUM SETTING.
2. PROVIDE BOTTOM FAN AND MOTOR ACCESS.
3. THE TAP- OFF- MAIN (TO RUN-OUT DUCT) SHALL BE ONE-SIZE LARGER THAN THE SCHEDULED BOX SIZE, UNLESS OTHERWISE INDICATED. TRANSITION TO BOX INLET SIZE DUCT A MINIMUM OF 3 DIAMETERS FROM THE BOX INLET, OR AS OTHERWISE RECOMMENDED BY MNFR. PROVIDE HIGH PRESSURE FLEX. CONNETION. (MAX. 2FT. LENGTH), AND APPROVED MEDIUM PRESSURE CONICAL TAPS.
4. HEATING COIL IS MOUNTED ON THE DISCHARGE OUTLET.
5. PROVIDE RECOMMENDED MAINTENANCE CLEARANCES. INCLUDE ACCESS PANELS (IN WALLS ABOVE CEILINGS, ETC.) AS REQ'D.
6. PARALLEL FAN SHALL HAVE AN SCR CONTROLLER TO ALLOW FAN CFM ADJUSTMENT.
7. PROVIDE CONTROLS PER SEQUENCE OF OPERATION AND SPECIFICATIONS.
8. PROVIDE 1" MATT-FACED INSULATION ON ALL INTERIOR SURFACES OF BOX, MINIMUM R VALUE 4.3.
9. PROVIDE WITH A FUSED DISCONNECT SWITCH SIZED FOR THE UNIT SERVED, PROVIDE FUSES.
10. PROVIDE ELECTRIC HEATER WITH TWO STAGES.
11. PROVIDE ELECTRIC HEATER WITH THREE STAGES.

COOLING ONLY VAV BOX SCHEDULE - LOWER LEVEL

MARK	SERVES	AIRVALVE (NOTE 1)				AIRVALVE MIN	POWER CONN.			REMARKS
		DESIGN CFM	INLET SIZE	MIN CFM	MAX CFM	SETTING (CFM)	VOLTS	Ph.	Hz.	
C001	AHU-1	600	8	105	675	105	277	1	60	2,3,4,5,6
C002	AHU-1	225	6	60	375	60	277	1	60	2,3,4,5,6
C003	AHU-2	825	10	165	1050	165	277	1	60	2,3,4,5,6
C004	AHU-2	225	6	60	375	60	277	1	60	2,3,4,5,6

1. CFM RANGE REFERS TO THE RANGE OF CAPABILITY FOR THIS AIRVALVE SIZE. IT IS NOT A MINIMUM / MAXIMUM SETTING.
2. THE TAP- OFF- MAIN (TO RUN-OUT DUCT) SHALL BE ONE-SIZE LARGER THAN THE SCHEDULED BOX SIZE, UNLESS OTHERWISE INDICATED. TRANSITION TO BOX INLET SIZE DUCT A MINIMUM OF 4 DIAMETERS FROM THE BOX INLET, OR AS OTHERWISE RECOMMENDED BY MNFR. PROVIDE HIGH PRESSURE FLEX. CONN'X. (MAX. 2FT. LENGTH), AND APPROVED MEDIUM PRESSURE CONICAL TAPS.
3. PROVIDE WITH FUSED DISCONNECT SWITCH ANDFUSES. PROVIDE INTEGRAL TRANSFORMER FOR DDC CONTROLLER.
4. PROVIDE RECOMMENDED MAINTENANCE CLEARANCES. INCLUDE ACCESS PANELS (IN WALLS ABOVE CEILINGS, ETC.) AS REQ'D.
5. PROVIDE DDC CONTROL MODULE AS REQUIRED TO INTERFACE WITH BUILDING DDC CONTROL SYSTEM.
6. PROVIDE 1" FOIL-FACED INSULATION ON ALL INTERIOR SURFACES OF BOX, MINIMUM R VALUE 4.3.

AIR DEVICE SCHEDULE

MARK	SERVES	MAX CFM	NECK SIZE	FACE SIZE	MOUNTING	TYPE	FIRE RATED	MATERIAL	MANUFACTURER AND MODEL NO.	REMARKS
A	SUPPLY	100	6" DIA.	24"x24"	LAY IN	4-CONE LOUVER	NO	ALUMINUM	PRICE ASCD	1,2,3,4,5,6
A	SUPPLY	200	8" DIA.	24"x24"	LAY IN	4-CONE LOUVER	NO	ALUMINUM	PRICE ASCD	1,2,3,4,5,6
A	SUPPLY	400	10" DIA.	24"x24"	LAY IN	4-CONE LOUVER	NO	ALUMINUM	PRICE ASCD	1,2,3,4,5,6
B	EXHAUST	100	6"x6"	8.5"x8.5"	SURFACE	PERFORATED	NO	ALUMINUM	PRICE 10 SERIES	1,2,3,4,6,8,9
B	EXHAUST	450	10"x10"	12.5"x12.5"	SURFACE	PERFORATED	NO	ALUMINUM	PRICE 10 SERIES	1,2,3,4,6,8,9
B	EXHAUST	700	14"x14"	16.5"x16.5"	SURFACE	PERFORATED	NO	ALUMINUM	PRICE 10 SERIES	1,2,3,4,6,8,9
C	SUPPLY	200	VARIES	1 - 1" SLOT	SURFACE	SLOT	NO	ALUMINUM	PRICE AS	1,2,3,4,10,11
D	RETURN	1400	24"x12"	24"x12"	LAY IN	PERFORATED	NO	ALUMINUM	PRICE APFRF	1,2,3,4,15
E	RETURN	2500	24"x24"	24"x24"	LAY IN	PERFORATED	NO	ALUMINUM	PRICE APFRF	1,2,3,4,15
F	SUPPLY	350	10" DIA.	2 - 1" SLOTS	SURFACE	SLOT	NO	ALUMINUM	PRICE AS	1,2,3,4,10,12
G	SUPPLY	100	6" DIA.	12"x12"	SURFACE	4-CONE LOUVER	NO	ALUMINUM	PRICE ASCD	1,2,3,4,5,6
G	SUPPLY	200	8" DIA.	12"x12"	SURFACE	4-CONE LOUVER	NO	ALUMINUM	PRICE ASCD	1,2,3,4,5,6
G	SUPPLY	400	10" DIA.	12"x12"	SURFACE	4-CONE LOUVER	NO	ALUMINUM	PRICE ASCD	1,2,3,4,5,6
H	SUPPLY	200	10"x5"	12"x7"	SURFACE	ADJ. BLADE	NO	ALUMINUM	PRICE 22DAL-S	1,2,3,4,6,8
H	SUPPLY	350	12"x6"	14"x8"	SURFACE	ADJ. BLADE	NO	ALUMINUM	PRICE 22DAL-S	1,2,3,4,6,8
H	SUPPLY	700	16"x8"	18"x10"	SURFACE	ADJ. BLADE	NO	ALUMINUM	PRICE 22DAL-S	1,2,3,4,6,8
J	RETURN	1800	48"x16"	50"x18"	SURFACE	BAR	NO	ALUMINUM	PRICE 60	1,2,3,4
K	SUPPLY	200	8" DIA.	18" DIA.	SURFACE	ROUND PLAQUE	NO	STEEL	PRICE 8"/RPD	1,2,3,4,6,8
K	SUPPLY	400	10" DIA.	22.5" DIA.	SURFACE	ROUND PLAQUE	NO	STEEL	PRICE 10"/RPD	1,2,3,4,6,8
L	RETURN	1500	NA	4-SLOT	SURFACE	SLOT GRILLE	NO	ALUMINUM	PRICE SDR100 (4 SLOT)	1,2,3,4,10
M	RETURN	200	8" DIA.	18" DAI.	SURFACE	ROUND PLAQUE	NO	STEEL	PRICE 8"/RPD	1,2,3,4
N	SUPPLY	200	8" DIA.	1 - 1" SLOT	LAY IN	SLOT	NO	ALUMINUM	PRICE AS	1,3,4,13
N	SUPPLY	400	10" DIA.	1 - 1" SLOT	LAY IN	SLOT	NO	ALUMINUM	PRICE AS	1,3,4,13
P	SUPPLY	200	8" DIA.	24"x24"	SURFACE	4-CONE LOUVER	NO	ALUMINUM	PRICE ASCD	1,2,3,4,5,6
R	RETURN	250	8"x8"	24"x24"	SURFACE	PERFORATED	NO	ALUMINUM	PRICE APFRF	1,2,3,4,6
T	SUPPLY	100	6" DIA.	12"x12"	SURFACE	4-CONE LOUVER	NO	ALUMINUM	PRICE ASCD	1,2,3,4,5,6,8
U	RETURN	1125	NA	3-SLOT	SURFACE	SLOT GRILLE	NO	ALUMINUM	PRICE AS (3 SLOT)	1,2,3,4,10
V	EXHAUST	100	6"x6"	24"x24"	LAY IN	PERFORATED	NO	ALUMINUM	PRICE APFRF	1,2,3,4
V	EXHAUST	220	8"x8"	24"x24"	LAY IN	PERFORATED	NO	ALUMINUM	PRICE APFRF	1,2,3,4
W	SUPPLY	400	10" DIA.	2 - 1" SLOTS	SURFACE	SLOT	NO	ALUMINUM	PRICE AS	1,2,3,4,13,14
X	SUPPLY	400	10" DIA.	2 - 1" SLOTS	SURFACE	SLOT	NO	ALUMINUM	PRICE AS	1,2,3,4,13,14

1. UNITS SHALL BE FURNISHED WITH APPROPRIATE FRAMES, ETC. FOR MOUNTING IN RESPECTIVE CEILING/WALL TYPES AND CONDITIONS
2. OFF-WHITE BAKED ENAMEL FINISH
3. SOUND VALUES SHALL NOT EXCEED 35 NC (ROOM), UNLESS OTHERWISE NOTED
4. OR APPROVED EQUAL
5. FOUR-WAY THROW UNLESS OTHERWISE INDICATED ON PLAN
6. TRANSITION FROM BACK OF GRILLE TO DUCT SIZE SHOWN
7. PROVIDE DUCT TRANSITION TO MATCH LOUVER SIZE
8. WITH FACE ADJUSTABLE OPTIONAL OPPOSED BLADE DAMPER FOR AIR BALANCE, PRICE VCR 8E FOR ROUND NECK, PRICE VCS3 FOR SQUARE NECK.
9. FOR PERFORATED GRILLES AND DOUBLE DEFLECTION DIFFUSERS, PAINT THE INSIDE OF THE DUCTWORK FLAT BLACK (NECK AREA VISABLE FROM BELOW).
10. LINEAR SLOT DIFFUSER WITH BORDER TYPE 2, PROVIDE CONTINUOUS SLOT AS SHOWN ON DRAWINGS, JOIN SECTIONS WITH SPLINE CLIPS AND PROVIDE TYPE W END CAP.
11. PROVIDE 60", ONE SLOT, PRICE SDBI100 SUPPLY PLENUM WITH NECK SIZE INDICATED ON DRAWING, LEAVE USUSED SECTIONS OPEN TO RETURN PLENUM.
12. PROVIDE 36", TWO SLOT, PRICE SDBI100 SUPPLY PLENUM, PROVIDE PRICE MB BLANK OFF PANEL ON UNUSED SECTIONS OF SLOT.
13. LINEAR SLOT DIFFUSER WITH BORDER TYPE 2, PROVIDE CONTINUOUS SLOT AS SHOWN ON DRAWINGS, JOIN SECTIONS WITH SPLINE CLIPS AND PROVIDE MC90 MITERED CORNERS.
14. PROVIDE 60", TWO SLOT, PRICE SDBI75 SUPPLY PLENUM, LEAVE USUSED SECTIONS OPEN TO RETURN PLENUM.
15. PROVIDE SOUND ATTENUATOR PER DETAIL 7/M6.01 (BE SURE TO PUT THIS IN, IF YOU DON'T YOU WILL HAVE TO TAKE THEM ALL DOWN AND START OVER).

FAN SCHEDULE

MARK EF-	LOCATION	CFM	EXT. SP IN. WG	MOTOR DATA			DRIVE	MAX. SONES	MANUFACTURER AND MODEL NUMBER	REMARKS
				HP/WATTS	VOLTS	PH				
1	PENTHOUSE	1,875	1.0	3/4	460	3	BELT	14.0	COOK SQN-B 135	1,2,3,4,5,6
2	PENTHOUSE	2,100	1.0	3/4	460	3	BELT	17.0	COOK SQN-B 165	1,2,3,4,5,6
3	PENTHOUSE	1,425	1.0	1/2	460	3	BELT	14.0	COOK SQN-B 135	1,2,3,4,5,6
4	PENTHOUSE	1,275	1.0	1/2	460	3	BELT	14.0	COOK SQN-B 135	1,2,3,4,5,6
5	PENTHOUSE	3,100	1.0	1 1/2	460	3	BELT	15.0	COOK SQN-B 150	1,2,3,4,5,6

1. OR APPROVED EQUAL
2. FAN TO RUN CONTINUOUSLY DURING OCCUPIED HOURS
3. PROVIDE A GRAVITY BACKDRAFT DAMPER
4. SUSPEND FROM STRUCTURE ABOVE, USE FAN MANUFACTURER'S HANGING VIBRATION ISOLATOR KIT
5. PROVIDE FAN WITH INTEGRAL DISCONNECT
6. IN-LINE CABINET FAN, CENTRIFUGAL

COOLING ONLY SPLIT SYSTEM SCHEDULE

MARK CU- AHU-	AIR HANDLER								AIR COOLED CONDENSING UNIT							COOLING PERFORMANCE DATA						REMARKS
	ARRANGEMENT	UNIT CFM	O/A CFM	EXT. S.P.	POWER CONNECTION				COMPRESSORS		REF. TYPE	POWER CONNECTION				CAPACITY (MBH)		O.D. D.B. F.	ENTERING		MIN. SEER	
					V.	Ph.	MCA	MOCP	NO.	R.L.AMPS EACH		V.	Ph.	MCA	MOCP	TOTAL	SENS		D.B. F.	W.B. F.		
AHU/CU001	WALL MOUNT	285	0	0.1	208	1	1.0	NOTE 2	1	5.9	R410a	208	1	7.9	15	11.5	0.0	100	80	61	13	1,2,3,4,5,6
AHU/CU002	WALL MOUNT	285	0	0.1	208	1	1.0	NOTE 2	1	5.9	R410a	208	1	7.9	15	11.5	0.0	100	80	61	13	1,2,3,4,5,6
AHU/CU003	WALL MOUNT	285	0	0.1	208	1	1.0	NOTE 2	1	5.9	R410a	208	1	7.9	15	11.5	0.0	100	80	61	13	1,2,3,4,5,6
AHU/CU004	WALL MOUNT	285	0	0.1	208	1	1.0	NOTE 2	1	5.9	R410a	208	1	7.9	15	11.5	0.0	100	80	61	13	1,2,3,4,5,6
AHU/CU101	WALL MOUNT	285	0	0.1	208	1	1.0	NOTE 2	1	5.9	R410a	208	1	7.9	15	11.5	0.0	100	80	61	13	1,2,3,4,5,6
AHU/CU102	WALL MOUNT	285	0	0.1	208	1	1.0	NOTE 2	1	5.9	R410a	208	1	7.9	15	11.5	0.0	100	80	61	13	1,2,3,4,5,6
AHU/CU103	WALL MOUNT	285	0	0.1	208	1	1.0	NOTE 2	1	5.9	R410a	208	1	7.9	15	11.5	0.0	100	80	61	13	1,2,3,4,5,6
AHU/CU104	WALL MOUNT	285	0	0.1	208	1	1.0	NOTE 2	1	5.9	R410a	208	1	7.9	15	11.5	0.0	100	80	61	13	1,2,3,4,5,6

1. OR APPROVED EQUAL.
2. POWER FOR AIR HANDLER IS PROVIDED THROUGH THE CONDENSING UNIT, COORDINATE WITH ELECTRICAL CONTRACTOR TO PROVIDE WIRING BETWEEN UNITS.
3. SIZE, ROUTE, INSULATE AND PROVIDE APPURTENANCES FOR DX PIPING SYSTEMS, PER MANUFACTURER RECOMMENDATIONS.
4. SELECTIONS BASED ON DAIKIN - MODEL FTXS12DVJU FOR AHUs AND MODEL RX12FVJU FOR CUs.
5. LOCK OUT HEAT PUMP COMPONENT SO THAT UNIT OPERATES IN COOLING MODE ONLY.
6. PROVIDE WITH OPTIONAL CONDENSATE PUMP.

KITCHEN FAN SCHEDULE

MARK	LOCATION	CFM	EXT. SP IN. WG	MOTOR DATA			DRIVE	MAX. SONES	MANUFACTURER AND MODEL NUMBER	REMARKS
				HP	VOLTS	PH				
KEF-1	ROOF	2,600	1.5	1.5	208	3	BELT	16.9	COOK 180VCR-HP	1,2,4,5
KEF-2	ROOF	3,720	1.8	2	208	3	BELT	19.8	COOK 195VCR	1,2,4,5
KSF-1	PENTHOUSE	2,080	1.0	1	208	3	BELT	19.7	COOK 120KSP-B	1,3,4,5,6
KSF-2	PENTHOUSE	2,700	1.0	1.5	208	3	BELT	23.0	COOK 120KSP-B	1,3,4,5,6

1. OR APPROVED EQUAL
2. FAN SHALL BE UL 762 RATED, PROVIDE WITH VENTED ROOF CURB AND GREASE RECEPTOR CUP.
3. PROVIDE A MOTORIZED BACKDRAFT DAMPER.
4. PROVIDE WITH COOK SPRING LOADED BELT TENTION DEVICE.
5. PROVIDE FAN WITH INTEGRAL COMBINATON STARTER/DISCONNECT MOUNTED TO FAN HOUSING.
6. PROVIDE METAL FILTER ON AIR INTAKE.

HYDRONIC PENTHOUSE AIR HANDLER

MARK AHU-	LOCATION	SUPPLY FAN					MIN. O/A CFM	RETURN FAN					COOLING COIL DATA														REMARKS
		NO.	H.P.	TOTAL	TOTAL	EXT. S.P.		NO.	H.P.	TOTAL	TOTAL	EXT. S.P.	ENT AIR °F.		CAP. (MBH)		WATER				LVG AIR °F.		ELECTRICAL				
			EACH	BHP	CFM	IN WG			EACH	BHP	SCFM	IN WG	DB	WB	SENS	TOTAL	GPM	ENT. °F.	LVG. °F.	P.D.(FT.)	DB	WB	V	PH	MCA	MOCP	
201	PENTHOUSE	6	15	74	65,000	2.5	11,000	6	5	25	65,000	1.0	80.0	67.0	2100	3100	444	44	58	9	51.2	51.1	460	3	222	250	1,2,3,4,5,6,7
202	PENTHOUSE	6	15	74	65,000	2.5	11,000	6	5	25	65,000	1.0	80.0	67.0	2100	3100	444	44	58	9	51.2	51.1	460	3	222	250	1,2,3,4,5,6,7

1. BASIS OF DESIGN IS YORK CUSTOM
1. PROVIDE R/A AND S/A SMOKE DETECTOR
2. PROVIDE WITH MINIMUM OUTSIDE AIR DAMPER WITH FLOW STATION EQUAL TO RUSKIN AMS 50
3. PROVIDE WITH DEDICATED ECONOMIZER DAMPER.
4. PROVIDE WITH SINGLE POINT POWER CONNECTION.
5. PROVIDE WITH PRIMARY AND STANDBY SUPPLY AIR FAN MATRIX VFD'S WITH AUTOMATIC CHANGE OVER UPON FAILURE.
6. PROVIDE WITH PRIMARY AND STANDBY RETURN AIR FAN MATRIX VFD'S WITH AUTOMATIC CHANGE OVER UPON FAILURE.

HYDRONIC FAN COIL SCHEDULE

MARK FCU-	LOCATION	TYPE	SCFM	EXT. S.P. IN WG	COOLING DATA								ELEC HEATING COIL		ELEC. DATA			MANUFACTURER AND MODEL NUMBER	REMARKS
					ENT AIR DEG. F.		MIN. CAP. MBH		WATER			MAX. PD FT	EAT DB DEG. F.	KW	AMPS	VOLTS	PH		
					DB	WB	SENS	TOTAL	GPM	ENT. DEG. F.	LVG. DEG. F.								
"001"	PLENUM	HORIZONTAL	800	0.4	80.0	67.0	2.0	3.2	6.5	42.0	52.0	6.5	70.0	6.0	30	208	1	JCI FNP	1,2,3,4
"002"	PLENUM	HORIZONTAL	800	0.4	80.0	67.0	2.0	3.2	6.5	42.0	52.0	6.5	70.0	6.0	30	208	1	JCI FNP	1,2,3,4
101	PLENUM	HORIZONTAL	800	0.4	80.0	67.0	2.0	3.2	6.5	42.0	52.0	6.5	70.0	6.0	30	208	1	JCI FNP	1,2,3,4
102	PLENUM	HORIZONTAL	800	0.4	80.0	67.0	2.0	3.2	6.5	42.0	52.0	6.5	70.0	6.0	30	208	1	JCI FNP	1,2,3,4

1. DOES NOT INCLUDE FILTER OR UNIT LOSSES
2. MIN. 4 ROW COOLING COIL
3. PROVIDE FILTER RACK/SECTION WITH 1" THICK, T.A. FILTERS (20% EFF. PER ASHRAE 52-76)
4. PROVIDE LEAK DETECTION ALARM INTERLOCKED TO FAN IN LIEU OF AUXILIARY DRAIN PAN SYSTEM

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PROJECT TITLE
COLLIN COUNTY
COURTHOUSE
ADDITION

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2100 BLOOMDALE ROAD
McKINNEY, TX 75071

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Alexandria | Atlanta | Boca Raton | Dallas | Fort Lauderdale | Houston | Las Vegas | Los Angeles | Phoenix

REGISTRATION

SHEET TITLE
MECHANICAL
SCHEDULES

SHEET NUMBER
M0.02

COOLING ONLY VAV BOX SCHEDULE - LEVEL ONE

MARK	SERVES	AIRVALVE (NOTE 1) DESIGN CFM	INLET SIZE	MIN CFM	MAX CFM	AIRVALVE MIN SETTING (CFM)	POWER CONN. VOLTS	Ph.	Hz.	REMARKS
C101	AHU-1	400	8	105	675	105	277	1	60	2,3,4,5,6
C102	AHU-1	225	6	60	375	60	277	1	60	2,3,4,5,6
C103	AHU-2	225	6	60	375	60	277	1	60	2,3,4,5,6
C104	AHU-2	225	6	60	375	60	277	1	60	2,3,4,5,6

1. CFM RANGE REFERS TO THE RANGE OF CAPABILITY FOR THIS AIRVALVE SIZE. IT IS NOT A MINIMUM / MAXIMUM SETTING.
2. THE TAP- OFF- MAIN (TO RUN-OUT DUCT) SHALL BE ONE-SIZE LARGER THAN THE SCHEDULED BOX SIZE, UNLESS OTHERWISE INDICATED. TRANSITION TO BOX INLET SIZE DUCT A MINIMUM OF 4 DIAMETERS FROM THE BOX INLET, OR AS OTHERWISE RECOMMENDED BY MNFR. PROVIDE HIGH PRESSURE FLEX. CONN'X. (MAX. 2FT. LENGTH), AND APPROVED MEDIUM PRESSURE CONICAL TAPS.
3. PROVIDE WITH FUSED DISCONNECT SWITCH ANDFUSES. PROVIDE INTEGRAL TRANSFORMER FOR DDC CONTROLLER.
4. PROVIDE RECOMMENDED MAINTENANCE CLEARANCES. INCLUDE ACCESS PANELS (IN WALLS ABOVE CEILINGS, ETC.) AS REQ'D.
5. PROVIDE DDC CONTROL MODULE AS REQUIRED TO INTERFACE WITH BUILDING DDC CONTROL SYSTEM.
6. PROVIDE 1" FOIL-FACED INSULATION ON ALL INTERIOR SURFACES OF BOX, MINIMUM R VALUE 4.3.

COOLING ONLY VAV BOX SCHEDULE - LEVEL ONE REMODEL

MARK	SERVES	AIRVALVE (NOTE 1) DESIGN CFM	INLET SIZE	MIN CFM	MAX CFM	AIRVALVE MIN SETTING (CFM)	POWER CONN. VOLTS	Ph.	Hz.	REMARKS
VAV-NE-1-1	P-NE	300	6	60	375	60	277	1	60	2,3,4,5,6
VAV-NE-1-2	P-NE	300	6	60	375	60	277	1	60	2,3,4,5,6
VAV-SE-1-1	P-SE	300	6	60	375	60	277	1	60	2,3,4,5,6
VAV-SE-1-2	P-SE	300	6	60	375	60	277	1	60	2,3,4,5,6

1. CFM RANGE REFERS TO THE RANGE OF CAPABILITY FOR THIS AIRVALVE SIZE. IT IS NOT A MINIMUM / MAXIMUM SETTING.
2. THE TAP- OFF- MAIN (TO RUN-OUT DUCT) SHALL BE ONE-SIZE LARGER THAN THE SCHEDULED BOX SIZE, UNLESS OTHERWISE INDICATED. TRANSITION TO BOX INLET SIZE DUCT A MINIMUM OF 4 DIAMETERS FROM THE BOX INLET, OR AS OTHERWISE RECOMMENDED BY MNFR. PROVIDE HIGH PRESSURE FLEX. CONN'X. (MAX. 2FT. LENGTH), AND APPROVED MEDIUM PRESSURE CONICAL TAPS.
3. PROVIDE WITH FUSED DISCONNECT SWITCH ANDFUSES. PROVIDE INTEGRAL TRANSFORMER FOR DDC CONTROLLER.
4. PROVIDE RECOMMENDED MAINTENANCE CLEARANCES. INCLUDE ACCESS PANELS (IN WALLS ABOVE CEILINGS, ETC.) AS REQ'D.
5. PROVIDE DDC CONTROL MODULE AS REQUIRED TO INTERFACE WITH BUILDING DDC CONTROL SYSTEM.
6. PROVIDE 1" FOIL-FACED INSULATION ON ALL INTERIOR SURFACES OF BOX, MINIMUM R VALUE 4.3.

COOLING ONLY VAV BOX SCHEDULE - LEVEL TWO REMODEL

MARK	SERVES	AIRVALVE (NOTE 1) DESIGN CFM	INLET SIZE	MIN CFM	MAX CFM	AIRVALVE MIN SETTING (CFM)	POWER CONN. VOLTS	Ph.	Hz.	REMARKS
VAV-NE-2-3	P-NE	300	6	60	375	60	277	1	60	2,3,4,5,6
VAV-NE-2-4	P-NE	300	6	60	375	60	277	1	60	2,3,4,5,6
VAV-NE-2-13	P-NE	1,340	12	240	1500	240	277	1	60	2,3,4,5,6
VAV-NE-2-14	P-NE	1,340	12	240	1500	240	277	1	60	2,3,4,5,6
VAV-SE-2-2	P-SE	300	6	60	375	60	277	1	60	2,3,4,5,6
VAV-SE-2-3	P-SE	300	6	60	375	60	277	1	60	2,3,4,5,6
VAV-SE-2-4	P-SE	400	8	105	675	105	277	1	60	2,3,4,5,6
VAV-SE-2-7	P-SE	1,340	12	240	1500	240	277	1	60	2,3,4,5,6
VAV-SE-2-8	P-SE	1,340	12	240	1500	240	277	1	60	2,3,4,5,6

1. CFM RANGE REFERS TO THE RANGE OF CAPABILITY FOR THIS AIRVALVE SIZE. IT IS NOT A MINIMUM / MAXIMUM SETTING.
2. THE TAP- OFF- MAIN (TO RUN-OUT DUCT) SHALL BE ONE-SIZE LARGER THAN THE SCHEDULED BOX SIZE, UNLESS OTHERWISE INDICATED. TRANSITION TO BOX INLET SIZE DUCT A MINIMUM OF 4 DIAMETERS FROM THE BOX INLET, OR AS OTHERWISE RECOMMENDED BY MNFR. PROVIDE HIGH PRESSURE FLEX. CONN'X. (MAX. 2FT. LENGTH), AND APPROVED MEDIUM PRESSURE CONICAL TAPS.
3. PROVIDE WITH FUSED DISCONNECT SWITCH ANDFUSES. PROVIDE INTEGRAL TRANSFORMER FOR DDC CONTROLLER.
4. PROVIDE RECOMMENDED MAINTENANCE CLEARANCES. INCLUDE ACCESS PANELS (IN WALLS ABOVE CEILINGS, ETC.) AS REQ'D.
5. PROVIDE DDC CONTROL MODULE AS REQUIRED TO INTERFACE WITH BUILDING DDC CONTROL SYSTEM.
6. PROVIDE 1" FOIL-FACED INSULATION ON ALL INTERIOR SURFACES OF BOX, MINIMUM R VALUE 4.3.

COOLING ONLY VAV BOX SCHEDULE - LEVEL THREE REMODEL

MARK	SERVES	AIRVALVE (NOTE 1) DESIGN CFM	INLET SIZE	MIN CFM	MAX CFM	AIRVALVE MIN SETTING (CFM)	POWER CONN. VOLTS	Ph.	Hz.	REMARKS
VAV-SE-3-05	P-SE	400	8	105	675	105	277	1	60	2,3,4,5,6
VAV-SE-3-06	P-SE	300	6	60	375	60	277	1	60	2,3,4,5,6
VAV-SE-3-07	P-SE	300	6	60	375	60	277	1	60	2,3,4,5,6

1. CFM RANGE REFERS TO THE RANGE OF CAPABILITY FOR THIS AIRVALVE SIZE. IT IS NOT A MINIMUM / MAXIMUM SETTING.
2. THE TAP- OFF- MAIN (TO RUN-OUT DUCT) SHALL BE ONE-SIZE LARGER THAN THE SCHEDULED BOX SIZE, UNLESS OTHERWISE INDICATED. TRANSITION TO BOX INLET SIZE DUCT A MINIMUM OF 4 DIAMETERS FROM THE BOX INLET, OR AS OTHERWISE RECOMMENDED BY MNFR. PROVIDE HIGH PRESSURE FLEX. CONN'X. (MAX. 2FT. LENGTH), AND APPROVED MEDIUM PRESSURE CONICAL TAPS.
3. PROVIDE WITH FUSED DISCONNECT SWITCH ANDFUSES. PROVIDE INTEGRAL TRANSFORMER FOR DDC CONTROLLER.
4. PROVIDE RECOMMENDED MAINTENANCE CLEARANCES. INCLUDE ACCESS PANELS (IN WALLS ABOVE CEILINGS, ETC.) AS REQ'D.
5. PROVIDE DDC CONTROL MODULE AS REQUIRED TO INTERFACE WITH BUILDING DDC CONTROL SYSTEM.
6. PROVIDE 1" FOIL-FACED INSULATION ON ALL INTERIOR SURFACES OF BOX, MINIMUM R VALUE 4.3.

VAV BOX WITH ELECTRIC HEATING COIL SCHEDULE - LEVEL ONE REMODEL

MARK	SERVES	AIR VALVE (NOTE 1) DESIGN CFM	INLET SIZE	MAX CFM	VALVE MIN. SETTING (CFM)	HEATING PERFORMANCE HEAT CFM	FAN CFM	FAN AMPS	FAN HP	EXT. S.P.	HEATER KW	LVG. AIR TEMP.	POWER CONN. VOLTS	Ph.	Hz.	REMARKS
FP-SE-1-01	P-SE	550	8		110						4		480	3	60	12
FP-SE-1-02	P-SE	800	10	1050	165	615	450	0.7	1/8	0.5	7	102	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-1-03	P-SE	1385	12		275						10		480	3	60	12
FP-SE-1-04	P-SE	850	10		170						6		480	3	60	12
FP-SE-1-05	P-SE	1070	12		215						10		480	3	60	12
FP-SE-1-06	P-SE	850	10		170						10		480	3	60	12
FP-SE-1-07	P-SE	840	10	1050	165	715	550	1.8	1/3	0.5	8	101	480	3	60	1,2,3,4,5,6,7,8,9,11
FP-SE-1-08	P-SE	920	10	1050	165	765	600	1.8	1/3	0.5	8	99	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-1-09	P-SE	750	10	1050	165	565	400	0.7	1/8	0.5	3.5	85	480	3	60	1,2,3,4,5,6,7,8,9
FP-SE-1-10	P-SE	1040	10	1050	165	815	650	1.8	1/3	0.5	5	86	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-1-11	P-SE	595	8	675	105	405	300	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
FP-SE-1-12	P-SE	750	10	1050	165	565	400	0.7	1/8	0.5	3.5	85	480	3	60	1,2,3,4,5,6,7,8,9
FP-SE-1-13	P-SE	615	8	675	105	455	350	0.7	1/8	0.5	5	101	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-1-14	P-SE	880	10	1050	165	725	560	1.8	1/3	0.5	7.5	99	480	3	60	1,2,3,4,5,6,7,8,9,11
FP-SE-1-15	P-SE	750	10	1050	165	565	400	0.7	1/8	0.5	3.5	85	480	3	60	1,2,3,4,5,6,7,8,9
FP-SE-1-16	P-SE	595	8	675	105	405	300	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
FP-SE-1-17	P-SE	1040	10	1050	165	815	650	1.8	1/3	0.5	5	86	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-1-18	P-SE	750	10	1050	165	565	400	0.7	1/8	0.5	3.5	85	480	3	60	1,2,3,4,5,6,7,8,9
FP-SE-1-19	P-SE	1040	10	1050	165	515	350	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
FP-NE-1-01	P-NE	810	10	1050	165	615	450	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
FP-NE-1-02	P-NE	830	10		165						6		480	3	60	12
FP-NE-1-03	P-NE	600	8		120						4		480	3	60	12
FP-NE-1-04	P-NE	680	8		135						4		480	3	60	12
FP-NE-1-05	P-NE	600	10		120						6		480	3	60	12
FP-NE-1-06	P-NE	840	10	1050	165	715	550	1.8	1/3	0.5	7.5	99	480	3	60	1,2,3,4,5,6,7,8,9,11
FP-NE-1-07	P-NE	830	10	1050	165	715	550	1.8	1/3	0.5			277	1	60	1,2,3,5,6,7,8,9
FP-NE-1-08	P-NE	750	10	1050	165	565	400	0.7	1/8	0.5	3.5	85	480	3	60	1,2,3,4,5,6,7,8,9
FP-NE-1-09	P-NE	600	10		120						6		480	3	60	12
FP-NE-1-10	P-NE	800	10	1050	165	615	450	0.7	1/8	0.5	6.5	99	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-NE-1-11	P-NE	1040	10	1050	165	815	650	1.8	1/3	0.5	5	86	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-NE-1-12	P-NE	595	8	675	105	405	300	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
FP-NE-1-13	P-NE	750	10	1050	165	565	400	0.7	1/8	0.5	3.5	85	480	3	60	1,2,3,4,5,6,7,8,9
FP-NE-1-14	P-NE	500	8	675	105	355	250	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
FP-NE-1-15	P-NE	750	10	1050	165	565	400	0.7	1/8	0.5	3.5	85	480	3	60	1,2,3,4,5,6,7,8,9
FP-NE-1-16	P-NE	595	8	675	105	405	300	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
FP-NE-1-17	P-NE	1040	10	1050	165	815	650	1.8	1/3	0.5	5	86	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-NE-1-18	P-NE	750	10	1050	165	565	400	0.7	1/8	0.5	3.5	85	480	3	60	1,2,3,4,5,6,7,8,9
FP-NE-1-19	P-NE	890	10	1050	165	745	580	1.8	1/3	0.5			277	1	60	1,2,3,5,6,7,8,9
FP-NE-1-20	P-NE	1,050	10	1050	165	815	650	1.8	1/3	0.5	5	86	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-NE-1-21	P-NE	365	6	375	60	280	220	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9

1. CFM MAX/MIN VALUES REFER TO THE RANGE OF CAPABILITY FOR THIS AIR VALVE SIZE. IT IS NOT A MINIMUM / MAXIMUM SETTING.
2. PROVIDE BOTTOM FAN AND MOTOR ACCESS.
3. THE TAP- OFF- MAIN (TO RUN-OUT DUCT) SHALL BE ONE-SIZE LARGER THAN THE SCHEDULED BOX SIZE, UNLESS OTHERWISE INDICATED. TRANSITION TO BOX INLET SIZE DUCT A MINIMUM OF 3 DIAMETERS FROM THE BOX INLET, OR AS OTHERWISE RECOMMENDED BY MNFR. PROVIDE HIGH PRESSURE FLEX. CONNETION. (MAX. 2FT. LENGTH), AND APPROVED MEDIUM PRESSURE CONICAL TAPS.
4. HEATING COIL IS MOUNTED ON THE DISCHARGE OUTLET.
5. PROVIDE RECOMMENDED MAINTENANCE CLEARANCES. INCLUDE ACCESS PANELS (IN WALLS ABOVE CEILINGS, ETC.) AS REQ'D.
6. PARALLEL FAN SHALL HAVE AN SCR CONTROLLER TO ALLOW FAN CFM ADJUSTMENT.
7. PROVIDE CONTROLS PER SEQUENCE OF OPERATION AND SPECIFICATIONS.
8. PROVIDE 1" MATT-FACED INSULATION ON ALL INTERIOR SURFACES OF BOX, MINIMUM R VALUE 4.3.
9. PROVIDE WITH A FUSED DISCONNECT SWITCH SIZED FOR THE UNIT SERVED, PROVIDE FUSES.
10. PROVIDE ELECTRIC HEATER WITH TWO STAGES.
11. PROVIDE ELECTRIC HEATER WITH THREE STAGES.
12. FAN POWERED VAV BOX IS EXISTING TO REMAIN, REBALANCE AS REQUIRED AT CFM INDICATED ON THIS SCHEDULE AND ON DRAWINGS.

VAV BOX WITH ELECTRIC HEATING COIL SCHEDULE - LEVEL TWO REMODEL

MARK	SERVES	AIR VALVE (NOTE 1) DESIGN CFM	INLET SIZE	MAX CFM	VALVE MIN. SETTING (CFM)	HEATING PERFORMANCE HEAT CFM	FAN CFM	FAN AMPS	FAN HP	EXT. S.P.	HEATER KW	LVG. AIR TEMP.	POWER CONN. VOLTS	Ph.	Hz.	REMARKS
FP-SE-2-1	P-SE	440	8	675	105	355	250	0.7	1/8	0.5	4.0	101	480	3	60	1,2,3,4,5,6,7,8,9
FP-SE-2-2	P-SE	880	10	1050	165	665	500	0.7	1/8	0.5	7.5	102	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-2-3	P-SE	790	10	1050	160						6.0		480	3	60	12
FP-SE-2-4	P-SE	830	10	1050	165						6.0		480	3	60	12
FP-SE-2-5	P-SE	1010	10	1050	200						6.0		480	3	60	12
FP-SE-2-6	P-SE	925	10	1050	185						6.0		480	3	60	12
FP-SE-2-7	P-SE	920	10	1050	185						6.0		480	3	60	12
FP-SE-2-8	P-SE	350	6	375	60	280	220	0.7	1/8	0.5	3.0	100	480	3	60	1,2,3,4,5,6,7,8,9
FP-SE-2-9	P-SE	1750	14	2250	350						15.0		480	3	60	12
FP-SE-2-10	P-SE	1150	12	1500	230						10.0		480	3	60	12
FP-SE-2-11	P-SE	2000	14	2250	400						15.0		480	3	60	12
FP-SE-2-12	P-SE	975	10	1050	195						6.0		480	3	60	12
FP-SE-2-13	P-SE	500	8	675	100						4.0		480	3	60	12
FP-SE-2-14	P-SE	750	10	1050	165	565	400	0.7	1/8	0.5	3.5	85	480	3	60	1,2,3,4,5,6,7,8,9
FP-SE-2-15	P-SE	1040	10	1050	165	815	650	1.8	1/3	0.5	4.5	84	480	3	60	1,2,3,4,5,6,7,8,9
FP-SE-2-16	P-SE	595	8	675	105	430	325	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
FP-SE-2-17	P-SE	750	10	1050	165	565	400	0.7	1/8	0.5	3.5	85	480	3	60	1,2,3,4,5,6,7,8,9
FP-SE-2-18	P-SE	620	8	675	105	430	325	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
FP-SE-2-19	P-SE	750	10	1050	165	565	400	0.7	1/8	0.5	3.5	85	480	3	60	1,2,3,4,5,6,7,8,9
FP-SE-2-20	P-SE	595	8	675	105	430	325	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
FP-SE-2-21	P-SE	1040	10	1050	165	815	650	1.8	1/3	0.5	5.0	86	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-2-22	P-SE	750	10	1050	165	565	400	0.7	1/8	0.5	3.5	85	480	3	60	1,2,3,4,5,6,7,8,9
FP-SE-2-23	P-SE	620	8	675	105	430	325	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
FP-SE-2-24	P-SE	890	10	1050	165	715	550	1.8	1/3	0.5	8.0	101	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-2-25	P-SE	1040	10	1050	165	815	650	1.8	1/3	0.5			277	1	60	1,2,3,5,6,7,8,9
FP-NE-2-1	P-NE	660	10	1050	130						6.0		480	3	60	12
FP-NE-2-2	P-NE	300	8	675	60						4.0		480	3	60	12
FP-NE-2-3	P-NE	660	10	1050	130						6.0		480	3	60	12
FP-NE-2-4	P-NE	910	10	1050	180						6.0		480	3	60	12
FP-NE-2-5	P-NE	750	10	1050	165	565	400	0.7	1/8	0.5	3.5	85	480	3	60	1,2,3,4,5,6,7,8,9
FP-NE-2-6	P-NE	1040	10	1050	165	815	650	1.8	1/3	0.5	5.0	86	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-NE-2-7	P-NE	595	8	675	105	405	300	0.7	2/8	0.5			277	1	60	1,2,3,5,6,7,8,9
FP-NE-2-8	P-NE	750	10	1050	165	565	400	0.7	1/8	0.5	3.5	85	480	3	60	1,2,3,4,5,6,7,8,9
FP-NE-2-9	P-NE	330	6	375	60	280	220	0.7	1/8	0.5	3.0	100	480	3	60	1,2,3,4,5,6,7,8,9
FP-NE-2-10	P-NE	810	10	1050	165	665	500	0.7	1/8	0.5	7.5	101	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-NE-2-11	P-NE	1040	10	1050	165	815	650	1.8	1/3	0.5			277	1	60	1,2,3,5,6,7,8,9
FP-NE-2-12	P-NE	750	10	1050	165	565	400	0.7	1/8	0.5	3.5	85	480	3	60	1,2,3,4,5,6,7,8,9
FP-NE-2-13	P-NE	595	8	675	105	405	300	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
FP-NE-2-14	P-NE	300	6	375	60	270	210	0.7	1/8	0.5	3.0	101	480	3	60	1,2,3,4,5,6,7,8,9
FP-NE-2-15	P-NE	1040	10	1050	165	815	650	0.7	1/3	0.5	5.0	86	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-NE-2-16	P-NE	750	10	1050	165	565	400	0.7	1/8	0.5	3.5	85	480	3	60	1,2,3,4,5,6,7,8,9
FP-NE-2-17	P-NE	740	10	1050	165	565	400	0.7	1/8	0.5	6.5	102	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-NE-2-18	P-NE	620	8	675	105	430	325	0.7	1/8	0.5			277	1	60	1,2,3,5,6,7,8,9
FP-NE-2-19	P-NE	1,020	10	1050	165	785	620	1.8	1/3	0.5	8.5	100	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-NE-2-20	P-NE	840	10	1050	165	690	525	1.8	1/3	0.5	7.5	100	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-NE-2-21	P-NE	1100	12	1500	220						10.0		480	3	60	12
FP-NE-2-22	P-NE	890	10	1050	165	715	550	1.8	1/3	0.5			277	1	60	1,2,3,5,6,7,8,9

1. CFM MAX/MIN VALUES REFER TO THE RANGE OF CAPABILITY FOR THIS AIR VALVE SIZE. IT IS NOT A MINIMUM / MAXIMUM SETTING.
2. PROVIDE BOTTOM FAN AND MOTOR ACCESS.
3. THE TAP- OFF- MAIN (TO RUN-OUT DUCT) SHALL BE ONE-SIZE LARGER THAN THE SCHEDULED BOX SIZE, UNLESS OTHERWISE INDICATED. TRANSITION TO BOX INLET SIZE DUCT A MINIMUM OF 3 DIAMETERS FROM THE BOX INLET, OR AS OTHERWISE RECOMMENDED BY MNFR. PROVIDE HIGH PRESSURE FLEX. CONNETION. (MAX. 2FT. LENGTH), AND APPROVED MEDIUM PRESSURE CONICAL TAPS.
4. HEATING COIL IS MOUNTED ON THE DISCHARGE OUTLET.
5. PROVIDE RECOMMENDED MAINTENANCE CLEARANCES. INCLUDE ACCESS PANELS (IN WALLS ABOVE CEILINGS, ETC.) AS REQ'D.
6. PARALLEL FAN SHALL HAVE AN SCR CONTROLLER TO ALLOW FAN CFM ADJUSTMENT.
7. PROVIDE CONTROLS PER SEQUENCE OF OPERATION AND SPECIFICATIONS.
8. PROVIDE 1" MATT-FACED INSULATION ON ALL INTERIOR SURFACES OF BOX, MINIMUM R VALUE 4.3.
9. PROVIDE WITH A FUSED DISCONNECT SWITCH SIZED FOR THE UNIT SERVED, PROVIDE FUSES.
10. PROVIDE ELECTRIC HEATER WITH TWO STAGES.
11. PROVIDE ELECTRIC HEATER WITH THREE STAGES.
12. FAN POWERED VAV BOX IS EXISTING TO REMAIN, REBALANCE AS REQUIRED AT CFM INDICATED ON THIS SCHEDULE AND ON DRAWINGS.

VAV BOX WITH ELECTRIC HEATING COIL SCHEDULE - LEVEL ONE

MARK	SERVES	AIR VALVE (NOTE 1) DESIGN CFM	INLET SIZE	MAX CFM	VALVE MIN. SETTING (CFM)	HEATING PERFORMANCE HEAT CFM	FAN CFM	FAN AMPS	FAN HP	EXT. S.P.	HEATER KW	LVG. AIR TEMP.	POWER CONN. VOLTS	Ph.	Hz.	REMARKS
V101	AHU-1	2,145	14	2250	320	1420	1100	2.6	1/2	0.5	11.0	91	480	3	60	1,2,3,4,5,6,7,8,9,11
V102A	AHU-1	2,300	16	3000	420	1620	1400	3.8	1/2	0.5	11.0	88	480	3	60	1,2,3,4,5,6,7,8,9,11
V102B	AHU-1	2,300	16	3000	420	1620	1200	3.8	1/2	0.5	11.0	88	480	3	6	1,2,3,4,5,6,7,8,9,11
V103	AHU-1	2,300	16	3000	420	1620	1200	3.8	1/2	0.5	11.0	88	480	3	60	1,2,3,4,5,6,7,8,9,11
V104	AHU-1	2,300	16	3000	420	1620	1200	3.8	1/2	0.5	11.0	88	480	3	60	1,2,3,4,5,6,7,8,9,11
V105	AHU-1	2,300	16	3000	420	1620	1200	3.8	1/2	0.5	11.0	88	480	3	60	1,2,3,4,5,6,7,8,9,11
V106	AHU-1	3,000	16	3000	420	1620	1200	3.8	1/2	0.5	20.0	101	480	3	60	1,2,3,4,5,6,7,8,9,11
V107	AHU-1	600	8	675	105	405	300	0.7	1/8	0.5	4.5	101	480	3	60	1,2,3,4,5,6,7,8,9,10
V108	AHU-1	730	10	1050	165	515	350	0.7	1/8	0.5	4.0	90	480	3	60	1,2,3,4,5,6,7,8,9
V109	AHU-1	1,790	14	2250	320	1370	1050	2.6	1/2	0.5	10.0	89	480	3	60	1,2,3,4,5,6,7,8,9,11
V110	AHU-1	1,220	12	1500	240	840	600	1.8	1/3	0.5	6.5	90	480	3	60	1,2,3,4,5,6,7,8,9,10
V111	AHU-1	1,050	10	1050	165	740	575	1.8	1/3	0.5	8.0	100	480	3	60	1,2,3,4,5,6,7,8,9,11
V112	AHU-1	650	8	675	105	455	350	0.7	1/8	0.5	5.0	101	480	3	60	1,2,3,4,5,6,7,8,9,10
V113	AHU-1	1,665	14	2250	320	1370	1050	2.6	1/2	0.5	10.0	89	480	3	60	1,2,3,4,5,6,7,8,9,11
V114	AHU-1	1,450	12	1500	240	990	750	1.8	1/3	0.5	7.5	90	480	3	60	1,2,3,4,5,6,7,8,9,11
V115	AHU-1	650	8	675	165	515	350	0.7	1/8	0.5	6.0	102	480	3	60	1,2,3,4,5,6,7,8,9,10
V116	AHU-1	1,500	12	1500	240	940	700	1.8	1/3	0.5	7.5	91	480	3	60	1,2,3,4,5,6,7,8,9,11
V117	AHU-1	870	10	1050	165	565	400	0.7	1/8	0.5	6.5	102	480	3	60	1,2,3,4,5,6,7,8,9,10
V118	AHU-1	1,500	12	1500	240	940	700	1.8	1/3	0.5	7.5	91	480	3	60	1,2,3,4,5,6,7,8,9,11
V119	AHU-1	2,940	16	3000	420	1920	1500	3.8	1/2	0.5	14.0	89	480	3	60	1,2,3,4,5,6,7,8,9,11
V120	AHU-1	1,000	10	1050	165	715	550	0.7	1/8	0.5	7.5	99	480	3	60	1,2,3,4,5,6,7,8,9,11
V121	AHU-1	1,250	12	1500	240	865	625	1.8	1/3	0.5	6.5	90	480	3	60	1,2,3,4,5,6,7,8,9,10
V122	AHU-1	1,250	12	1500	240	865	625	1.8	1/3	0.5	6.5	90	480	3	60	1,2,3,4,5,6,7,8,9,10
V123	AHU-1	2,465	16	3000	420	1720	1300	3.8	1/2	0.5	13.0	90	480	3	60	1,2,3,4,5,6,7,8,9,11
V124	AHU-1	1,500	12	1500	240	940	700	1.8	1/3	0.5	7.5	91	480	3	60	1,2,3,4,5,6,7,8,9,11
V125	AHU-1	1,240	12	1500	240	865	625	1.8	1/3	0.5	9.5	100	480	3	60	1,2,3,4,5,6,7,8,9,11
V126	AHU-1	1,220	12	1500	240	840	600	1.8	1/3	0.5	6.5	90	480	3	60	1,2,3,4,5,6,7,8,9,10
V127	AHU-1	1,500	12	1500	240	940	700	1.8	1/3	0.5	7.5	91	480	3	60	1,2,3,4,5,6,7,8,9,11
V128	AHU-1	870	10	1050	165	565	400	0.7	1/8	0.5	6.5	102	480	3	60	1,2,3,4,5,6,7,8,9,10
V129	AHU-1	1,050	10	1050	165	715	550	1.8	1/3	0.5	7.5	100	480	3	60	1,2,3,4,5,6,7,8,9,11
V130	AHU-1	1,050	10	1050	165	715	550	1.8	1/3	0.5	7.5	99	480	3	60	1,2,3,4,5,6,7,8,9,11
V131	AHU-2	1,050	10	1050	165	715	550	1.8	1/3	0.5	7.5	99	480	3	60	1,2,3,4,5,6,7,8,9,11
V132	AHU-2	1,050	10	1050	165	715	550	1.8	1/3	0.5	7.5	99	480	3	60	1,2,3,4,5,6,7,8,9,11
V133	AHU-2	870	10	1050	165	565	400	0.7	1/8	0.5	6.5	102	480	3	60	1,2,3,4,5,6,7,8,9,10
V134	AHU-2	1,500	12	1500	240	940	700	1.8	1/3	0.5	10.0	100	480	3	60	1,2,3,4,5,6,7,8,9,11
V135	AHU-2	1,220	12	1500	240	840	600	1.8	1/3	0.5	6.5	90	480	3	60	1,2,3,4,5,6,7,8,9,10
V136	AHU-2	1,500	12	1500	240	940	700	1.8	1/3	0.5	7.5	91	480	3	60	1,2,3,4,5,6,7,8,9,11
V137	AHU-2	870	10	1050	165	565	400	0.7	1/8	0.5	6.5	102	480	3	60	1,2,3,4,5,6,7,8,9,10
V138	AHU-2	1,500	12	1050	240	940	700	1.8	1/3	0.5	7.5	91	480	3	60	1,2,3,4,5,6,7,8,9,11
V139	AHU-2	1,500	12	1500	240	940	700	1.8	1/3	0.5	7.5	91	480	3	60	1,2,3,4,5,6,7,8,9,11
V140	AHU-2	1,050	10	1050	165	715	550	1.8	1/3	0.5	5.5	90	480	3	60	1,2,3,4,5,6,7,8,9,10
V141	AHU-2	1,250	12	1500	240	865	625	1.8	1/3	0.5	6.5	90	480	3	60	1,2,3,4,5,6,7,8,9,10
V142	AHU-2	1,050	10	1050	165	715	550	1.8	1/3	0.5	5.5	90	480	3	60	1,2,3,4,5,6,7,8,9,10
V143	AHU-2	600	8	675	105	405	300	0.7	1/8	0.5	4.5	101	480	3	60	1,2,3,4,5,6,7,8,9,10
V144	AHU-2	1,480	12	1500	240	940	700	1.8	1/3	0.5	7.5	91	480	3	60	1,2,3,4,5,6,7,8,9,11
V145	AHU-2	1,320	12	1500	240	890	650	1.8	1/3	0.5	7.0	91	480	3	60	1,2,3,4,5,6,7,8,9,11
V146	AHU-2	720	10	1050	165	540	375	0.7	1/8	0.5	6.0	101	480	3	60	1,2,3,4,5,6,7,8,9,10
V147	AHU-2	2,240	14	2250	320	1420	1100	2.6	1/2	0.5	11.0	91	480	3	60	1,2,3,4,5,6,7,8,9,11
V148	AHU-2	520	8	675	105	405	300	0.7	1/8	0.5	3.0	89	480	3	60	1,2,3,4,5,6,7,8,9
V149	AHU-2	2,060	14	2250	320	1370	1050	2.6	1/2	0.5	10.0	89	480	3	60	1,2,3,4,5,6,7,8,9,11
V150	AHU-2	920	10	1050	165	715	550	1.8	1/3	0.5	7.5	99	480	3	60	1,2,3,4,5,6,7,8,9,11
V151	AHU-2	1,220	12	1500	240	840	600	2.6	1/2	0.5	6.5	90	480	3	60	1,2,3,4,5,6,7,8,9,10
V152	AHU-2	580	8	675	105	430	325	0.7	1/8	0.5	3.5	92	480	3	60	1,2,3,4,5,6,7,8,9
V153	AHU-2	1,250	12	1500	240	865	625	1.8	1/3	0.5	6.5	90	480	3	60	1,2,3,4,5,6,7,8,9,10
V154	AHU-2	1,750	14	2250	320	1370	1050	2.6	1/2	0.5	10.0	89	480	3	60	1,2,3,4,5,6,7,8,9,11
V155	AHU-2	910	10	1050	165	615	450	0.7	1/8	0.5	6.5	99	480	3	60	1,2,3,4,5,6,7,8,9,10
V156	AHU-2	1,005	10	1050	165	665	500	0.7	1/8	0.5	7.5	102	480	3	60	1,2,3,4,5,6,7,8,9,10
V157	AHU-2	910	10	1050	165	615	450	0.7	1/8	0.5	5.0	92	480	3	60	1,2,3,4,5,6,7,8,9,10
V158	AHU-2	1,340	12	1500	240	915	675	1.8	1/3	0.5	7.0	90	480	3	60	1,2,3,4,5,6,7,8,9,11
V159	AHU-2	900	10	1050	165	615	450	0.7	1/8	0.5	4.5	89	480	3	60	1,2,3,4,5,6,7,8,9,10
V160	AHU-2	675	8	675	105	505	400	0.7	1/8	0.5	5.5	101	480	3	60	1,2,3,4,5,6,7,8,9,10
V161	AHU-2	1,205	12	1500	240	840	600	1.8	1/3	0.5	6.5	90	480	3	60	1,2,3,4,5,6,7,8,9,10
V162	AHU-2	2,000	14	2250	320	1370	1050	2.6	1/2	0.5	10.0	89	480	3		1,2,3,4,5,6,7,8,9,11
V163	AHU-2	300	6	375	60	310	250	0.7	1/8	0.5	2.5	92	480	3		1,2,3,4,5,6,7,8,9
V164	AHU-2	500	8	675	105	405	300	0.7	1/8	0.5	4.5	101	480	3		1,2,3,4,5,6,7,8,9,10

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11. PROVIDE ELECTRIC HEATER WITH THREE STAGES.

VAV BOX WITH ELECTRIC HEATING COIL SCHEDULE - LEVEL THREE REMODEL

MARK	SERVES	AIR VALVE (NOTE 1) DESIGN CFM	INLET SIZE	MAX CFM	VALVE MIN. SETTING (CFM)	HEATING PERFORMANCE HEAT CFM	FAN CFM	FAN AMPS	FAN HP	EXT. S.P.	HEATER KW	LVG. AIR TEMP.	POWER CONN. VOLTS	Ph.	Hz.	REMARKS
FP-SE-3-01	P-SE	1085	12	1500	230	780	550	1.8	1/3	0.5	8.50	100	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-3-02	P-SE	900	10	1050	165	715	550	1.8	1/3	0.5	7.50	99	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-3-03	P-SE	1000	10	1050	200						6.00		480	3	60	12
FP-SE-3-04	P-SE	890	10	1050	165	715	550	1.8	1/3	0.5	7.50	99	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-3-05	P-SE	975	10	1050	195						6.00		480	3	60	12
FP-SE-3-06	P-SE	2000	14	2250	400						15.00		480	3	60	12
FP-SE-3-07	P-SE	975	10	1050	195						6.00		480	3	60	12
FP-SE-3-08	P-SE	1300	12	1500	260						8.00		480	3	60	12
FP-SE-3-09	P-SE	940	10	1050	165	715	550	1.8	1/3	0.5	7.50	99	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-3-10	P-SE	1140	12	1500	230	855	625	1.8	1/3	0.5	9.50	101	480	3	60	1,2,3,4,5,6,7,8,9,11
FP-SE-3-11	P-SE	660	8	675	105	480	375	0.7	1/8	0.5	5.50	102	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-3-12	P-SE	890	10	1050	165	715	550	1.8	1/3	0.5	7.50	99	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-3-13	P-SE	1020	10	1050	165	740	575	1.8	1/3	0.5	8.00	100	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-3-14	P-SE	940	10	1050	165	715	550	1.8	1/3	0.5	7.50	99	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-3-15	P-SE	670	8	675	105	490	385	0.7	1/8	0.5	5.50	101	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-3-16	P-SE	440	8	675	105	380	275	0.7	1/8	0.5	4.00	99	480	3	60	1,2,3,5,6,7,8,9
FP-SE-3-17	P-SE	920	10	1050	165	715	550	1.8	1/3	0.5	7.50	99	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-3-18	P-SE	940	10	1050	165	715	550	1.8	1/3	0.5	7.50	99	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-3-19	P-SE	660	8	675	105	480	375	0.7	1/8	0.5	5.50	102	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-3-20	P-SE	375	6	375	60	310	250	0.7	1/8	0.5	3.50	102	480	3	60	1,2,3,5,6,7,8,9
FP-SE-3-21	P-SE	1140	12	1500	230	855	625	1.8	1/3	0.5	9.50	101	480	3	60	1,2,3,4,5,6,7,8,9,11
FP-SE-3-22	P-SE	940	10	1050	165	715	550	1.8	1/3	0.5	7.50	99	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-3-23	P-SE	670	8	675	105	490	385	0.7	1/8	0.5	5.50	101	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-3-24	P-SE	1040	10	1050	165	750	585	1.8	1/3	0.5	8.00	100	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-SE-3-25	P-SE	1040	10	1050	165	750	585	1.8	1/3	0.5	8.00	100	480	3	60	1,2,3,4,5,6,7,8,9,10
FP-NE-3-17	P-NE	2090	14	2250	320	1520	1200	2.6	1/2	0.5	16.00	99	480	3	60	1,2,3,4,5,6,7,8,9,11

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CONSULTANT

Brian D. Richards
8/7/2009
BRIAN D. RICHARDS
74703
119.8.7.2009.8017

PROJECT TITLE

COLLIN COUNTY
COURTHOUSE
ADDITION

PROJECT NUMBER

590.0800.00

PROJECT LOCATION

2100 BLOOMDALE ROAD
McKINNEY, TX 75071

DATE OF ISSUE

AUGUST 7 2009
CONSTRUCTION DOCUMENTS

REVISIONS

1 ADDENDUM #1 07/27/2009
2 ADDENDUM #2 08/07/2009

Pierce Goodwin Alexander & Linville

Alexandria | Atlanta | Boca Raton | Dallas | Fort Lauderdale | Houston | Las Vegas | Los Angeles | Phoenix

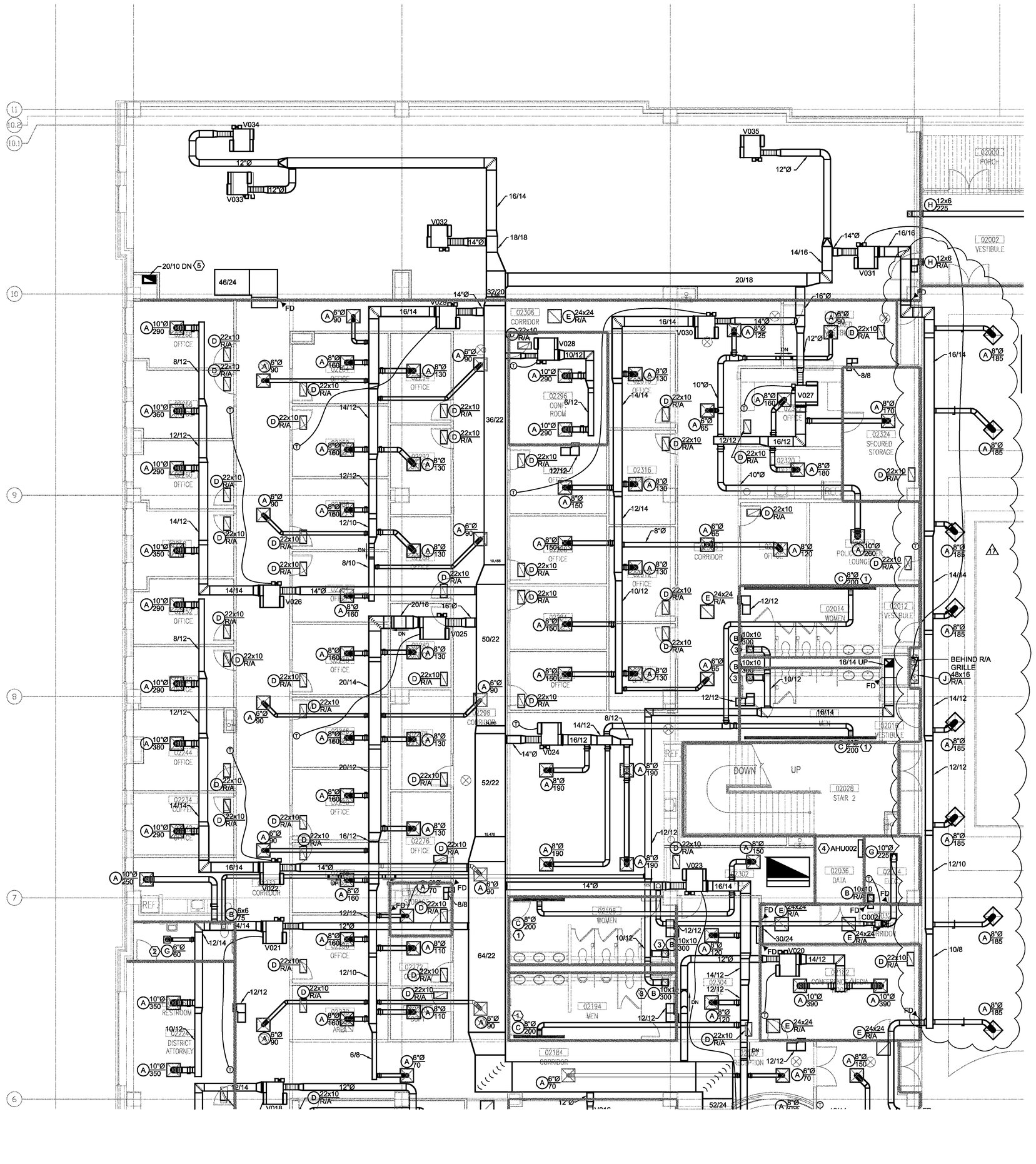
REGISTRATION

SHEET TITLE

MECHANICAL
SCHEDULES

SHEET NUMBER

M0.03



NOTES BY SYMBOL "#"

1. EDGE OF DIFFUSER FLANGE SHALL BE 1.5" FROM WALL AND 7" FROM ENDS.
2. CENTER THE DIFFUSER BETWEEN THE CAN LIGHTS.
3. EXHAUST GRILLE SHALL BE INLINE WITH THE CAN LIGHTS AND SHALL BE CENTERED OVER THE TOILET FIXTURE.
4. MOUNT AHU HIGH ON WALL AND ROUTE REFRIGERANT PIPES IN WALL UP TO CU LOCATION ON ROOF.
5. 20/10 DUCT FROM CEILING PLENUM TO CRAWLSPACE BELOW. DUCT TO BE INSTALLED IN RETED CHASE (REF ARCHITECTURAL). PROVIDE FIRE DAMPER AT TOP OF DUCT STUBBED OUT HORIZONTALLY FROM CHASE ABOVE CEILING.

MECHANICAL PLAN

LOWER LEVEL SECTION A

SCALE:1/8"=1'-0" 01

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Pierce Goodwin Alexander & Linville

COLLIN COUNTY

OWNER

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ARCHITECT

PGAL
105 DECKER COURT
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CONSULTANT

STATE OF TEXAS
12/31/2010
GARRETT S. BROWN
90873
LICENSED PROFESSIONAL ENGINEER
7106.12.31.2010.8017

PROJECT TITLE

COLLIN COUNTY
COURTHOUSE
ADDITION

PROJECT NUMBER

590.0800.00

PROJECT LOCATION

2100 BLOOMDALE ROAD
McKINNEY, TX 75071

DATE OF ISSUE

DECEMBER 14 2009
CONSTRUCTION DOCUMENTS

REVISIONS

1	ADDENDUM #1	07/27/2009
2	ADDENDUM #2	08/07/2009
3	ADDENDUM #3	09/12/2009
4	ADDENDUM #6	12/14/2009
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11	PR #5	11/24/2010
12	RFI 92	12/02/2010
13	RFI 93	12/02/2010
14	RFI 95	12/02/2010
15	RFI 101,102	12/07/2010
16	RFI 115	12/15/2010
17	RFI 118	12/31/2010

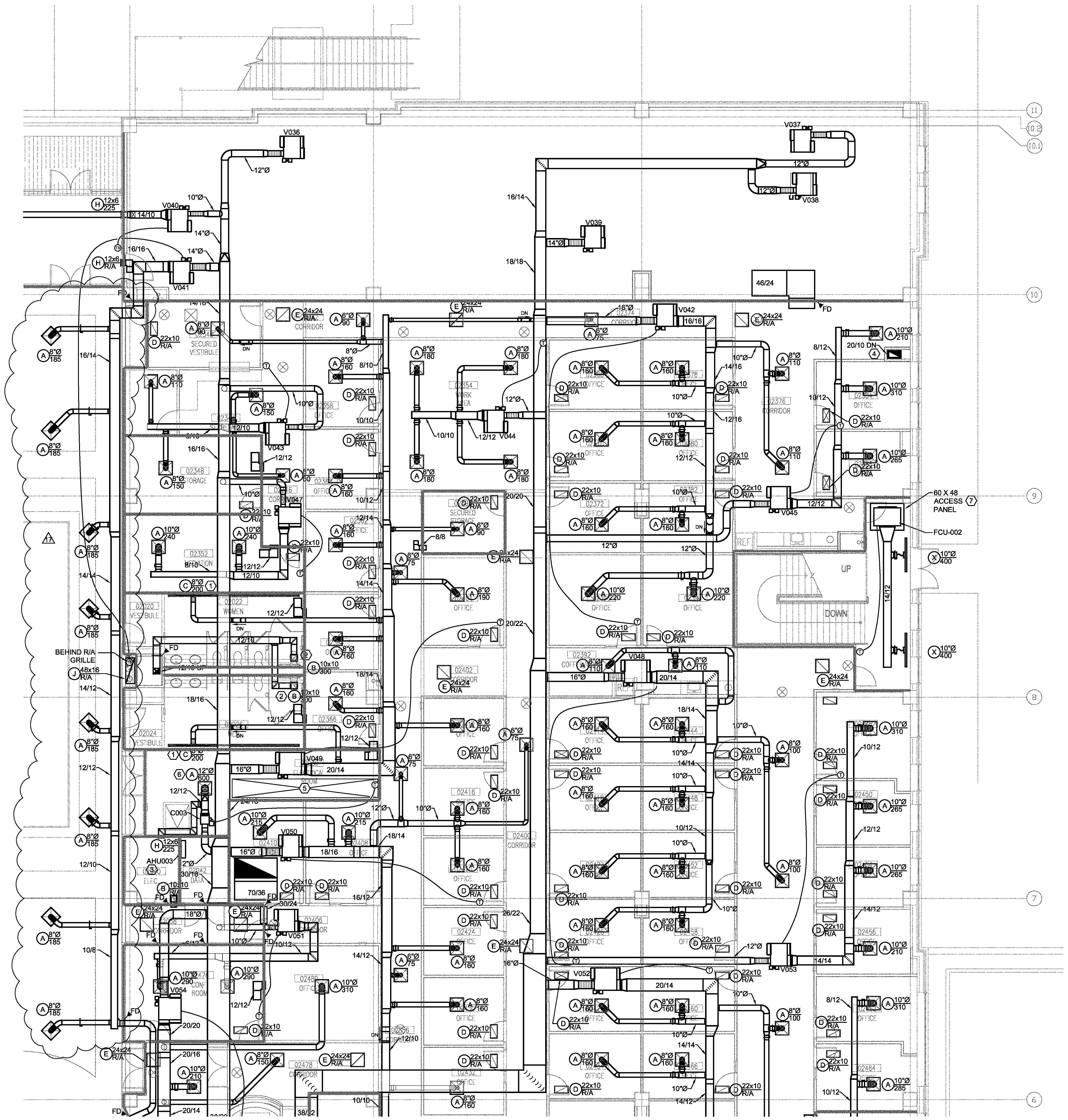
REGISTRATION

SHEET TITLE

MECHANICAL PLAN
LOWER LEVEL
SECTION A

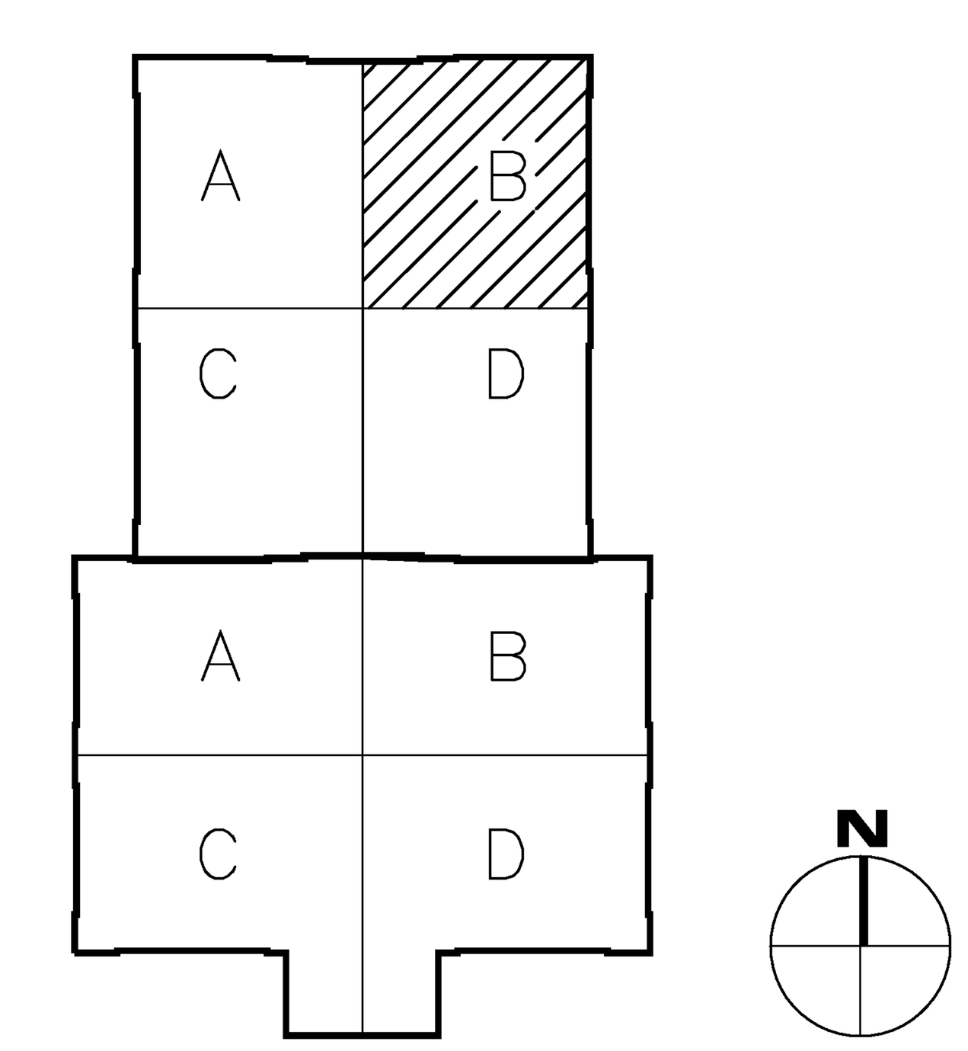
SHEET NUMBER

M2.01



NOTES BY SYMBOL "#"

1. EDGE OF DIFFUSER FLANGE SHALL BE 1.5" FROM WALL AND 7" FROM ENDS.
2. EXHAUST GRILLE SHALL BE INLINE WITH THE CAN LIGHTS AND SHALL BE CENTERED OVER THE TOILET FIXTURE.
3. MOUNT AHU HIGH ON WALL AND ROUTE REFRIGERANT PIPES IN WALL UP TO CU LOCATION ON ROOF.
4. 20/10 DUCT FROM CEILING PLENUM TO CRAWLSPACE BELOW. DUCT TO BE INSTALLED IN RETED CHASE (REF ARCHITECTURAL). PROVIDE FIRE DAMPER AT TOP OF DUCT STUBBED OUT HORIZONTALLY FROM CHASE ABOVE CEILING.
5. DO NOT ROUTE ANY DUCTWORK OVER THIS AREA, THERE ARE ELECTRICAL PANELS BELOW AND IF YOU RUN DUCTS IN THE AREA THE ELECTRICAL INSPECTOR WILL MAKE YOU MOVE THEM.
6. SUSPEND TYPE "A" DIFFUSER FROM RIGID DUCT WITH BOTTOM OF DIFFUSER AT SAME HEIGHT AS BOTTOM OF THE LIGHT FIXTURES.
7. ACCESS PANEL TO HAVE 24 X 24 FILTER GRILLE LOCATED IN CENTER



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MECHANICAL PLAN

LOWER LEVEL SECTION B

SCALE: 1/8"=1'-0" (01)

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CONSULTANT
STATE OF TEXAS
12/31/2010
GARRETT S. BROWN
90873
LICENSED PROFESSIONAL ENGINEER
7106.12.31.2010.8017

PROJECT TITLE
COLLIN COUNTY
COURTHOUSE
ADDITION

PROJECT NUMBER
590.0800.00

PROJECT LOCATION
2100 BLOOMDALE ROAD
McKINNEY, TX 75071

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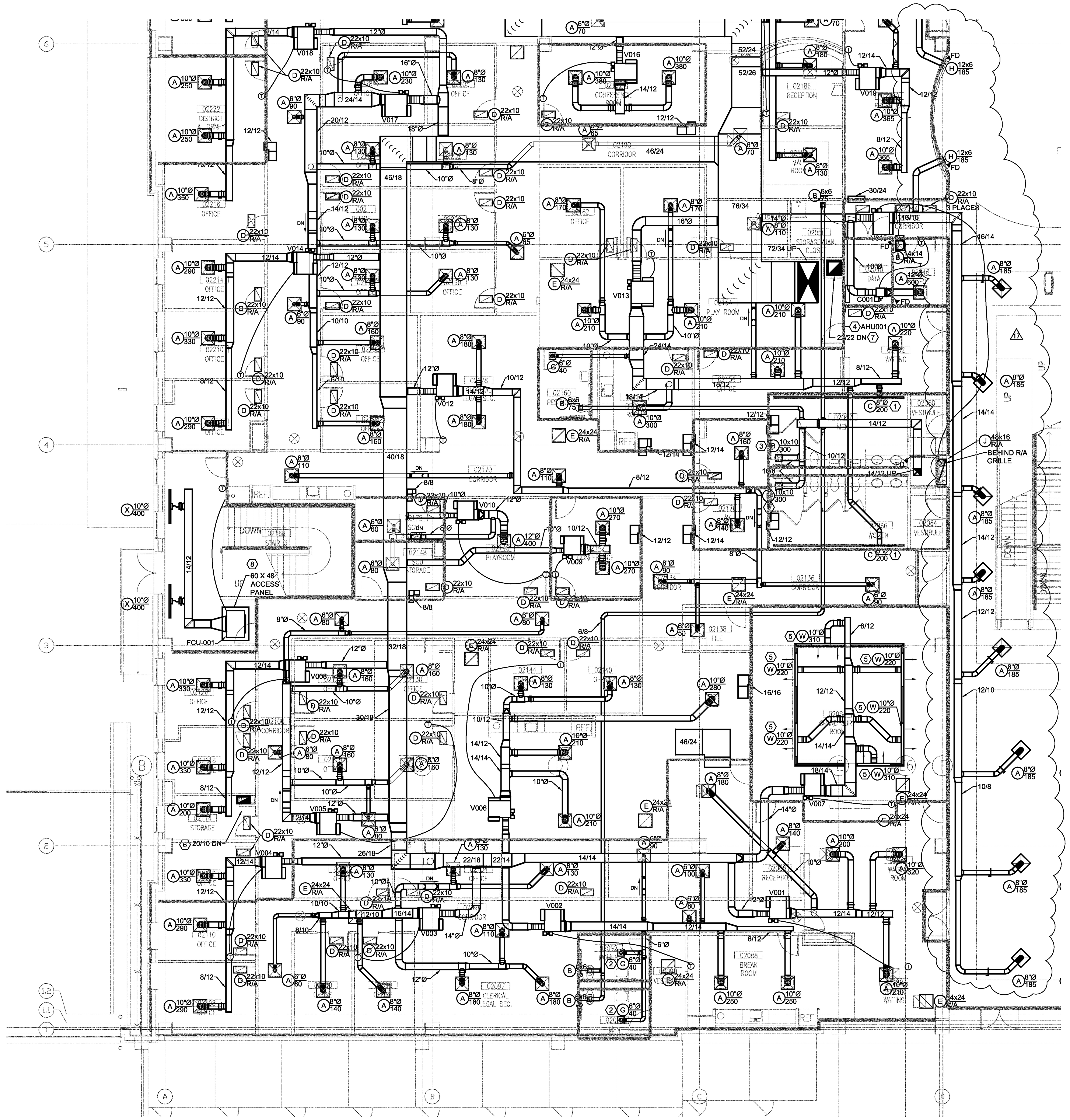
REGISTRATION

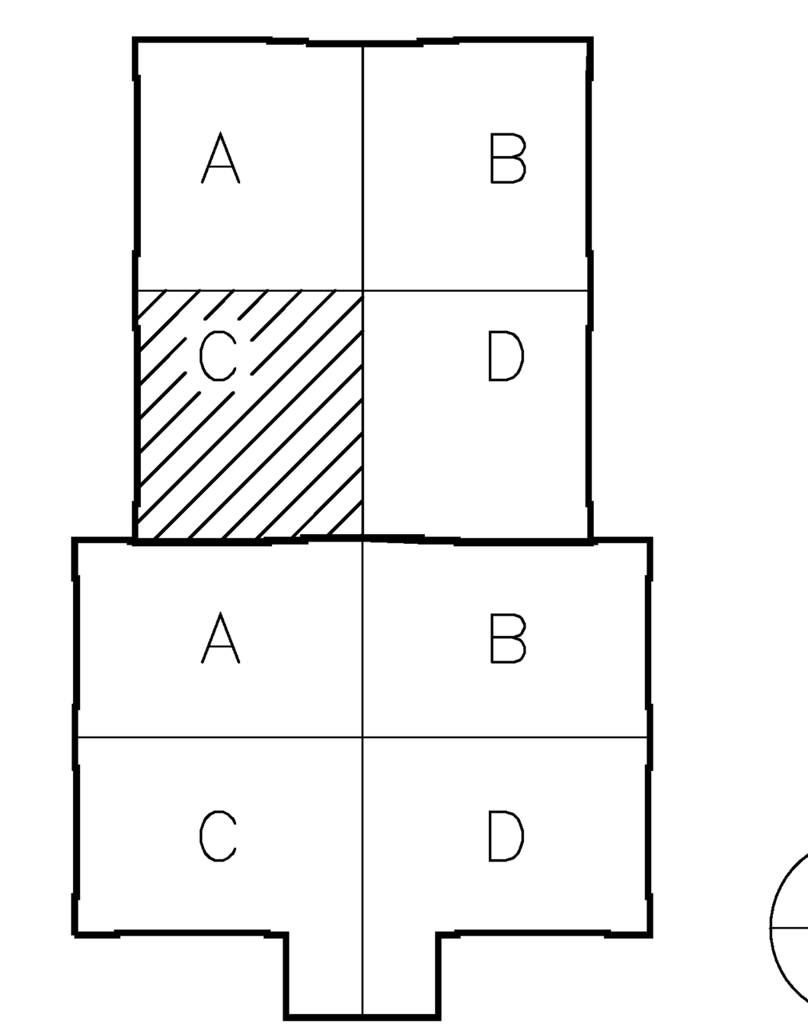
SHEET TITLE
MECHANICAL PLAN
LOWER LEVEL
SECTION B

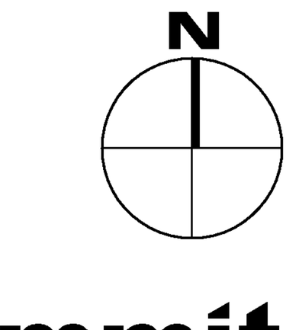
SHEET NUMBER
M2.02



NOTES BY SYMBOL "#"

1. EDGE OF DIFFUSER FLANGE SHALL BE 1.5" FROM WALL AND 7" FROM ENDS.
2. CENTER THE DIFFUSER BETWEEN THE CAN LIGHTS.
3. EXHAUST GRILLE SHALL BE INLINE WITH THE CAN LIGHTS AND SHALL BE CENTERED OVER THE TOILET FIXTURE.
4. MOUNT AHU HIGH ON WALL AND ROUTE REFRIGERANT PIPES IN WALL UP TO CU LOCATION ON ROOF.
5. OUTSIDE EDGE OF SLOT DIFFUSER SHALL BE 10" FROM THE OUTSIDE EDGE OF THE GYPBOARD.
6. 20/10 DUCT FROM CEILING PLENUM TO CRAWLSPACE BELOW. DUCT TO BE INSTALLED IN RETED CHASE (REF ARCHITECTURAL). PROVIDE FIRE DAMPER AT TOP OF DUCT STUBBED OUT HORIZONTALLY FROM CHASE ABOVE CEILING.
7. 22/22 DUCT FROM EXHAUST FAN EF-5 AT ROOF TO CRAWLSPACE BELOW. DUCT TO BE INSTALLED IN RATED CHASE (REF ARCHITECTURAL).
8. ACCESS PANEL TO HAVE 24 X 24 FILTER GRILLE LOCATED IN CENTER





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MECHANICAL PLAN

LOWER LEVEL SECTION C — SCALE:1/8"=1'-0" (01)

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CONSULTANT
STATE OF TEXAS
12/31/2010
GARRETT S. BROWN
90873
LICENSED PROFESSIONAL ENGINEER
7106.12.31.2010.8017

PROJECT TITLE
COLLIN COUNTY
COURTHOUSE
ADDITION

PROJECT NUMBER
590.0800.00

PROJECT LOCATION
2100 BLOOMDALE ROAD
McKINNEY, TX 75071

DATE OF ISSUE
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CONSTRUCTION DOCUMENTS

REVISIONS

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17	RFI 118	12/31/2010

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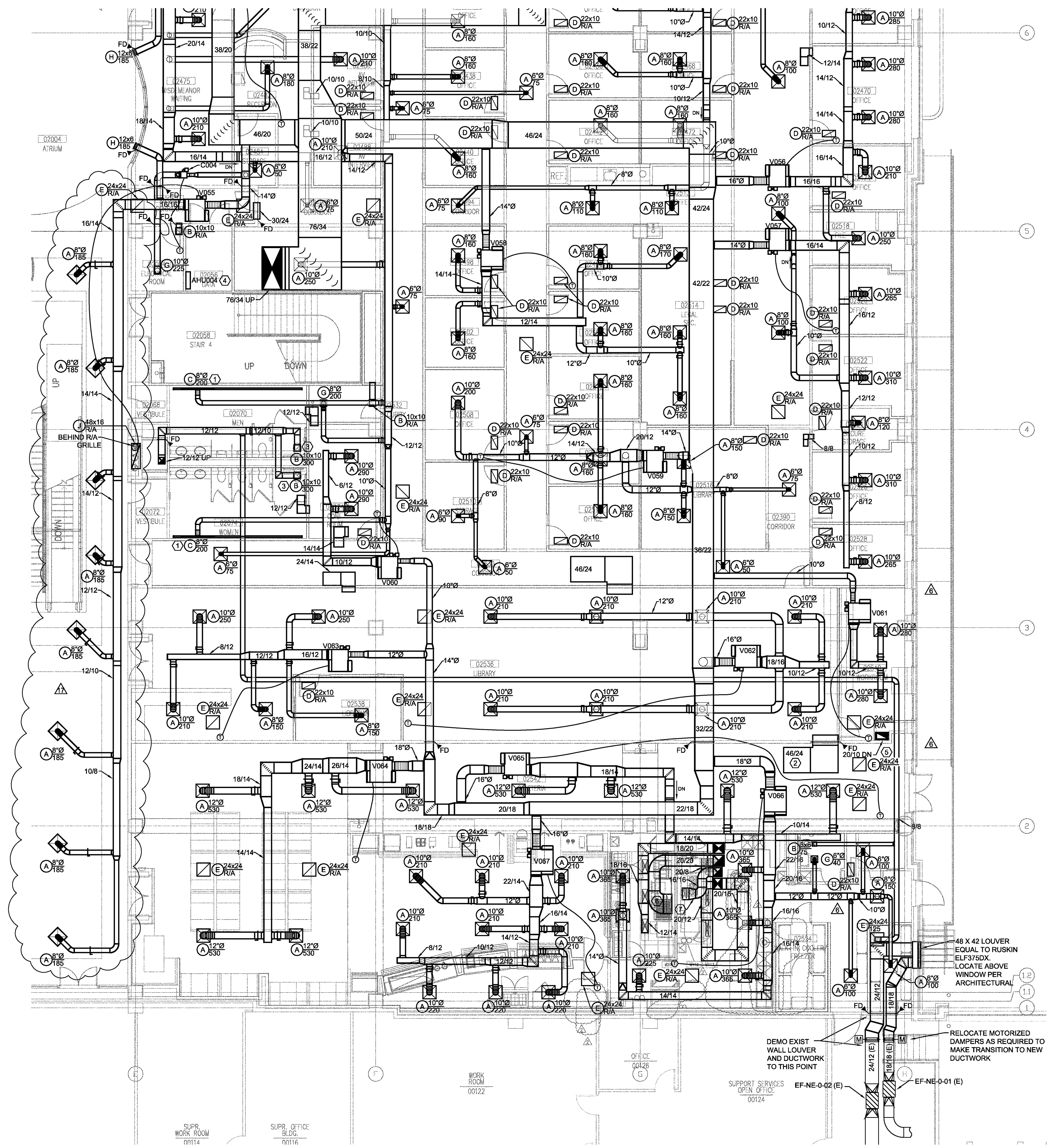
REGISTRATION

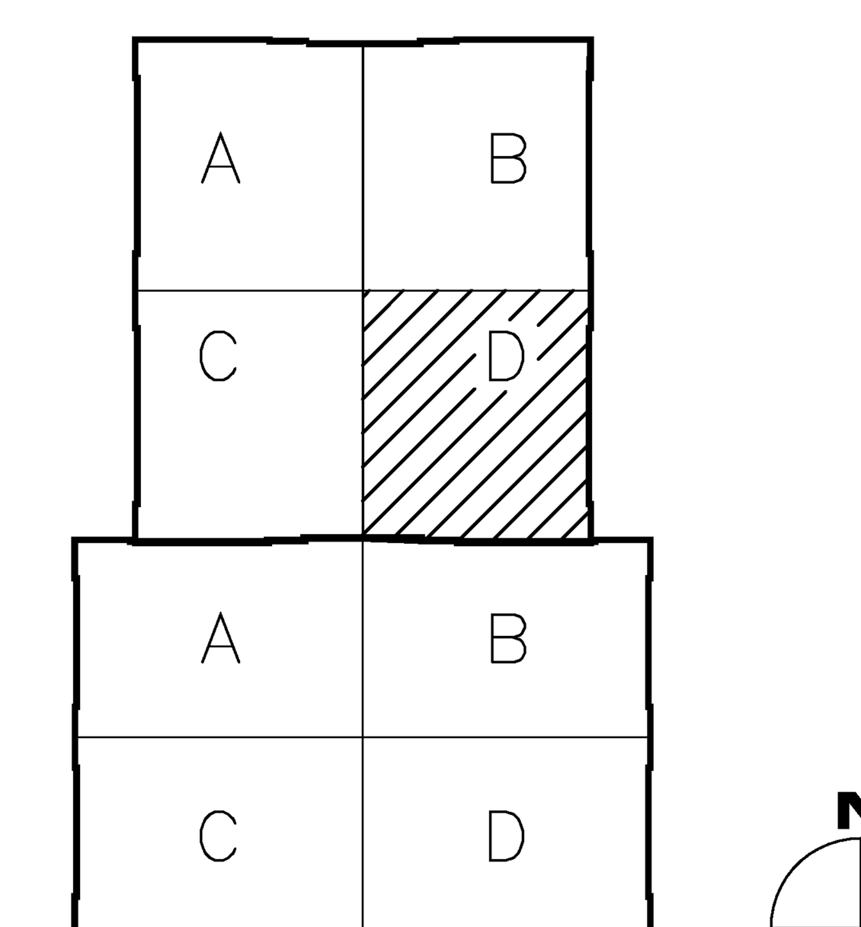
SHEET TITLE
MECHANICAL PLAN
LOWER LEVEL
SECTION C

SHEET NUMBER
M2.03



NOTES BY SYMBOL "#"

1. EDGE OF DIFFUSER FLANGE SHALL BE 1.5" FROM WALL AND 7" FROM ENDS.
2. THE 46/24 RETURN DUCT HAS BEEN PROVIDED FOR THE CAFETERIA SHELL SPACE. ONCE THE SPACE IS CONVERTED TO AN ACTIVE CAFETERIA THE RETURN DUCT NEEDS TO BE REMOVED AND THE WALL PATCHED. FURTHER DESIGN IS REQUIRED TO COMPLETE THE SPACE DESIGN, PRIMARILY AN AIR BALANCE SO THAT THE SPACE REMAINS NEGATIVE TO THE REST OF THE BUILDING AND THEREFORE THE RETURN DUCT IS NOT NEEDED. IF YOU LEAVE THE RETURN DUCT IN PLACE THE FOOD ODOR WILL GET INTO THE RETURN SYSTEM AND GET DISTRIBUTED THROUGHOUT THE BUILDING; WHICH IS NOT A HAZARD BUT PEOPLE ARE HUNGRY ALL OF THE TIME.
3. EXHAUST GRILLE SHALL BE INLINE WITH THE CAN LIGHTS AND SHALL BE CENTERED OVER THE TOILET FIXTURE.
4. MOUNT AHU HIGH ON WALL AND ROUTE REFRIGERANT PIPES IN WALL UP TO CU LOCATION ON ROOF.
5. 20/10 DUCT FROM CEILING PLENUM TO CRAWLSPACE BELOW. DUCT TO BE INSTALLED IN RATED CHASE (REF ARCHITECTURAL). PROVIDE FIRE DAMPER AT TOP OF DUCT STUBBED OUT HORIZONTALLY FROM CHASE ABOVE CEILING.
6. TRANSITION FROM 20/20 TO HOOD CONNECTION SIZE USING TRANSITION RADIUS.
7. TRANSITION FROM 16/16 TO HOOD CONNECTION SIZE AND THEN USE HOOD OPENING SIZE RADIUS ELBOW DOWN TO HOOD CONNECTION.



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MECHANICAL PLAN

LOWER LEVEL SECTION D — SCALE: 1/8"=1'-0" (01)

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CONSULTANT
STATE OF TEXAS — 12/31/2010 — GARRETT S. BROWN — 90873 — LICENSED PROFESSIONAL ENGINEER
7106.12.31.2010.8017

PROJECT TITLE
COLLIN COUNTY
COURTHOUSE
ADDITION

PROJECT NUMBER
590.0800.00

PROJECT LOCATION
2100 BLOOMDALE ROAD
McKINNEY, TX 75071

DATE OF ISSUE
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17	RFI 118	12/31/2010

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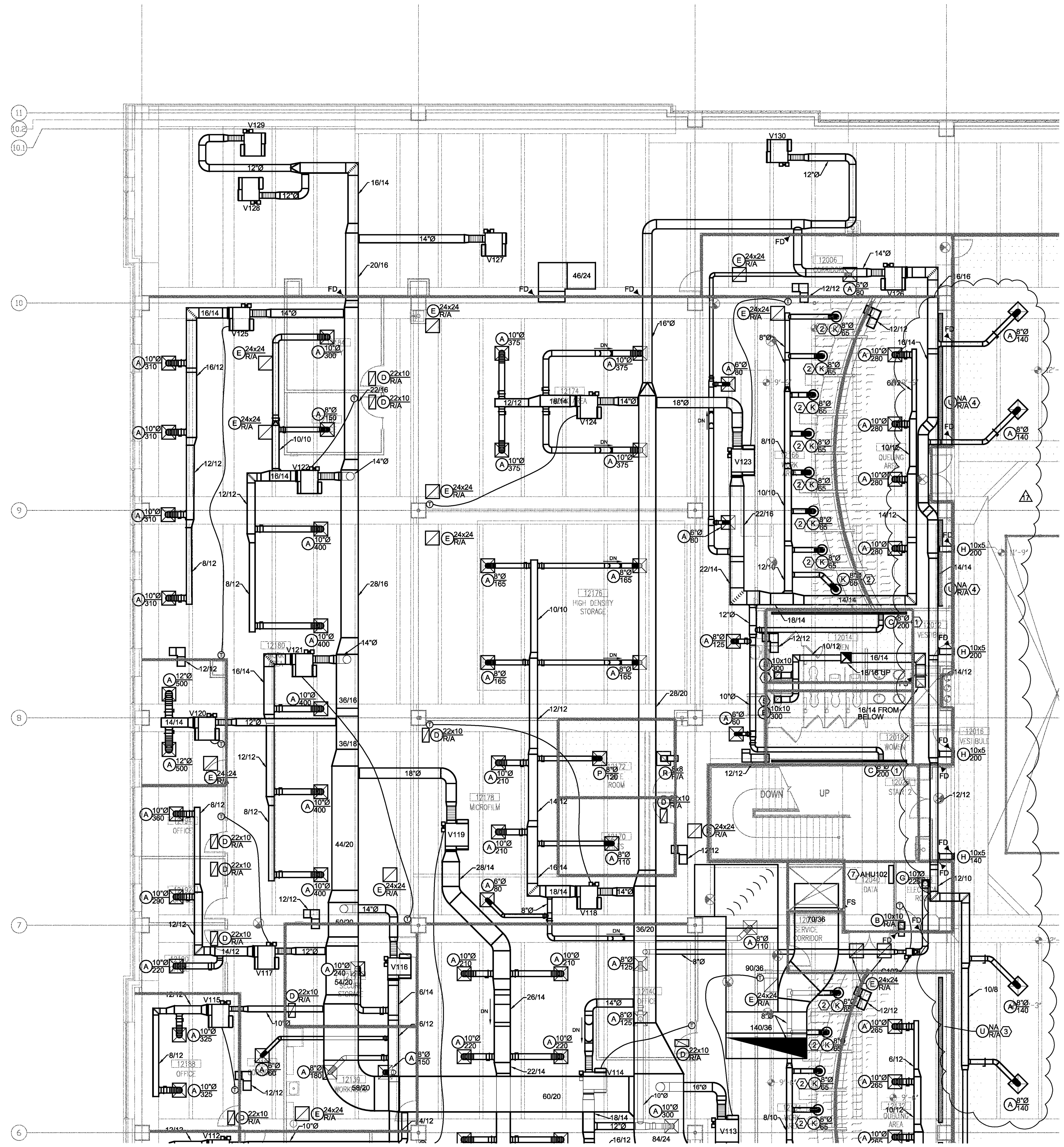
REGISTRATION

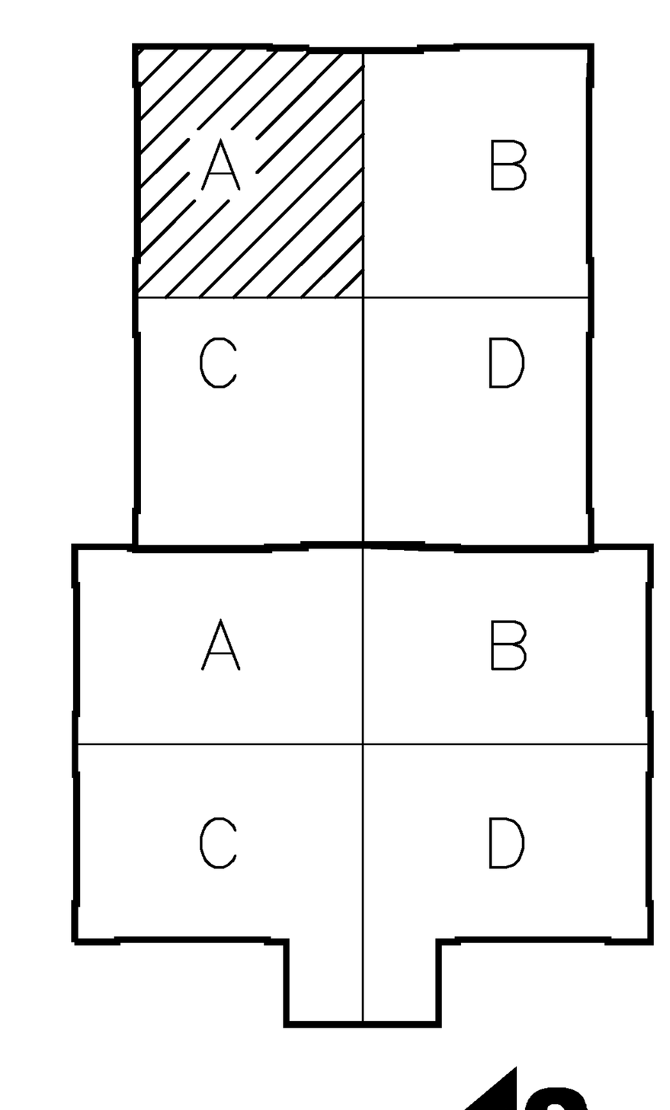
SHEET TITLE
MECHANICAL PLAN
LOWER LEVEL
SECTION D

SHEET NUMBER
M2.04



NOTES BY SYMBOL "#"

1. EDGE OF DIFFUSER FLANGE SHALL BE 1.5" FROM WALL AND 7" FROM ENDS.
2. DIFFUSER SHALL BE MOUNTED BETWEEN THE PARTITION WALLS. THE DIFFUSER SHALL BE 3'-0" FROM THE CUSTOMER SERVICE REPRESENTATIVE SIDE OF THE CURVED WALL TO THE CENTER OF THE DIFFUSER. IT CAN BE PARTICULARLLY IRRATATING IF THE DIFFUSERS ARE NOT LOCATED CORRECTLY; SO TAKE THE TIME TO LAY THEM OUT AS INDICATED. IF THERE ARE QUESTIONS CALL OR SEND AN RFI.
3. RETURN AIR SLOTS SHALL BE 21'-0" AND 5'-6" LONG AND SHALL BE MOUNTED BETWEEN THE WALL AND THE COLUMN FACE. THE INSIDE EDGE OF THE SLOT SHALL ALIGN WITH THE INSIDE FACE OF THE COLUMN.
4. RETURN AIR SLOTS SHALL BE 19'-0" AND 12'-6" LONG AND SHALL BE MOUNTED BETWEEN THE WALL AND THE COLUMN FACE. THE INSIDE EDGE OF THE SLOT SHALL ALIGN WITH THE INSIDE FACE OF THE COLUMN.
5. EXHAUST GRILLE SHALL BE INLINE WITH THE CAN LIGHTS AND SHALL BE CENTERED OVER THE TOILET FIXTURE.
6. DIFFUSER/GRILLES SHALL BE INLINE WITH THE LIGHTS AND BE CENTERED BETWEEN THE LIGHT AND THE WALL.
7. MOUNT AHU HIGH ON WALL AND ROUTE REFRIGERANT PIPES IN WALL UP TO CU LOCATION ON ROOF.



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MECHANICAL PLAN
LEVEL ONE SECTION A
SCALE: 1/8"=1'-0" (01)

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90873
LICENSED PROFESSIONAL ENGINEER
12/31/2010
7106.12.31.2010.8017

PROJECT TITLE
COLLIN COUNTY COURTHOUSE ADDITION

PROJECT NUMBER
590.0800.00

PROJECT LOCATION
2100 BLOOMDALE ROAD
McKINNEY, TX 75071

DATE OF ISSUE
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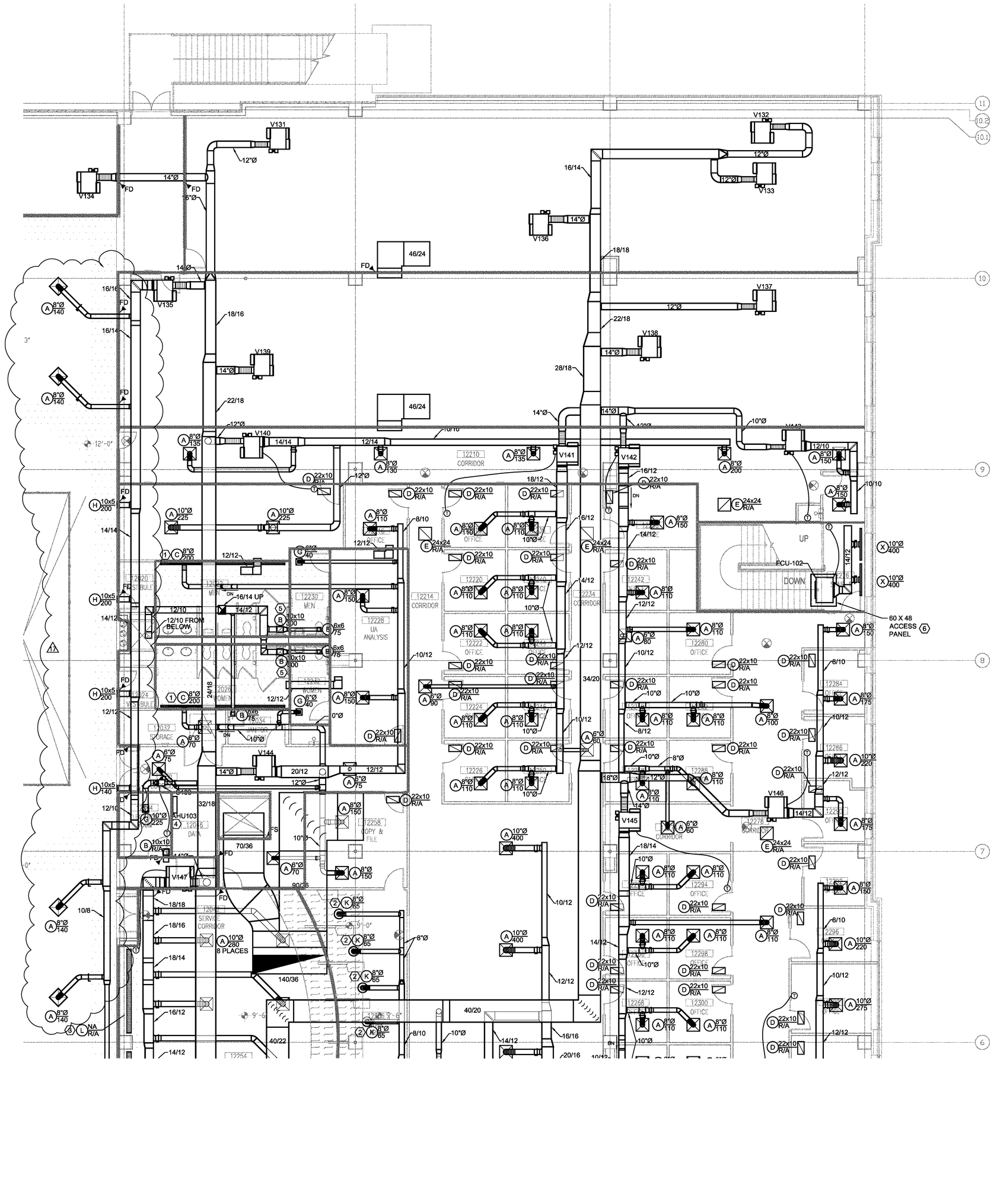
REGISTRATION

SHEET TITLE
MECHANICAL PLAN
LEVEL ONE
SECTION A

SHEET NUMBER
M2.11

NOTES BY SYMBOL "#"

1. EDGE OF DIFFUSER FLANGE SHALL BE 1.5" FROM WALL AND 7" FROM ENDS.
2. DIFFUSER SHALL BE MOUNTED BETWEEN THE PARTITION WALLS. THE DIFFUSER SHALL BE 3'-0" FROM THE CUSTOMER SERVICE REPRESENTATIVE SIDE OF THE CURVED WALL TO THE CENTER OF THE DIFFUSER. IT CAN BE PARTICULARLLY IRRATATING IF THE DIFFUSERS ARE NOT LOCATED CORRECTLY; SO TAKE THE TIME TO LAY THEM OUT AS INDICATED. IF THERE ARE QUESTIONS CALL OR SEND AN RFI.
3. RETURN AIR SLOT SHALL BE 13'-0" LONG AND SHALL BE MOUNTED BETWEEN THE WALL AND THE COLUMN FACE. THE INSIDE EDGE OF THE SLOT SHALL ALIGN WITH THE INSIDE FACE OF THE COLUMN.
4. MOUNT AHU HIGH ON WALL AND ROUTE REFRIGERANT PIPES IN WALL UP TO CU LOCATION ON ROOF.
5. EXHAUST GRILLE SHALL BE INLINE WITH THE CAN LIGHTS AND SHALL BE CENTERED OVER THE TOILET FIXTURE.
6. ACCESS PANEL TO HAVE 24 X 24 FILTER GRILLE LOCATED IN CENTER



COLLIN COUNTY

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SUMMIT CONSULTANTS, INC.

ENGINEER: GARRETT BROWN
LICENSED#:90873
DATE: 12 / 31 / 2010

PROJECT TITLE

COLLIN COUNTY
COURTHOUSE
ADDITION

PROJECT NUMBER

590.0800.00

PROJECT LOCATION

2100 BLOOMDALE ROAD
McKINNEY, TX 75071

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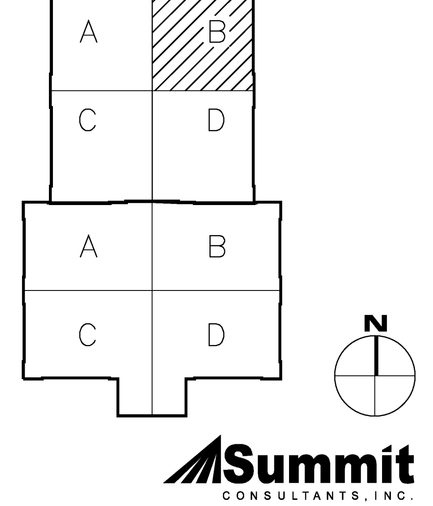

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MECHANICAL PLAN

LEVEL ONE SECTION B

SCALE: 1/8"=1'-0" (01)

SHEET TITLE

MECHANICAL PLAN
LEVEL ONE
SECTION B

SHEET NUMBER

M2.12

NOTES BY SYMBOL "Ⓝ"

(1) EDGE OF DIFFUSER FLANGE SHALL BE 1.5" FROM WALL AND 7" FROM ENDS.

(2) EXHAUST GRILLE SHALL BE INLINE WITH THE CAN LIGHTS AND SHALL BE CENTERED BETWEEN THE LAST TWO LIGHTS IN THE ROW.

(3) EXHAUST GRILLE SHALL BE INLINE WITH THE CAN LIGHTS AND SHALL BE CENTERED OVER THE TOILET FIXTURE.

(4) 18/18 DUCT UP TO EF-2.

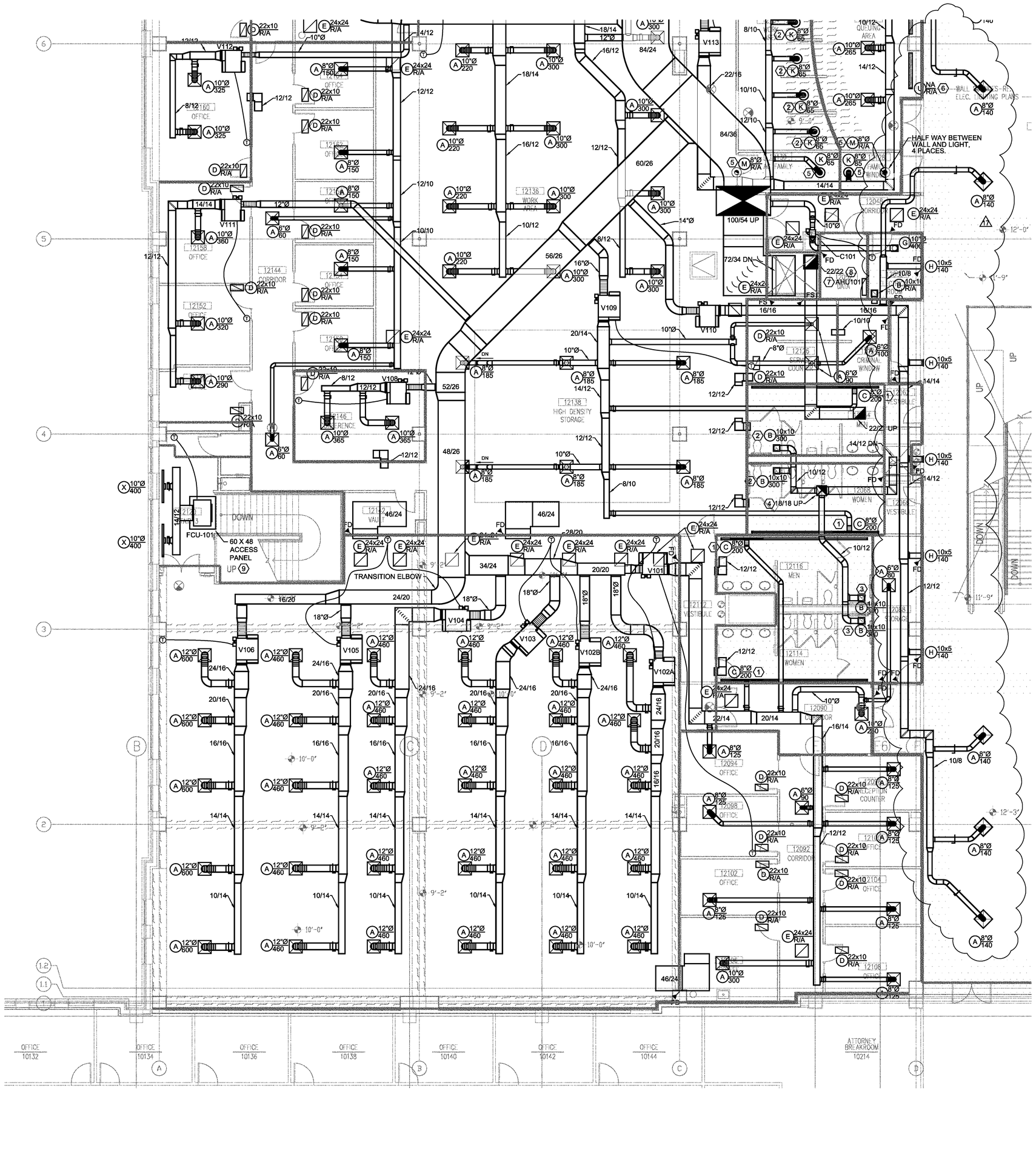
(5) DIFFUSER/GRILLES SHALL BE INLINE WITH THE LIGHTS AND BE CENTERED BETWEEN THE LIGHT AND THE WALL.

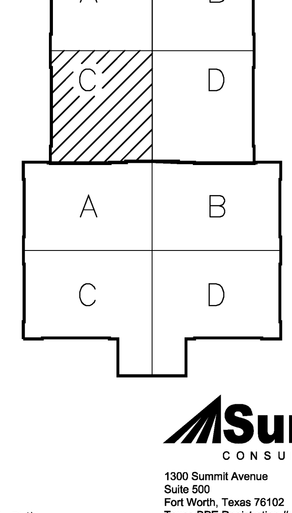
(6) RETURN AIR SLOTS SHALL BE 21'-0" AND 5'-6" LONG AND SHALL BE MOUNTED BETWEEN THE WALL AND THE COLUMN FACE. THE INSIDE EDGE OF THE SLOT SHALL ALIGN WITH THE INSIDE FACE OF THE COLUMN.

(7) MOUNT AHU HIGH ON WALL AND ROUTE REFRIGERANT PIPES IN WALL UP TO CU LOCATION ON ROOF.

(8) 22/22 FROM EF-5 ABOVE DOWN TO CRAWLSPACE.

(9) ACCESS PANEL TO HAVE 24 X 24 FILTER GRILLE LOCATED IN CENTER





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MECHANICAL PLAN

LEVEL ONE SECTION C

SCALE: 1/8"=1'-0" (01)

COLLIN COUNTY

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CONSULTANT

STATE OF TEXAS
GARRETT S. BROWN
90873
LICENSED PROFESSIONAL ENGINEER
12/31/2010
7106.12.31.2010.8017

PROJECT TITLE

COLLIN COUNTY
COURTHOUSE
ADDITION

PROJECT NUMBER

590.0800.00

PROJECT LOCATION

2100 BLOOMDALE ROAD
McKINNEY, TX 75071

DATE OF ISSUE

DECEMBER 14 2009
CONSTRUCTION DOCUMENTS

REVISIONS

1	ADDENDUM #1 07/27/2009
2	ADDENDUM #2 08/07/2009
3	ADDENDUM #3 09/12/2009
4	ADDENDUM #6 12/14/2009
5	PRR2 08/03/2010
6	RFI 28 08/25/2010
7	PRR4 09/14/2010
8	RFI 53R 09/21/2010
9	RFI 67 11/24/2010
10	REVISED PENTHOUSE LTG 11/24/2010
11	PR #5 11/24/2010
12	RFI 92 12/02/2010
13	RFI 93 12/02/2010
14	RFI 95 12/02/2010
15	RFI 101,102 12/07/2010
16	RFI 115 12/15/2010
17	RFI 118 12/31/2010

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REGISTRATION

SHEET TITLE

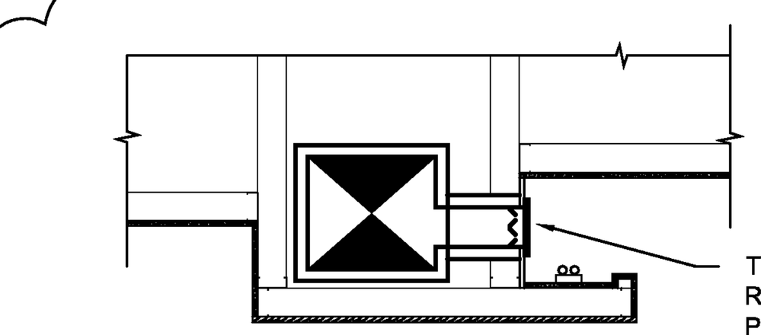
MECHANICAL PLAN
LEVEL ONE
SECTION C

SHEET NUMBER

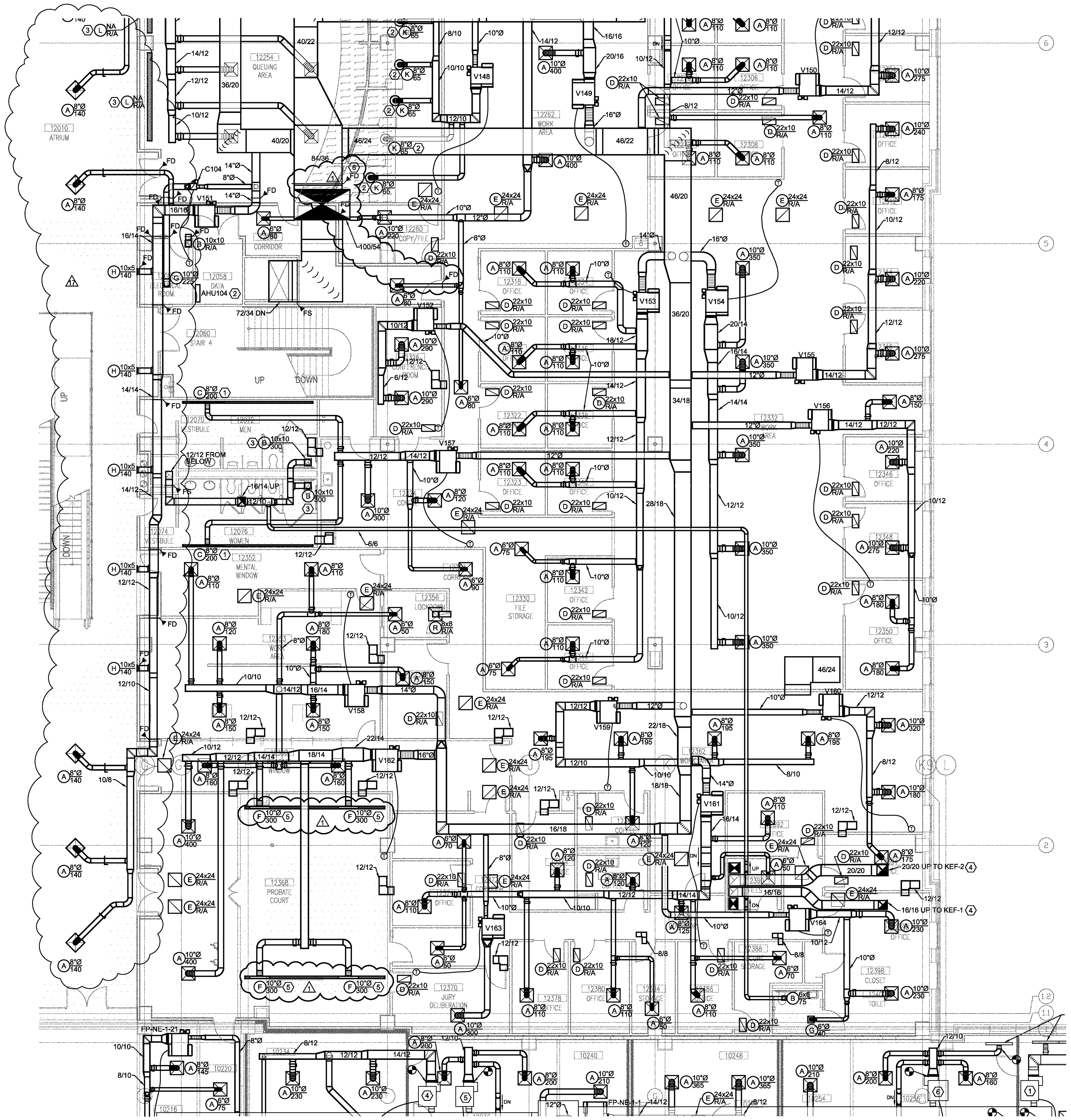
M2.13

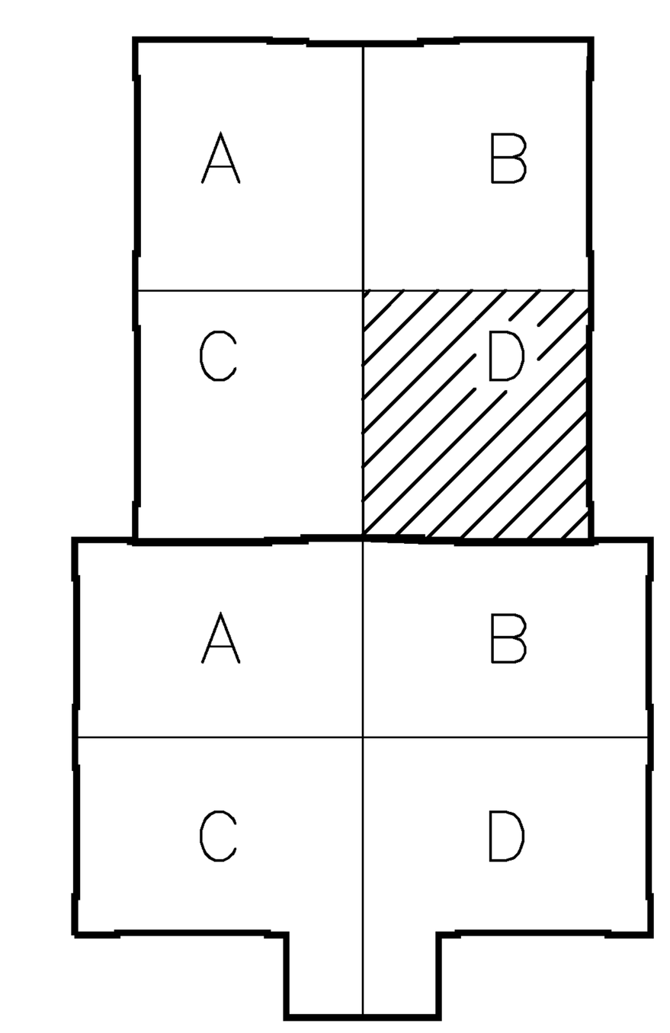
NOTES BY SYMBOL "#"

1. EDGE OF DIFFUSER FLANGE SHALL BE 1.5" FROM WALL AND 7" FROM ENDS.
2. MOUNT AHU HIGH ON WALL AND ROUTE REFRIGERANT PIPES IN WALL UP TO CU LOCATION ON ROOF.
3. EXHAUST GRILLE SHALL BE INLINE WITH THE CAN LIGHTS AND SHALL BE CENTERED OVER THE TOILET FIXTURE.
4. THE KITCHEN EXHAUST FAN ON THE ROOF SHALL BE PROVIDED WITH A HINGED ROOF CURB/MOUNTING FLANGE TO ALLOW CLEANING OF THE ELBOW BELOW FROM THE ROOF. DO NOT PUT A DUCT ACCESS AT THE ELBOWS BELOW THE FANS AS THE JUDGE WILL NOT WANT PEOPLE IN HIS OFFICE TO CLEAN THE DUCTS.
5. REFER TO ARCHITECTURAL CEILING PLAN FOR EXACT LOCATION AND LENGTH OF CEILING DIFFUSER.
6. LOCATE FIRE DAMPER AS CLOSE TO DUCT TAP FROM VERTICAL MAIN AS POSSIBLE. COORDINATE WITH FIRE RATED DUCT WRAP INSTALLERS TO ENSURE THAT FIRE DAMPER FRAME IS COVERED BY THE FIRE WRAP. PROVIDE ACCESS DOOR DOWN STREAM OF FIRE DAMPER.



MECHANICAL DETAIL
SIDEWALL DIFFUSER DETAIL
SCALE: 1/2"=1'-0" 02





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MECHANICAL PLAN
LEVEL ONE SECTION D
SCALE: 1/8"=1'-0" 01

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CONSULTANT
GARRETT S. BROWN 90873 LICENSED PROFESSIONAL ENGINEER 12/31/2010
7106.12.31.2010.8017

PROJECT TITLE
COLLIN COUNTY COURTHOUSE ADDITION

PROJECT NUMBER
590.0800.00

PROJECT LOCATION
2100 BLOOMDALE ROAD
McKINNEY, TX 75071

DATE OF ISSUE
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No.	Revision	Date
1	ADDENDUM #1	07/27/2009
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4	ADDENDUM #6	12/14/2009
5	PR#2	08/03/2010
6	RFI 28	08/25/2010
7	PR#4	09/14/2010
8	RFI 53R	09/21/2010
9	RFI 67	11/24/2010
10	REVISED PENTHOUSE LTG	11/24/2010
11	PR #5	11/24/2010
12	RFI 92	12/02/2010
13	RFI 93	12/02/2010
14	RFI 95	12/02/2010
15	RFI 101,102	12/07/2010
16	RFI 115	12/15/2010
17	RFI 118	12/31/2010

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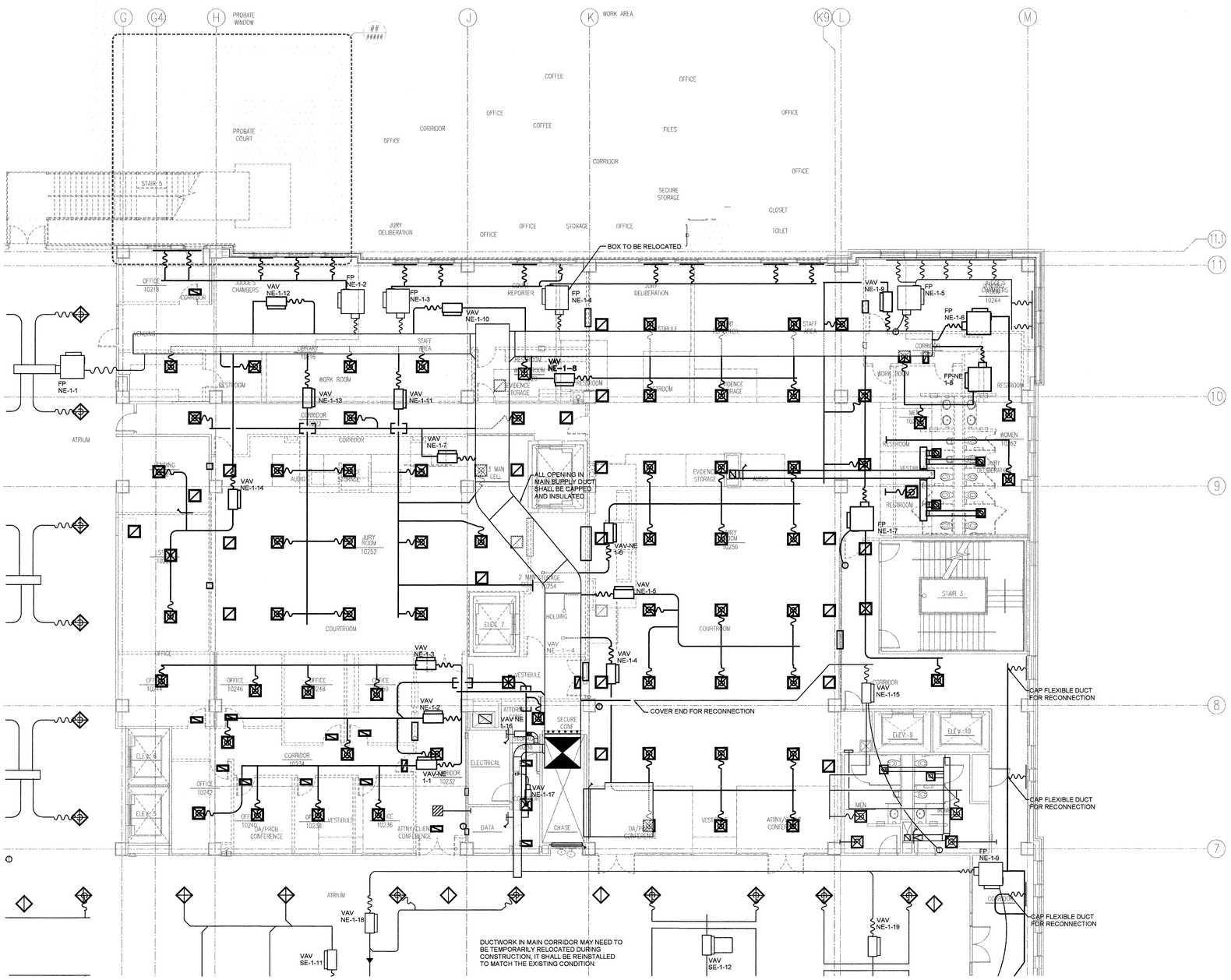
REGISTRATION

SHEET TITLE
MECHANICAL PLAN
LEVEL ONE
SECTION D

SHEET NUMBER
M2.14

GENRAL NOTES

1. ALL FAN POWERED VAV BOXES AND VALVE ONLY VAV BOXES THAT ARE NOT INDICATED TO BE REUSED SHALL BE CAREFULLY TAKEN DOWN. EACH BOX SHALL BE CLEANED AND THE OPENINGS COVERED WITH HEAVY GAGE PLASTIC. THE BOXES SHALL BE DELIVERED TO THE OWNER'S STORAGE FACILITY (CONTACT COLLIN COUNTY PERSONNEL FOR STORAGE FACILITY LOCATION).
2. ALL SUPPLY AND RETURN AIR DEVICES SHALL BE REMOVED FROM THE CEILING, CLEANED AND SET ASIDE FOR REUSE. IT IS ACCEPTABLE TO REUSE THE EXISTING AIR DEVICES FOR THE NEW BUILDING OR IN THE RENOVATED PORTIONS OF THE EXISTING BUILDING AS LONG AS THEY MATCH THE MODEL NUMBERS INDICATED ON THE AIR DEVICE SCHEDULE. AIR DEVICES NOT USED SHALL BE RETURNED TO THE OWNER.



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PROJECT TITLE
COLLIN COUNTY COURTHOUSE ADDITION

PROJECT NUMBER
590.0800.00

PROJECT LOCATION
2100 BLOOMDALE ROAD
McKINNEY, TX 75071

DATE OF ISSUE
JUNE 4, 2009
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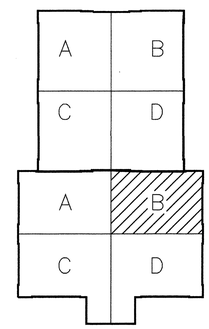

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MECHANICAL DEMOLITION PLAN

LEVEL ONE SECTION B

SCALE: 1/8"=1'-0" (01)

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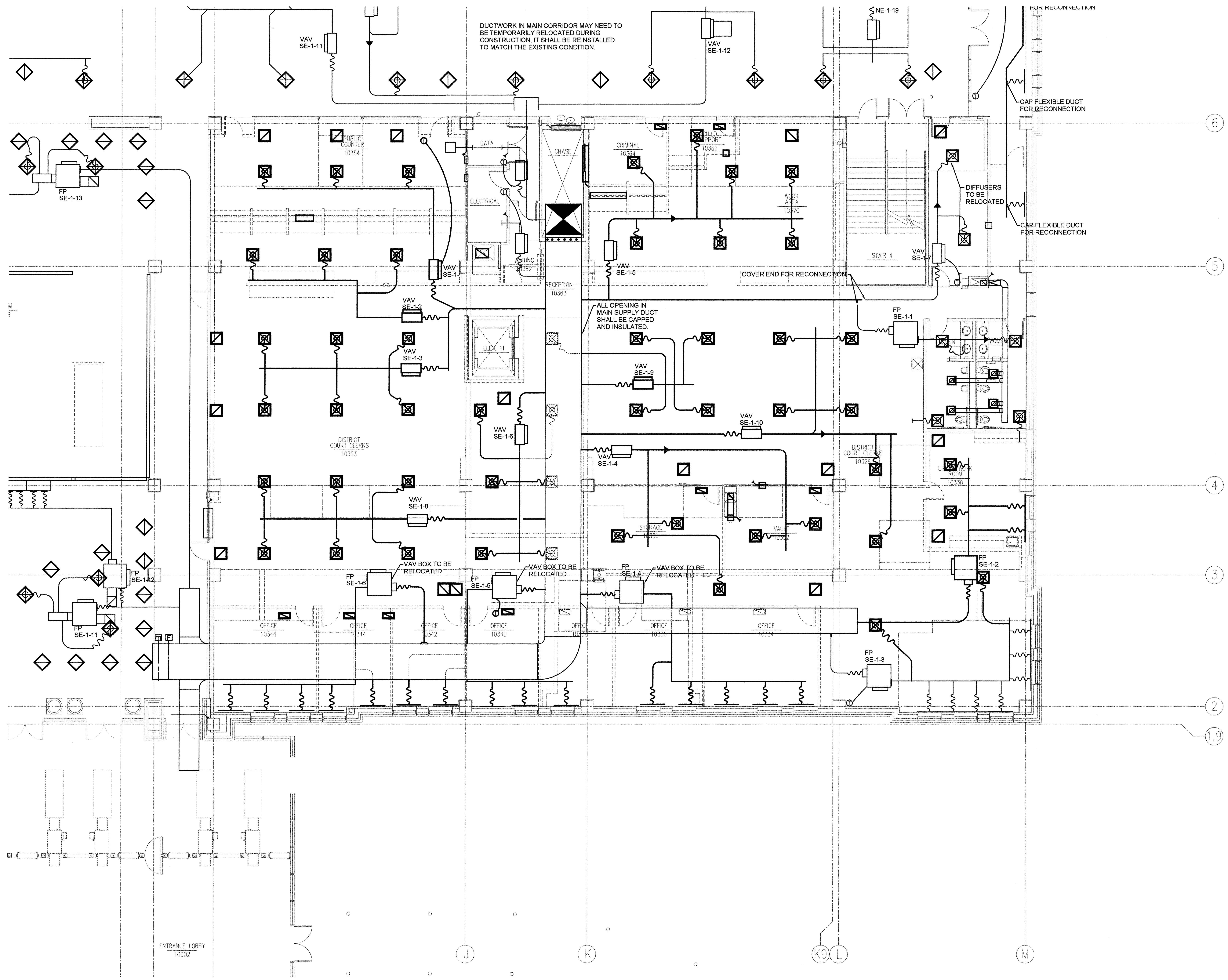
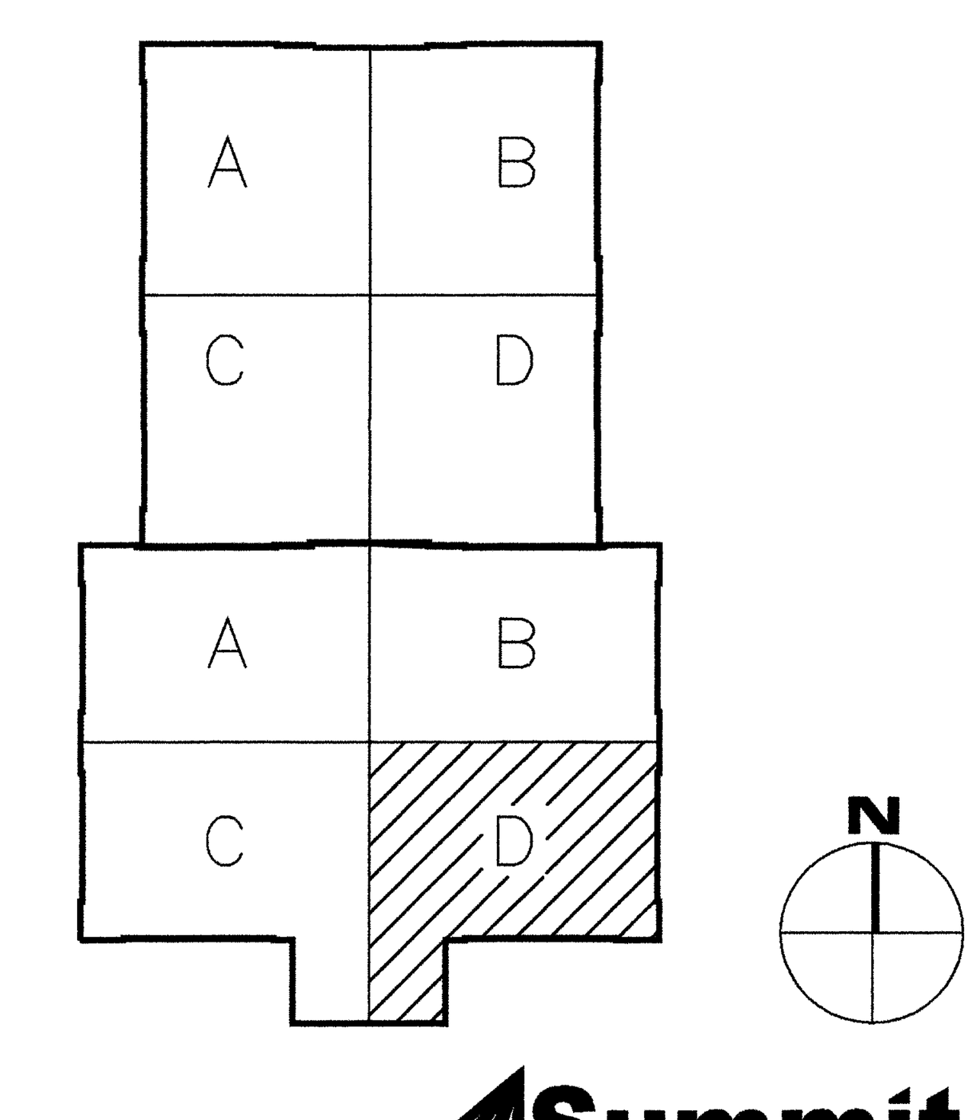
SHEET TITLE
MECHANICAL DEMOLITION PLAN - LEVEL ONE SECTION B

SHEET NUMBER
M2.15

GENRAL NOTES

1. ALL FAN POWERED VAV BOXES AND VALVE ONLY VAV BOXES THAT ARE NOT INDICATED TO BE REUSED SHALL BE CAREFULLY TAKEN DOWN. EACH BOX SHALL BE CLEANED AND THE OPENINGS COVERED WITH HEAVY GAGE PLASTIC. THE BOXES SHALL BE DELIVERED TO THE OWNER'S STORAGE FACILITY (CONTACT COLLIN COUNTY PERSONNEL FOR STORAGE FACILITY LOCATION).
2. ALL SUPPLY AND RETURN AIR DEVICES SHALL BE REMOVED FROM THE CEILING, CLEANED AND SET ASIDE FOR REUSE. IT IS ACCEPTABLE TO REUSE THE EXISTING AIR DEVICES FOR THE NEW BUILDING OR IN THE RENOVATED PORTIONS OF THE EXISTING BUILDING AS LONG AS THEY MATCH THE MODEL NUMBERS INDICATED ON THE AIR DEVICE SCHEDULE. AIR DEVICES NOT USED SHALL BE RETURNED TO THE OWNER.





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CONSULTANT

STATE OF TEXAS
6/4/2009
GARRETT S. BROWN
90873
LICENSED PROFESSIONAL ENGINEER
5600.6.4.2009.8017

PROJECT TITLE

COLLIN COUNTY COURTHOUSE ADDITION

PROJECT NUMBER

590.0800.00

PROJECT LOCATION

2100 BLOOMDALE ROAD
McKINNEY, TX 75071

DATE OF ISSUE

JUNE 4, 2009
CONSTRUCTION DOCUMENTS
REVISIONS

REGISTRATION

Pierce Goodwin Alexander & Linville

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MECHANICAL DEMOLITION PLAN

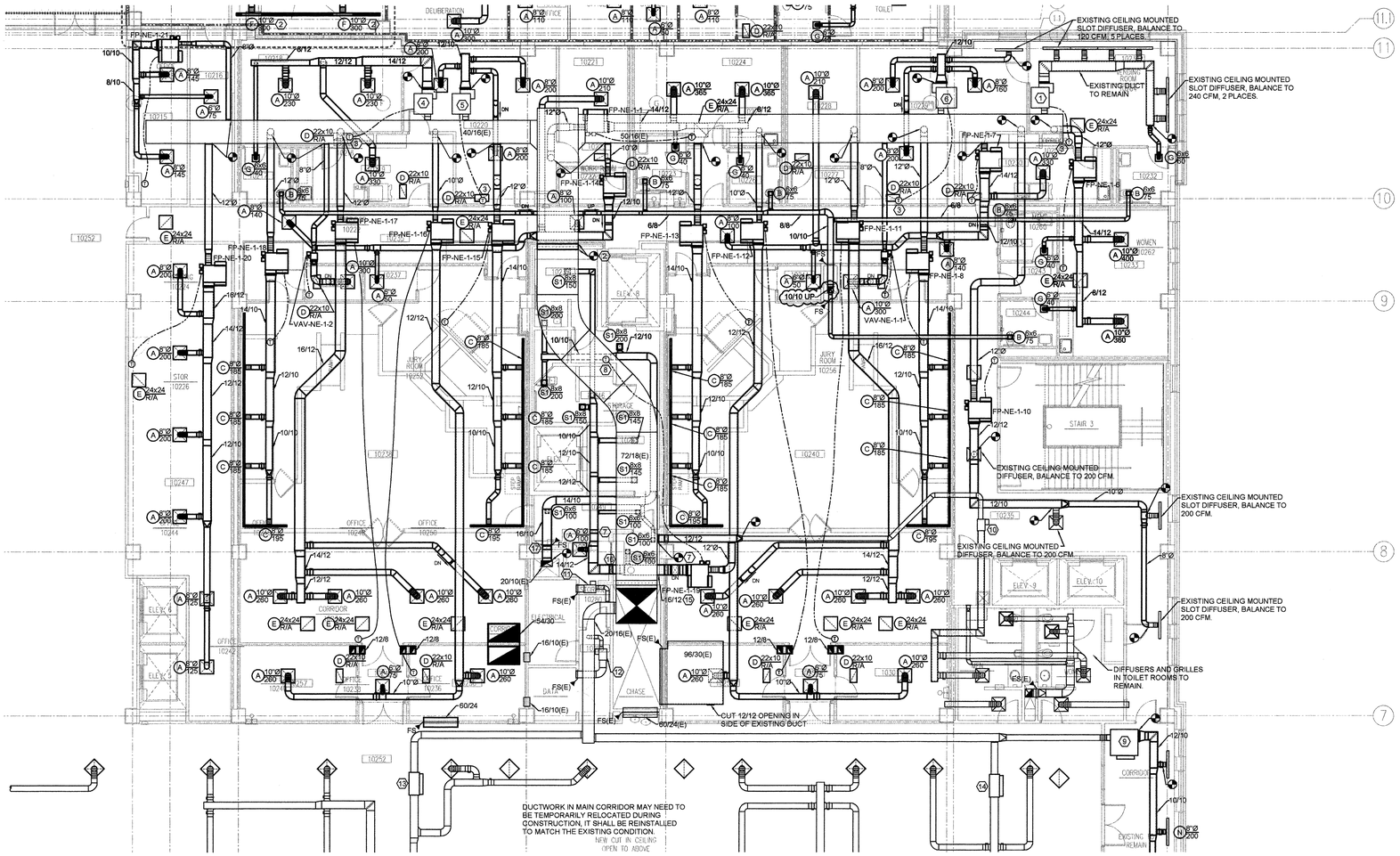
LEVEL ONE SECTION D — SCALE: 1/8"=1'-0" (01)

SHEET TITLE

MECHANICAL DEMOLITION PLAN - LEVEL ONE SECTION D

SHEET NUMBER

M2.16



GENRAL NOTES

1. THE FLOOR TO FLOOR HEIGHT OF THE EXISTING STRUCTURE IN AREA "D" IS 18'-0". THE STRUCTURAL DEPTH, WORST CASE, IS 2'-1", WHICH LEAVES 15'-11" CLEAR BELOW THE STRUCTURE. THE HIGH GYPBOARD CEILING IN THE COURTROOM IS 11'-4", THIS DOES NOT INCLUDE THE DOME IN THE CENTER (DON'T RUN DUCTS OVER THE DOME, IF YOU DO THEN SOMETHING ELSE WON'T FIT THEN I WILL GET AND RFI AND THE WHOLE PROCESS SLOWS DOWN; EASIER IF YOU AVOID THE DOME). IF 1'-0" IS ALLOWED FOR RECESSED LIGHTING THEN THE CLEAR SPACE BETWEEN THE TOP OF THE LIGHTS AND THE BOTTOM OF THE STRUCTURE IS 15'-11" - 12'-4" = 3'-7". THE WORST CASE DUCT CROSSING OVER THIS AREA ARE TWO 12/12 DUCTS THAT REQUIRE A TOTAL OF 2'-8" TO INSTALL. PLANNING AHEAD AND COORDINATING WITH OTHER TRADES IS REQUIRED, DUCTS HAVE BEEN SIZED TO FIT THE ALOTTED SPACE.

NOTES BY SYMBOL "#"

1. REBALANCE EXISTNG VAV BOX, FP-NE-1-5 TO 1020 CFM. CAP UNUSED 8'Ø DUCT TAP AT MAIN, SEAL AIR TIGHT AND INSULATE.
2. PROVIDE NEW 72/18 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
3. RELOCATE EXISTING THERMOSTAT TO LOCATION INDICATED.
4. REBALANCE EXISTNG VAV BOX, FP-NE-1-2 TO 830 CFM.
5. REBALANCE EXISTNG VAV BOX, FP-NE-1-3 TO 600 CFM.
6. REBALANCE EXISTNG VAV BOX, FP-NE-1-4 TO 680 CFM.
7. PROVIDE NEW 12/12 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
8. PROVIDE LOCKING METAL COVER OVER THERMOSTAT.
9. REBALANCE EXISTNG VAV BOX, FP-NE-1-9 TO 600 CFM.
10. EXISTING VAV-NE-1-15 TO REMAIN AND BE RELABELED AS VAV-NE-1-3.
11. EXISTING VAV-NE-1-16 TO REMAIN AND BE RELABELED AS VAV-NE-1-4.
12. EXISTING VAV-NE-1-17 TO REMAIN AND BE RELABELED AS VAV-NE-1-5.
13. EXISTING VAV-NE-1-18 TO REMAIN AND BE RELABELED AS VAV-NE-1-6.
14. EXISTING VAV-NE-1-19 TO REMAIN AND BE RELABELED AS VAV-NE-1-7.
15. PROVIDE NEW 16/12 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
16. PROVIDE NEW 14/12 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
17. PROVIDE NEW 16/10 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.

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PROJECT TITLE
COLLIN COUNTY
COURTHOUSE
ADDITION

PROJECT NUMBER
590.0800.00

PROJECT LOCATION
2100 BLOOMDALE ROAD
McKINNEY, TX 75071

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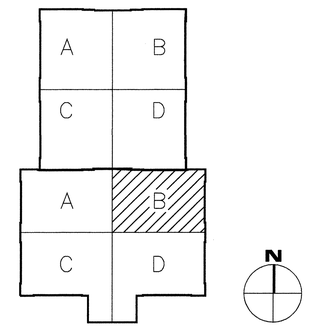
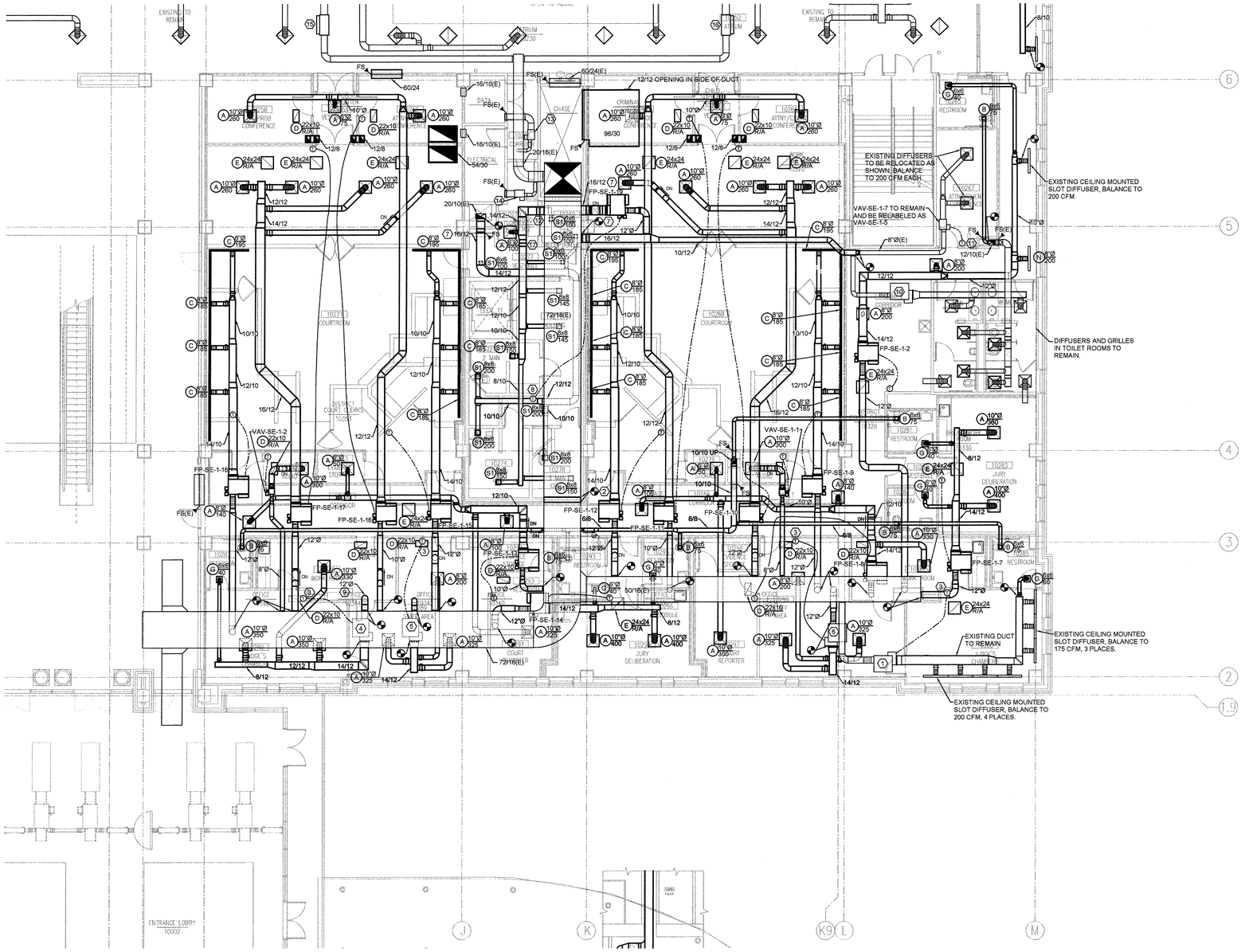


REGISTRATION

SHEET TITLE
MECHANICAL RENOVATION PLAN - LEVEL ONE SECTION B

SHEET NUMBER
M2.17

MECHANICAL RENOVATION PLAN
LEVEL ONE SECTION B
SCALE: 1/8"=1'-0" (01)



GENRAL NOTES

1. THE FLOOR TO FLOOR HEIGHT OF THE EXISTING STRUCTURE IN AREA "D" IS 18'-0". THE STRUCTURAL DEPTH, WORST CASE, IS 2'-1", WHICH LEAVES 15'-11" CLEAR BELOW THE STRUCTURE. THE HIGH GYPBOARD CEILING IN THE COURTROOM IS 11'-4", THIS DOES NOT INCLUDE THE DOME IN THE CENTER (DON'T RUN DUCTS OVER THE DOME, IF YOU DO THEN SOMETHING ELSE WON'T FIT THEN I WILL GET AND RFI AND THE WHOLE PROCESS SLOWS DOWN; EASIER IF YOU AVOID THE DOME). IF 1'-0" IS ALLOWED FOR RECESSED LIGHTING THEN THE CLEAR SPACE BETWEEN THE TOP OF THE LIGHTS AND THE BOTTOM OF THE STRUCTURE IS 15'-11" - 12'-4" = 3'-7". THE WORST CASE DUCT CROSSING OVER THIS AREA ARE TWO 12/12 DUCTS THAT REQUIRE A TOTAL OF 2'-8" TO INSTALL. PLANNING AHEAD AND COORDINATING WITH OTHER TRADES IS REQUIRED, DUCTS HAVE BEEN SIZED TO FIT THE ALOTTED SPACE.

NOTES BY SYMBOL "#"

1. REBALANCE EXISTNG VAV BOX, FP-SE-1-3 TO 1385 CFM. CAP UNUSED 8'Ø DUCT TAP AT MAIN, SEAL AIR TIGHT AND INSULATE.
2. PROVIDE NEW 72/18 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
3. RELOCATE EXISTING THERMOSTAT TO LOCATION INDICATED.
4. REBALANCE EXISTNG VAV BOX, FP-SE-1-5 TO 1070 CFM.
5. REBALANCE EXISTNG VAV BOX, FP-SE-1-6 TO 850 CFM.
6. REBALANCE EXISTNG VAV BOX, FP-SE-1-4 TO 850 CFM.
7. PROVIDE NEW 16/12 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
8. PROVIDE LOCKING METAL COVER OVER THERMOSTAT.
9. EXTEND SUPPLY TAP FROM MAIN OUT A MINIMUM OF TWO DUCT DIAMETERS THEN EXTEND DOWN AND BACK TO CONNECT TO EXISTING VAV BOX. I KNOW THIS IS A BIT RINKY DINK BUT IT WAS THE ONLY WAY TO GET A DECENT TAP?
10. VAV BOX, FP-SE-1-1 TO REMAIN.
11. EXISTING THERMOSTAT TO REMAIN.
12. PROVIDE NEW 14/12 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
13. EXISTING VAV-SE-1-13 TO REMAIN AND BE RELABELED AS VAV-SE-1-3.
14. EXISTING VAV-SE-1-14 TO REMAIN AND BE RELABELED AS VAV-SE-1-4.
15. EXISTING VAV-SE-1-11 TO REMAIN AND BE RELABELED AS VAV-SE-1-6.
16. EXISTING VAV-SE-1-12 TO REMAIN AND BE RELABELED AS VAV-SE-1-7.
17. PROVIDE NEW 12/12 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.

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5600.6.4.2009.8017

PROJECT TITLE
COLLIN COUNTY
COURTHOUSE
ADDITION

PROJECT NUMBER
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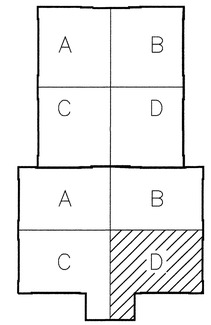

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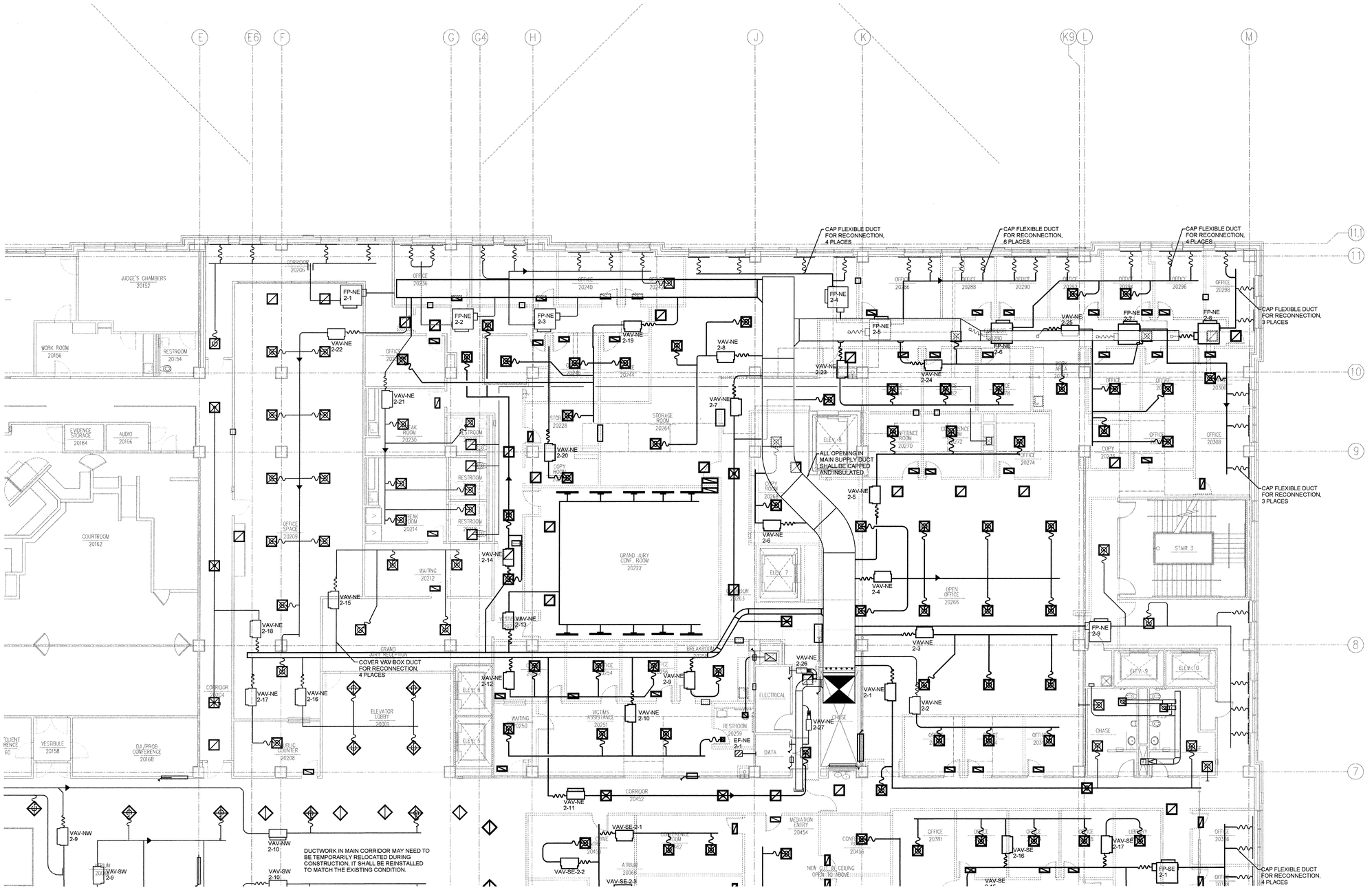
MECHANICAL RENOVATION PLAN

LEVEL ONE SECTION D

SCALE: 1/8"=1'-0" (01)

SHEET TITLE
MECHANICAL RENOVATION
PLAN - LEVEL ONE
SECTION D

SHEET NUMBER
M2.18



GENRAL NOTES

1. ALL FAN POWERED VAV BOXES AND VALVE ONLY VAV BOXES THAT ARE NOT INDICATED TO BE REUSED SHALL BE CAREFULLY TAKEN DOWN. EACH BOX SHALL BE CLEANED AND THE OPENINGS COVERED WITH HEAVY GAGE PLASTIC. THE BOXES SHALL BE DELIVERED TO THE OWNER'S STORAGE FACILITY (CONTACT COLLIN COUNTY PERSONNEL FOR STORAGE FACILITY LOCATION).
2. ALL SUPPLY AND RETURN AIR DEVICES SHALL BE REMOVED FROM THE CEILING, CLEANED AND SET ASIDE FOR REUSE. IT IS ACCEPTABLE TO REUSE THE EXISTING AIR DEVICES FOR THE NEW BUILDING OR IN THE RENOVATED PORTIONS OF THE EXISTING BUILDING AS LONG AS THEY MATCH THE MODEL NUMBERS INDICATED ON THE AIR DEVICE SCHEDULE. AIR DEVICES NOT USED SHALL BE RETURNED TO THE OWNER.

DUCTWORK IN MAIN CORRIDOR MAY NEED TO BE TEMPORARILY RELOCATED DURING CONSTRUCTION, IT SHALL BE REINSTALLED TO MATCH THE EXISTING CONDITION.

MECHANICAL DEMOLITION PLAN

LEVEL TWO SECTION B

SCALE:1/8"=1'-0" (01)

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COLLIN COUNTY

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5600.6.4.2009.8017

PROJECT TITLE
COLLIN COUNTY
COURTHOUSE
ADDITION

PROJECT NUMBER
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McKINNEY, TX 75071

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REVISIONS

REGISTRATION

SHEET TITLE
MECHANICAL DEMOLITION
PLAN - LEVEL TWO
SECTION B

SHEET NUMBER
M2.21

GENRAL NOTES

1. ALL FAN POWERED VAV BOXES AND VALVE ONLY VAV BOXES THAT ARE NOT INDICATED TO BE REUSED SHALL BE CAREFULLY TAKEN DOWN. EACH BOX SHALL BE CLEANED AND THE OPENINGS COVERED WITH HEAVY GAGE PLASTIC. THE BOXES SHALL BE DELIVERED TO THE OWNER'S STORAGE FACILITY (CONTACT COLLIN COUNTY PERSONNEL FOR STORAGE FACILITY LOCATION).
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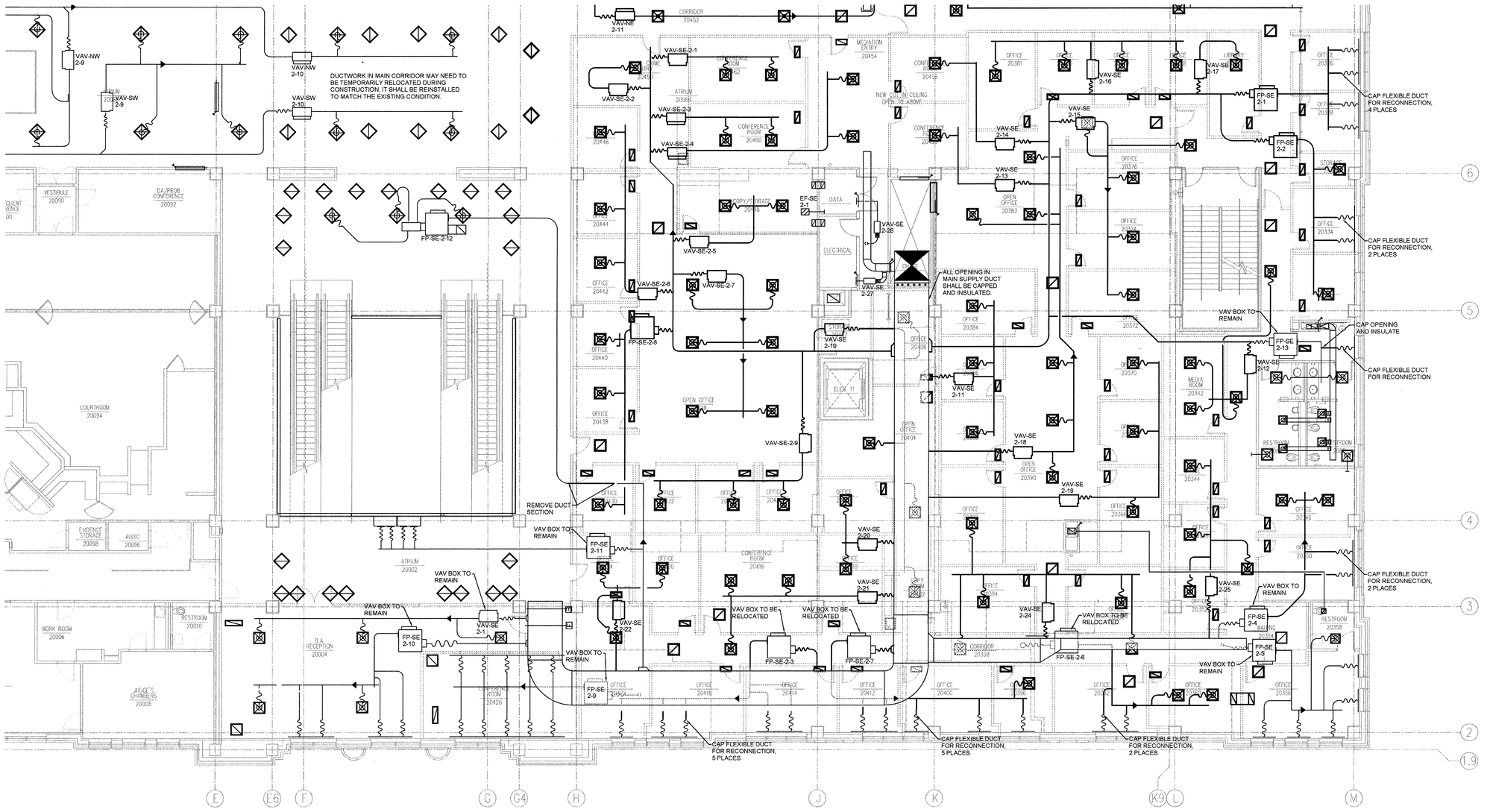

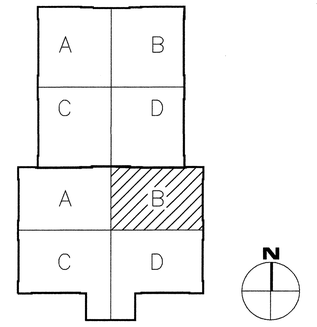

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MECHANICAL DEMOLITION PLAN

LEVEL TWO SECTION D

SCALE: 1/8"=1'-0" (01)

COLLIN COUNTY

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CONSULTANT
STATE OF TEXAS
DATE: 5/4/2009
GARRETT S. BROWN
90873
LICENSED
PROFESSIONAL ENGINEER
5600.6.4.2009.8017

PROJECT TITLE
COLLIN COUNTY
COURTHOUSE
ADDITION

PROJECT NUMBER
590.0800.00

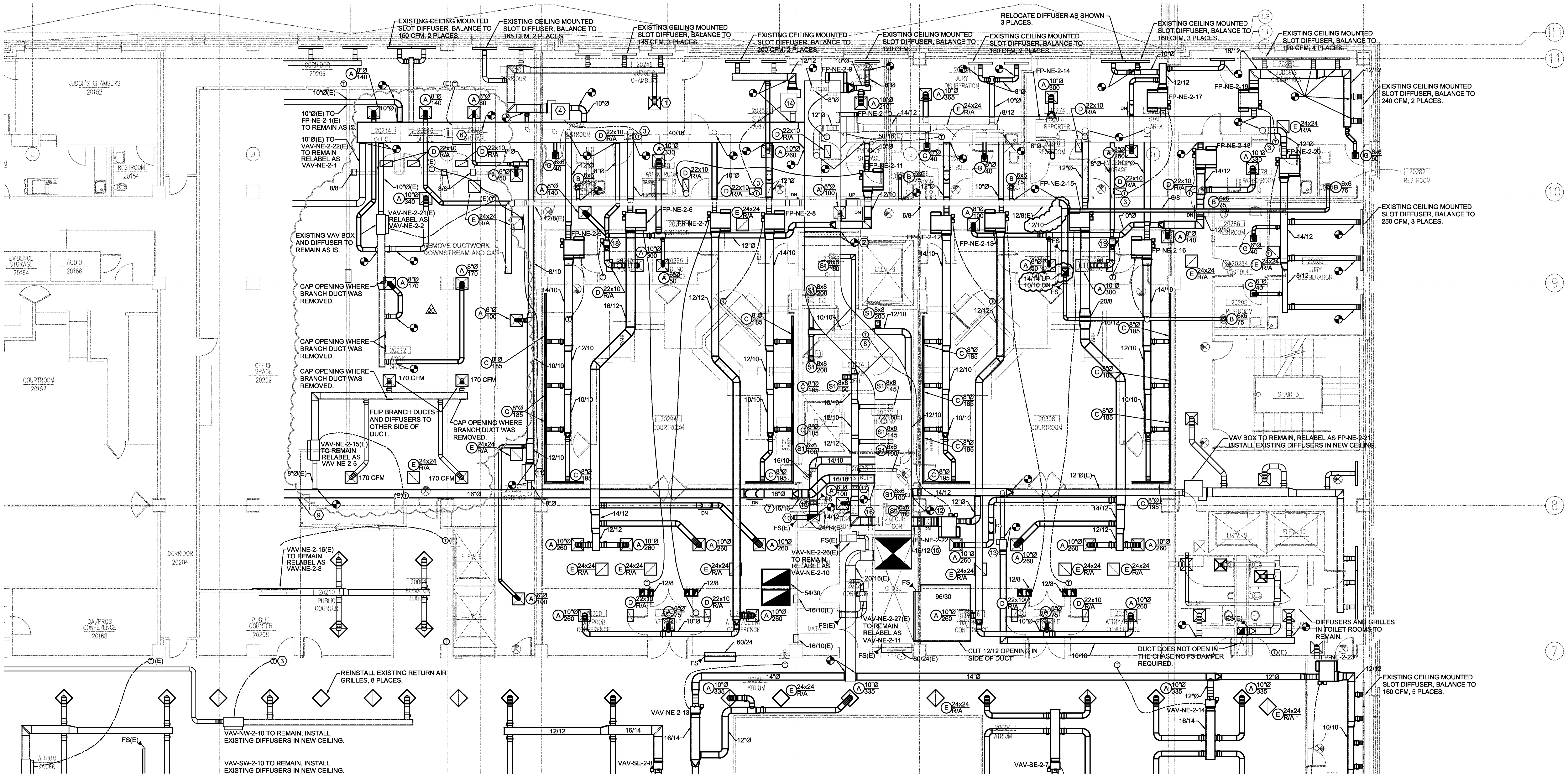
PROJECT LOCATION
2100 BLOOMDALE ROAD
McKINNEY, TX 75071

DATE OF ISSUE
JUNE 4, 2009
CONSTRUCTION DOCUMENTS
REVISIONS

REGISTRATION

SHEET TITLE
MECHANICAL DEMOLITION
PLAN - LEVEL TWO
SECTION D

SHEET NUMBER
M2.22

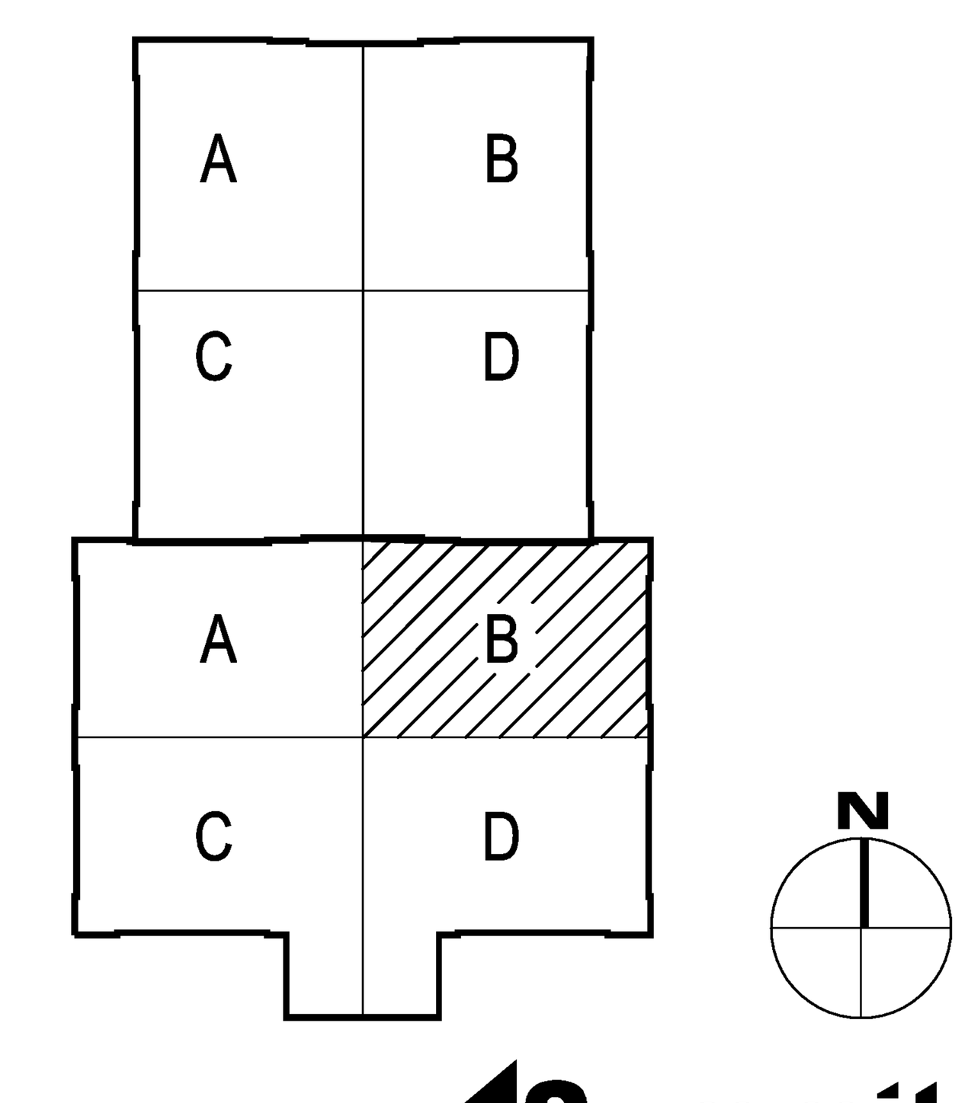


GENRAL NOTES

1. THE FLOOR TO FLOOR HEIGHT OF THE EXISTING STRUCTURE IN AREA "D" IS 16'-0". THE STRUCTURAL DEPTH, WORST CASE, IS 2'-1"; WHICH LEAVES 13'-11" CLEAR BELOW THE STRUCTURE. THE HIGH GYPBOARD CEILING IN THE COURTROOM IS 11'-4", THIS DOES NOT INCLUDE THE DOME IN THE CENTER (DON'T RUN DUCTS OVER THE DOME, IF YOU DO THEN SOMETHING ELSE WON'T FIT THEN I WILL GET AND RFI AND THE WHOLE PROCESS SLOWS DOWN; EASIER IF YOU AVOID THE DOME). IF 1'-0" IS ALLOWED FOR RECESSED LIGHTING THEN THE CLEAR SPACE BETWEEN THE TOP OF THE LIGHTS AND THE BOTTOM OF THE STRUCTURE IS 13'-11" - 12'-4" = 1'-7". THE WORST CASE DUCT CROSSING OVER THIS AREA ARE TWO DUCTS, ONE 8" AND ONE 6", THAT REQUIRE A TOTAL OF 1'-5" TO INSTALL. PLANNING AHEAD AND COORDINATING WITH OTHER TRADES IS REQUIRED, DUCTS HAVE BEEN SIZED TO FIT THE ALOTTED SPACE.

NOTES BY SYMBOL "#"

1. RELOCATE EXISTING CEILING DIFFUSER TO LOCATION SHOWN.
2. PROVIDE NEW 72/18 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
3. RELOCATE EXISTING THERMOSTAT TO LOCATION INDICATED.
4. REBALANCE EXISTNG VAV BOX, FP-NE-2-4 TO 910 CFM AND RELOCATE AS INDICATED.
5. REBALANCE EXHAUST GRILLE TO 75 CFM.
6. REBALANCE EXISTNG VAV BOX, FP-NE-2-2 TO 300 CFM. RELOCATE VAV BOX TO BELOW NEW 40/16 MEDIUM PRESSURE SUPPLY MAIN IF REQUIRED.
7. PROVIDE NEW 16/16 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
8. PROVIDE LOCKING METAL COVER OVER THERMOSTAT.
9. EXTEND 16"Ø DUCT ACROSS ROOM TO ALLOW RECONNECTION OF EXISTING VAV-NE-2-16 (RELABEL AS VAV-NE-2-8), VAV-NE-2-17 (RELABEL AS VAV-NE-2-7) AND VAV-NE-2-18 (RELABEL AS VAV-NE-2-6). THE THREE EXISTING VAV BOXES AND ASSOICATED DUCTWORK AND DIFFUSERS SHALL REMAIN AS IS.
10. CAP EXISTING 8/8 EXHAUST DUCT AND SEAL AIR TIGHT.
11. RELOCATE EXISTING VAV-NE-2-19 TO THE LOCATION SHOWN AND BALANCE TO 470 CFM. RELABEL AS VAV-NE-2-9.
12. PROVIDE NEW 14/12 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
13. RELOCATE EXISTING VAV-NE-2-2 TO LOCATION SHOWN AND RELABEL AS VAV-NE-2-12. BALANCE BOX TO 500 CFM AND BALANCE EACH TOILET DIFFUSER TO 250 CFM. CONNECT VAV BOX TO EXISTING THERMOSTAT IN WOMEN'S ROOM.
14. REBALANCE EXISTNG VAV BOX, FP-NE-2-3 TO 660 CFM. RELOCATE VAV BOX TO LOCATION SHOWN.
15. PROVIDE NEW 16/12 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
16. PROVIDE NEW 14/12 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
17. PROVIDE NEW 12/12 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
18. VAV BOX VAV-NE-2-3.
19. VAV BOX VAV-NE-2-4.



MECHANICAL RENOVATION PLAN

LEVEL TWO SECTION B

SCALE: 1/8"=1'-0" (01)

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CONSULTANT
STATE OF TEXAS — BRIAN D. RICHARDS — 74703 — LICENSED PROFESSIONAL ENGINEER — 7/22/2011
374.7.22.2011.8017

PROJECT TITLE
COLLIN COUNTY COURTHOUSE ADDITION

PROJECT NUMBER
590.0800.00

PROJECT LOCATION
2100 BLOOMDALE ROAD
McKINNEY, TX 75071

DATE OF ISSUE
DECEMBER 14 2009
CONSTRUCTION DOCUMENTS

REVISIONS

No.	Revision	Date
1	ADDENDUM #1	07/27/2009
2	ADDENDUM #2	08/07/2009
3	ADDENDUM #3	09/12/2009
4	ADDENDUM #6	12/14/2009
5	PR#2	08/03/2010
6	RFI 28	08/25/2010
7	PR#4	09/14/2010
8	RFI 53R	09/21/2010
9	RFI 67	11/24/2010
10	REVISED PENTHOUSE LTG	11/24/2010
11	PR #5	11/24/2010
12	RFI 92	12/02/2010
13	RFI 93	12/02/2010
14	RFI 95	12/02/2010
15	RFI 101,102	12/07/2010
16	RFI 115	12/15/2010
17	RFI 118	12/31/2010
18	RFI 166	02/08/2011
19	PR#13	04/29/2011
20	PFI 339	07/22/2011

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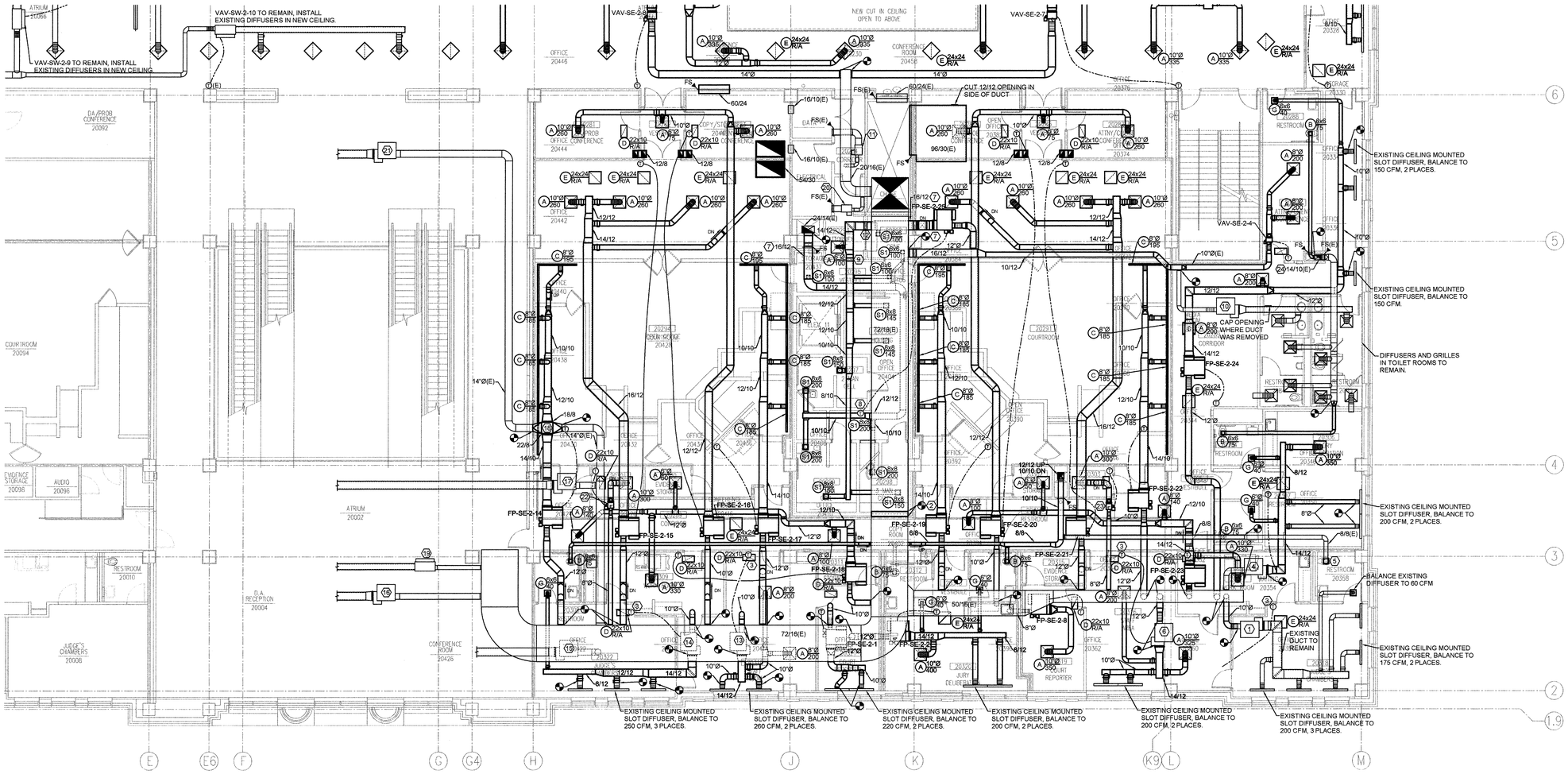
REGISTRATION

SHEET TITLE
MECHANICAL RENOVATION PLAN - LEVEL TWO SECTION B

SHEET NUMBER
M2.23

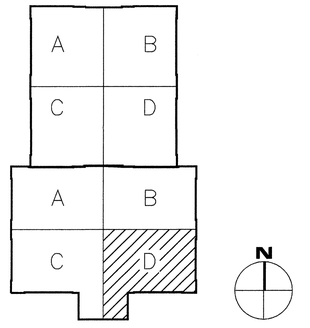


GENRAL NOTES

1. THE FLOOR TO FLOOR HEIGHT OF THE EXISTING STRUCTURE IN AREA "D" IS 16'-0". THE STRUCTURAL DEPTH, WORST CASE, IS 2'-1", WHICH LEAVES 13'-11" CLEAR BELOW THE STRUCTURE. THE HIGH GYPBOARD CEILING IN THE COURTROOM IS 11'-4", THIS DOES NOT INCLUDE THE DOME IN THE CENTER (DON'T RUN DUCTS OVER THE DOME, IF YOU DO THEN SOMETHING ELSE WON'T FIT THEN I WILL GET AND RFI AND THE WHOLE PROCESS SLOWS DOWN; EASIER IF YOU AVOID THE DOME). IF 1'-0" IS ALLOWED FOR RECESSED LIGHTING THEN THE CLEAR SPACE BETWEEN THE TOP OF THE LIGHTS AND THE BOTTOM OF THE STRUCTURE IS 13'-11" - 12'-4" = 1'-7". THE WORST CASE DUCT CROSSING OVER THIS AREA ARE TWO 8" DEEP DUCTS THAT REQUIRE A TOTAL OF 1'-7" TO INSTALL. PLANNING AHEAD AND COORDINATING WITH OTHER TRADES IS REQUIRED, DUCTS HAVE BEEN SIZED TO FIT THE ALOTTED SPACE.

NOTES BY SYMBOL "⊛"

1. REBALANCE EXISTNG VAV BOX, FP-SE-2-5 TO 1010 CFM AND RELOCATE TO LOCATION SHOWN.
2. PROVIDE NEW 72/18 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
3. RELOCATE EXISTING THERMOSTAT TO LOCATION INDICATED.
4. REBALANCE EXISTNG VAV BOX, FP-SE-2-4 TO 830 CFM.
5. REBALANCE EXHAUST GRILLE TO 75 CFM.
6. REBALANCE EXISTNG VAV BOX, FP-SE-2-6 TO 925 CFM AND RELOCATE TO LOCATION SHOWN.
7. PROVIDE NEW 16/12 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
8. PROVIDE LOCKING METAL COVER OVER THERMOSTAT.
9. PROVIDE NEW 12/12 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
10. REBALANCE EXISTING VAV BOX, FP-SE-2-13 TO 500 CFM.
11. EXISTING VAV BOX TO REMAIN, RELABEL AS VAV-SE-2-6.
12. PROVIDE NEW 14/12 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
13. REBALANCE EXISTNG VAV BOX, FP-SE-2-7 TO 920 CFM AND RELOCATE TO LOCATION SHOWN.
14. REBALANCE EXISTNG VAV BOX, FP-SE-2-3 TO 790 CFM AND RELOCATE TO LOCATION SHOWN.
15. EXISTING VAV BOX FP-SE-2-9 TO REMAIN.
16. EXISTING VAV BOX FP-SE-2-10 TO REMAIN.
17. EXISTING VAV BOX FP-SE-2-11 TO REMAIN.
18. THIS AREA WILL REQUIRE CAREFUL COORDINATION AS THERE IS NOT ENOUGH SPACE FOR THE DUCTS TO CROSS WITH THE EXISITNG 14"Ø DUCT; SO THE DUCTS NEED TO BE MODIFIED AS SHOWN. BE SURE THAT YOU DON'T PUT THE TRANSITIONS IN A LOCATION WHERE THERE IS A CAN LIGHT OR YOU WILL HAVE TO TAKE IT DOWN AND DO IT AGAIN. I FIND THESE SITUATIONS PARTICULARLY IRRITATING, BUT WITH SOME FORE-THOUGHT AND COORDINATION IT WILL WORKOUT.
19. EXISTING VAV BOX TO REMAIN, RELABEL AS VAV-SE-2-1.
20. EXISTING VAV BOX TO REMAIN, RELABEL AS VAV-SE-2-5.
21. EXISTING VAV BOX FP-SE-2-12 TO REMAIN.
22. VAV BOX VAV-SE-2-2.
23. VAV BOX VAV-SE-2-3.
24. THE ORIGINAL CONSTRUCTION DRAWINGS SHOW THAT THE EXHAUST RISER ON LEVEL 2, EXTENDING TO LEVEL 3 IS A 14/10, WHICH IS WHAT IS SHOWN HERE. THE DUCT IS TO SMALL FOR THE AIR VOLUME (1,425 CFM) THAT IS MOVING FROM LEVEL 2 TO LEVEL 3. IF THE DUCT IS A 14/10 IT SHALL BE REMOVED AND A 24/10 DUCT INSTALLED AND CONNECTED AT EITHER END TO THE EXISTING DUCTS.



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MECHANICAL RENOVATION PLAN

LEVEL TWO SECTION D

SCALE: 1/8"=1'-0" 01

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STATE OF TEXAS — 8/4/2009 — GARRETT S. BROWN — 90873 — LICENSED PROFESSIONAL ENGINEER

5600.6.4.2009.8017

PROJECT TITLE
COLLIN COUNTY COURTHOUSE ADDITION

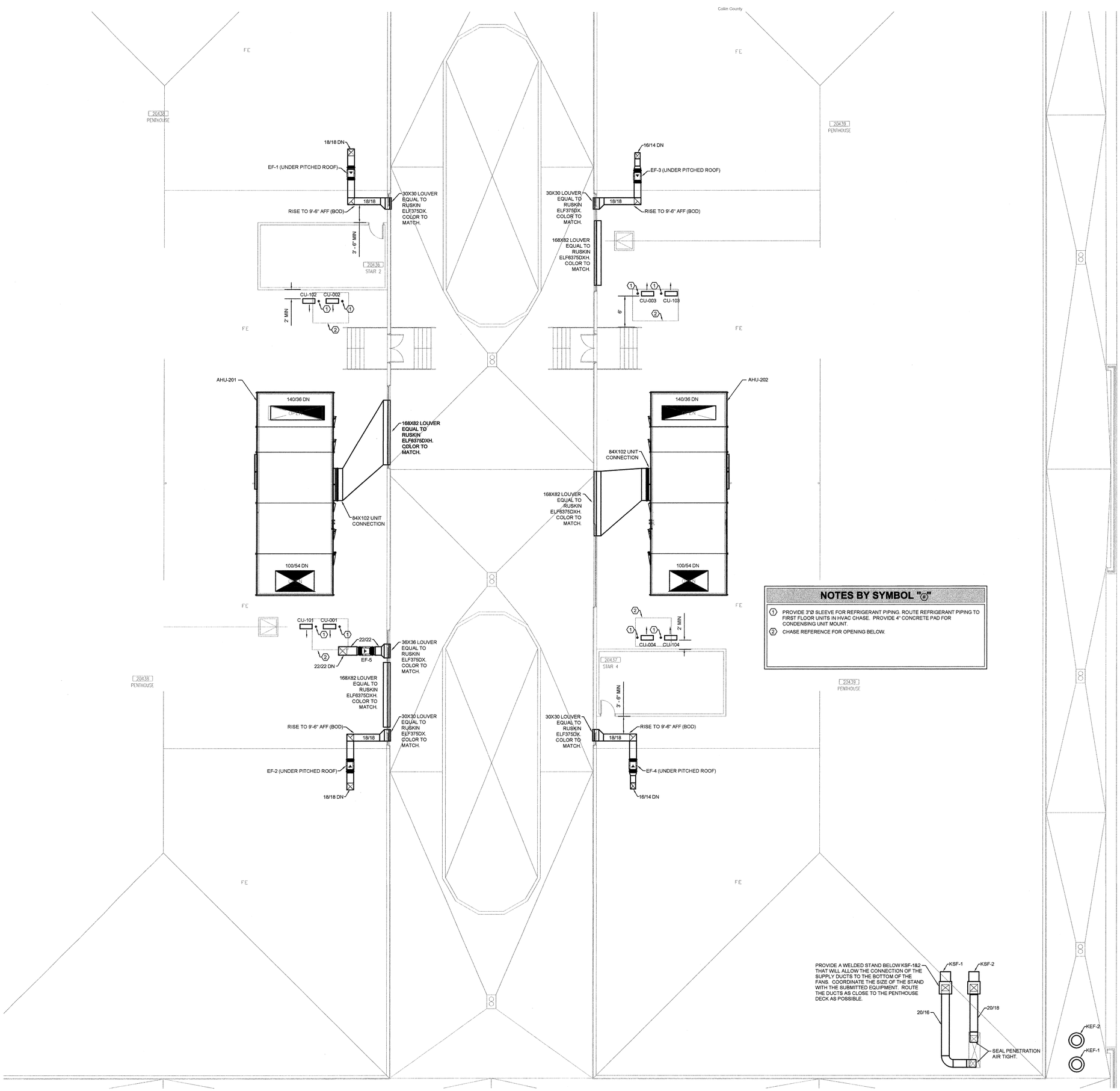
PROJECT NUMBER
590.0800.00

PROJECT LOCATION
2100 BLOOMDALE ROAD
McKINNEY, TX 75071

DATE OF ISSUE
JUNE 4, 2009
CONSTRUCTION DOCUMENTS
REVISIONS

SHEET TITLE
MECHANICAL RENOVATION PLAN - LEVEL TWO SECTION D

SHEET NUMBER
M2.24



NOTES BY SYMBOL "②"

1. PROVIDE 3"Ø SLEEVE FOR REFRIGERANT PIPING. ROUTE REFRIGERANT PIPING TO FIRST FLOOR UNITS IN HVAC CHASE. PROVIDE 4" CONCRETE PAD FOR CONDENSING UNIT MOUNT.
2. CHASE REFERENCE FOR OPENING BELOW.

MECHANICAL – ROOF PLAN

SCALE: 1/16"=1'-0" (01)

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6/4/2009
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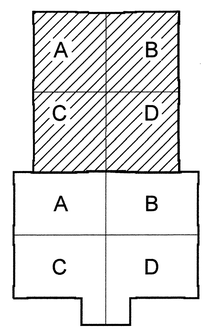
PROJECT TITLE
COLLIN COUNTY COURTHOUSE ADDITION

PROJECT NUMBER
590.0800.00

PROJECT LOCATION
2100 BLOOMDALE ROAD
McKINNEY, TX 75071

DATE OF ISSUE
JUNE 4, 2009
CONSTRUCTION DOCUMENTS
REVISIONS

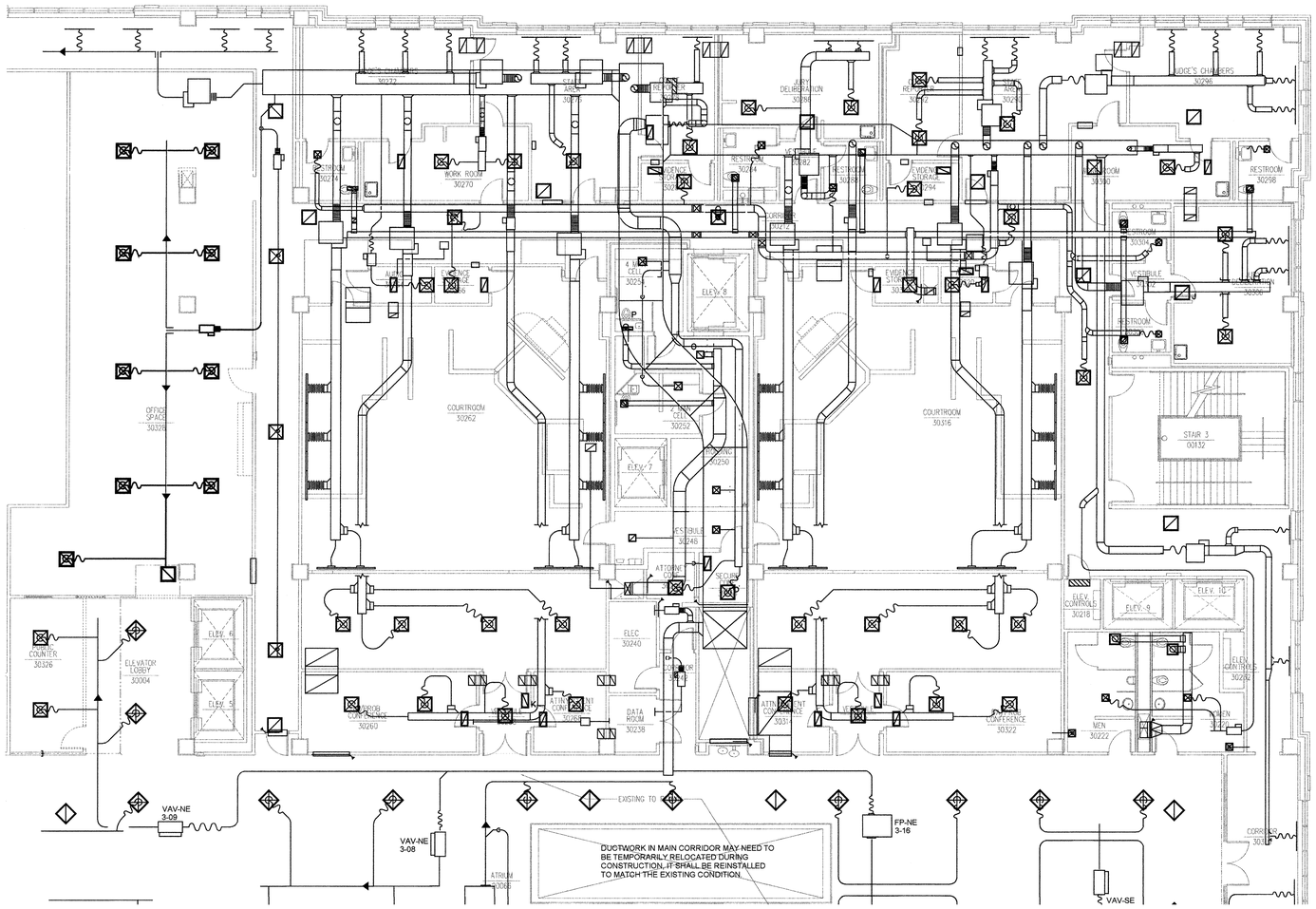


SHEET TITLE
MECHANICAL PLAN - LEVEL TWO ROOF PLAN

SHEET NUMBER
M2.30

GENRAL NOTES

1. ALL FAN POWERED VAV BOXES AND VALVE ONLY VAV BOXES THAT ARE NOT INDICATED TO BE REUSED SHALL BE CAREFULLY TAKEN DOWN. EACH BOX SHALL BE CLEANED AND THE OPENINGS COVERED WITH HEAVY GAGE PLASTIC. THE BOXES SHALL BE DELIVERED TO THE OWNER'S STORAGE FACILITY (CONTACT COLLIN COUNTY PERSONNEL FOR STORAGE FACILITY LOCATION).
2. ALL SUPPLY AND RETURN AIR DEVICES SHALL BE REMOVED FROM THE CEILING, CLEANED AND SET ASIDE FOR REUSE. IT IS ACCEPTABLE TO REUSE THE EXISTING AIR DEVICES FOR THE NEW BUILDING OR IN THE RENOVATED PORTIONS OF THE EXISTING BUILDING AS LONG AS THEY MATCH THE MODEL NUMBERS INDICATED ON THE AIR DEVICE SCHEDULE. AIR DEVICES NOT USED SHALL BE RETURNED TO THE OWNER.



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CONSULTANT
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3/14/2009
GARRETT S. BROWN
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5600.6.4.2009.8017

PROJECT TITLE
COLLIN COUNTY
COURTHOUSE
ADDITION

PROJECT NUMBER
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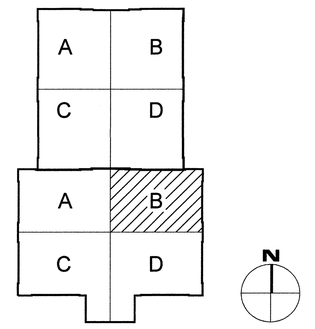

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MECHANICAL DEMOLITION PLAN

LEVEL THREE SECTION B

SCALE: 1/8"=1'-0" (01)

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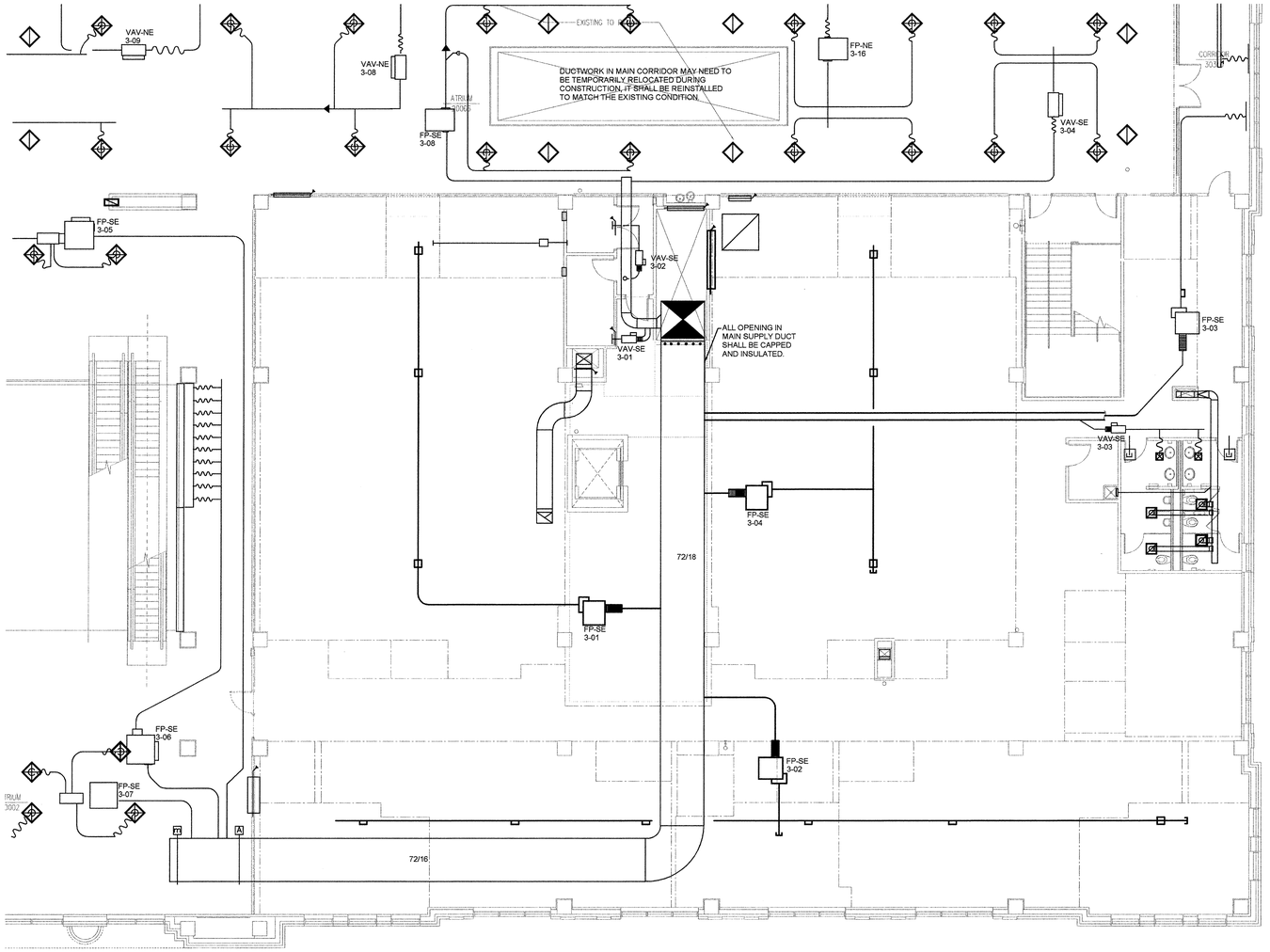
SHEET TITLE
MECHANICAL DEMOLITION PLAN - LEVEL THREE SECTION B

SHEET NUMBER
M2.31

GENRAL NOTES

1. ALL FAN POWERED VAV BOXES AND VALVE ONLY VAV BOXES THAT ARE NOT INDICATED TO BE REUSED SHALL BE CAREFULLY TAKEN DOWN. EACH BOX SHALL BE CLEANED AND THE OPENINGS COVERED WITH HEAVY GAGE PLASTIC. THE BOXES SHALL BE DELIVERED TO THE OWNER'S STORAGE FACILITY (CONTACT COLLIN COUNTY PERSONNEL FOR STORAGE FACILITY LOCATION).
2. ALL SUPPLY AND RETURN AIR DEVICES SHALL BE REMOVED FROM THE CEILING, CLEANED AND SET ASIDE FOR REUSE. IT IS ACCEPTABLE TO REUSE THE EXISTING AIR DEVICES FOR THE NEW BUILDING OR IN THE RENOVATED PORTIONS OF THE EXISTING BUILDING AS LONG AS THEY MATCH THE MODEL NUMBERS INDICATED ON THE AIR DEVICE SCHEDULE. AIR DEVICES NOT USED SHALL BE RETURNED TO THE OWNER.



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STATE OF TEXAS
6/4/2009
GARRETT S. BROWN
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5600.6.4.2009.8017

PROJECT TITLE
COLLIN COUNTY
COURTHOUSE
ADDITION

PROJECT NUMBER
590.0800.00

PROJECT LOCATION
2100 BLOOMDALE ROAD
McKINNEY, TX 75071

DATE OF ISSUE
JUNE 4, 2009
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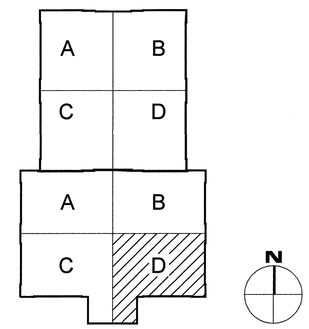

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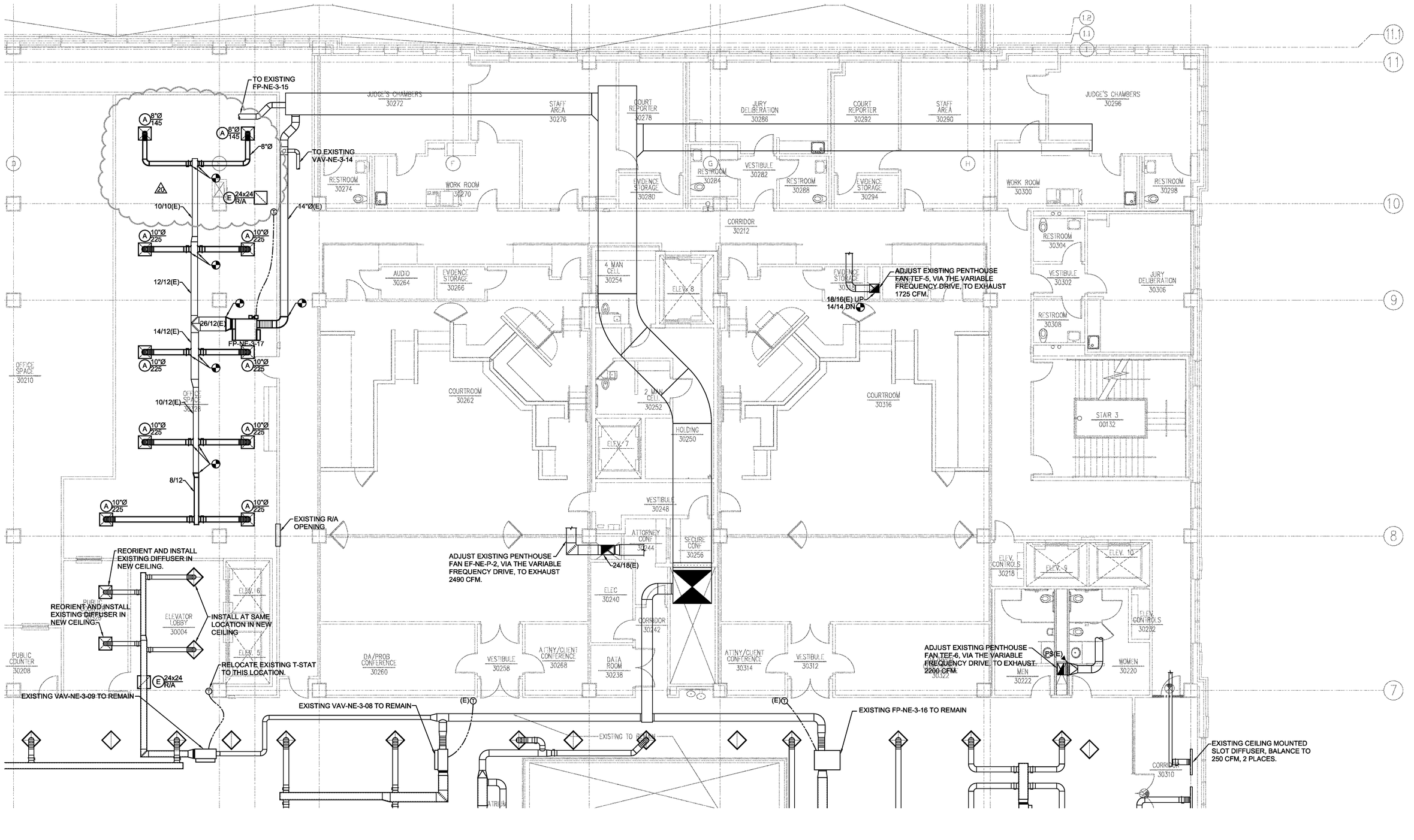
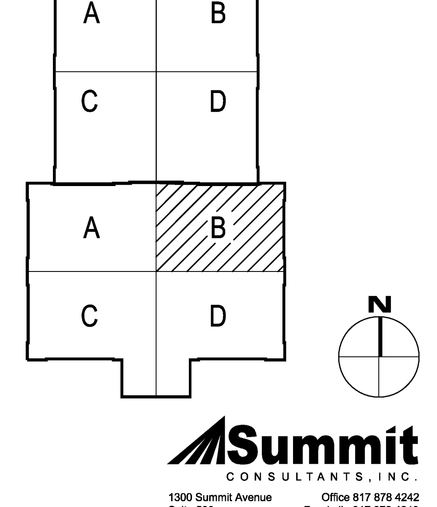
REGISTRATION

SHEET TITLE
MECHANICAL DEMOLITION
PLAN - LEVEL THREE
SECTION D

SHEET NUMBER
M2.32

MECHANICAL DEMOLITION PLAN
LEVEL THREE SECTION D
SCALE 1/8"=1'-0" (01)





MECHANICAL RENOVATION PLAN

LEVEL THREE SECTION B

SCALE: 1/8"=1'-0" (01)

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COLLIN COUNTY

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374.7.22.2011.8017

PROJECT TITLE
COLLIN COUNTY
COURTHOUSE
ADDITION

PROJECT NUMBER
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PROJECT LOCATION
2100 BLOOMDALE ROAD
McKINNEY, TX 75071

DATE OF ISSUE
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1	ADDENDUM #1 07/27/2009
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3	ADDENDUM #3 09/12/2009
4	ADDENDUM #6 12/14/2009
5	PR#2 08/03/2010
6	RFI 28 08/25/2010
7	PR#4 09/14/2010
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9	RFI 67 11/24/2010
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16	RFI 115 12/15/2010
17	RFI 118 12/31/2010
18	RFI 166 02/08/2011
19	PR#13 04/29/2011
20	PFI 339 07/22/2011

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REGISTRATION

SHEET TITLE
MECHANICAL RENOVATION PLAN - LEVEL THREE SECTION B

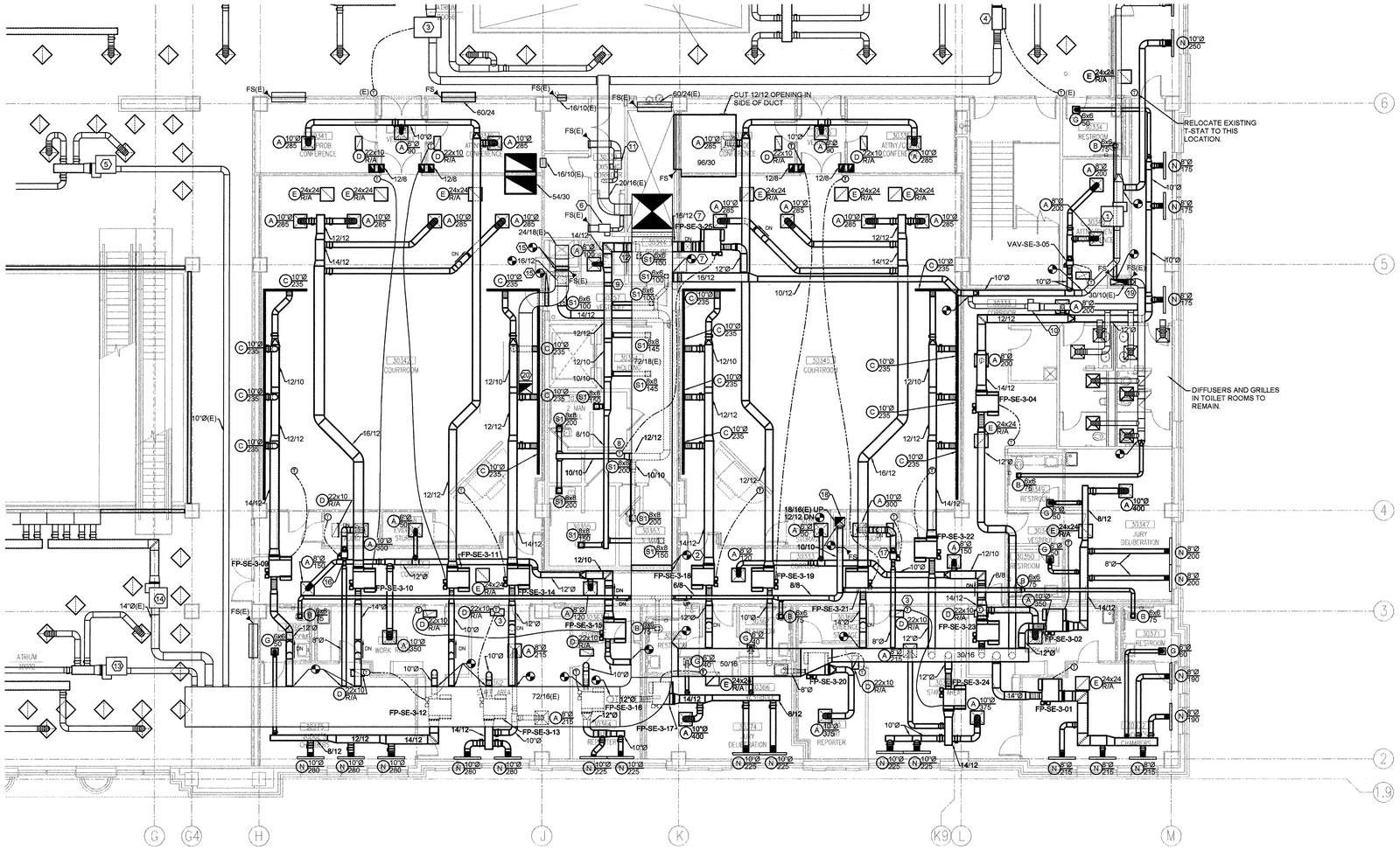
SHEET NUMBER
M2.33

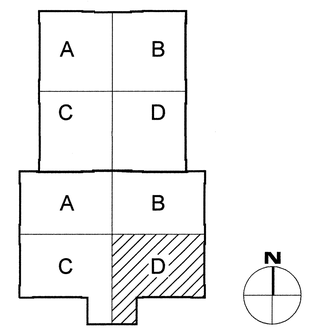
GENRAL NOTES

1. THE FLOOR TO FLOOR HEIGHT OF THE EXISTING STRUCTURE IN AREA "D" IS 16'-0". THE STRUCTURAL DEPTH, WORST CASE, IS 2'-1", WHICH LEAVES 13'-11" CLEAR BELOW THE STRUCTURE. THE HIGH GYPBOARD CEILING IN THE COURTROOM IS 11'-4", THIS DOES NOT INCLUDE THE DOME IN THE CENTER (DON'T RUN DUCTS OVER THE DOME, IF YOU DO THEN SOMETHING ELSE WON'T FIT THEN I WILL GET AND RFI AND THE WHOLE PROCESS SLOWS DOWN, EASIER IF YOU AVOID THE DOME). IF 1'-0" IS ALLOWED FOR RECESSED LIGHTING THEN THE CLEAR SPACE BETWEEN THE TOP OF THE LIGHTS AND THE BOTTOM OF THE STRUCTURE IS 13'-11" - 12'-4" = 1'-7". THE WORST CASE DUCT CROSSING OVER THIS AREA ARE TWO 8" DEEP DUCTS THAT REQUIRE A TOTAL OF 1'-7" TO INSTALL. PLANNING AHEAD AND COORDINATING WITH OTHER TRADES IS REQUIRED, DUCTS HAVE BEEN SIZED TO FIT THE ALOTTED SPACE.

NOTES BY SYMBOL "#"

1. REBALANCE EXISTING VAV BOX, FP-SE-3-03 TO 500 CFM.
2. PROVIDE NEW 72/18 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
3. EXISTING VAV BOX FP-SE-3-08 TO REMAIN.
4. EXISTING VAV BOX VAV-SE-3-04 TO REMAIN.
5. EXISTING VAV BOX FP-SE-3-05 TO REMAIN.
6. EXISTING VAV BOX TO VAV-SE-3-01 TO REMAIN.
7. PROVIDE NEW 16/12 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
8. PROVIDE LOCKING METAL COVER OVER THERMOSTAT.
9. PROVIDE NEW 12/12 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
10. EXISTING VAV BOX VAV-SE-3-03 TO REMAIN.
11. EXISTING VAV BOX VAV-SE-3-02 TO REMAIN.
12. PROVIDE NEW 14/12 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
13. EXISTING VAV BOX FP-SE-3-07 TO REMAIN.
14. EXISTING VAV BOX FP-SE-3-06 TO REMAIN.
15. PROVIDE NEW 24/18 DUCT SECTION WITH PRICE SECURITY BARS, MODEL MSDRBG WELDED INSIDE THE DUCT.
16. VAV-SE-3-06
17. VAV-SE-3-07
18. ADJUST EXISTING PENTHOUSE FAN TEF-7, VIA THE VARIABLE FREQUENCY DRIVE, TO EXHAUST 1150 CFM.
19. ADJUST EXISTING PENTHOUSE FAN TEF-8, VIA THE VARIABLE FREQUENCY DRIVE, TO EXHAUST 2275 CFM.
20. ADJUST EXISTING PENTHOUSE FAN EF-SE-P-4, VIA THE VARIABLE FREQUENCY DRIVE, TO EXHAUST 3000 CFM.





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MECHANICAL RENOVATION PLAN

LEVEL THREE SECTION D

SCALE: 1/8"=1'-0" 01

COLLIN COUNTY

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STATE OF TEXAS
GARRETT S. BROWN
90873
LICENSED PROFESSIONAL ENGINEER
6/4/2009
5600.6.4.2009.8017

PROJECT TITLE
COLLIN COUNTY
COURTHOUSE
ADDITION

PROJECT NUMBER
590.0800.00

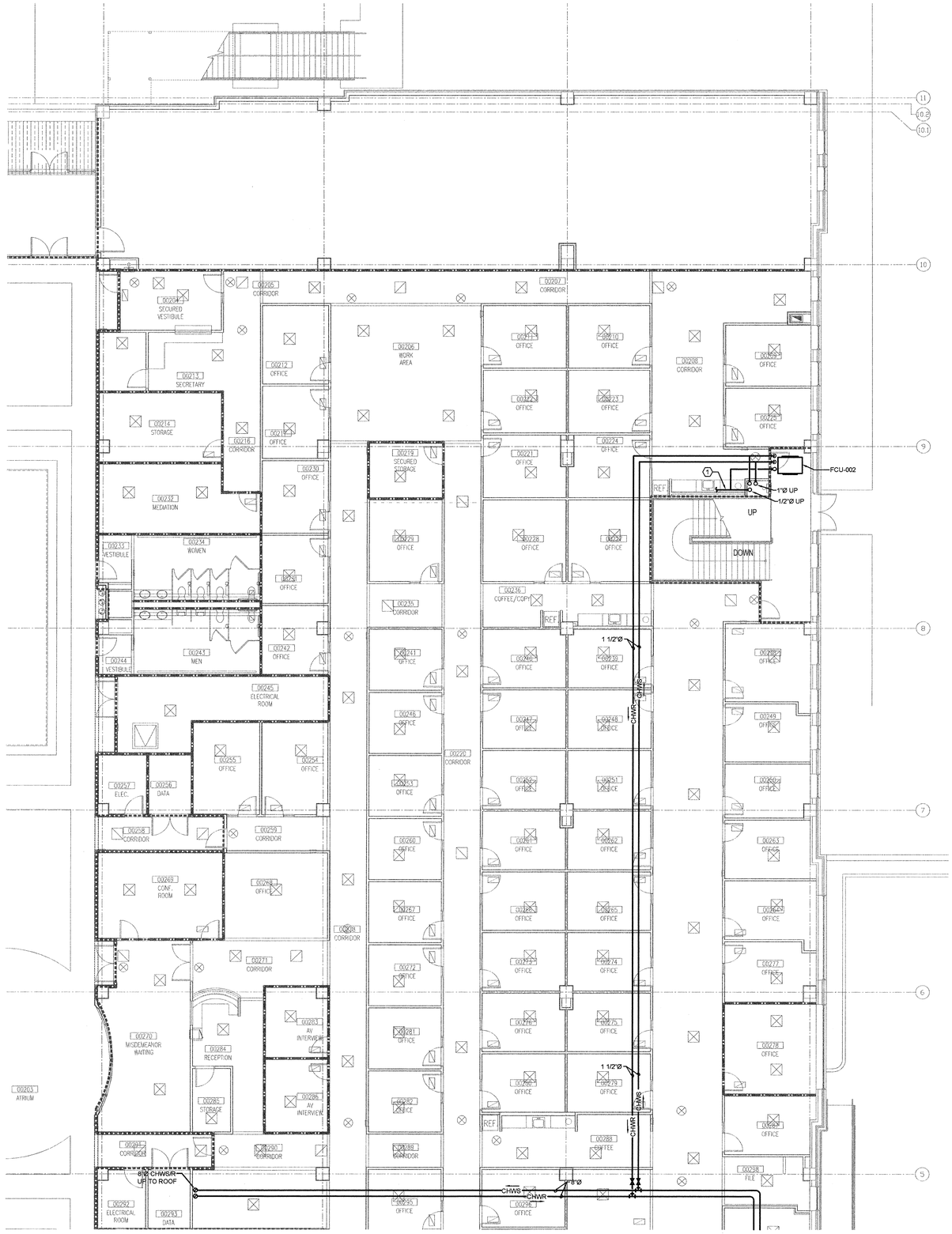
PROJECT LOCATION
2100 BLOOMDALE ROAD
McKINNEY, TX 75071

DATE OF ISSUE
JUNE 4, 2009
CONSTRUCTION DOCUMENTS
REVISIONS

REGISTRATION

SHEET TITLE
MECHANICAL RENOVATION
PLAN - LEVEL THREE
SECTION D

SHEET NUMBER
M2.34



NOTES BY SYMBOL "#"

1. 1/2" CONDENSATE FROM FCU-002 AND FCU-102, COMBINE INTO 3/4" AND CONNECT TO TAIL PIECE AT SINK IN BREAKROOM.

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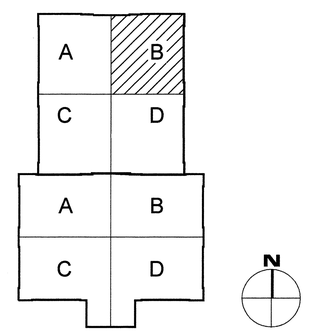

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MECHANICAL PLAN

LOWER LEVEL SECTION B

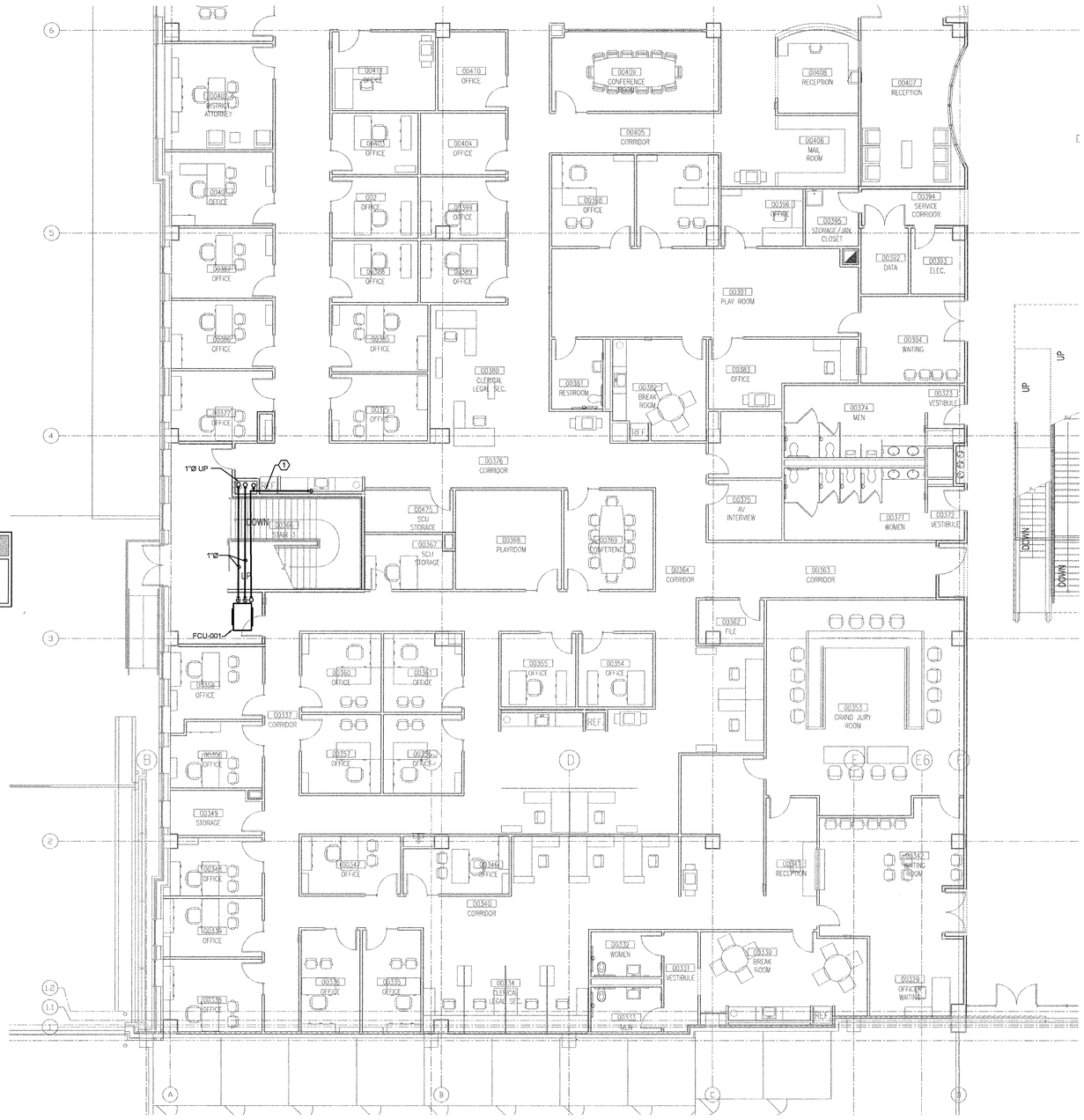
SCALE: 1/8"=1'-0" (01)

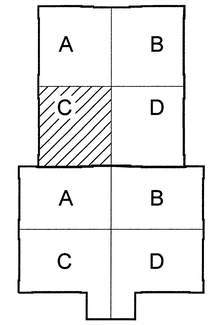
SHEET TITLE
HVAC PIPING PLAN
LOWER LEVEL
SECTION B

SHEET NUMBER
M3.02

NOTES BY SYMBOL "①"

① 1/2" CONDENSATE FROM FCU-001 AND FCU-101, COMBINE INTO 3/4" AND CONNECT TO TAIL PIECE AT SINK IN BREAKROOM.





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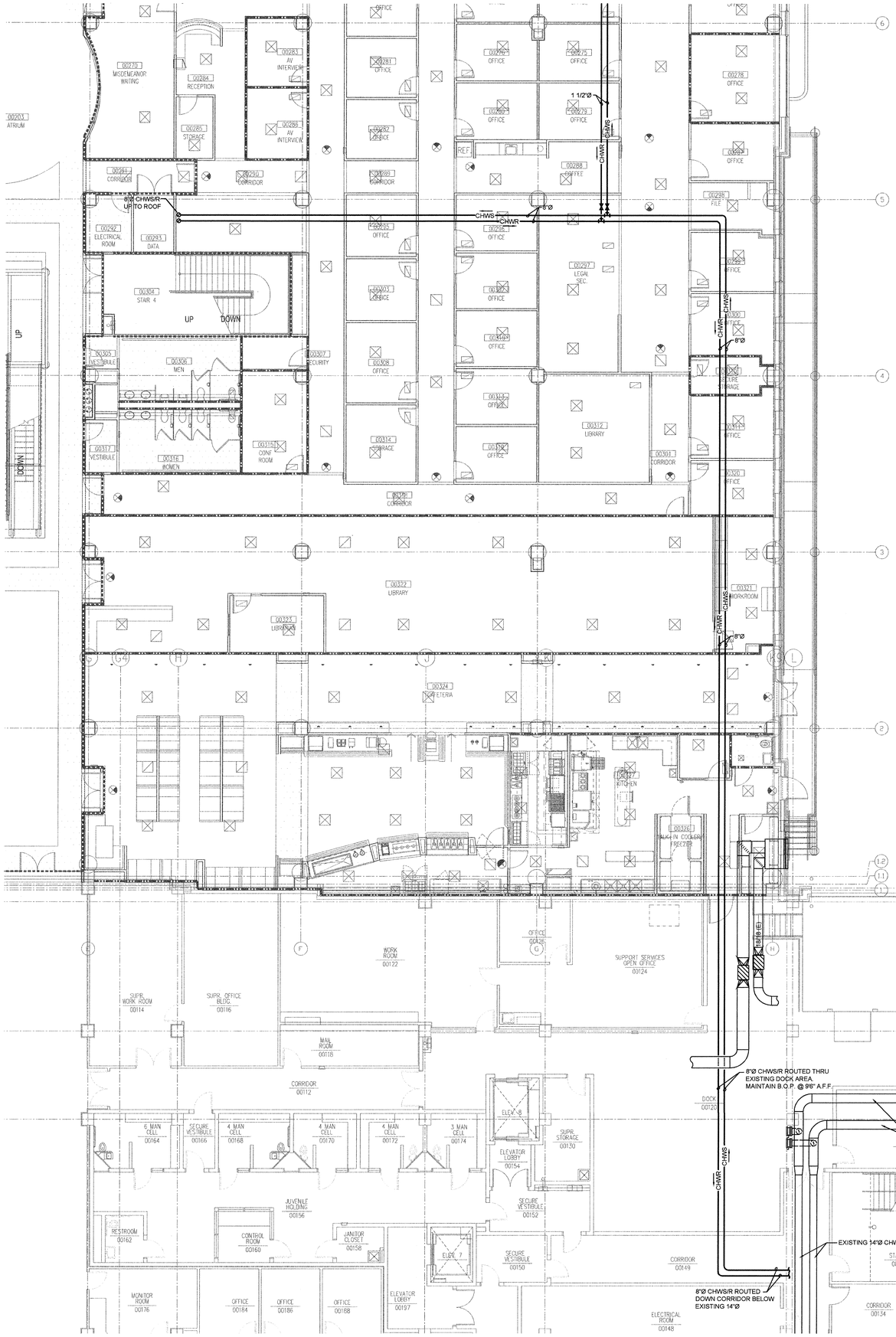
SHEET TITLE
HVAC PIPING PLAN
LOWER LEVEL
SECTION C

SHEET NUMBER
M3.03

MECHANICAL PLAN
LOWER LEVEL SECTION C
SCALE: 1/8"=1'-0" (01)

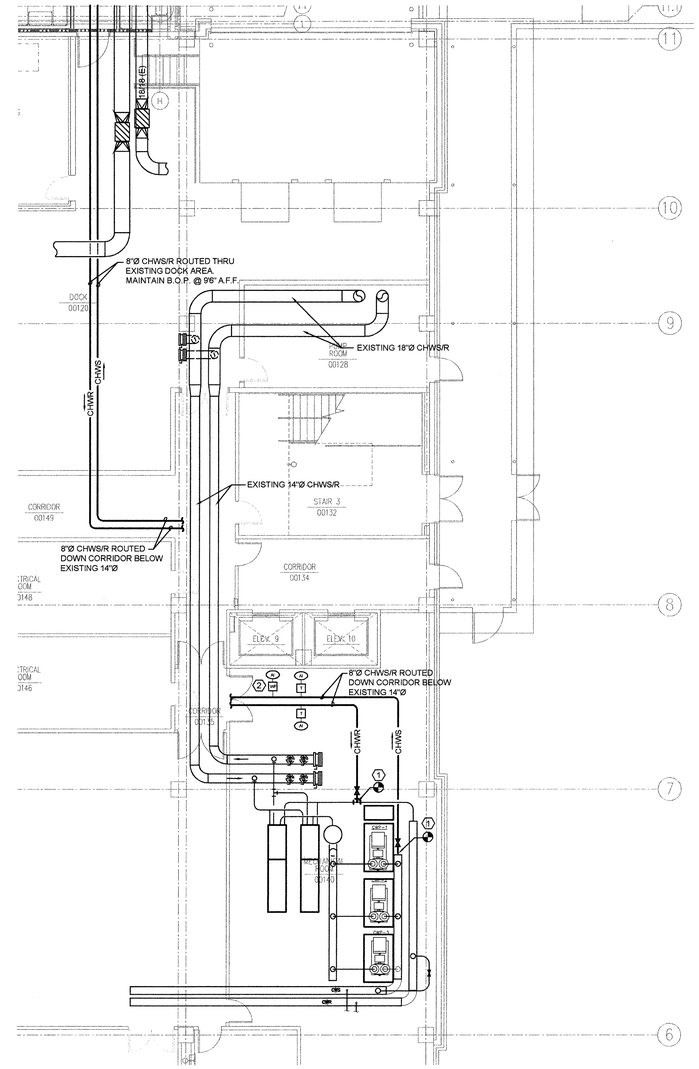
NOTES BY SYMBOL "@"

1. CONNECT TO EXISTING 12"Ø
2. ONICON DUAL PADDLE FLOW METER. REF M5.01



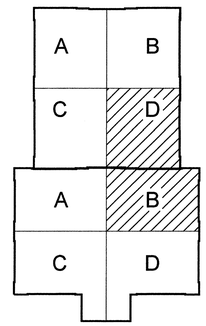
HVAC PIPING PLAN

LOWER LEVEL SECTION D | SCALE:1/8"=1'-0" (01)



HVAC PIPING PLAN

LOWER LEVEL PHASE 1 SECTION B | SCALE:1/8"=1'-0" (02)



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COLLIN COUNTY COURTHOUSE ADDITION

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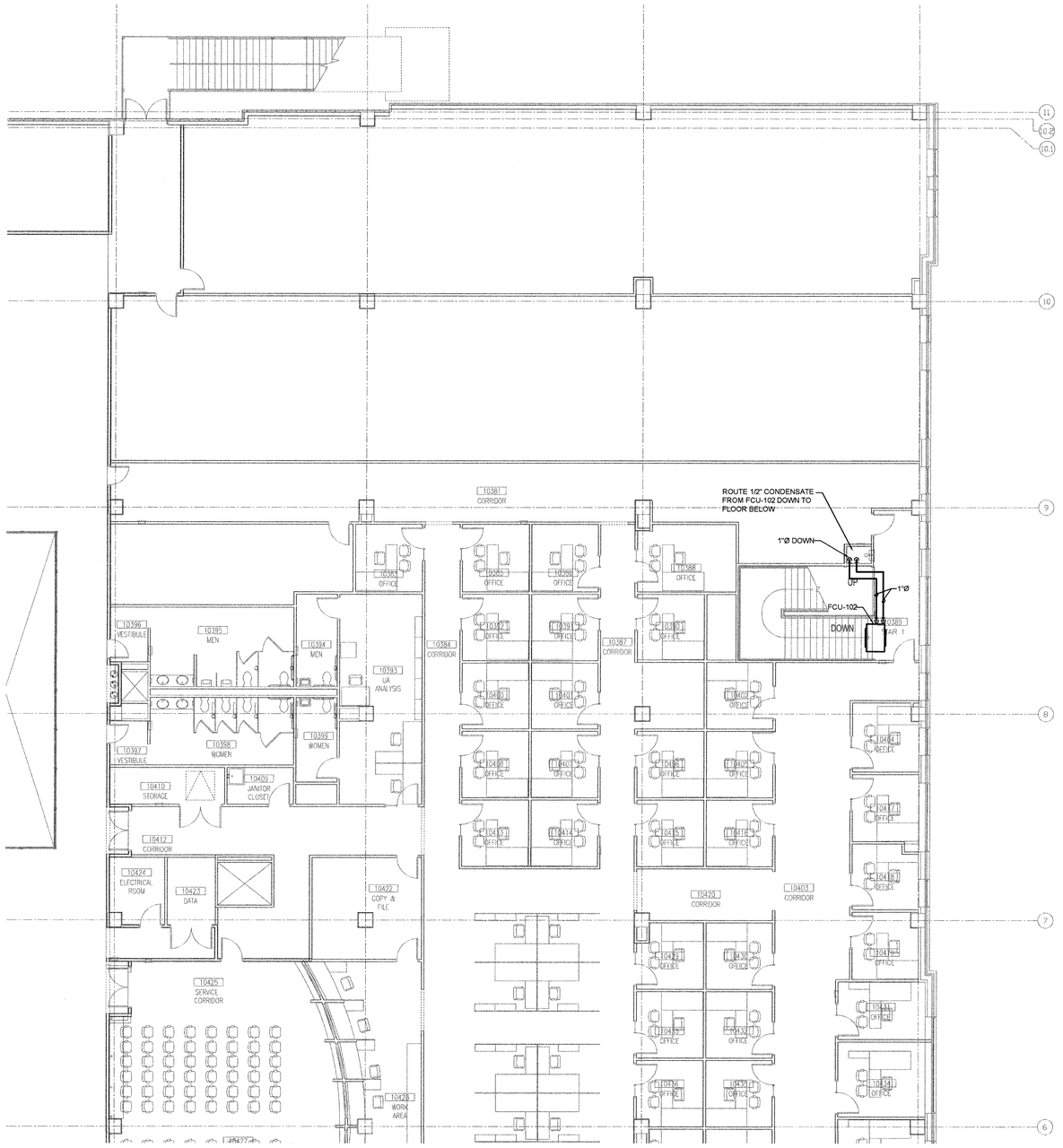
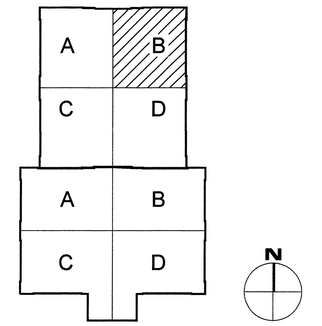
SHEET TITLE
HVAC PIPING PLAN
LOWER LEVEL
SECTION D

SHEET NUMBER
M3.04





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MECHANICAL PLAN

LEVEL ONE SECTION B

SCALE: 1/8"=1'-0" (01)

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PROJECT TITLE
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SHEET TITLE
HVAC PIPING PLAN
LEVEL ONE
SECTION B

SHEET NUMBER
M3.12

Bid 01111-12

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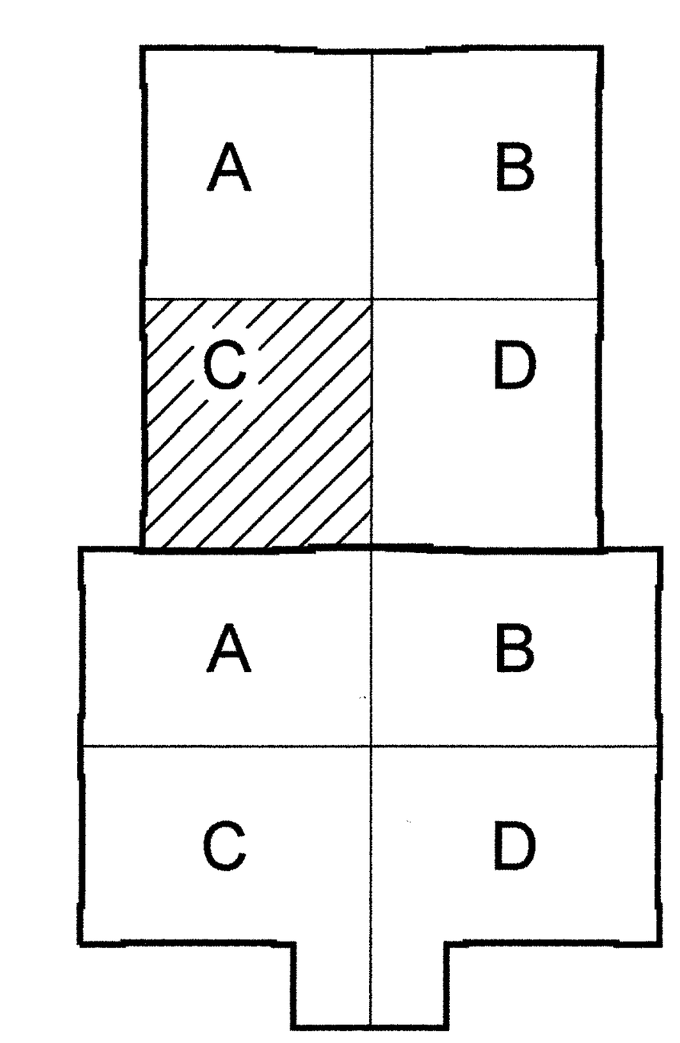

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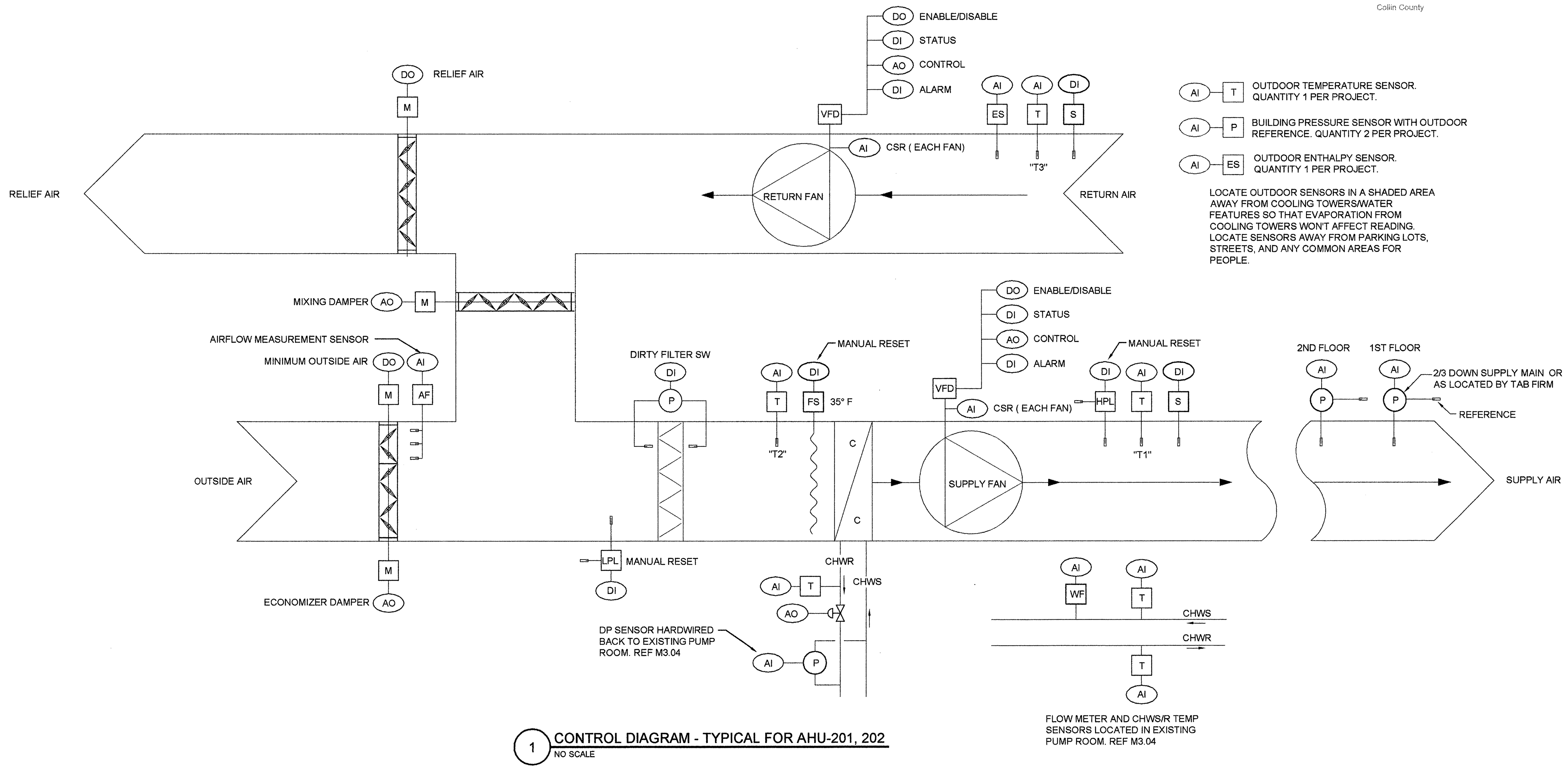
HVAC PIPING PLAN
LEVEL ONE SECTION C
SCALE: 1/8"=1'-0" (01)

SHEET TITLE
HVAC PIPING PLAN - LEVEL ONE SECTION C

SHEET NUMBER
M3.13



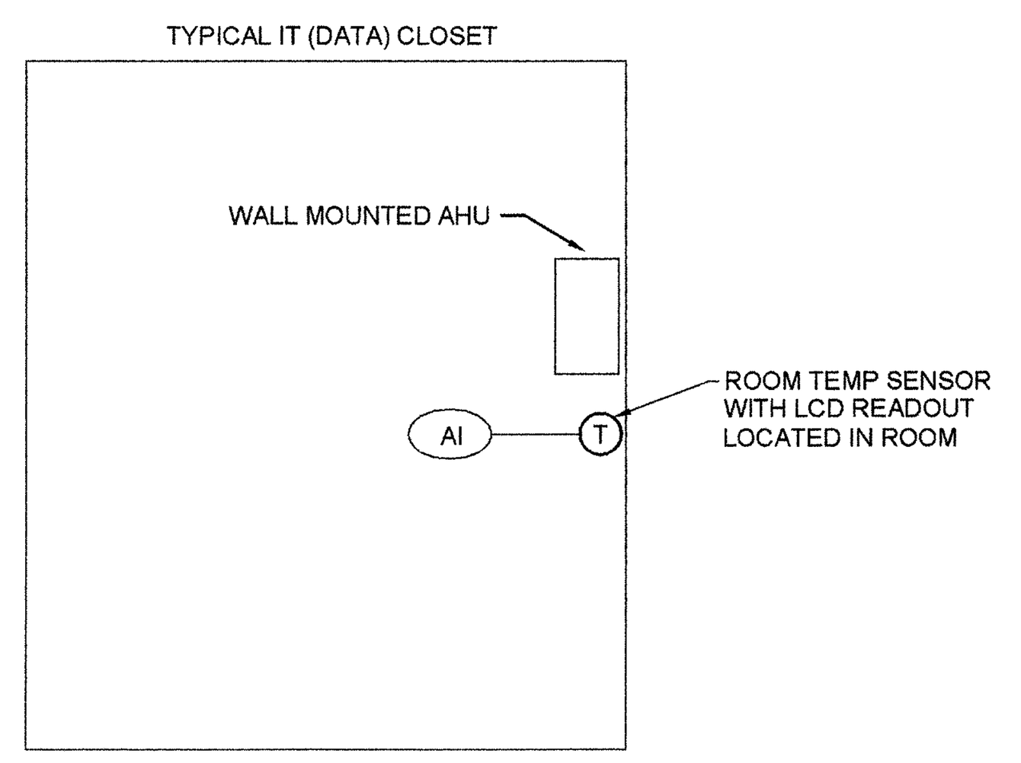
1 CONTROL DIAGRAM - TYPICAL FOR AHU-201, 202
NO SCALE

SEQUENCE OF OPERATION, AHU-201,202

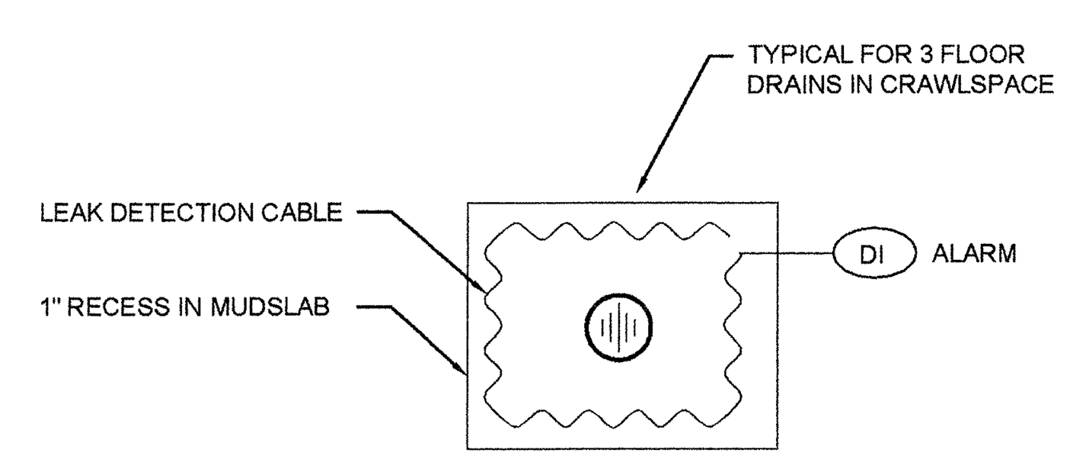
1. THE UNIT MAY BE STARTED AND STOPPED AUTOMATICALLY AS SCHEDULED AT THE OPERATORS WORKSTATION, OR MANUALLY AT THE VARIABLE FREQUENCY DRIVE. THE MINIMUM OUTDOOR AIR DAMPER WILL BE OPENED THE SUPPLY FAN IS ENERGIZED AND WILL CLOSE WHEN THE FAN IS DE-ENERGIZED. THE CHILLED WATER CONTROL VALVE WILL BE FULLY CLOSED WHEN THE FAN IS DE-ENERGIZED.
2. THE SUPPLY FAN VFD WILL MODULATE TO MAINTAIN THE DUCT STATIC PRESSURE SETPOINT. INITIAL STATIC PRESSURE SETPOINT TO BE 1.25 IN WG. FINAL SETPOINT TO BE DETERMINED THROUGH TEST AND BALANCE SERVICES. THE CONTROL LOOP SHALL "LOW SELECT" THE 2 DP SENSORS SHOWN. THE RELIEF FAN VFD WILL MODULATE TO MAINTAIN THE BUILDING STATIC PRESSURE SETPOINT (.05 IN W.G. ADJUSTABLE).
3. THE DDC CONTROLLER WILL MODULATE THE CHILLED WATER VALVE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT, AS SENSED AT "T1".
4. THE ECONOMIZER MODE SHALL BE ENABLED AND DISABLED FROM THE OPERATORS WORKSTATION. THE ECONOMIZER MODE SELECTION SHALL ALLOW THE OPERATOR TO SELECT EITHER "DRY BULB" OR "ENTHALPY MODE" CONTROL. IN "DRY BULB" MODE THE ECONOMIZER CYCLE SHALL BE ENABLED WHEN THE OUTDOOR AIR TEMPERATURE FALLS TO 55 °F (ADJUSTABLE). IN "ENTHALPY MODE" THE ECONOMIZER CYCLE SHALL BE ENABLED WHEN OUTDOOR AIR ENTHALPY IS LESS THAN RETURN AIR ENTHALPY. IN ECONOMIZER MODE THE ECONOMIZER DAMPER AND RELIEF DAMPER WILL MODULATE OPEN AND THE MIXED AIR DAMPER WILL MODULATE CLOSED TO MAINTAIN THE MIXED AIR TEMPERATURE SETPOINT AT "T2". IF "T2" IS ABOVE THE SUPPLY AIR TEMPERATURE SETPOINT REQUIRED AT "T1", THE CHILLED WATER VALVE WILL MODULATE OPEN TO PROVIDE SUPPLEMENTAL COOLING.
5. UNOCCUPIED MODE OF OPERATION. THROUGHOUT THE UNOCCUPIED MODE, THE COOLING COIL VALVE IS CLOSED, THE OUTSIDE AIR AND RELIEF AIR DAMPERS ARE CLOSED, MIXED AIR DAMPER OPEN SUPPLY AND RELIEF FANS WILL BE OFF. THE SUPPLY AND RELIEF FANS AND COOLING COIL CONTROL VALVE RESUME NORMAL OPERATION IF ANY ZONE TEMPERATURE RISES ABOVE THE SET-UP (SUMMER 80°F - ADJUSTABLE) SPACE TEMPERATURE.
6. VENTILATION DELAY MODE OF OPERATION: OUTSIDE AND RELIEF AIR DAMPERS ARE CLOSED. RELIEF FAN IS OFF. THE SUPPLY FAN VFD WILL MODULATE TO MAINTAIN THE DUCT STATIC PRESSURE SETPOINT. THE DDC CONTROLLER WILL MODULATE THE CHILLED WATER VALVE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT, AS SENSED AT "T1".
7. SAFETY SHUTDOWN OF THE FANS:
   A. SMOKE DETECTION. DUCT SMOKE DETECTORS SHALL STOP THE SUPPLY AND RELIEF FANS WHENEVER THE PRESENCE OF SMOKE IS DETECTED. AN ALARM SHALL BE SENT TO THE OPERATORS WORKSTATION AND A SUPERVISORY ALARM TO THE FIRE ALARM SYSTEM. TO RESTART THE FAN, THE SMOKE DETECTORS AND THE CONTROL PANEL MUST BE MANUALLY RESET.
   B. HIGH STATIC PRESSURE DETECTION. ON A RISE IN STATIC PRESSURE ABOVE THE SETPOINT (3 IN W.G.) OF A HIGH LIMIT STATIC PRESSURE SWITCH DOWNSTREAM OF THE SUPPLY FAN THE SUPPLY AND RETURN FANS WILL STOP. AN ALARM SHALL BE SENT TO THE OPERATORS WORKSTATION. TO RESTART THE FANS, THE LIMIT SWITCH MUST BE MANUALLY RESET.
   C. LOW STATIC PRESSURE DETECTION. ON A FAL IN STATIC PRESSURE BELO THE SETPOINT (-3 IN W.G.) OF A LOW LIMIT STATIC PRESSURE SWITCH UPSTREAM OF THE FILTER FAN THE SUPPLY AND RETURN FANS WILL STOP. AN ALARM SHALL BE SENT TO THE OPERATORS WORKSTATION. TO RESTART THE FANS, THE LIMIT SWITCH MUST BE MANUALLY RESET.
   D. FREEZE STAT DETECTION: IF THE MIXED AIR TEMPERATURE FREEZE STAT (35°F) TRIPS AT ITS LOW TEMP SETPOINT THE SUPPLY AND RELIEF FANS SHALL BE DISABLED, THE COOLING COIL VALVE SHALL MODULATE TO FULL OPEN, AND AN ALARM SHALL BE SENT TO THE OPERATORS WORKSTATION. THE LIMIT SWITCH SHALL REQUIRE MANUAL RESET.
   E. FIRE ALARM SYSTEM SHUTDOWN: THE FIRE ALARM SYSTEM SHALL BE PROVIDED WITH CONTACT POINTS THAT ALLOW SHUTDOWN OF THE SUPPLY AND RELIEF FANS UPON ACTIVATION OF THE FIRE ALARM.
8. DIRTY FILTER SWITCH: THE DIRTY FILTER SWITCH SHALL TRIP WHEN THE PRESSURE DROP ACROSS THE FILTER REACHES THE SETPOINT (1.5 IN W.G. ADJUSTABLE). A SERVICE ALARM SHALL BE SENT TO THE OPERATORS WORKSTATION
9. CHILLED WATER DIFFERENTIAL PRESSURE SENSORS SHALL BE HARDWIRED BACK TO EXISTING PUMP ROOM. THE TWO DP SENSORS SHALL BE ADDED TO THE CONTROL LOOP OF EXISTING VFD DRIVEN PUMPS AND EXISTING DP SENSORS. USE "LOW SELECT" SENSOR TO CONTROL PUMP SPEEDS. INITIAL DIFFERENTIAL PRESSURE SETPOINT TO BE 20 PSI. FINAL SETPOINT TO BE DETERMINED THROUGH TEST AND BALANCE SERVICES.
10. SUPPLY AND RETURN TEMP SENSORS AND FLOW METER SHOWN TO BE INSTALLED IN EXISTING PUMP ROOM SHALL BE REPORTED BACK AT THE CENTRAL PLANT WORK STATION. THE CALCULATED INSTANTANEOUS TONNAGE (500 X GPM X DELTA T) SHALL ALSO BE REPORTED AND TRENDED AT THE CENTRAL PLANT WORKSTATION
11. CHILLED WATER COIL RETURN TEMPERATURE WILL BE REPORTED BACK TO THE OPERATORS WORKSTATION.

SYMBOL LIST

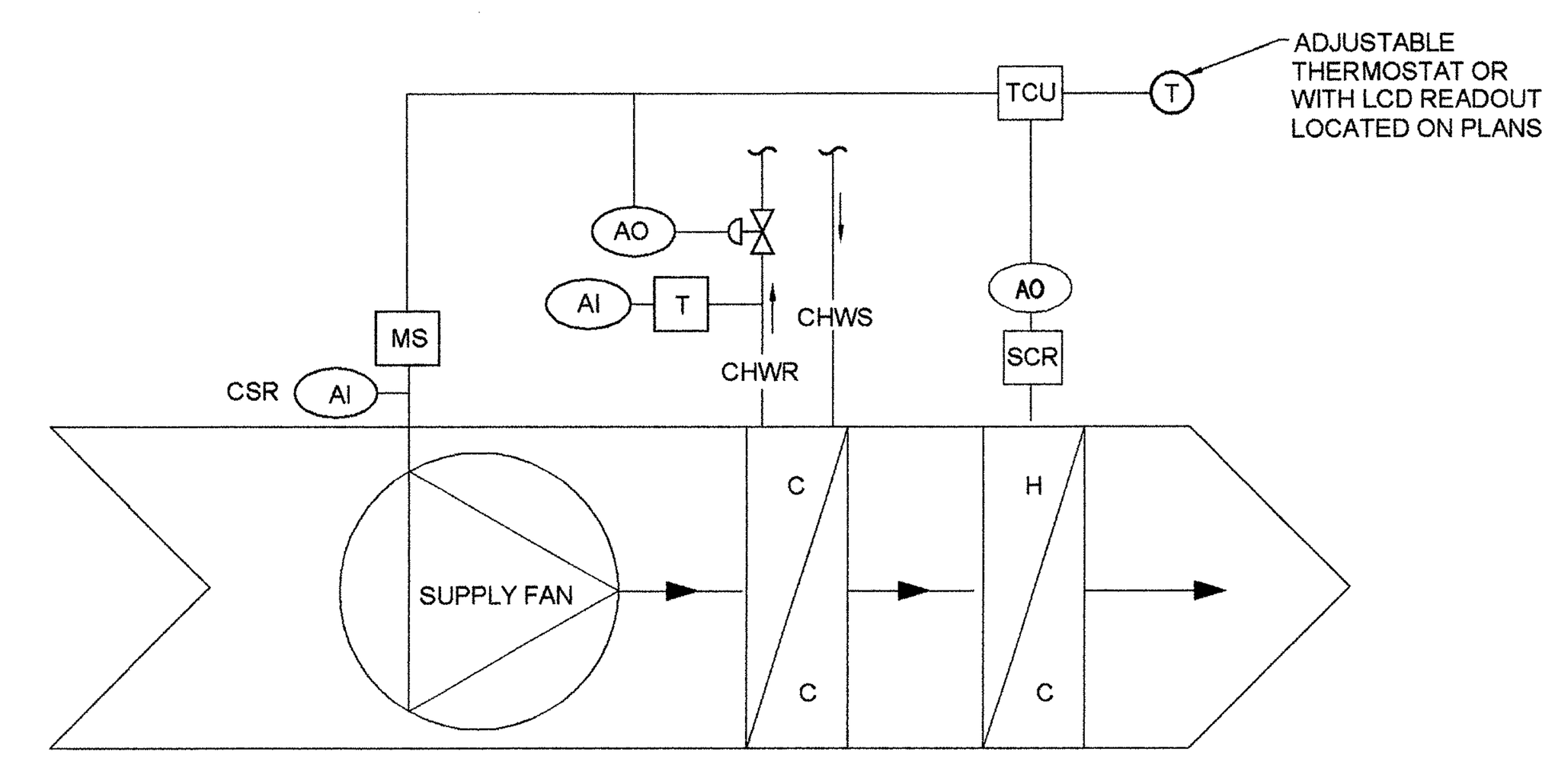
SYMBOL	DESCRIPTION
	OPPOSED BLADE DAMPER
	HEATING OR COOLING COIL
	AUTOMATIC 2-WAY VALVE
	AUTOMATIC 3-WAY VALVE
	FAN OR PUMP MOTOR
P	DIFFERENTIAL PRESSURE SENSOR
P	PRESSURE TRANSMITTER
CSR	CURRENT SENSING RELAY
FS	FREEZESTAT
S	SMOKE DETECTOR
T	TEMPERATURE SENSOR
T	THERMOSTAT
TCU	TERMINAL CONTROL UNIT
VFD	VARIABLE FREQUENCY DRIVE
VS	VIBRATION SENSOR
	VAV DAMPER W/FLOW MONITOR
DI	DDC DIGITAL INPUT POINT
DO	DDC DIGITAL OUTPUT POINT
AI	DDC ANALOG INPUT POINT
AO	DDC ANALOG OUTPUT POINT
OPB	OPEN PROTOCOL BUS
M	MOTOR
MS	MOTOR STARTER
SCR	SCR HEATING ELEMENT CONTROLLER
ES	ENTHALPY SENSOR
LPL	LOW PRESSURE LIMIT SWITCH
HPL	HIGH PRESSURE LIMIT SWITCH
CO_2	CARBON DIOXIDE DETECTOR
AF	AIRFLOW MONITORING SENSOR
WF	WATERFLOW MONITORING SENSOR
RH	RELATIVE HUMIDITY SENSOR



2 IT ROOM COOLING - TYPICAL FOR AHU-001,002,003,004,101,102,103,104
NO SCALE



3 LEAK DETECTION - TYPICAL FOR 3 FLOOR DRAINS IN CRAWLSPACE
NO SCALE



4 FAN COIL UNIT - TYPICAL FOR FCU-001, 101, 002, 102
NO SCALE

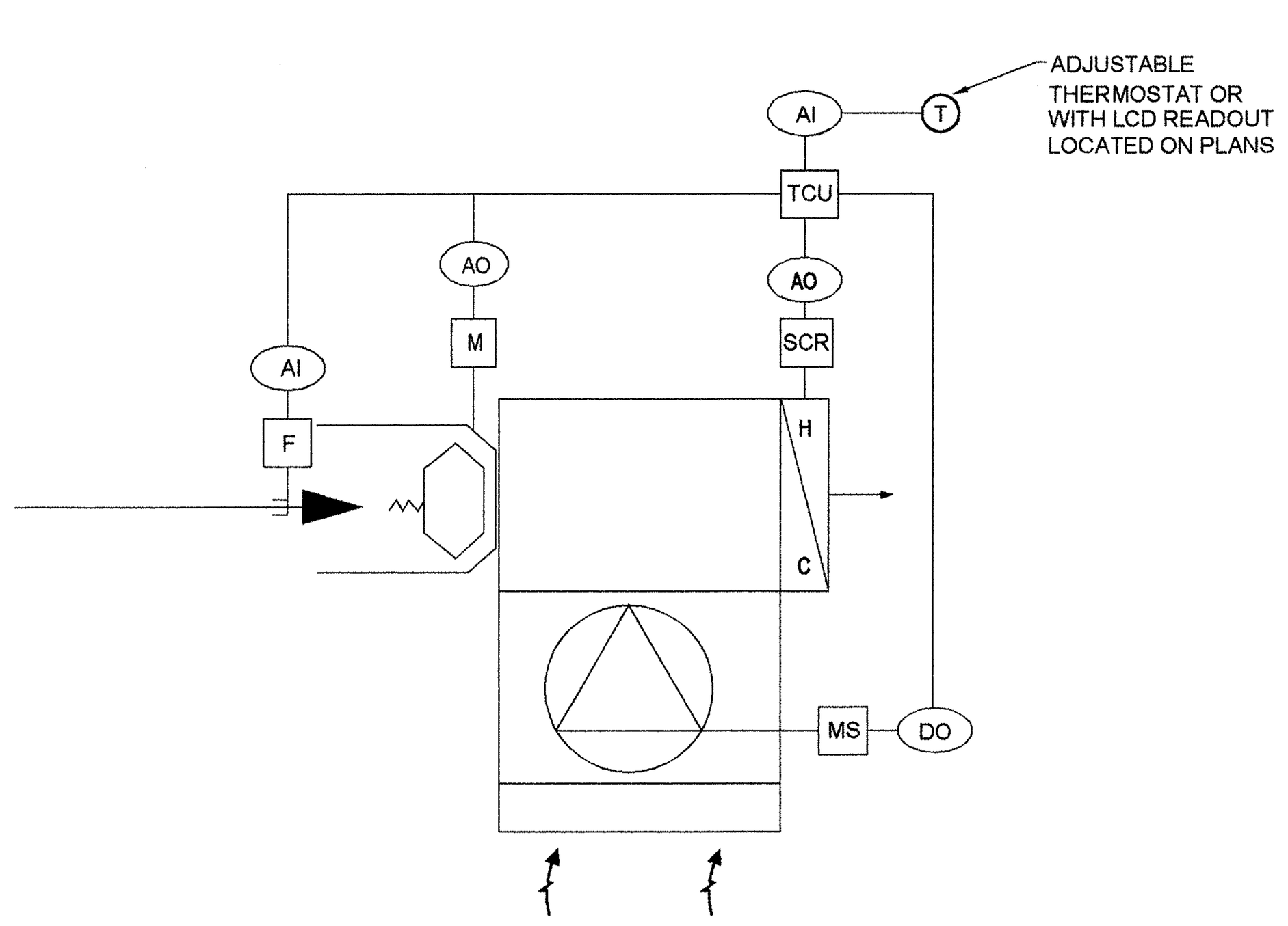
FAN COIL UNIT SEQUENCE OF OPERATION

1. FAN COIL UNIT SHALL BE ENABLED DURING OCCUPIED MODE AND DISABLED DURING UNOCCUPIED MODE.
2. COOLING COIL VALVE SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE SETPOINT. FAN WILL CYCLE WITH A CALL FOR COOLING.
3. AS THE TEMPERATURE IN THE SPACE FALLS THE HEATING MODE WILL BE ENABLED. THERE WILL BE A 5 °F DEADBAND BETWEEN COOLING AND HEATING MODE. WHEN THE SPACE TEMPERATURE FALLS FROM 73° F TO 68°F THE HEATING MODE WILL BE ENABLED.
4. DURING HEATING MODE THE TERMINAL CONTROL UNIT WILL MODULATE THE SCR HEATING CONTROL AS REQUIRED TO MAINTAIN THE HEATING MODE SPACE TEMPERATURE SETPOINT.
5. THE CURRENT SENSING RELAY WILL REPORT FAN STATUS TO THE OPERATORS WORKSTATION.
6. THE COIL RETURN WATER TEMPERATURE WILL REPORT TO THE OPERATORS WORKSTATION.

PARALLEL FAN POWERED VAV BOX SEQ. OF OPS.

SPACE TEMPERATURE CONTROL: EACH CONTROLLED SPACE IS EQUIPPED WITH A VARIABLE AIR VOLUME (VAV) BOX, WHICH IS CONTROLLED BY A MICROPROCESSOR- BASED VAV BOX CONTROLLER. THE CONTROLLER RECEIVES TEMPERATURE SIGNALS FROM AN ADJUSTABLE THERMOSTAT IN THE SPACE SERVED, AND FROM A FLOW SENSOR IN THE VAV BOX. THE AIR VALVE TO THE VAV BOX IS ALWAYS IN AT LEAST THE MINIMUM OPEN POSITION. ON A RISE IN SPACE TEMPERATURE, THE CONTROLLER MODULATES THE AIR VALVE TO DESIGN MAX AIRFLOW TO MAINTAIN THE COOLING SETPOINT. THE AIR VALVE IS THROTTLED DOWN AS THE DESIGN TEMPERATURE IN THE SPACE IS REACHED. IF THE TEMPERATURE FALLS BELOW THE COOLING SETPOINT THE BOX SHALL REMAIN AT THE VALVE MINIMUM STOP THROUGH A 5° F. DEADBAND. AS THE TEMPERATURE FALLS BELOW THE DEADBAND TO THE HEATING SETPOINT THE FAN SHALL START INDUCING WARM RETURN AIR THROUGH THE BOX. UPON A FURTHER DROP IN SPACE TEMPERATURE THE ELECTRIC HEATING COIL SHALL BE MODULATED THROUGH ITS SCR CONTROLLER TO MAINTAIN THE SPACE TEMPERATURE SETPOINT. THE REVERSE SEQUENCE OCCURS AS TEMPERATURE INCREASES. EACH BOX THERMOSTAT SHALL HAVE AN OCCUPANT OVERRIDE FEATURE THAT WILL ALLOW SOMEONE TO ENGAGE THE AIR CONDITIONING SYSTEM DURING THE UNOCCUPIED MODE. THE SYSTEM WILL OPERATE IN THE OCCUPIED MODE FOR A PERIOD OF TWO (2) HOURS AND THEN REVERT TO UNOCCUPIED MODE.

DAMPER ACTUATOR CONTROLLERS SHALL HAVE THE CAPABILITY OF MAINTAINING A MINIMUM VALVE POSITION IN OCCUPIED MODE AND FULLY CLOSE IN UNOCCUPIED MODE.



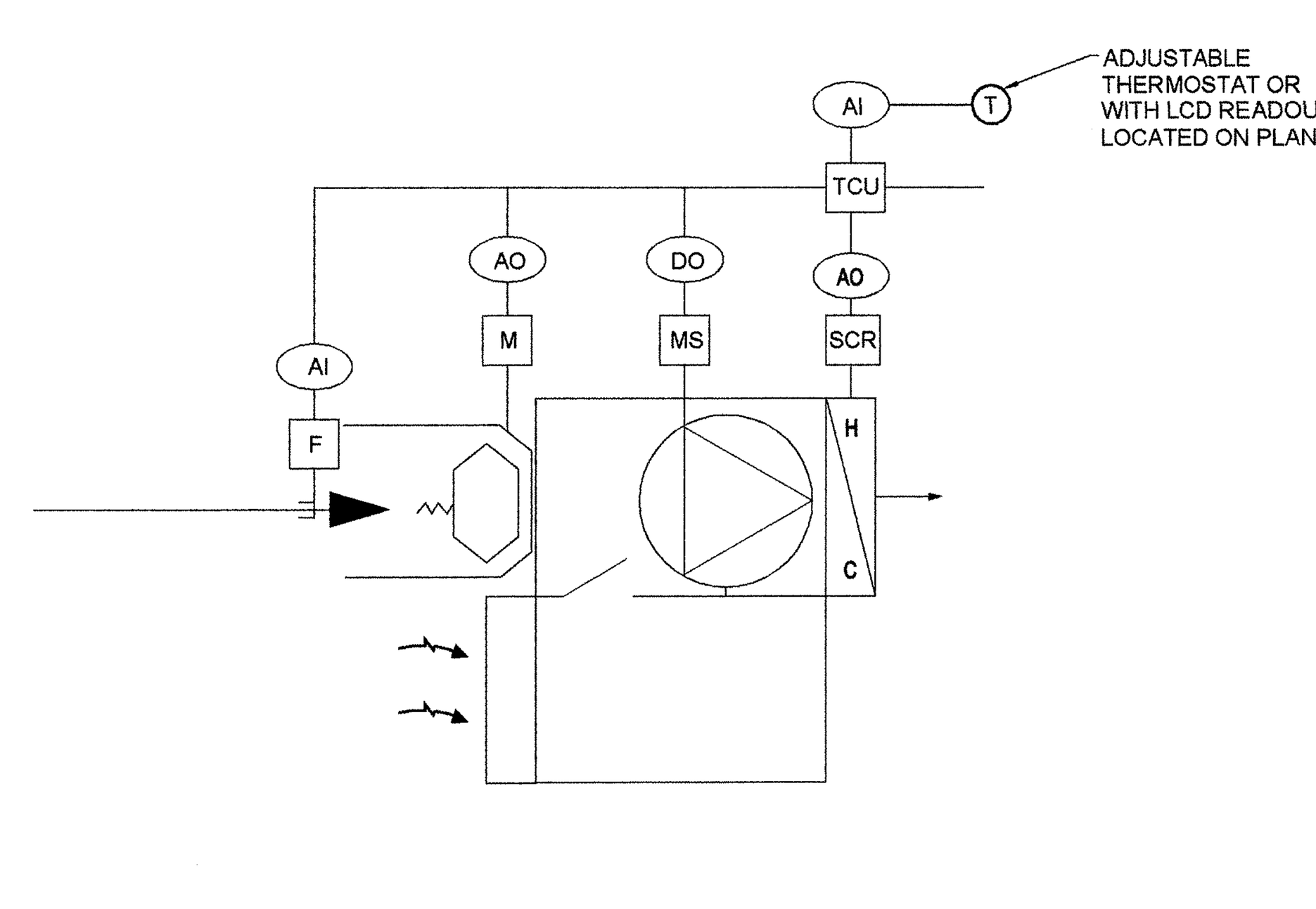
5 TYPICAL PARALLEL FAN POWERED VAV BOX
NO SCALE

SERIES FAN POWERED VAV BOX SEQ. OF OPS.

FAN SHALL RUN CONTINUOUSLY IN OCCUPIED MODE.

SPACE TEMPERATURE CONTROL: EACH CONTROLLED SPACE IS EQUIPPED WITH A VARIABLE AIR VOLUME (VAV) BOX, WHICH IS CONTROLLED BY A MICROPROCESSOR- BASED VAV BOX CONTROLLER. THE CONTROLLER RECEIVES TEMPERATURE SIGNALS FROM AN ADJUSTABLE THERMOSTAT IN THE SPACE SERVED, AND FROM A FLOW SENSOR IN THE VAV BOX. THE AIR VALVE TO THE VAV BOX IS ALWAYS IN AT LEAST THE MINIMUM OPEN POSITION. ON A RISE IN SPACE TEMPERATURE, THE CONTROLLER MODULATES THE AIR VALVE TO DESIGN MAX AIRFLOW TO MAINTAIN THE COOLING SETPOINT. THE AIR VALVE IS THROTTLED DOWN AS THE DESIGN TEMPERATURE IN THE SPACE IS REACHED. IF THE TEMPERATURE FALLS BELOW THE COOLING SETPOINT THE BOX SHALL REMAIN AT THE VALVE MINIMUM STOP THROUGH A 5° F. DEADBAND. AS THE TEMPERATURE FALLS BELOW THE DEADBAND TO THE HEATING SETPOINT THE ELECTRIC HEATING COIL SHALL BEMODULATED THROUGH ITS SCR CONTROLLER TO MAINTAIN THE SPACE TEMPERATURE SETPOINT. THE REVERSE SEQUENCE OCCURS AS TEMPERATURE INCREASES. EACH BOX THERMOSTAT SHALL HAVE AN OCCUPANT OVERRIDE FEATURE THAT WILL ALLOW SOMEONE TO ENGAGE THE AIR CONDITIONING SYSTEM DURING THE UNOCCUPIED MODE. THE SYSTEM WILL OPERATE IN THE OCCUPIED MODE FOR A PERIOD OF TWO (2) HOURS AND THEN REVERT TO UNOCCUPIED MODE.

DAMPER ACTUATOR CONTROLLERS SHALL HAVE THE CAPABILITY OF MAINTAINING A MINIMUM VALVE POSITION IN OCCUPIED MODE AND FULLY CLOSE IN UNOCCUPIED MODE.

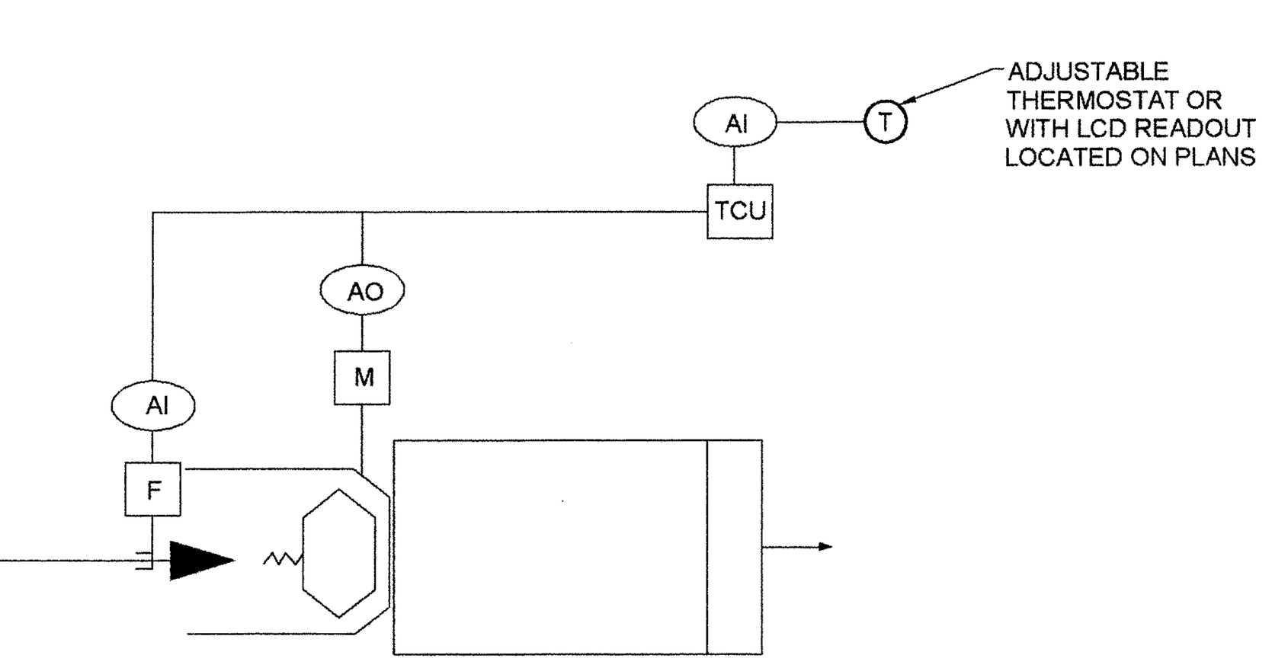


6 TYPICAL SERIES FAN POWERED VAV BOX
NO SCALE

VALVE ONLY VAV BOX SEQUENCE OF OPERATION

SPACE TEMPERATURE CONTROL: EACH CONTROLLED SPACE IS EQUIPPED WITH A VARIABLE AIR VOLUME (VAV) BOX, WHICH IS CONTROLLED BY A MICROPROCESSOR- BASED VAV BOX CONTROLLER. THE CONTROLLER RECEIVES TEMPERATURE SIGNALS FROM AN ADJUSTABLE THERMOSTAT IN THE SPACE SERVED, AND FROM A FLOW SENSOR IN THE VAV BOX. THE AIR VALVE TO THE VAV BOX IS ALWAYS IN AT LEAST THE MINIMUM OPEN POSITION. ON A RISE IN SPACE TEMPERATURE, THE CONTROLLER MODULATES THE AIR VALVE TO DESIGN MAX AIRFLOW TO MAINTAIN THE COOLING SETPOINT. THE AIR VALVE IS THROTTLED DOWN AS THE DESIGN TEMPERATURE IN THE SPACE IS REACHED. IF THE TEMPERATURE FALLS BELOW THE COOLING SETPOINT AIRVALVE SHALL MODULATE TO MINIMUM STOP. EACH BOX THERMOSTAT SHALL HAVE AN OCCUPANT OVERRIDE FEATURE THAT WILL ALLOW SOMEONE TO ENGAGE THE AIR CONDITIONING SYSTEM DURING THE UNOCCUPIED MODE. THE SYSTEM WILL OPERATE IN THE OCCUPIED MODE FOR A PERIOD OF TWO (2) HOURS AND THEN REVERT TO UNOCCUPIED MODE.

DAMPER ACTUATOR CONTROLLERS SHALL HAVE THE CAPABILITY OF MAINTAINING A MINIMUM VALVE POSITION IN OCCUPIED MODE AND FULLY CLOSE IN UNOCCUPIED MODE.

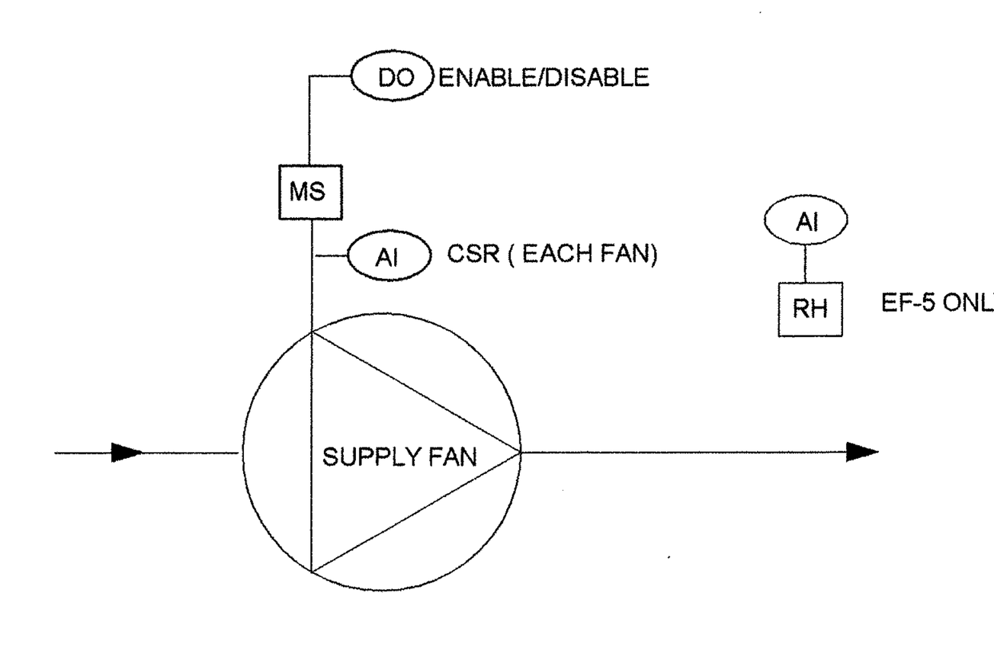


7 TYPICAL COOLING ONLY VAV BOX
NO SCALE

EXHAUST FAN SEQUENCE OF OPERATION

EACH FAN SHALL BE ENABLED BY TIME OF DAY SCHEDULE FROM THE BUILDING AUTOMATION SYSTEM. EACH FAN SHALL HAVE PROOF OF FLOW STATUS AVAILABLE AT THE OPERATORS WORKSTATION. AN ALARM SHALL BE GENERATED UPON FAN FAILURE.

EF-5: CRAWLSPACE VENTILATION FAN SHALL BE ENABLED WHEN CRAWLSPACE HUMIDITY RISES ABOVE 50%. RELATIVE HUMIDITY SHALL BE REPORTED AT OPERATORS WORKSTATION. AN ALARM SHALL SOUND IF RELATIVE HUMIDITY RISES TO 70%.



8 EXHAUST FAN - TYPICAL FOR EF-1,2,3,4,5
NO SCALE

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COLLIN COUNTY

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CONSULTANT
STATE OF TEXAS
6/4/2009
GARRETT S. BROWN
90873
LICENSED PROFESSIONAL ENGINEER
5600.6.4.2009.8017

PROJECT TITLE
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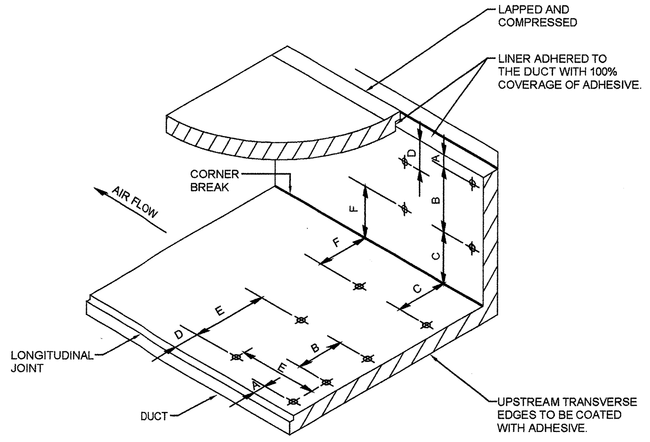
REGISTRATION

SHEET TITLE
HVAC CONTROL DIAGRAMS

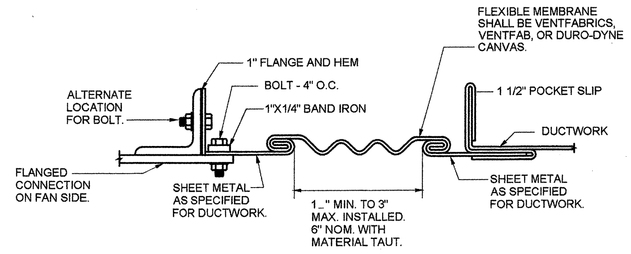
SHEET NUMBER
M5.01



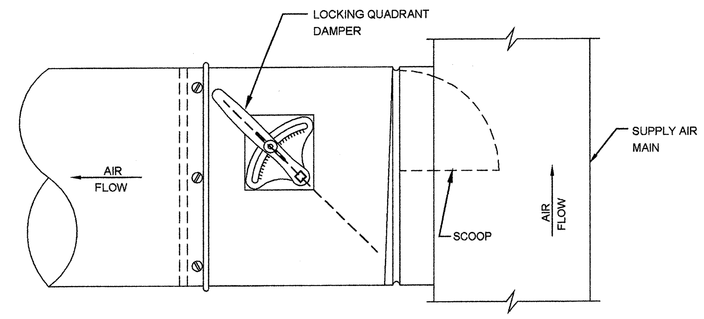
MAXIMUM SPACING FOR FASTENERS USED WITH FLEXIBLE DUCT LINER.

VELOCITY	UPSTREAM EDGE			MID-SECTION		
	A	B	C	D	E	F
0-2000 F.P.M.	3"	12"	12"	6"	18"	12"

1 FLEXIBLE DUCT LINER INSTALLATION DETAIL
NO SCALE

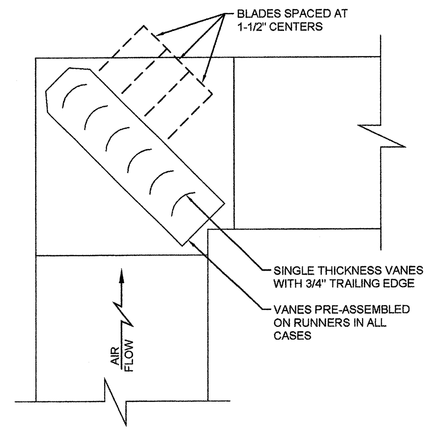


2 EQUIPMENT TO DUCTWORK FLEXIBLE CONNECTION
NO SCALE

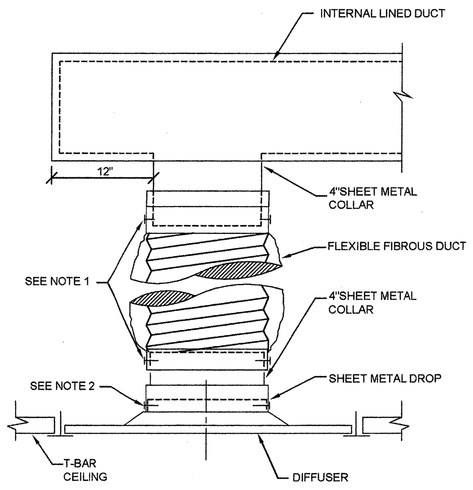


REQ'D AT EACH RUN-OUT TAP TO EVERY TERMINAL SUPPLY AIR DEVICE, AND OTHERWISE AS INDICATED.

3 SPIN-IN TAP DETAIL
NO SCALE

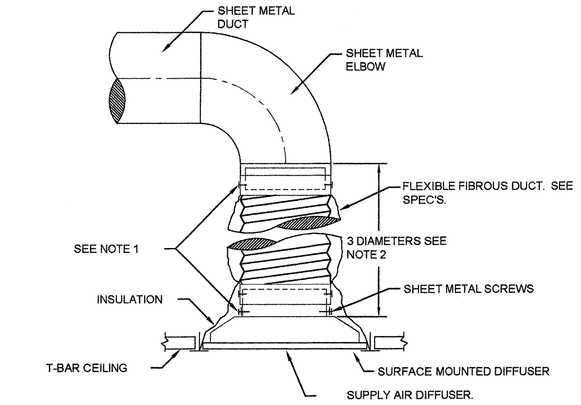


4 SQUARE ELBOW DETAIL
NO SCALE



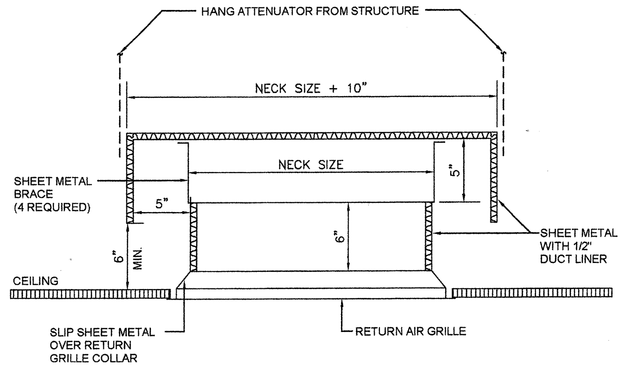
NOTES:
1. **USE PLENUM COLLARS TO ATTACH FLEXIBLE DUCT . USE SHEET METAL SCREWS AND (2) WRAPS OF TAPE TO SECURE PLENUM COLLARS. ALTERNATE METHOD: BANDING DEVICE OR PANDUIT STRAP, IN LIEU OF SHEET METAL SCREWS. ALL TAPES AND SEALING MATERIALS SHALL COMPLY WITH UL181A FOR RIGID DUCT AND UL181B FOR FLEXIBLE DUCT.**
2. SECURE SHEET METAL DROP TO DIFFUSER NECK WITH A MIN. OF (3) SHEET METAL SCREWS AND FULL WRAPS OF TAPE PER UL REQUIREMENTS LISTED IN NOTE 1.
3. ALL FLEX DUCT SHALL BE INSTALLED WITHOUT KINKS, SAGGING, OR SHORT-RADIUS BENDS.

5 IN-LINE FLEX CONNECTION DETAIL
NO SCALE



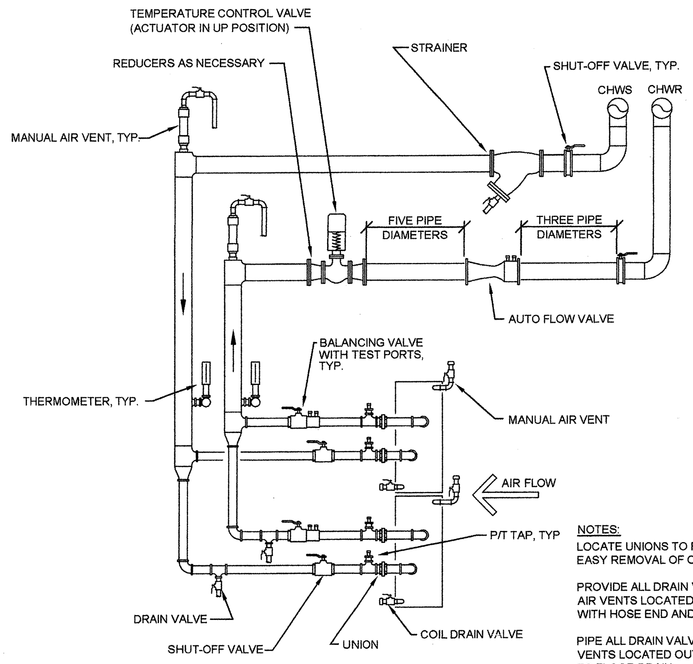
NOTES:
1. **USE PLENUM COLLARS TO ATTACH FLEXIBLE DUCT . USE SHEET METAL SCREWS AND (2) WRAPS OF TAPE TO SECURE PLENUM COLLARS. ALTERNATE METHOD: BANDING DEVICE OR PANDUIT STRAP, IN LIEU OF SHEET METAL SCREWS. ALL TAPES AND SEALING MATERIALS SHALL COMPLY WITH UL181A FOR RIGID DUCT AND UL181B FOR FLEXIBLE DUCT.**
2. **IF A MINIMUM OF 2 DIAMETERS OF STRAIGHT RUN IS NOT AVAILABLE ABOVE THE REGISTER USE HARD DUCT SHORT RADIUS CONNECTION.**
3. **ALL FLEX DUCT SHALL BE INSTALLED WITHOUT KINKS, SAGGING, OR SHORT-RADIUS BENDS.**

6 TYPICAL FLEX CONNECTION DETAIL
NO SCALE



NOTE: USE ONLY WHERE ACOUSTICAL PROTECTION IS REQUIRED - SEE PLANS

7 RETURN AIR SOUND ATTENUATION DETAIL
NO SCALE



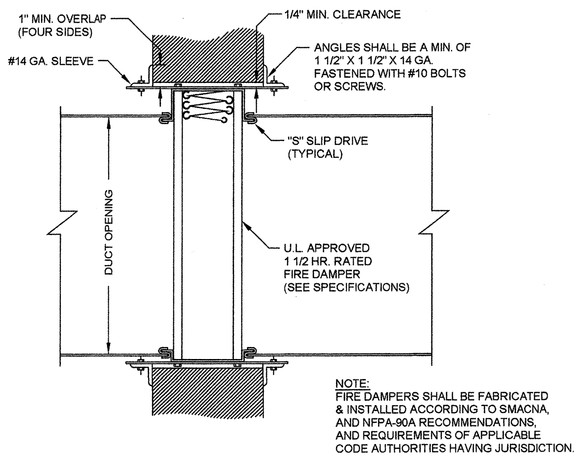
NOTES:
LOCATE UNIONS TO PROVIDE EASY REMOVAL OF COILS

PROVIDE ALL DRAIN VALVES AND AIR VENTS LOCATED INSIDE UNIT WITH HOSE END AND CAP

PIPE ALL DRAIN VALVES AND AIR VENTS LOCATED OUTSIDE UNIT TO FLOOR DRAIN

IF UNITS PROVIDED HAVE 3 STACKED COILS THE PIPING SHALL BE SIMILAR AS SHOWN IN THIS DETAIL. EXTEND THE PIPING REQUIREMENTS SHOWN TO THE THIRD COIL AS REQUIRED.

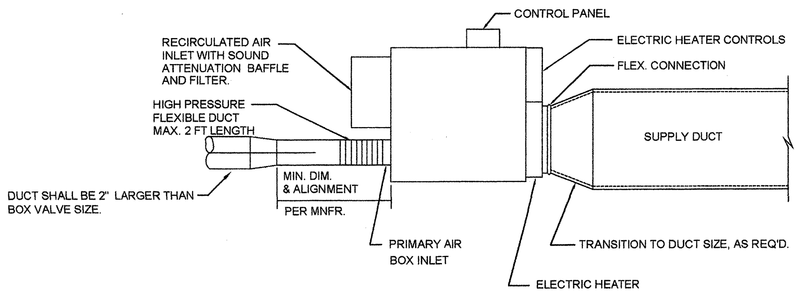
8 ROOFTOP UNIT COOLING COIL DETAIL
NO SCALE



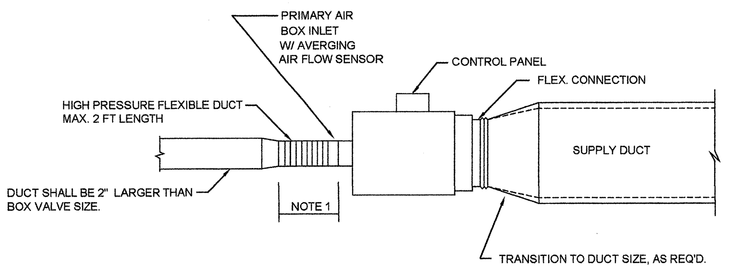
NOTE:
FIRE DAMPERS SHALL BE FABRICATED & INSTALLED ACCORDING TO SMACNA, AND NFPA-90A RECOMMENDATIONS, AND REQUIREMENTS OF APPLICABLE CODE AUTHORITIES HAVING JURISDICTION.

NOTE: CLEAR OPENING OF FIRE DAMPER IS TO BE THE SAME AS DUCT.

9 FIRE DAMPER INSTALLATION DETAIL
NO SCALE

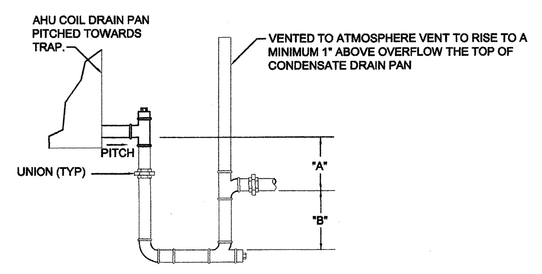


10 PARALLEL FAN POWERED VAV TERMINAL BOX
NO SCALE



NOTES:
1. DUCT CONNECTION TO BE SAME SIZE AS INLET. WITH A MINIMUM STRAIGHT SECTION OF 3Ø OR AS RECOMMENDED BY MANUFACTURER.
2. STAINLESS STEEL CLAMPS SHALL BE USED TO SECURE FLEX DUCT.
3. SUPPORT BOX FROM STRUCTURE WITH ALL THREAD RODS. PROVIDE VIBRATION ISOLATION AS REQUIRED.

11 COOLING ONLY VAV TERMINAL BOX
NO SCALE



NOTES FOR DETAIL:
1. **ALL CONDENSATE TRAP PIPING SHALL BE COPPER**

12 AIR HANDLING UNIT CONDENSATE DETAIL
NO SCALE

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CONSULTANT
STATE OF TEXAS
6/4/2009
GARRETT S. BROWN
90873
LICENSED PROFESSIONAL ENGINEER
5600.6.4.2009.8017

PROJECT TITLE
COLLIN COUNTY COURTHOUSE ADDITION

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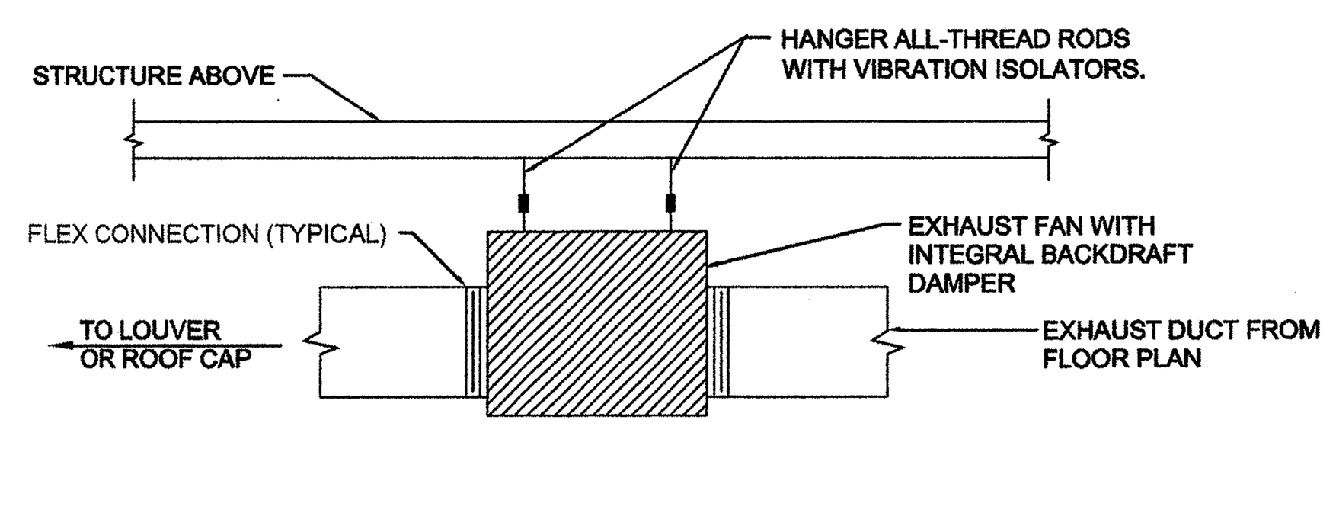
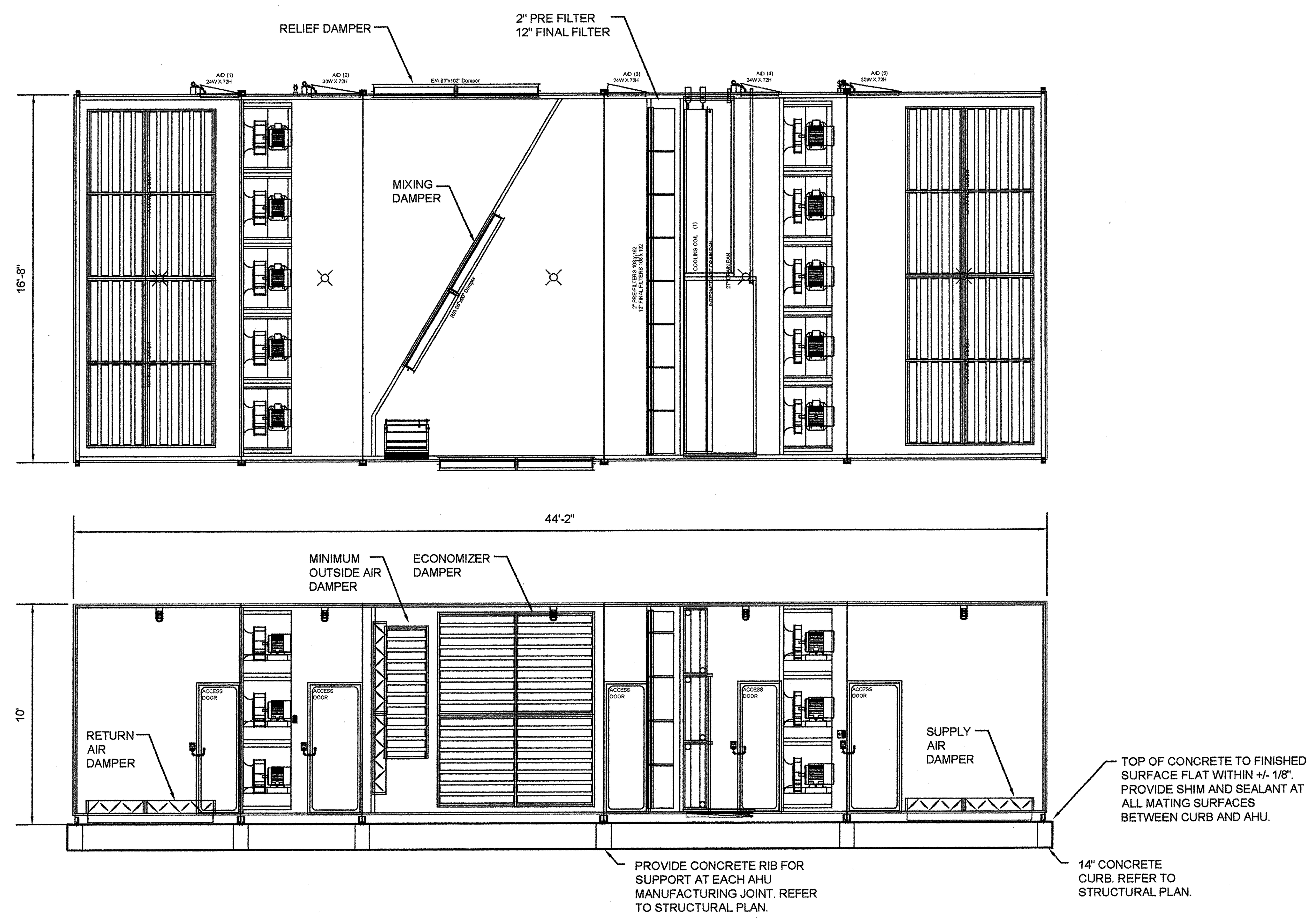
SHEET TITLE
MECHANICAL DETAILS

SHEET NUMBER
M6.01

Mar 14, 2012 1:37:26 PM CDT



1 TYPICAL SUSPENDED INLINE EXHAUST FAN
NO SCALE



2 PENTHOUSE AHU DETATIL - TYP FOR AHU-1/AHU-2
SCALE: 1/4"= 1'-0"

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Exp. Date 6/30/09

SHEET TITLE
MECHANICAL DETAILS

SHEET NUMBER
M6.02

SIGNATURE FORM
COLLIN COUNTY, TEXAS

DELIVERY WILL BE F.O.B. INSIDE DELIVERY AT COLLIN COUNTY DESIGNATED LOCATIONS AND ALL TRANSPORTATION CHARGES PAID BY THE SUPPLIER TO DESTINATION.

DELIVERY TO BE SPECIFIED IN CALENDAR DAYS FROM DATE OF ORDER.

WE **DO NOT** TAKE EXCEPTION TO THE BID SPECIFICATIONS.

WE **TAKE** EXCEPTION TO THE BID SPECIFICATIONS (EXPLAIN):

COMPANY INFORMATION/PROFILE/REFERENCES

Preferential Requirement: The County of Collin, as a governmental agency of the State of Texas, may not award a contract to a nonresident bidder unless the nonresident's bid is lower than the lowest bid submitted by a responsible Texas resident bidder by the same amount that a Texas resident bidder would be required to underbid a nonresident bidder to obtain a comparable contract in the state in which the nonresident's principal place of business is located (Government Code, Title 10, V.T.C.A., Chapter 2252, Subchapter A). Bidder shall make answer to the following questions by selecting the appropriate radio button or inserting information in the box provided:

Is your principal place of business in the State of Texas? Yes No

If the answer to question is "yes", no further information is necessary; if "no", please indicate:

in which state is your principal place of business is located:

if that state favors resident bidders (bidders in your state) by some dollar increment or percentage: Yes No

if "yes", what is that dollar increment or percentage?

Company Profile: IS YOUR FIRM?

Sole Proprietorship	Yes	No
General Partnership	Yes	No
Limited Partnership	Yes	No
Corporation	Yes	No
Other	Yes	No

List Legal Names in Company:

List at least three (3) companies or governmental agencies where these same/like products/services, as stated herein, have been provided. Include company name, address, contact name and telephone number.

AS PERMITTED UNDER TITLE 8, CHAPTER 271, SUBCHAPTER F, SECTION 271.101 AND 271.102 V.T.C.A. AND TITLE 7, CHAPTER 791, SUBCHAPTER C, SECTION 791.025, V.T.C.A., OTHER LOCAL GOVERNMENTAL ENTITIES MAY WISH TO ALSO PARTICIPATE UNDER THE SAME TERMS AND CONDITIONS CONTAINED IN THIS CONTRACT. EACH ENTITY WISHING TO PARTICIPATE MUST ENTER INTO AN INTERLOCAL AGREEMENT WITH COLLIN COUNTY AND HAVE PRIOR AUTHORIZATION FROM VENDOR. IF SUCH PARTICIPATION IS AUTHORIZED, ALL PURCHASE ORDERS WILL BE ISSUED DIRECTLY FROM AND SHIPPED DIRECTLY TO THE LOCAL GOVERNMENTAL ENTITY REQUIRING SUPPLIES/SERVICES. COLLIN COUNTY SHALL NOT BE HELD RESPONSIBLE FOR ANY ORDERS PLACED, DELIVERIES MADE OR PAYMENT FOR SUPPLIES/SERVICES ORDERED BY THESE ENTITIES. EACH ENTITY RESERVES THE RIGHT TO DETERMINE THEIR PARTICIPATION IN THIS CONTRACT. WOULD BIDDER BE WILLING TO ALLOW OTHER LOCAL GOVERNMENTAL ENTITIES TO PARTICIPATE IN THIS CONTRACT, IF AWARDED, UNDER THE SAME TERMS AND CONDITIONS? Yes No

By signing and submitting this Bid/Proposal, Bidder/Offeror acknowledges, understands the specifications, any and all addenda, and agrees to the bid/proposal terms and conditions and can provide the minimum requirements stated herein. Bidder/Offeror acknowledges they have read the document in its entirety, visited the site, performed investigations and verifications as deemed necessary, is familiar with local conditions under which work is to be performed and will be responsible for any and all errors in Bid/Proposal submittal resulting from Bidder/Offeror's failure to do so. Bidder/Offeror acknowledges the prices submitted in this Bid/Proposal have been carefully reviewed and are submitted as correct and final. If Bid/Proposal is accepted, vendor further certifies and agrees to furnish any and all products/services upon which prices are extended at the price submitted, and upon conditions in the specifications of the Invitation for Bid/Request for Proposal.

THE UNDERSIGNED HEREBY CERTIFIES THE FOREGOING BID/PROPOSAL SUBMITTED BY THE COMPANY LISTED BELOW HEREINAFTER CALLED "BIDDER/OFFEROR" IS THE DULY AUTHORIZED AGENT OF SAID COMPANY AND THE PERSON SIGNING SAID BID/PROPOSAL HAS BEEN DULY AUTHORIZED TO EXECUTE SAME. BIDDER/OFFEROR AFFIRMS THAT THEY ARE DULY AUTHORIZED TO EXECUTE THIS CONTRACT; THIS COMPANY; CORPORATION, FIRM, PARTNERSHIP OR INDIVIDUAL HAS NOT PREPARED THIS BID/PROPOSAL IN COLLUSION WITH ANY OTHER BIDDER/OFFEROR OR OTHER PERSON OR PERSONS ENGAGED IN THE SAME LINE OF BUSINESS; AND THAT THE CONTENTS OF THIS BID/PROPOSAL AS TO PRICES, TERMS AND CONDITIONS OF SAID BID/PROPOSAL HAVE NOT BEEN COMMUNICATED BY THE UNDERSIGNED NOR BY ANY EMPLOYEE OR AGENT TO ANY OTHER PERSON ENGAGED IN THIS TYPE OF BUSINESS PRIOR TO THE OFFICIAL OPENING OF THIS BID/PROPOSAL.

Company Name	
Street Address of Principal Place of Business	
City, State, Zip	
Phone of Principal Place of Business	
Fax of Principal Place of Business	
E-mail Address of Representative	
Federal Identification Number	
Date	
Acknowledgement of Addenda	#1 ☐ #2 ☐ #3 ☐ #4 ☐ #5 ☐ #6 ☐
Authorized Representative Name	
Authorized Representative Title	
Signature (Required for paper bid submission)	

COLLIN COUNTY

OFFICE OF COUNTY AUDITOR
2300 Bloomdale Road • Suite 3100
McKinney, Texas 75071
(972) 548-4731 • Metro (972) 424-1460
Fax (972) 548-4696

Dear Vendor:

In order for Collin County to comply with Internal Revenue Service Guidelines, we are required to keep a W-9 on file for each vendor to whom we have remitted payment(s). Collin County is in the process of up dating their files.

Please complete the attached/faxed W-9 form and **fax** to (972) 548-4696 OR **mail** the original to 2300 Bloomdale Road, Suite 3100, McKinney, Tx 75071. Failure to do so may result in delay(s) of future payments.

Thank you in advance for your assistance in this matter.

Sincerely,

Jeffry May
Collin County Auditor

JM/pac

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

Request for Taxpayer Identification Number and Certification

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

Print or type See Specific Instructions on page 2.

Name (as shown on your income tax return)

Business name, if different from above

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

☐ Exempt payee

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

Requester's name and address (optional)

City, state, and ZIP code

List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

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

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

Social security number

or

Employer identification number

Part II Certification

Under penalties of perjury, I certify that:

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

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

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

General Instructions

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

Purpose of Form

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

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

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),

2. Certify that you are not subject to backup withholding, or

3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.

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

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

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

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

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

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

CONFLICT OF INTEREST QUESTIONNAIRE
FORM CIQ
For vendor or other person doing business with local governmental entity

This questionnaire is being filed in accordance with chapter 176 of the Local Government Code by a person doing business with the governmental entity.

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

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

OFFICE USE ONLY

Date Received

1	**Name of person doing business with local governmental entity.**
2	☐ **Check this box if you are filing an update to a previously filed questionnaire.** (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than September 1 of the year for which an activity described in Section 176.006(a), Local Government Code, is pending and not later than the 7th business day after the date the originally filed questionnaire becomes incomplete or inaccurate.)
3	**Name each employee or contractor of the local governmental entity who makes recommendations to a local government officer of the governmental entity with respect to expenditures of money AND describe the affiliation or business relationship.**
4	**Name each local government officer who appoints or employs local government officers of the governmental entity for which this questionnaire is filed AND describe the affiliation or business relationship.**

Adopted 11/02/2005

FORM CIQ

CONFLICT OF INTEREST QUESTIONNAIRE

Page 2

For vendor or other person doing business with local governmental entity

5 **Name of local government officer with whom filer has affiliation or business relationship.**
(Complete this section only if the answer to A, B, or C is YES.

This section, item 5 including subparts A, B, C & D, must be completed for each officer with whom the filer has affiliation or other relationship. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income from the filer of the questionnaire? ○ Yes ○ No

B. Is the filer of the questionnaire receiving or likely to receive taxable income from or at the direction of the local government officer named in this section AND the taxable income is not from the local governmental entity? ○ Yes ○ No

C. Is the filer of this questionnaire affiliated with a corporation or other business entity that the local government officer serves as an officer or director, or holds an ownership of 10 percent or more?
○ Yes ○ No

D. Describe each affiliation or business relationship.

6

Signature of person doing business with the governmental entity

Date

Adopted 11/02/2005

AFFIDAVIT OF COMPLIANCE

I, the undersigned, declare and affirm that my company is in compliance with the Immigration and Reform Act of 1986 and all employees are legally eligible to work in the United States of America.

I further understand and acknowledge that any non-compliance with the Immigration and Reform Act of 1986 at any time during the term of this contract will render the contract voidable.

Name of Company	
Title of Officer	
Name of Officer	
Date:	

In order to better serve our bidders, the Collin County Purchasing Department is conducting the following survey. We appreciate your time and effort expended to submit your bid. Please take a moment to complete the below. Should you have any questions or require more information please call (972) 548-4165.

HOW DID YOU RECEIVE NOTICE OF THIS REQUEST FOR BID OR PROPOSALS?

McKinney Courier-Gazette?	☐	Yes	☐	No
Plan Room?	☐	Yes	☐	No
Collin County Web-Site?	☐	Yes	☐	No
Facsimile or email from BidSync?	☐	Yes	☐	No

Other

HOW DID YOU RECEIVE THE BID DOCUMENTS?

Downloaded from Home Computer?	☐	Yes	☐	No
Downloaded from Company Computer?	☐	Yes	☐	No
Requested a Copy from Collin County?	☐	Yes	☐	No

Other

Thank You,

Collin County Purchasing Department

Question and Answers for Bid #01111-12 - Services, Energy Management Integration

OVERALL BID QUESTIONS

There are no questions associated with this bid. If you would like to submit a question, please click on the "Create New Question" button below.