COLLIN COUNTY

Office of the Purchasing Agent
2300 Bloomdale Road
Suite 3160
McKinney, Texas 75071
www.collincountytx.gov

COLLIN COUNTY, TEXAS

ADDENDUM No. Three (3) IFB No. 2018-162

INVITATION FOR BID

FOR

CONSTRUCTION, COLLIN COUNTY JUSTICE CENTER, UPGRADE PNEUMATIC TO ELECTRONIC ACTUATORS

DATE: MAY 9, 2018

NOTICE TO ALL PROSPECTIVE BIDDERS:

PLEASE MAKE THE FOLLOWING CHANGES TO THE INVITATION FOR BID:

ADD DOCUMENT:	APRIL 24, 2018 PRE-BID SIGN-IN SHEET
ADD DOCUMENT:	APRIL 24, 2018 PRE-BID CLARIFICATIONS
ADD DOCUMENT:	ENGINEER'S ADDENDUM 3
DELETE DOCUMENT:	REVISED SECTION 23 09 00
REPLACE WITH:	SECTION 23 09 00 REV. 2
ADD DOCUMENT:	SECTION 23 09 00 SUPPLEMENTAL INFORMATION
DELETE DOCUMENT:	DRAWING EO.1
REPLACE WITH:	DRAWING EO.1 REV. 1
DELETE DOCUMENT:	DRAWING EO.2
REPLACE WITH:	DRAWING EO.2 REV. 1
DELETE DOCUMENT:	DRAWING MO.0
REPLACE WITH:	DRAWING MO.0 REV. 1
DELETE DOCUMENT:	DRAWING ME3.1
REPLACE WITH:	DRAWING ME3.1 REV. 1
ADD ATTRIBUTE:	#20-ADDENDUM 3 ACKNOWLEDGEMENT

DELETE DOCUMENT: SECTION 004100-BID FORM ADDENDUM 2

REPLACE WITH: SECTION 004100-BID FORM ADDENDUM 3

CHANGE QUESTION DEADLINE:	FROM:	MAY 4, 2018 AT 12:00 PM
	TO:	MAY 18, 2018 AT 12:00 PM
CHANGE INTENT TO BID DEADLINE:	FROM:	MAY 4, 2018 AT 5:00 PM
	TO:	MAY 18, 2018 AT 5:00 PM
CHANGE BID DUE DATE:	FROM:	MAY 10, 2018 AT 2:00 PM
	TO:	MAY 24, 2018 AT 2:00 PM

ALL OTHER TERMS AND CONDITIONS OF THE BID AND SPECIFICATIONS REMAIN THE SAME.

SINCERELY,
MICHALYN RAINS, CPPO, CPPB
PURCHASING AGENT

JDG

IFB# 2018-162
MANDATORY PRE-BID SIGN-IN SHEET

Project:	Construction, Collin County Justice Center, Upgrade Pneumatic to Electronic Actuators	**Meeting Date:**	April 24, 2018
Facilitator:	J. D. Griffin	**Place/Room:**	Collin County Justice Center Jail Lobby

Name	Company	Phone	Fax	E-Mail
SAM Deere	Compass	214-454-1580		sdeere@compassdallas.com
MIKE MATTERA	COMPASS	469-964-2360		MMATTERA@COMPASSDALLAS.COM
Danny Baumgartner	3D MSC	972-932-3810		danny@3dmsc.com
Larry Dalrymple	3D MSC	972-932-3810		larry@3dmsc.com
DENNIS EVANS	MD ENG	469-467-0200		devans@md-eng.com
RICHARD REDD	JMS-IBS	817-791-9215		r.redd@JMS-IBS.com
MIKE KENDRICK	JMS	214-243-3425		mikekendrick@automated-controls.net
Felipe Gayle	JMS	972-750-6130		f.gayle@JMS-IBS.com
Brad Harris	Collin County	972-547-5492		bjharris@co.collin.tx.us
Ricky Thomas	Collin County	972-547-5365		rthomas2@co.collin.tx.us
LAZ VADASZ	CC	9725475332		lvadasz@co.collin.tx.us
Rickee Harris	CC	9725475343		rwharris@ " " " "
George King	CC	9725475363		gking@co.collin.tx.us
Bill Barker	CC	972-547-5340		bbarker@co.collin.tx.us
J.D. Griffin	Collin County			

April 24, 2018 Pre-bid Conference Clarifications

1. Actuator supplemental to be provided by MD Engineering.
   Provided in Addendum #3

2. MD Engineering to clarify if a Fire alarm contractor required.
   Shall be required for commissioning the new work to the existing fire alarm system.

3. MD Engineering to clarify smoke damper actuator rating.
   Addendum #3 shows the 2-position requirement outlined in the supplemental attachment to the specifications.

4. MD Engineering to clarify the power of actuators are low voltage.
   Addendum #3 shows the requirement that all of the actuators are low voltage as outlined in the supplemental attachment to the specifications.

5. MD Engineering to clarify demo requirements for the existing copper pneumatic lines.
   Addendum #3 – M0.0 outlines and clarifies the demo requirements for the project.

6. All power circuits are required to come from UPS power. UPS power is located in Mechanical Rooms A,B,C,D and in one of the two lower level mechanical rooms.
   Addendum #3 – E0.1 & E0.2 outlines the requirement for a point of use UPS at the new connections to the existing gen-set panels.

7. A permit will need to be pulled for the electrical portion of the project.

8. Information to the contractors- Note the approximate door opening for the POD entry is 2' 11 9/16". Contractors are required to verify for equipment access prior to bid.

9. Information to the contractors-The contractor should allow minimum of 1 hour per day to access in and out of the facility.

10. Information to the contractors- No walking on the plaster ceilings. May require scaffolding or walk boards in areas of ceilings to access actuators.

11. Information to the contractors- T20 security bits on tectum ceiling T25 and T27 security bits.

12. MD Engineering to clarify where the documents clarify wire requirements for plenum rated wire and where conduit is required. Conduit in mechanical rooms? Control wire plenum rated about ceiling and chase?
    Addendum #3 line item modification to the specifications clarifies these installation requirements.

14. Collin County will provide all UPS power at the existing UPS power locations.

15. Bidder shall state the number of calendar days to complete the project from notice to proceed on Attribute 1.

DATE: May 3, 2018

PROJECT: **FY18 AD Pneu to DDC Conversion**

TO: **John Griffin**

RE: Addendum #3

John,

1. Attached are the changes to add the sizing of the actuators in the form of an attachment to the back of Specification 23 09 00 after Part 3 – Execution 3.5. The supplemental PDF's are attached.

2. Based on the last owner comments the new actuators need to be UPS backed up to prevent delays in the operation of the formal smoke evacuation system when power is deactivated. We are adding individual UPS units at the existing panels. Additions have been made to electrical schedules drawings E.0.1 and E0.2 to reflect changes.

3. Drawing M0.0 – Revised Demolition Note #5 – Added the provision to remove the pneumatic copper tubes on the project where physically possible.

4. We have also added several control diagrams on drawing ME3.1 to further clarifying the new work installation requirements.

5. We will need a licensed Fire Alarm Contractor to commission the new actuators input signals at the existing Fire Alarm System Panel designated on drawing ME3.1.

6. Specification section 23 09 00 / 3.5 C. - Add the following sentence; "All wiring for smoke control system shall follow IFC & IEC… All wiring in a smoke control system shall be in a continuous raceway (conduit)". Control wiring in mechanical rooms shall be in conduit.

End of Addendum #3

Please contact me if you have any questions or concerns.

Sincerely,

Dennis J. Evans
MD Engineering, LLP

SECTION 23 09 00 - INSTRUMENTATION AND CONTROL FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to the Work in this Section.

1.2 SUMMARY

A. This Section includes control equipment for HVAC systems, components and other systems shown to be controlled by the existing ~~Barber-Colman (Lon Works)~~ Building Automation System (BAS), including, but not limited to, revised computer software, controllers, transmission equipment, local panels, installation, engineering, supervision, commissioning, acceptance testing, training and warranty service necessary for a complete and working system, revising all of the pneumatic to electronic actuators revising all of the pneumatic to electronic actuators.

B. The Contractor shall furnish and install the controls including all necessary hardware and all revised operating and applications software necessary to perform the existing control sequences of operation as specified.

C. All components of the system – local controllers, unitary controllers, etc. shall communicate using the ~~BACnet~~ LonWorks protocol, as defined by the most current edition of ASHRAE Standard 135 and as specified herein or equal. Proprietary communications shall not be acceptable.

D. The BAS contractor shall review and study all drawings and the entire specification to become familiar with the equipment and system operation and to verify the quantities and types of controllers and devices to be provided.

E. All interlock, control and power wiring and installation of control devices associated with the equipment described in this specification, and maintain the existing sequence of operations, shall be provided under this Contract. All power wiring shall conform to the methods and materials described in Division 26 Section “Low-Voltage Electrical Power Conductors and Cables”.

F. Provide services and manpower necessary for commissioning of the revised control system.

G. All work performed under this section of the specifications will comply with all codes, laws and governing bodies. If the drawings and/or specifications are in conflict with governing codes, the Contractor shall submit a proposal with appropriate modifications to the project to meet code restrictions. If this specification and associated drawings exceed governing code requirements, the specification will govern. The Controls Contractor shall obtain and pay for all necessary construction permits and licenses associated with this scope of work.

1.3 QUALITY ASSURANCE

A. Additions and revisions to existing Building Automation System (BAS) shall be manufactured, tested and installed in accordance with the following standards:
1. National Electrical Manufacturers Association (NEMA).
2. Underwriters Laboratories (UL).

3. ~~BACnet Testing Laboratories (BTL).~~LonWorks
4. National Fire Protection Association (NFPA).

B. Installer Qualifications: Automatic control system manufacturer's authorized representative who is trained and approved for installation of system components required for this Project.

C. Upon completion of the installation, the Contractor shall thoroughly inspect, check, adjust, calibrate, and make ready for use all devices/sensors comprising the control system and certify that they are installed in accordance with "Record" Drawings.

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

E. Data Communications Protocol: Certify that each proposed Controls system component complies with ASHRAE Standard 135 for each protocol.

F. Controls system component testing: Comply with ASHRAE 135.1 and all addenda for all controllers.

G. All controllers used to control or monitor equipment and/or field devices shall be tested, compliant with and carry the mark of ~~the BACnet Testing Laboratories (BTL)~~LonWorks:
1. Building Controllers.
2. Advanced Application Controllers.
3. Application Specific Controllers.

H. Quality Management Program
1. Designate a competent and experienced employee to provide BAS Project Management. The designated Project Manger shall be full time on this project and be empowered to make financial, technical, scheduling and related decisions on behalf of the BMS Contractor. At minimum, the Project Manager shall:
   a. Serve as the point of contact for the Construction Team.
   b. Manage the scheduling of the work to ensure that adequate materials, labor and other resources are available when needed.
   c. Lead and be involved in the coordination efforts with other trades.
   d. Be responsible for the work and actions of the BAS workforce on site.

I. As evidence and assurance of the Contractor's ability to support the project's Commissioning efforts, the Contractor must have successfully completed three commissioned projects totaling at least the value of this contract, as a minimum.

1.4 SUBMITTALS

A. Provide submittals as required in Section 23 00 10, “Submittal Process”.

B. Product Data: For all products listed in Part 2 below provide detailed manufacturer product data, technical literature indicating dimensions, finishes, material, weights, performance characteristics, electrical characteristics, capacities, loads, required clearances, method of field assembly, components, and location and size of each field connection. Include manufacturer's technical literature for each control device. Indicate finishes for materials, and installation and startup instructions for each type of product indicated.
1. Existing Control System Software: Include technical data for operating the revised system software and other third-party applications including all software licensing agreements.
2. Revised Controlled Systems: Instrumentation list with element name, type of device, manufacturer, model number, and product data. Include schematic control diagram.

C. Shop Drawings:
   1. Bill of materials of equipment indicating quantity, manufacturer, and model number.
   2. Schematic flow/control diagrams showing fans, pumps, coils, dampers, valves, and control devices.
   3. Wiring Diagrams: Power, signal, and control wiring.
   4. Conductor numbering or color code schedules.
   5. Details of control panel faces, including controls, instruments, and labeling.
   6. Schedule of identification labels for controllers and devices.
   7. Floor plans indicating control panel locations.
   8. Schedule of dampers including size, leakage, and airflow characteristics.
   9. Revised Control System Hardware:
      a. Wiring diagrams for control units with termination numbers.
      b. Schematic diagrams and floor plans for control hardware.
      c. Schematic diagrams for control, communication, and power wiring.
   10. Revised Control System Software (as required): Graphics outline and “Print Page” examples of final product indicating monitored systems, data (connected and calculated) point addresses, output schedule, and operator notations.
   11. Controlled Systems:
      a. Schematic diagrams of each controlled system with control points labeled and control elements graphically shown, with wiring.
      b. Scaled drawings showing mounting, routing, and wiring of elements including bases and special construction.
      c. Points list.
   12. Submit hard and soft copies in file format compatible with AutoCAD 2012.

D. Data Communications Protocol Certificates: Certify that each proposed control system component complies with ASHRAE Standard 135 for each protocol.

E. Software Update and Firmware Operational Documentation: Include the following:
   1. Revised Software operating and upgrade manuals.
   2. Program Software Backup required to reinstall and configure system in the event of a catastrophic failure: On CD, complete with data files.

F. Field quality-control test report forms.

G. Contract Closeout Documentation:
   1. Revisions to Operation and Maintenance Data: Include emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
      a. Maintenance instructions and lists of spare parts for each type of control device.
      b. Interconnection wiring diagrams with identified and numbered system components and devices.
      c. Inspection period, cleaning methods, cleaning materials recommended, and calibration tolerances.
      d. Calibration records and list of set points.

1.5 WARRANTY

A. Controls Contractor shall guarantee all system components and installations to be free from defects for one (1) year from the date of acceptance as determined by the Owner. Any defects found during this period shall be repaired and/or replaced at no cost to the Owner. The Controls Contractor shall provide maximum of 24-hour response time for trouble calls or maintenance.

B. Controls Contractor shall provide all corrective software modifications or updates available from the software manufacturer during warranty service periods. All user documentation shall be updated on user and manufacturer backup software disks.

1.6 WORK BY OTHERS

A. The installation of motor starters that are not factory installed, thermal overload switches, and power wiring to motors, starters, and thermal overload switches, is specified in another section. This section includes the furnishing and installing of all controls, devices, interlocks, and wiring to provide a complete operating system as outlined in the existing building sequence of operation.

B. The following general work scope of Contractors requiring coordination by the Controls Contractor includes, but is not limited to:
   1. Electrical Contractor shall:
      a. Provide dedicated 120VAC circuits in ~~j~~J-boxes throughout all building areas for control panel and terminal box control power.

PART 2 - PRODUCTS

2.1 ACTUATORS

A. Electric Motors: Size to operate with sufficient reserve power to provide smooth modulating action or two-position action.
   1. Nonspring-Return Motors for Dampers Larger Than 25 Sq. Ft.: Size for running torque of 150 in. x lbf and breakaway torque of 300 in. x lbf.
   2. Spring-Return Motors for Dampers Larger Than 25 Sq. Ft.: Size for running and breakaway torque of 150 in. x lbf.

B. Electronic Actuators shall be of 0 10 VDC type. Direct-coupled type designed for minimum 60,000 full-stroke cycles at rated torque. The minimum actuator impedance shall be 800 ohms even when more than one actuator is connected in parallel. Spring return shall be required for two-position (NO/NC) control sequence or for steam valve control. Non-spring return actuators shall be used for all modulating sequence of control. They shall conform to all requirements of sequence descriptions specified or scheduled. Main mechanical equipment actuators shall have a manual position dial to allow manual positioning of valve in absence of control power.
   1. Dampers: Size for running torque calculated as follows:
      a. Opposed-Blade Damper with Edge Seals: 5 inch-lb/sq. ft. of damper.
      b. Opposed-Blade Damper without Edge Seals: 3 inch-lb/sq. ft. of damper.
      c. Parallel-Blade Damper with Edge Seals: 7 inch-lb/sq. ft. of damper.
      d. Parallel-Blade Damper without Edge Seals: 4 inch-lb/sq. ft of damper.
      e. Dampers with 2- to 3-Inch wg of Pressure Drop or Face Velocities of 1000 to 2500 fpm: Increase running torque by 1.5.
      f. Dampers with 3- to 4-Inch wg of Pressure Drop or Face Velocities of 2500 to 3000 fpm: Increase running torque by 2.0.
      g. Nonspring-Return Motors for Dampers Larger Than 25 Sq. Ft.: Size for running torque of 150 in. x lbf and breakaway torque of 300 in. x lbf.
      h. Spring-Return Motors for Dampers Larger Than 25 Sq. Ft.: Size for running and breakaway torque of 150 in. x lbf.
   2. Coupling: V-bolt and V-shaped, toothed cradle.
   3. Overload Protection: Electronic overload or digital rotation-sensing circuitry.
   4. Fail-Safe Operation: Mechanical, spring-return mechanism. Provide external, manual gear release on nonspring-return actuators.
   5. Power Requirements (Two-Position Spring Return): 24-Vac.
   6. Power Requirements (Modulating): Maximum 10 VA at 24-V ac or 8 W at 24-V dc.
   7. Proportional Signal: 2- to 10-V dc or 4 to 20 mA, and 2- to 10-V dc position feedback signal with damper position indicator indicating percent of travel.
   8. Temperature Rating: Minus 0 degrees to plus 122 deg F.
   9. Actuator Housing: Molded or die-cast zinc or aluminum.

10. Comply with NEMA designation.
11. Size to operate with sufficient reserve power to provide smooth modulating action or two-position action.
    a. Permanent Split-Capacitor or Shaded-Pole Type: Gear trains completely oil immersed and sealed. Equip spring-return motors with integral spiral-spring mechanism in housings designed for easy removal for service or adjustment of limit switches, auxiliary switches, or feedback potentiometer.

C. Actuators for smoke dampers shall be 24V floating point, 0-10Vdc, modulating and their position shall be readable as open or closed via end switch at the OWS.

~~C.~~D. Actuators shall be Belimo or pre-approved equal manufacturer.

2.2 CONTROL CABLE

A. Electronic and fiber-optic cables for control wiring are specified in Division 27 Section "Communications Horizontal Cabling".

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE, AND HANDLING

A. Factory-Mounted Components: Where control devices specified in this Section are indicated to be factory mounted on equipment in other Sections, arrange for shipping of control devices to equipment manufacturer. Upon delivery the equipment manufacturer shall inspect shipment for visual damages. The Controls Contractor shall replace any damaged control equipment at no cost to the Owner.

B. Provide factory shipping containers for each piece of equipment. Provide factory applied plastic end caps on each length of pipe and tube. Maintain cartons and end caps through shipping, storage and handling as required to prevent equipment and pipe-end damage, and to eliminate dirt and moisture from equipment and inside of pipe and tube. Where possible store equipment and materials inside and protected from weather. When necessary, to store outside, elevate well above grade and enclose with durable water-proof wrapping.

3.2 EXAMINATION

A. Verify that power supply is available to all controllers, and electric actuators.

3.3 COORDINATION

A. Coordinate equipment with Division 28 Section "Fire Detection and Alarm" to achieve compatibility with equipment that interfaces with that system.

B. Coordinate supply of conditioned electrical branch circuits for control units with Division 26 contractor. BAS contractor responsible for work associated with installation of power supply from electrical panelboard to all powered controllers and devices.

C. Coordinate equipment with Division 26 Section "Electrical Power Monitoring and Control" to achieve compatibility of communication interfaces.

D. Coordinate equipment with Division 26 Section "Panelboards" to achieve compatibility with starter coils and annunciation devices.

3.4 INSTALLATION

A. Install software in control units. Implement all features of programs to specified requirements and as appropriate to achieve the existing sequence of operations.

B. Connect and configure equipment and software to achieve the existing sequence of operations.

C. Install damper motors on outside of duct in warm areas, not in locations exposed to outdoor temperatures.

D. Install labels and nameplates to identify control components according to existing Base Building Division 23 standards.

3.5 ELECTRICAL WIRING AND CONNECTION INSTALLATION

A. Install systems and materials in accordance with manufacturer's instructions, rough-in drawings and equipment details. Install electrical components and use electrical products complying with requirements of applicable Division 26 Sections of these Specifications except where specifically stated in this Section.

B. The term "control wiring" is defined to include providing of wire, conduit, and miscellaneous material as required for mounting and connecting electric or electronic control devices.

C. Install all control wiring in conduit for electric/electronic control systems. Conceal wiring, except in mechanical rooms and areas where other conduit and piping are exposed. UL plenum rated cable shall be allowed above accessible lift out ceilings, in air plenums and in other areas as approved by Engineer and local and NEC codes.

D. All wiring for smoke control systems shall follow IFC & IEC

1. All wiring in a smoke control system shall be in a continuous raceway (conduit). This includes all mechanical and electrical rooms. Wiring shall not be free-aired.

~~C.~~E. Stub conduit to above lift out ceilings. Plastic bushing shall be installed where the wiring exits the conduit to prevent damage.

~~D.~~F. Properly support and run in a neat workmanlike manner all wiring and conduit. Run parallel to or at a right angle to building structure.

~~E.~~G. Number-code or color-code conductors, excluding those used for individual zone controls, appropriately for future identification and servicing of control system.

~~F.~~H. This section shall provide all line voltage power wiring required because of substitution of equipment specified in this section.

~~G.~~I. Install raceways, boxes, and cabinets according to Division 26 Section "Raceway and Boxes for Electrical Systems".

~~H.~~J. Install line voltage wiring in rigid conduit.

~~I.~~K. Install wire and cable according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables".

~~J.~~L. Install signal and communication cable according to Division 27 Section "Communications Horizontal Cabling".

1. Bundle and harness multi-conductor instrument cable in place of single cables where several cables follow a common path.
2. Fasten flexible conductors, bridging cabinets and doors, along hinge side; protect against abrasion. Tie and support conductors.
3. Number-code or color-code conductors for future identification and service of control system, except local individual room control cables.
4. Install wire and cable with sufficient slack and flexible connections to allow for vibration of piping and equipment.

3.6 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including connections. Report results in writing.

B. Perform the following field tests and inspections and prepare test reports:
1. Operational Test: After electrical circuitry has been energized, start units to confirm proper unit operation. Remove and replace malfunctioning units and retest.
2. Test and adjust controls and safeties.
3. Test each point through its full operating range to verify that safety and operating control set points are as required.
4. Test each control loop to verify stable mode of operation and compliance with sequence of operation. Adjust PID actions.
5. Test each system for compliance with the existing sequences of operation.
6. Test software and hardware interlocks.

C. Controls Verification:
1. Check dampers. Verify that proper blade alignment, either parallel or opposed, has been provided.
2. Check control system as follows:
a. Verify that controller power supply is from emergency power supply.
b. Verify that wires at control panels are tagged with their service designation and approved tagging system.
c. Verify that spare I/O capacity has been provided.
d. Verify that controllers are protected from power supply surges.

D. Replace damaged or malfunctioning controls and equipment and repeat testing procedures.

3.7 ADJUSTING

A. Calibrating and Adjusting:
1. Calibrate instruments.
2. Make three-point calibration test for both linearity and accuracy for each analog instrument.
3. Calibrate equipment and procedures using manufacturer's written recommendations and instruction manuals. Use test equipment with accuracy at least double that of instrument being calibrated.
4. Control System Inputs and Outputs:
a. Check digital inputs using jumper wire.
b. Check digital outputs using ohmmeter to test for contact making or breaking.
c. Check resistance temperature inputs at 0, 50, and 100 percent of span using a precision-resistant source.
5. Stroke and adjust control valves and dampers without positioners, following the manufacturer's recommended procedure, so that valve or damper is 100 percent open and closed.

6. Stroke and adjust control valves and dampers with positioners, following manufacturer's recommended procedure, so that valve and damper is 0, 50, and 100 percent closed.
7. Provide diagnostic and test instruments for calibration and adjustment of system.
8. Provide written description of procedures and equipment for calibrating each type of instrument. Submit procedures review and approval before initiating startup procedures.

END OF SECTION

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Supplemental Information

Belimo Actuator sizing Charts

for

SECTION 23 09 00 - INSTRUMENTATION AND CONTROL FOR HVAC

Area A - Mech Rm
A2001

Designation	Assoc Equip	Dmpr Size SqFt	Actuator Type	Torque Req. lb-in	Actuator	VA	Torque lb-in	Power Supply
2A-AD-1	HD-2A1	2.78	Modulating|Spring Return	19	FSAF24-SR	11	133	24 VAC
2A-AD-2	AHU-1	12.00	Modulating|Spring Return	84	FSAF24-SR	11	133	24 VAC
2A-AD-3	AHU-1	3.11	Modulating|Spring Return	22	FSAF24-SR	11	133	24 VAC
2A-AD-4	HD-1A1	16.00	Modulating|Spring Return	112	FSAF24-SR	11	133	24 VAC
2A-SD-1	AHU-1	1.35	Two-Position| Spring Return	9	FSTF24-S	5	18	24 VAC
2A-SD-2	AHU-1	4.00	Two-Position| Spring Return	28	FSLF24-S	15	30	24 VAC
2A-SD-3	AHU-1	0.99	Two-Position| Spring Return	7	FSTF24-S	5	18	24 VAC
2A-SD-4	AHU-1	2.89	Two-Position| Spring Return	20	FSLF24-S	15	30	24 VAC
2A-SD-5	AHU-1	4.00	Two-Position| Spring Return	28	FSLF24-S	15	30	24 VAC
2A-SD-6	AHU-1	4.72	Two-Position| Spring Return	33	FSNF24-S	24	70	24 VAC
2A-SD-7	AHU-1	1.67	Two-Position| Spring Return	12	FSTF24-S	5	18	24 VAC
2A-SD-8	AHU-1	1.17	Two-Position| Spring Return	8	FSTF24-S	5	18	24 VAC
2A-SD-9	AHU-1	1.50	Two-Position| Spring Return	11	FSTF24-S	5	18	24 VAC
2A-SD-10	AHU-1	1.00	Two-Position| Spring Return	7	FSTF24-S	5	18	24 VAC
2A-SD-11	AHU-1	1.00	Two-Position| Spring Return	7	FSTF24-S	5	18	24 VAC

2A-SD-12	AHU-1	1.00	Two-Position| Spring Return	7	FSTF24-S	5	18	24 VAC
1A-SD-13	AHU-1	0.50	Two-Position| Spring Return	4	FSTF24-S	5	18	24 VAC
1A-SD-14	AHU-1	0.69	Two-Position| Spring Return	5	FSTF24-S	5	18	24 VAC
1A-SD-15	EF-1A3	0.56	Two-Position| Spring Return	4	FSTF24-S	5	18	24 VAC
1A-SD-16	EF-1A3	0.56	Two-Position| Spring Return	4	FSTF24-S	5	18	24 VAC
1A-SD-17	AHU-1	0.56	Two-Position| Spring Return	4	FSTF24-S	5	18	24 VAC
1A-SD-18	AHU-1	1.00	Two-Position| Spring Return	7	FSTF24-S	5	18	24 VAC
1A-SD-19	AHU-1	0.83	Two-Position| Spring Return	6	FSTF24-S	5	18	24 VAC
1A-SD-20	AHU-1	0.83	Two-Position| Spring Return	6	FSTF24-S	5	18	24 VAC
2A-SD-SS	AHU-1	1.22	Two-Position| Spring Return	9	FSTF24-S	5	18	24 VAC
					24 VAC Power	198	VA	

Area B

Designation	Assoc Equip	Dmpr Size SqFt	Actuator Type	Torque Req. lb-in	Actuator	VA	Torque lb-in	Power Supply
2B-AD-1	AHU 3.4	2.78	Modulating|Spring Return	19	FSAF24-SR	10	133	24 VAC
2B-AD-2	AHU 3,4	5.56	Modulating|Spring Return	39	FSAF24-SR	10	133	24 VAC
2B-AD-3	AHU 3,4	8.89	Modulating|Spring Return	62	FSAF24-SR	10	133	24 VAC
1B-AD-4	SF-1B1	5.84	Modulating|Spring Return	41	FSAF24-SR	10	133	24 VAC
1B-AD-5	EF-1B8	10.03	Modulating|Spring Return	70	FSAF24-SR	10	133	24 VAC

1B-AD-6	EF-1B9	10.03	Modulating|Spring Return	70	FSAF24-SR	10	133	24 VAC
1B-AD-7	SF-1B10	5.84	Modulating|Spring Return	41	FSAF24-SR	10	133	24 VAC
1B-SD-1	EF-1B	0.56	Two-Position| Spring Return	4	FSTF24-S	5	18	24 VAC
1B-SD-2	AHU-4	0.44	Two-Position| Spring Return	3	FSTF24-S	5	18	24 VAC
1B-SD-3	AHU-4	0.56	Two-Position| Spring Return	4	FSTF24-S	5	18	24 VAC
1B-SD-4	AHU-4	1.40	Two-Position| Spring Return	10	FSTF24-S	5	18	24 VAC
1B-SD-5	AHU-4	2.33	Two-Position| Spring Return	16	FSTF24-S	5	18	24 VAC
1B-SD-6	AHU-4	2.78	Two-Position| Spring Return	19	FSLF24-S	15	30	24 VAC
1B-SD-7	AHU-3	0.67	Two-Position| Spring Return	5	FSTF24-S	5	18	24 VAC
1B-SD-8	AHU-3	0.44	Two-Position| Spring Return	3	FSTF24-S	5	18	24 VAC
1B-SD-9	AHU-3	0.44	Two-Position| Spring Return	3	FSTF24-S	5	18	24 VAC
1B-SD-10	AHU-3	0.44	Two-Position| Spring Return	3	FSTF24-S	5	18	24 VAC
1B-SD-11	AHU-3	0.44	Two-Position| Spring Return	3	FSTF24-S	5	18	24 VAC
1B-SD-12	AHU-4	2.33	Two-Position| Spring Return	16	FSTF24-S	5	18	24 VAC
1B-SD-13	AHU-4	1.40	Two-Position| Spring Return	10	FSTF24-S	5	18	24 VAC
1B-SD-14	AHU-4	3.88	Two-Position| Spring Return	27	FSLF24-S	15	30	24 VAC
1B-SD-15	AHU-4	4.72	Two-Position| Spring Return	33	FSNF24-S	24	70	24 VAC
1B-SD-16	AHU-4	0.83	Two-Position| Spring Return	6	FSTF24-S	5	18	24 VAC

1B-SD-17	EF-1B6	0.20	Two-Position| Spring Return	1	FSTF24-S	5	18	24 VAC
1B-SD-18	AHU-3	0.50	Two-Position| Spring Return	4	FSTF24-S	5	18	24 VAC
1B-SD-19	AHU-3	1.83	Two-Position| Spring Return	13	FSTF24-S	5	18	24 VAC
1B-SD-20	AHU-3	0.67	Two-Position| Spring Return	5	FSTF24-S	5	18	24 VAC
1B-SD-21	AHU-3	0.67	Two-Position| Spring Return	5	FSTF24-S	5	18	24 VAC
1B-SD-22	AHU-4	4.44	Two-Position| Spring Return	31	FSNF24-S	24	70	24 VAC
1B-SD-23	AHU-4	2.89	Two-Position| Spring Return	20	FSLF24-S	15	30	24 VAC
1B-SD-24	AHU-4	2.88	Two-Position| Spring Return	20	FSLF24-S	15	30	24 VAC
1B-SD-25	AHU-4	3.25	Two-Position| Spring Return	23	FSLF24-S	15	30	24 VAC
1B-SD-26	AHU-4	1.78	Two-Position| Spring Return	12	FSTF24-S	5	18	24 VAC
2B-SD-27	AHU-4	3.88	Two-Position| Spring Return	27	FSLF24-S	15	30	24 VAC
2B-SD-28	AHU-4	4.00	Two-Position| Spring Return	28	FSLF24-S	15	30	24 VAC
2B-SD-29	AHU-3	1.83	Two-Position| Spring Return	13	FSTF24-S	5	18	24 VAC
2B-SD-30	AHU-3	2.75	Two-Position| Spring Return	19	FSLF24-S	15	30	24 VAC
2B-SD-31	AHU-3	2.72	Two-Position| Spring Return	19	FSLF24-S	15	30	24 VAC
2B-SD-32	AHU-3	1.83	Two-Position| Spring Return	13	FSTF24-S	5	18	24 VAC
2B-SD-33	AHU-3	1.17	Two-Position| Spring Return	8	FSTF24-S	5	18	24 VAC
2B-SD-34	AHU-3	1.17	Two-Position| Spring Return	8	FSTF24-S	5	18	24 VAC

2B-SD-35	AHU-4	2.78	Two-Position| Spring Return	19	FSLF24-S	15	30	24 VAC
2B-SD-36	AHU-4	7.50	Two-Position| Spring Return	53	FSNF24-S	24	70	24 VAC
2B-SD-37	AHU-4	3.89	Two-Position| Spring Return	27	FSLF24-S	15	30	24 VAC
2B-SD-38	AHU-4	0.78	Two-Position| Spring Return	5	FSTF24-S	5	18	24 VAC
2B-SD-39	AHU-4	0.78	Two-Position| Spring Return	5	FSTF24-S	5	18	24 VAC
2B-SD-40	AHU-4	7.33	Two-Position| Spring Return	51	FSNF24-S	24	70	24 VAC
2B-SD-41	AHU-4	7.33	Two-Position| Spring Return	51	FSNF24-S	24	70	24 VAC
2B-SD-42	AHU-4	3.00	Two-Position| Spring Return	21	FSLF24-S	15	30	24 VAC
2B-SD-43	AHU-4	1.33	Two-Position| Spring Return	9	FSTF24-S	5	18	24 VAC
2B-SD-44	AHU-4	1.00	Two-Position| Spring Return	7	FSTF24-S	5	18	24 VAC
1B-SD-45	AHU-3	6.25	Two-Position| Spring Return	44	MS4109F1210	23	80	24 VAC
1B-SD-46	EF-1B6	0.56	Two-Position| Spring Return	4	FSTF24-S	5	18	24 VAC
1B-SD-47	AHU-3	0.44	Two-Position| Spring Return	3	FSTF24-S	5	18	24 VAC
1B-SD-48	AHU-4	3.25	Two-Position| Spring Return	23	FSLF24-S	15	30	24 VAC
1B-SD-49	AHU-4	3.00	Two-Position| Spring Return	21	FSLF24-S	15	30	24 VAC
1B-SD-50	AHU-4	3.88	Two-Position| Spring Return	27	FSLF24-S	15	30	24 VAC
1B-SD-51	AHU-4	0.83	Two-Position| Spring Return	6	FSTF24-S	5	18	24 VAC
1B-SD-52	AHU-4	3.88	Two-Position| Spring Return	27	FSLF24-S	15	30	24 VAC

1B-SD-53	AHU-3	6.00	Two-Position| Spring Return	42	FSNF24-S	24	70	24 VAC
1B-SD-54	AHU-3	0.44	Two-Position| Spring Return	3	FSTF24-S	5	18	24 VAC
1B-SD-55	AHU-3	0.44	Two-Position| Spring Return	3	FSTF24-S	5	18	24 VAC
1B-SD-56	AHU-3	0.69	Two-Position| Spring Return	5	FSTF24-S	5	18	24 VAC
1B-SD-57	AHU-3	0.78	Two-Position| Spring Return	5	FSTF24-S	5	18	24 VAC
1B-SD-58	AHU-3	1.17	Two-Position| Spring Return	8	FSTF24-S	5	18	24 VAC
1B-SD-59	AHU-3	0.44	Two-Position| Spring Return	3	FSTF24-S	5	18	24 VAC
1B-SD-60	AHU-3	0.56	Two-Position| Spring Return	4	FSTF24-S	5	18	24 VAC
1B-SD-61	AHU-3	0.83	Two-Position| Spring Return	6	FSTF24-S	5	18	24 VAC
1B-SD-62	AHU-4	0.44	Two-Position| Spring Return	3	FSTF24-S	5	18	24 VAC
1B-SD-63	AHU-4	1.00	Two-Position| Spring Return	7	FSTF24-S	5	18	24 VAC
					24 VAC Power	677	VA	

Area B

LL

Designation	Assoc Equip	Dmpr Size SqFt	Actuator Type	Torque Req. lb-in	Actuator	VA	Torque lb-in	Power Supply
0B-AD-8	AHU-2	6.25	Modulating|Spring Return	44	FSAF24-SR	10	133	24 VAC
0B-AD-9	AHU-2	6.25	Modulating|Spring Return	44	FSAF24-SR	10	133	24 VAC
0B-AD-10	EF-0B4	1.75	Modulating|Spring Return	12	FSAF24-SR	10	133	24 VAC
0B-AD-11	EF-0B3	3.33	Modulating|Spring Return	23	FSAF24-SR	10	133	24 VAC

0B-AD-12	AHU-2	1.77	Modulating|Spring Return	12	FSAF24-SR	10	133	24 VAC
0B-AD-13	AHU-2	3.25	Modulating|Spring Return	23	FSAF24-SR	10	133	24 VAC
0B-AD-14	AHU-2	1.83	Modulating|Spring Return	13	FSAF24-SR	10	133	24 VAC
0B-AD-15	EF-0B5	1.36	Modulating|Spring Return	10	FSAF24-SR	10	133	24 VAC
1A-SD-22	AHU-2	1.36	Two-Position| Spring Return	10	FSTF24-S	5	18	24 VAC
					24 VAC Power	85	VA	

Area C - Mech Rm C2001

Designation	Assoc Equip	Dmpr Size SqFt	Actuator Type	Torque Req. lb-in	Actuator	VA	Torque lb-in	Power Supply
2C-AD-1	HD-2C1	3.36	Modulating|Spring Return	24	FSAF24-SR	10	133	24 VAC
2C-AD-2	AHU-2	5.28	Modulating|Spring Return	37	FSAF24-SR	10	133	24 VAC
2C-AD-3	RF-2C1	7.78	Modulating|Spring Return	54	FSAF24-SR	10	133	24 VAC
2C-SD-1	AHU-6	5.25	Two-Position| Spring Return	37	FSNF24-S	24	70	24 VAC
2C-SD-2	AHU-6	4.00	Two-Position| Spring Return	28	FSLF24-S	15	30	24 VAC
2C-SD-3	AHU-5	6.75	Two-Position| Spring Return	47	FSNF24-S	24	70	24 VAC
2C-SD-4	AHU-5	2.44	Two-Position| Spring Return	17	FSTF24-S	5	18	24 VAC
2C-SD-5	AHU-5	3.56	Two-Position| Spring Return	25	FSLF24-S	15	30	24 VAC
2C-SD-6	AHU-5	4.22	Two-Position| Spring Return	30	FSLF24-S	15	30	24 VAC

2C-SD-7	AHU-5	2.89	Two-Position| Spring Return	20	FSLF24-S	15	30	24 VAC
2C-SD-8	MAU-2C1	2.25	Two-Position| Spring Return	16	FSTF24-S	5	18	24 VAC
2C-SD-9	AHU-6	1.33	Two-Position| Spring Return	9	FSTF24-S	5	18	24 VAC
2C-SD-10	AHU-6	1.33	Two-Position| Spring Return	9	FSTF24-S	5	18	24 VAC
2C-SD-11	AHU-6	0.69	Two-Position| Spring Return	5	FSTF24-S	5	18	24 VAC
1C-SD-12	AHU-4	1.36	Two-Position| Spring Return	10	FSTF24-S	5	18	24 VAC
1C-SD-13	AHU-4	2.88	Two-Position| Spring Return	20	FSLF24-S	15	30	24 VAC
1C-SD-14	AHU-5	1.33	Two-Position| Spring Return	9	FSTF24-S	5	18	24 VAC
1C-SD-15	AHU-5	1.33	Two-Position| Spring Return	9	FSTF24-S	5	18	24 VAC
					24 VAC Power	193	VA	

Area E - Mech Rm E2001

Designation	Assoc Equip	Dmpr Size SqFt	Actuator Type	Torque Req. lb-in	Actuator	VA	Torque lb-in	Power Supply
2E-AD-1	HD-2E1	3.36	Modulating|Spring Return	24	FSAF24-SR	10	133	24 VAC
2E-AD-2	AHU-8	5.28	Modulating|Spring Return	37	FSAF24-SR	10	133	24 VAC
2E-AD-3	AHU-8	6.67	Modulating|Spring Return	47	FSAF24-SR	10	133	24 VAC
2E-SD-1	AHU-7	6.67	Two-Position| Spring Return	47	FSNF24-S	24	70	24 VAC
2E-SD-2	AHU-7	6.67	Two-Position| Spring Return	47	FSNF24-S	24	70	24 VAC
2E-SD-3	AHU-7	3.75	Two-Position| Spring Return	26	FSLF24-S	15	30	24 VAC
2E-SD-4	AHU-8	5.75	Two-Position| Spring Return	40	FSNF24-S	24	70	24 VAC
2E-SD-5	EF-2E1	1.94	Two-Position| Spring Return	14	FSTF24-S	5	18	24 VAC
2E-SD-6	AHU-8	1.25	Two-Position| Spring Return	9	FSTF24-S	5	18	24 VAC
2E-SD-7	AHU-8	3.25	Two-Position| Spring Return	23	FSLF24-S	15	30	24 VAC
2E-SD-8	AHU-8	1.94	Two-Position| Spring Return	14	FSTF24-S	5	18	24 VAC

2E-SD-9	AHU-8	2.53	Two-Position| Spring Return	18	FSTF24-S	5	18	24 VAC
2E-SD-10	AHU-8	3.00	Two-Position| Spring Return	21	FSLF24-S	15	30	24 VAC
2E-SD-11	RF-2E1	6.67	Two-Position| Spring Return	47	FSNF24-S	24	70	24 VAC
2E-SD-12	AHU-7	4.50	Two-Position| Spring Return	32	FSNF24-S	24	70	24 VAC
2E-SD-13	AHU-7	5.00	Two-Position| Spring Return	35	FSNF24-S	24	70	24 VAC
2E-SD-14	AHU-7	6.67	Two-Position| Spring Return	47	FSNF24-S	24	70	24 VAC
2E-SD-15	AHU-7	6.67	Two-Position| Spring Return	47	FSNF24-S	24	70	24 VAC
1E-SD-16	AHU-8	1.25	Two-Position| Spring Return	9	FSTF24-S	5	18	24 VAC
1E-SD-17	AHU-8	3.25	Two-Position| Spring Return	23	FSLF24-S	15	30	24 VAC
1E-SD-18	AHU-8	1.94	Two-Position| Spring Return	14	FSTF24-S	5	18	24 VAC
1E-SD-19	AHU-8	2.53	Two-Position| Spring Return	18	FSTF24-S	5	18	24 VAC
1E-SD-20	AHU-8	3.00	Two-Position| Spring Return	21	FSLF24-S	15	30	24 VAC
1E-SD-21	RF-2E1	6.67	Two-Position| Spring Return	47	FSNF24-S	24	70	24 VAC
1E-SD-22	EF-2E1	1.94	Two-Position| Spring Return	14	FSTF24-S	5	18	24 VAC
					24 VAC Power	361 VA		

Area G

Designation	Assoc Equip	Dmpr Size SqFt	Actuator Type	Torque Req. lb-in	Actuator	VA	Torque lb-in	Power Supply
2G-AD-1	AHU-12	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2G-AD-2	AHU-12	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2G-AD-3	EF-2G26	8.00	Modulating|Spring Return	56	FSAF24-SR	10	133	24 VAC
2G-AD-4	AHU-10,13	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2G-AD-5	AHU-10,13	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2G-AD-6	EF-2G27	8.00	Modulating|Spring Return	56	FSAF24-SR	10	133	24 VAC
2G-AD-7	AHU-10,15	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2G-AD-8	AHU-10,15	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2G-AD-9	EF-2G28	8.00	Modulating|Spring Return	56	FSAF24-SR	10	133	24 VAC
2G-AD-10	AHU-14	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2G-AD-11	AHU-14	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2G-AD-12	EF-2G29	8.00	Modulating|Spring Return	56	FSAF24-SR	10	133	24 VAC

2G-AD-13	SF-2G10	6.14	Modulating|Spring Return	43	FSAF24-SR	10	133	24 VAC
2G-AD-14	SF-1G9	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
2G-AD-15	AHU-10	14.00	Modulating|Spring Return	98	FSAF24-SR	10	133	24 VAC
2G-AD-16	SF-2G18	5.56	Modulating|Spring Return	39	FSAF24-SR	10	133	24 VAC
2G-AD-17	EF-1G2	5.67	Modulating|Spring Return	40	FSAF24-SR	10	133	24 VAC
2G-AD-18	SF-2G8	6.14	Modulating|Spring Return	43	FSAF24-SR	10	133	24 VAC
2G-AD-19	SF-1G9	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
2G-AD-20	SF-2G7	6.14	Modulating|Spring Return	43	FSAF24-SR	10	133	24 VAC
2G-AD-21	SF-1G2	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
2G-AD-22	SF-2G10	6.14	Modulating|Spring Return	43	FSAF24-SR	10	133	24 VAC
2G-AD-23	SF-1G9	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
2G-AD-24	SF-2G15	2.78	Modulating|Spring Return	19	FSAF24-SR	10	133	24 VAC
2G-AD-25	SF-2G15	4.25	Modulating|Spring Return	30	FSAF24-SR	10	133	24 VAC
2G-AD-26	AHU-12	2.78	Modulating|Spring Return	19	FSAF24-SR	10	133	24 VAC
2G-AD-27	AHU-12	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2G-AD-28	EF-2G3	5.56	Modulating|Spring Return	39	FSAF24-SR	10	133	24 VAC
2G-AD-29	EF-2G7	22.56	Modulating|Spring Return	158	FSAF24-SR	10	133	24 VAC
2G-AD-30	EF-2G3	11.11	Modulating|Spring Return	78	FSAF24-SR	10	133	24 VAC
2G-AD-31	SF-2G16	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
2G-AD-32	EF-2G2	5.56	Modulating|Spring Return	39	FSAF24-SR	10	133	24 VAC
2G-AD-33	AHU-13	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2G-AD-34	EF-2G2	5.56	Modulating|Spring Return	39	FSAF24-SR	10	133	24 VAC
2G-AD-35	AHU-13	22.56	Modulating|Spring Return	158	FSAF24-SR	10	133	24 VAC
2G-AD-36	EF-2G2	11.11	Modulating|Spring Return	78	FSAF24-SR	10	133	24 VAC
2G-AD-37	SF-2G12	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
2G-AD-38	EF-2G1	5.56	Modulating|Spring Return	39	FSAF24-SR	10	133	24 VAC
2G-AD-39	AHU-15	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2G-AD-40	EF-2G1	5.56	Modulating|Spring Return	39	FSAF24-SR	10	133	24 VAC
2G-AD-41	EF-2G5	22.56	Modulating|Spring Return	158	FSAF24-SR	10	133	24 VAC
2G-AD-42	EF-2G1	11.11	Modulating|Spring Return	78	FSAF24-SR	10	133	24 VAC
2G-AD-43	2F-2G11	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
2G-AD-44	EF-2G4	5.56	Modulating|Spring Return	39	FSAF24-SR	10	133	24 VAC
2G-AD-45	AHU-14	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC

2G-AD-46	EF-2G4	5.56	Modulating|Spring Return	39	FSAF24-SR	10	133	24 VAC
2G-AD-47	EF-2G8	22.56	Modulating|Spring Return	158	FSAF24-SR	10	133	24 VAC
2G-AD-48	EF-2G4	11.11	Modulating|Spring Return	78	FSAF24-SR	10	133	24 VAC
2G-AD-49	SF-2G16	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
1G-AD-50	EF-1G2	3.36	Modulating|Spring Return	24	FSAF24-SR	10	133	24 VAC
1G-AD-51	EF-1G2	1.36	Modulating|Spring Return	10	FSAF24-SR	10	133	24 VAC
1G-AD-52	EF-1G2	1.36	Modulating|Spring Return	10	FSAF24-SR	10	133	24 VAC
1G-AD-53	EF-1G2	1.50	Modulating|Spring Return	11	FSAF24-SR	10	133	24 VAC
1G-AD-54	EF-1G2	1.33	Modulating|Spring Return	9	FSAF24-SR	10	133	24 VAC
1G-AD-55	EF-1G2	1.83	Modulating|Spring Return	13	FSAF24-SR	10	133	24 VAC
1G-AD-56	EF-1G2	0.83	Modulating|Spring Return	6	FSAF24-SR	10	133	24 VAC
1G-AD-57	EF-1G2	1.83	Modulating|Spring Return	13	FSAF24-SR	10	133	24 VAC
1G-AD-58	SF-1G7	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
1G-AD-59	SF-1G7	0.20	Modulating|Spring Return	1	FSAF24-SR	10	133	24 VAC
1G-AD-60	SF-1G11	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
1G-AD-61	SF-1G11	0.20	Modulating|Spring Return	1	FSAF24-SR	10	133	24 VAC
1G-AD-62	SF-1G1	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
1G-AD-63	SF-1G1	0.20	Modulating|Spring Return	1	FSAF24-SR	10	133	24 VAC
1G-AD-64	SF-1G4	5.06	Modulating|Spring Return	35	FSAF24-SR	10	133	24 VAC
1G-AD-65	SF-1G4	0.20	Modulating|Spring Return	1	FSAF24-SR	10	133	24 VAC
1G-AD-66	SF-1G8	5.06	Modulating|Spring Return	35	FSAF24-SR	10	133	24 VAC
1G-AD-67	SF-1G8	0.20	Modulating|Spring Return	1	FSAF24-SR	10	133	24 VAC
1G-AD-68	SF-1G1	5.06	Modulating|Spring Return	35	FSAF24-SR	10	133	24 VAC
1G-AD-69	SF-1G1	0.20	Modulating|Spring Return	1	FSAF24-SR	10	133	24 VAC
1G-AD-70	SF-1G10	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
1G-AD-71	SF-1G10	0.20	Modulating|Spring Return	1	FSAF24-SR	10	133	24 VAC
1G-AD-72	SF-1G8	5.06	Modulating|Spring Return	35	FSAF24-SR	10	133	24 VAC
1G-AD-73	SF-1G8	0.20	Modulating|Spring Return	1	FSAF24-SR	10	133	24 VAC
1G-AD-74	SF-2G18	1.22	Modulating|Spring Return	9	FSAF24-SR	10	133	24 VAC
2G-SD-1	AHU-10	2.53	Two-Position| Spring Return	18	FSTF24-S	5	18	24 VAC
2G-SD-2	AHU-12	7.78	Two-Position| Spring Return	54	FSNF24-S	24	70	24 VAC

2G-SD-3	AHU-10	14.00	Two-Position| Spring Return	98	FSAF24-S	35	133	24 VAC
2G-SD-4	AHU-13	7.78	Two-Position| Spring Return	54	FSNF24-S	24	70	24 VAC
2G-SD-5	AHU-15	7.78	Two-Position| Spring Return	54	FSNF24-S	24	70	24 VAC
2G-SD-6	AHU-14	7.78	Two-Position| Spring Return	54	FSNF24-S	24	70	24 VAC
2G-SD-7	EF-1G1	3.33	Two-Position| Spring Return	23	FSLF24-S	15	30	24 VAC
2G-SD-8	EF-1G2	5.67	Two-Position| Spring Return	40	FSNF24-S	24	70	24 VAC
2G-SD-9	SF-2G18	5.56	Two-Position| Spring Return	39	FSNF24-S	24	70	24 VAC
					24 VAC Power	939 VA		

Area H

Designation	Assoc Equip	Dmpr Size SqFt	Actuator Type	Torque Req. lb-in	Actuator	VA	Torque lb-in	Power Supply
2H-AD-1	AHU-16	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2H-AD-2	AHU-16	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2H-AD-3	EF-2H21	8.00	Modulating|Spring Return	56	FSAF24-SR	10	133	24 VAC
2H-AD-4	AHU-11,17	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2H-AD-5	AHU-11,17	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2H-AD-6	EF-2H28	8.00	Modulating|Spring Return	56	FSAF24-SR	10	133	24 VAC
2H-AD-7	AHU-11,19	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2H-AD-8	AHU-11,19	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2H-AD-9	EF-SH29	8.00	Modulating|Spring Return	56	FSAF24-SR	10	133	24 VAC
2H-AD-10	AHU-18	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2H-AD-11	AHU-18	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2H-AD-12	EF-2H30	8.00	Modulating|Spring Return	56	FSAF24-SR	10	133	24 VAC
2H-AD-13	SF-2H10	6.14	Modulating|Spring Return	43	FSAF24-SR	10	133	24 VAC
2H-AD-14	SF-1H9	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC

2H-AD-15	AHU-11	14.00	Modulating|Spring Return	98	FSAF24-SR	10	133	24 VAC
2H-AD-16	SF-2H18	5.56	Modulating|Spring Return	39	FSAF24-SR	10	133	24 VAC
2H-AD-17	EF-1H2	5.67	Modulating|Spring Return	40	FSAF24-SR	10	133	24 VAC
2H-AD-18	SF-2H8	6.14	Modulating|Spring Return	43	FSAF24-SR	10	133	24 VAC
2H-AD-19	SF-1H9	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
2H-AD-20	SF-2H7	6.14	Modulating|Spring Return	43	FSAF24-SR	10	133	24 VAC
2H-AD-21	SF-1H2	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
2H-AD-22	SF-1H14	2.17	Modulating|Spring Return	15	FSAF24-SR	10	133	24 VAC
2H-AD-23	SF-1H10	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
2H-AD-24	EF-2H7	5.56	Modulating|Spring Return	39	FSAF24-SR	10	133	24 VAC
2H-AD-25	AHU-16	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2H-AD-26	AHU-18	1.56	Modulating|Spring Return	11	FSAF24-SR	10	133	24 VAC
2H-AD-27	AHU-18	2.00	Modulating|Spring Return	14	FSAF24-SR	10	133	24 VAC
2H-AD-28	EF-2H7	5.56	Modulating|Spring Return	39	FSAF24-SR	10	133	24 VAC
2H-AD-29	EF-2H3	22.56	Modulating|Spring Return	158	FSAF24-SR	10	133	24 VAC
2H-AD-30	EF-2H7	11.11	Modulating|Spring Return	78	FSAF24-SR	10	133	24 VAC
2H-AD-31	SF-2H16	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
2H-AD-32	EF-2H6	5.56	Modulating|Spring Return	39	FSAF24-SR	10	133	24 VAC
2H-AD-33	AHU-17	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2H-AD-34	EF-2H6	5.56	Modulating|Spring Return	39	FSAF24-SR	10	133	24 VAC
2H-AD-35	EF-2H2	22.56	Modulating|Spring Return	158	FSAF24-SR	10	133	24 VAC
2H-AD-36	EF-2H6	11.11	Modulating|Spring Return	78	FSAF24-SR	10	133	24 VAC
2H-AD-37	SF-2H12	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
2H-AD-38	EF-2H5	5.56	Modulating|Spring Return	39	FSAF24-SR	10	133	24 VAC
2H-AD-39	AHU-19	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2H-AD-40	EF-2H5	5.56	Modulating|Spring Return	39	FSAF24-SR	10	133	24 VAC
2H-AD-41	EF-2H1	22.56	Modulating|Spring Return	158	FSAF24-SR	10	133	24 VAC
2H-AD-42	EF-2H5	11.11	Modulating|Spring Return	78	FSAF24-SR	10	133	24 VAC
2H-AD-43	SF-2H11	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
2H-AD-44	AHU-18	1.33	Modulating|Spring Return	9	FSAF24-SR	10	133	24 VAC
2H-AD-45	AHU-18	4.00	Modulating|Spring Return	28	FSAF24-SR	10	133	24 VAC
2H-AD-46	EF-2H8	5.56	Modulating|Spring Return	39	FSAF24-SR	10	133	24 VAC
2H-AD-47	EF-2H11	22.56	Modulating|Spring Return	158	FSAF24-SR	10	133	24 VAC

2H-AD-48	EF-2H8	11.11	Modulating|Spring Return	78	FSAF24-SR	10	133	24 VAC
2H-AD-49	SF-2H14	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
1H-AD-50	EF-1H2	3.36	Modulating|Spring Return	24	FSAF24-SR	10	133	24 VAC
1H-AD-51	EF-1H2	1.36	Modulating|Spring Return	10	FSAF24-SR	10	133	24 VAC
1H-AD-52	EF-1H2	1.36	Modulating|Spring Return	10	FSAF24-SR	10	133	24 VAC
1H-AD-53	EF-1H2	1.50	Modulating|Spring Return	11	FSAF24-SR	10	133	24 VAC
1H-AD-54	EF-1H2	1.33	Modulating|Spring Return	9	FSAF24-SR	10	133	24 VAC
1H-AD-55	EF-1H2	1.83	Modulating|Spring Return	13	FSAF24-SR	10	133	24 VAC
1H-AD-56	EF-1H2	0.83	Modulating|Spring Return	6	FSAF24-SR	10	133	24 VAC
1H-AD-57	EF-1H2	1.83	Modulating|Spring Return	13	FSAF24-SR	10	133	24 VAC
1H-AD-58	SF-1H8	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
1H-AD-59	SF-1H8	0.20	Modulating|Spring Return	1	FSAF24-SR	10	133	24 VAC
1H-AD-60	SF-1H7	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
1H-AD-61	SF-1H7	0.20	Modulating|Spring Return	1	FSAF24-SR	10	133	24 VAC
1H-AD-62	SF-1H6	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
1H-AD-63	SF-1H6	0.20	Modulating|Spring Return	1	FSAF24-SR	10	133	24 VAC
1H-AD-64	SF-1H4	5.06	Modulating|Spring Return	35	FSAF24-SR	10	133	24 VAC
1H-AD-65	SF-1H4	0.20	Modulating|Spring Return	1	FSAF24-SR	10	133	24 VAC
1H-AD-66	SF-1H8	5.06	Modulating|Spring Return	35	FSAF24-SR	10	133	24 VAC
1H-AD-67	SF-1H8	0.20	Modulating|Spring Return	1	FSAF24-SR	10	133	24 VAC
1H-AD-68	SF-1H1	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
1H-AD-69	SF-1H1	0.20	Modulating|Spring Return	1	FSAF24-SR	10	133	24 VAC
1H-AD-70	SH-1H11	3.14	Modulating|Spring Return	22	FSAF24-SR	10	133	24 VAC
1H-AD-71	SH-1H11	0.20	Modulating|Spring Return	1	FSAF24-SR	10	133	24 VAC
1H-AD-72	SF-1H12	6.00	Modulating|Spring Return	42	FSAF24-SR	10	133	24 VAC
1H-AD-73	SF-1H3	4.44	Modulating|Spring Return	31	FSAF24-SR	10	133	24 VAC
1H-AD-74	SF-2H18	1.22	Modulating|Spring Return	9	FSAF24-SR	10	133	24 VAC
1H-AD-75	EF-2H12	22.56	Modulating|Spring Return	158	FSAF24-SR	10	133	24 VAC
1H-AD-76	EF-2H27	11.11	Modulating|Spring Return	78	FSAF24-SR	10	133	24 VAC
1H-AD-77	AHU-18	0.35	Modulating|Spring Return	2	FSAF24-SR	10	133	24 VAC
2H-SD-1	AHU-11	2.53	Two-Position| Spring Return	18	FSTF24-S	5	18	24 VAC

2H-SD-2	AHU-16	7.78	Two-Position| Spring Return	54	FSNF24-S	24	70	24 VAC
2H-SD-3	AHU-11	14.00	Two-Position| Spring Return	98	FSAF24-S	35	133	24 VAC
2H-SD-4	AHU-17	7.78	Two-Position| Spring Return	54	FSNF24-S	24	70	24 VAC
2H-SD-5	AHU-19	7.78	Two-Position| Spring Return	54	FSNF24-S	24	70	24 VAC
2H-SD-6	AHU-18	7.78	Two-Position| Spring Return	54	FSNF24-S	24	70	24 VAC
2H-SD-7	EF-1H1	3.33	Two-Position| Spring Return	23	FSLF24-S	15	30	24 VAC
2H-SD-8	EF-1H2	5.67	Two-Position| Spring Return	40	FSNF24-S	24	70	24 VAC
2H-SD-9	SF-2H18	5.56	Two-Position| Spring Return	39	FSNF24-S	24	70	24 VAC
					24 VAC Power	969	VA	

POWER TO CONTROL DAMPER SCHEDULE - AREA 'A' (EXISTING)

DESIG.	LOCATION	ASSOC. EQUIP.	VOLTS/PH	VA	WIRE & CONDUIT	TERMINATION	120V HEAD-IN EQUIP. SOURCE	VOLTS/PH	LOCATION	WIRE & CONDUIT	TERMINATION
2A-AD-1	AREA A, LEVEL 2, MECH A200	HD-2A1	24/1	11	4# 16, 1/2" C.	DIRECT	E2BL-29	120/1	AREA A, LEVEL 2, MECH A2001	2#10, 1#10G. 3/4"C.	DIRECT
2A-AD-2	AREA A, LEVEL 2, MECH A200	AHU-1	24/1	11	4# 16, 1/2"C.	DIRECT					
2A-AD-3	AREA A, LEVEL 2, MECH A200	AHU-1	24/1	11	4# 16, 1/2"C.	DIRECT					
1A-AD-4	AREA A, LEVEL 1, RM 1220	HD-1A1	24/1	11	4# 16, 1/2"C.	DIRECT					
2A-SD-1	AREA A, LEVEL 2, MECH A200	AHU-1	24/1	15	4# 16, 1/2"C.	DIRECT					
2A-SD-2	AREA A, LEVEL 2, MECH A200	AHU-1	24/1	5	4# 16, 1/2"C.	DIRECT					
2A-SD-3	AREA A, LEVEL 2, MECH A200	AHU-1	24/1	15	4# 16, 1/2"C.	DIRECT					
2A-SD-4	AREA A, LEVEL 2, MECH A200	AHU-1	24/1	15	4# 16, 1/2"C.	DIRECT					
2A-SD-5	AREA A, LEVEL 2, MECH A200	AHU-1	24/1	24	4# 16, 1/2"C.	DIRECT					
2A-SD-6	AREA A, LEVEL 2, MECH A200	AHU-1	24/1	5	4# 16, 1/2"C.	DIRECT					
2A-SD-7	AREA A, LEVEL 2, MECH A200	AHU-1	24/1	5	4# 16, 1/2"C.	DIRECT					
2A-SD-8	AREA A, LEVEL 2, MECH A200	AHU-1	24/1	5	4# 16, 1/2"C.	DIRECT					
2A-SD-9	AREA A, LEVEL 2, MECH A200	AHU-1	24/1	5	4# 16, 1/2"C.	DIRECT					
2A-SD-10	AREA A, LEVEL 2, RM 2000A	AHU-1	24/1	5	4# 16, 1/2"C.	DIRECT					
2A-SD-11	AREA A, LEVEL 2, RM 2000A	AHU-1	24/1	5	4# 16, 1/2"C.	DIRECT					
2A-SD-12	AREA A, LEVEL 2, RM 2000A	AHU-1	24/1	5	4# 16, 1/2"C.	DIRECT					
1A-SD-13	AREA A, LEVEL 1, RM A1204	AHU-1	24/1	5	4# 16, 1/2"C.	DIRECT					
1A-SD-14	AREA A, LEVEL 1, RM A1204	AHU-1	24/1	5	4# 16, 1/2"C.	DIRECT					
1A-SD-15	AREA A, LEVEL 1, RM A1204	EF-1A3	24/1	5	4# 16, 1/2"C.	DIRECT					
1A-SD-16	AREA A, LEVEL 1, RM A1204	EF-1A3	24/1	5	4# 16, 1/2"C.	DIRECT					
1A-SD-17	AREA A, LEVEL 1, RM A1204	AHU-1	24/1	5	4# 16, 1/2"C.	DIRECT					
1A-SD-18	AREA A, LEVEL 1, RM A1208	AHU-1	24/1	5	4# 16, 1/2"C.	DIRECT					
1A-SD-19	AREA A, LEVEL 1, RM A1208	AHU-1	24/1	5	4# 16, 1/2"C.	DIRECT					
1A-SD-20	AREA A, LEVEL 1, RM A1209	AHU-1	24/1	5	4# 16, 1/2"C.	DIRECT					
2A-SD-22	AREA A, LEVEL 1, RM A1213	AHU-1	24/1	5	4# 16, 1/2"C.	DIRECT					
1A-SD-22	AREA A, LEVEL 2, CORR.	AHU-2	24/1	5	4# 16, 1/2"C.	DIRECT					

ACTUATOR SUM = 208

NOTES
1. DESIGATION ; 1-2-3 ; 1=BUILDING LEVEL / AREA ; 2=AD (AUTO DMPR) / SD (SMOKE DMPR) ; 3=DAMPER I.D. NUMBER
2. SERVICE ; OA=OUTSIDE AIR ; SA=SUPPLY AIR ; RA=RETURN AIR ; RE= RELIEF AIR ; EA=EXHAUST AIR ; TA= TRANSFER AIR
3. ALL DAMPER ACTUATORS ARE CURRENTLY PNEUMATIC AND NEED TO BE CHANGED TO ELECTRONIC.
4. CONTRACTOR SHALL PROVIDE AT EACH CIRCUIT A 1200VA 120V UPS MODEL APC BR1200G OR EQUIVALENT. (1)

CONTROL DAMPER SCHEDULE - AREA 'C' (EXISTING)

DESIG.	LOCATION	ASSOC. EQUIP.	VOLTS/PH	VA	WIRE & CONDUIT	TERMINATION	120V HEAD-IN EQUIP. SOURCE CIRCUIT	VOLTS/PH	LOCATION	WIRE & CONDUIT	TERMINATION
2C-AD-1	AREA C, LEVEL 2, MECH C2001	HD-2C1	24/1	10	4#16., 1/2"C.	DIRECT	E2BL-35	120/1	AREA C, LEVEL 2, MECH C20(	2#10,1#10G., 3/4"C.	DIRECT
2C-AD-2	AREA C, LEVEL 2, MECH C2001	AHU-2	24/1	10	4#16, 1/2"C.	DIRECT					
2C-AD-3	AREA C, LEVEL 2, MECH C2001	RF-2C1	24/1	10	4#16, 1/2"C.	DIRECT					
2C-SD-1	AREA C, LEVEL 2, MECH C2001	AHU-6	24/1	24	4#16, 1/2"C.	DIRECT					
2C-SD-2	AREA C, LEVEL 2, MECH C2001	AHU-6	24/1	15	4#16, 1/2"C.	DIRECT					
2C-SD-3	AREA C, LEVEL 2, MECH C2001	AHU-5	24/1	24	4#16, 1/2"C.	DIRECT					
2C-SD-4	AREA C, LEVEL 2, MECH C2001	AHU-5	24/1	5	4#16, 1/2"C.	DIRECT					
2C-SD-5	AREA C, LEVEL 2, MECH C2001	AHU-5	24/1	15	4#16, 1/2"C.	DIRECT					
2C-SD-6	AREA C, LEVEL 2, MECH C2001	AHU-5	24/1	15	4#16, 1/2"C.	DIRECT					
2C-SD-7	AREA C, LEVEL 2, MECH C2001	AHU-5	24/1	15	4#16, 1/2"C.	DIRECT					
2C-SD-8	AREA C, LEVEL 2, MECH C2001	MAU-2CI	24/1	5	4#16, 1/2"C.	DIRECT					
2C-SD-9	AREA C, LEVEL 2, C2001 CORR	AHU-6	24/1	5	4#16, 1/2"C.	DIRECT					
2C-SD-10	AREA C, LEVEL 2, C2001 CORR	AHU-6	24/1	5	4#16, 1/2"C.	DIRECT					
2C-SD-11	AREA C, LEVEL 2, C2001 CORR	AHU-6	24/1	5	4#16, 1/2"C.	DIRECT					
1C-SD-12	AREA C, LEVEL 2, C2002 CORR	AHU-4	24/1	5	4#16, 1/2"C.	DIRECT					
1C-SD-13	AREA C, LEVEL 1, RM B1412	AHU-4	24/1	15	4#16, 1/2"C.	DIRECT					
1C-SD-14	AREA C, LEVEL 1, RM C1503	AHU-5	24/1	5	4#16, 1/2"C.	DIRECT					
1C-SD-15	AREA C, LEVEL 1, RM C1500	AHU-5	24/1	5	4#16, 1/2"C.	DIRECT					

ACTUATOR SUI 193

NOTES
1. DESIGATION ; 1-2-3 ; 1=BUILDING LEVEL / AREA ; 2=AD (AUTO DMPR) / SD (SMOKE DMPR) ; 3=DAMPER I.D. NUMBER
2. SERVICE ; OA=OUTSIDE AIR ; SA=SUPPLY AIR ; RA=RETURN AIR ; RE= RELIEF AIR ; EA=EXHAUST AIR ; TA= TRANSFER AIR
3. ALL DAMPER ACTUATORS ARE CURRENTLY PNEUMATIC AND NEED TO BE CHANGED TO ELECTRONIC.
4. CONTRACTOR SHALL PROVIDE AT EACH CIRCUIT A 1200VA 120V UPS MODEL APC BR1200G OR EQUIVALENT. (1)

CONTROL DAMPER SCHEDULE - AREA 'E' (EXISTING)

DESIG.	LOCATION	ASSOC. EQUIP.	VOLTS/PH	VA	WIRE & CONDUIT	TERMINATION	120V HEAD-IN EQUIP. SOURCE CIRCUIT	VOLTS/PH	LOCATION	WIRE & CONDUIT	TERMINATION
2E-AD-1	AREA E, LEVEL 2, MECH E2001	HD-2E1	24/1	10	4# 16, 1/2"C.	DIRECT	1EL2-73	120/1	AREA E, LEVEL 2, MECH E20(	2#10, 1#10G., 3/4"C.	DIRECT
2E-AD-2	AREA E, LEVEL 2, MECH E2001	AHU-8	24/1	10	4#16, 1/2"C.	DIRECT					
2E-AD-3	AREA E, LEVEL 2, MECH E2001	AHU-8	24/1	10	4#16, 1/2"C.	DIRECT					
2E-SD-1	AREA E, LEVEL 2, MECH E2001	AHU-7	24/1	24	4#16, 1/2"C.	DIRECT					
2E-SD-2	AREA E, LEVEL 2, MECH E2001	AHU-7	24/1	24	4#16, 1/2"C.	DIRECT					
2E-SD-3	AREA E, LEVEL 2, MECH E2001	AHU-7	24/1	15	4#16, 1/2"C.	DIRECT					
2E-SD-4	AREA E, LEVEL 2, MECH E2001	AHU-8	24/1	24	4#16, 1/2"C.	DIRECT					
2E-SD-5	AREA E, LEVEL 2, MECH E2001	EF-2E1	24/1	5	4#16, 1/2"C.	DIRECT					
2E-SD-6	AREA E, LEVEL 2, MECH E2001	AHU-8	24/1	5	4#16, 1/2"C.	DIRECT					
2E-SD-7	AREA E, LEVEL 2, MECH E2001	AHU-8	24/1	15	4#16, 1/2"C.	DIRECT					
2E-SD-8	AREA E, LEVEL 2, MECH E2001	AHU-8	24/1	5	4#16, 1/2"C.	DIRECT					
2E-SD-9	AREA E, LEVEL 2, MECH E2001	AHU-8	24/1	5	4#16, 1/2"C.	DIRECT					
2E-SD-10	AREA E, LEVEL 2, MECH E2001	AHU-8	24/1	15	4#16, 1/2"C.	DIRECT					
2E-SD-11	AREA E, LEVEL 2, MECH E2001	RF-2E1	24/1	24	4#16, 1/2"C.	DIRECT					
2E-SD-12	AREA E, LEVEL 2, MECH E2001	AHU-7	24/1	24	4#16, 1/2"C.	DIRECT					
2E-SD-13	AREA E, LEVEL 2, MECH E2001	AHU-7	24/1	24	4#16, 1/2"C.	DIRECT					
2E-SD-14	AREA E, LEVEL 2, MECH E2001	AHU-7	24/1	24	4#16, 1/2"C.	DIRECT					
2E-SD-15	AREA E, LEVEL 2, MECH E2001	AHU-7	24/1	24	4#16, 1/2"C.	DIRECT					
1E-SD-16	AREA E, LEVEL 1, RM D1613 CHAS	AHU-8	24/1	5	4#16, 1/2"C.	DIRECT	LELA-36	120/1	AREA E, LEVEL 1, RM D1613 (	2#10, 1#10G., 3/4"C.	DIRECT
1E-SD-17	AREA E, LEVEL 1, RM D1613 CHAS	AHU-8	24/1	15	4#16, 1/2"C.	DIRECT					
1E-SD-18	AREA E, LEVEL 1, RM D1613 CHAS	AHU-8	24/1	5	4#16, 1/2"C.	DIRECT					
1E-SD-19	AREA E, LEVEL 1, RM D1613 CHAS	AHU-8	24/1	5	4#16, 1/2"C.	DIRECT					
1E-SD-20	AREA E, LEVEL 1, RM D1613 CHAS	AHU-8	24/1	15	4#16, 1/2"C.	DIRECT					
1E-SD-21	AREA E, LEVEL 1, RM D1613 CHAS	RF-2E1	24/1	24	4#16, 1/2"C.	DIRECT					
1E-SD-22	AREA E, LEVEL 1, RM D1613 CHAS	EF-2E1	24/1	5	4#16, 1/2"C.	DIRECT					

ACTUATOR SUM 361

NOTES
1. DESIGATION ; 1-2-3 ; 1=BUILDING LEVEL / AREA ; 2=AD (AUTO DMPR) / SD (SMOKE DMPR) ; 3=DAMPER I.D. NUMBER
2. SERVICE ; OA=OUTSIDE AIR ; SA=SUPPLY AIR ; RA=RETURN AIR ; RE= RELIEF AIR ; EA=EXHAUST AIR ; TA= TRANSFER AIR
3. ALL DAMPER ACTUATORS ARE CURRENTLY PNEUMATIC AND NEED TO BE CHANGED TO ELECTRONIC.
4. CONTRACTOR SHALL PROVIDE AT EACH CIRCUIT A 1200VA 120V UPS MODEL APC BR1200G OR EQUIVALENT. (1)

CONTROL DAMPER SCHEDULE - AREA 'B' (EXISTING)

DESIG.	LOCATION	ASSOC. EQUIP.	VOLTS/PH	VA	WIRE & CONDUIT	TERMINATION	120V HEAD-IN EQUIP. SOURCE	VOLTS/PH	LOCATION	WIRE & CONDUIT	TERMINATION
2B-AD-1	AREA B, LEVEL 2, MECH B2001	AHU-3,4	24/1	10	4 #16, 1/2"C.	DIRECT	E2BL-33	120/1	AREA B, LEVEL 2, MECH B2001	2#10,#10G., 3/4"C.	DIRECT
2B-AD-2	AREA B, LEVEL 2, MECH B2001	AHU-3,4	24/1	10	4 #16, 1/2"C.	DIRECT					
2B-AD-3	AREA B, LEVEL 2, MECH B2001	AHU-3,4	24/1	10	4 #16, 1/2"C.	DIRECT					
1B-AD-4	AREA B, LEVEL 1, RM B1307 N	SF-1B1	24/1	10	4 #16, 1/2"C.	DIRECT					
1B-AD-5	AREA B, LEVEL 1, RM B1307 NC	EF-1B8	24/1	10	4 #16, 1/2"C.	DIRECT					
1B-AD-6	AREA B, LEVEL 1, RM B1307 SC	EF-1B9	24/1	10	4 #16, 1/2"C.	DIRECT					
1B-AD-7	AREA B, LEVEL 1, RM B1307 S	SF-1B10	24/1	10	4 #16, 1/2"C.	DIRECT					
0B-AD-8	AREA B, LEVEL LL, MECH B0165	AHU-2	24/1	10	4 #16, 1/2"C.	DIRECT	E2BL-35	120/1	AREA B, LEVEL LL, MECH B016	2#10,1#10G.,3/4"C.	DIRECT
0B-AD-9	AREA B, LEVEL LL, MECH B0165	AHU-2	24/1	10	4 #16, 1/2"C.	DIRECT					
0B-AD-10	AREA B, LEVEL LL, MECH B0165	EF-0B4	24/1	10	4 #16, 1/2"C.	DIRECT					
0B-AD-11	AREA B, LEVEL LL, MECH B0165	EF-0B3	24/1	10	4 #16, 1/2"C.	DIRECT					
0B-AD-12	AREA B, LEVEL LL, MECH B0151	AHU-2	24/1	10	4 #16, 1/2"C.	DIRECT	E2BL-35	120/1	AREA B, LEVEL LL, MECH B015	2#10,1#10G.,3/4"C.	DIRECT
0B-AD-13	AREA B, LEVEL LL, MECH B0133	AHU-2	24/1	10	4 #16, 1/2"C.	DIRECT	E2BL-35	120/1	AREA B, LEVEL LL, MECH B015	2#10,1#10G.,3/4"C.	DIRECT
0B-AD-14	AREA B, LEVEL LL, MECH B0110	AHU-2	24/1	10	4 #16, 1/2"C.	DIRECT	E2BL-35	120/1	AREA B, LEVEL LL, MECH B015	2#10,1#10G.,3/4"C.	DIRECT
0B-AD-15	AREA B, LEVEL LL, MECH B0151	EF-0B5	24/1	10	4 #16, 1/2"C.	DIRECT	E2BL-35	120/1	AREA B, LEVEL LL, MECH B015	2#10,1#10G.,3/4"C.	DIRECT
1B-SD-1	AREA B, LEVEL 1,RM B1115	EF-1B	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-2	AREA B, LEVEL 1, RM B1115	AHU-4	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-3	AREA B, LEVEL 1, RM B1103	AHU-4	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-4	AREA B, LEVEL 1, RM B1103	AHU-4	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-5	AREA B, LEVEL 1, RM B1109	AHU-4	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-6	AREA B, LEVEL 1, RM B1330	AHU-4	24/1	15	4 #16, 1/2"C.	DIRECT					
1B-SD-7	AREA B, LEVEL 1, RM B1330	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-8	AREA B, LEVEL 1, RM B1331	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-9	AREA B, LEVEL 1, RM B1332	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-10	AREA B, LEVEL 1, RM B1329	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-11	AREA B, LEVEL 1, RM B1329	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-12	AREA B, LEVEL 1, RM B1116	AHU-4	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-13	AREA B, LEVEL 1, RM B1116	AHU-4	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-14	AREA B, LEVEL 1, RM 1350	AHU-4	24/1	15	4 #16, 1/2"C.	DIRECT					
1B-SD-15	AREA B, LEVEL 1, RM 1350	AHU-4	24/1	24	4 #16, 1/2"C.	DIRECT					
1B-SD-16	AREA B, LEVEL 1, RM 1350	AHU-4	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-17	AREA B, LEVEL 1, RM 1336	EF-1B6	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-18	AREA B, LEVEL 1, RM 1336	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-19	AREA B, LEVEL 1, RM 1336	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-20	AREA B, LEVEL 1, RM 1336	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-21	AREA B, LEVEL 1, RM 1336	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-22	AREA B, LEVEL 1, RM 1307	AHU-4	24/1	24	4 #16, 1/2"C.	DIRECT					
1B-SD-23	AREA B, LEVEL 1, RM 1307	AHU-4	24/1	15	4 #16, 1/2"C.	DIRECT					
1B-SD-24	AREA B, LEVEL 1, RM 1343	AHU-4	24/1	15	4 #16, 1/2"C.	DIRECT					
1B-SD-25	AREA B, LEVEL 1, RM 1343	AHU-4	24/1	15	4 #16, 1/2"C.	DIRECT					
1B-SD-26	AREA B, LEVEL 1, RM	AHU-4	24/1	5	4 #16, 1/2"C.	DIRECT					
2B-SD-27	AREA B, LEVEL 2, MECH B 2001	AHU-4	24/1	15	4 #16, 1/2"C.	DIRECT					
2B-SD-28	AREA B, LEVEL 2, MECH B 2001	AHU-4	24/1	15	4 #16, 1/2"C.	DIRECT					
2B-SD-29	AREA B, LEVEL 2, MECH B 2001	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
2B-SD-30	AREA B, LEVEL 2, MECH B 2001	AHU-3	24/1	15	4 #16, 1/2"C.	DIRECT					
2B-SD-31	AREA B, LEVEL 2, MECH B 2001	AHU-3	24/1	15	4 #16, 1/2"C.	DIRECT					
2B-SD-32	AREA B, LEVEL 2, MECH B 2001	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
2B-SD-33	AREA B, LEVEL 2, MECH B 2001	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
2B-SD-34	AREA B, LEVEL 2, MECH B 2001	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
2B-SD-35	AREA B, LEVEL 2, MECH B 2001	AHU-4	24/1	15	4 #16, 1/2"C.	DIRECT					
2B-SD-36	AREA B, LEVEL 2, B 2001 E CORR	AHU-4	24/1	24	4 #16, 1/2"C.	DIRECT					
2B-SD-37	AREA B, LEVEL 2, B 2001 E CORR	AHU-4	24/1	15	4 #16, 1/2"C.	DIRECT					
2B-SD-38	AREA B, LEVEL 2, B 2001 E CORR	AHU-4	24/1	5	4 #16, 1/2"C.	DIRECT					
2B-SD-39	AREA B, LEVEL 2, B 2001 E CORR	AHU-4	24/1	5	4 #16, 1/2"C.	DIRECT					
2B-SD-40	AREA B, LEVEL 2, B 2001 E CORR	AHU-4	24/1	24	4 #16, 1/2"C.	DIRECT					
2B-SD-41	AREA B, LEVEL 2, B 2001 E CORR	AHU-4	24/1	24	4 #16, 1/2"C.	DIRECT					
2B-SD-42	AREA B, LEVEL 2, B 2001 E CORR	AHU-4	24/1	15	4 #16, 1/2"C.	DIRECT					
2B-SD-43	AREA B, LEVEL 2, MECH B 2001	AHU-4	24/1	5	4 #16, 1/2"C.	DIRECT					
2B-SD-44	AREA B, LEVEL 2, MECH B 2001	AHU-4	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-45	AREA B, LEVEL 2, MECH B 2001	AHU-3	24/1	23	4 #16, 1/2"C.	DIRECT					
1B-SD-46	AREA B, LEVEL 1, RM 1341	EF-1B6	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-47	AREA B, LEVEL 1, RM 1341	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-48	AREA B, LEVEL 1, RM 1341	AHU-4	24/1	15	4 #16, 1/2"C.	DIRECT					
1B-SD-49	AREA B, LEVEL 1, RM 1341	AHU-4	24/1	15	4 #16, 1/2"C.	DIRECT					
1B-SD-50	AREA B, LEVEL 1, RM B1349	AHU-4	24/1	15	4 #16, 1/2"C.	DIRECT					
1B-SD-51	AREA B, LEVEL 1, RM B1349	AHU-4	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-52	AREA B, LEVEL 1, RM B1349	AHU-4	24/1	15	4 #16, 1/2"C.	DIRECT					
1B-SD-53	AREA B, LEVEL 1, RM B1326	AHU-3	24/1	24	4 #16, 1/2"C.	DIRECT					
1B-SD-54	AREA B, LEVEL 1, RM B 1326	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-55	AREA B, LEVEL 1, RM B 1326	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-56	AREA B, LEVEL 1, RM B 1326	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-57	AREA B, LEVEL 1, RM B 1319	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-58	AREA B, LEVEL 1, RM B 1319	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-59	AREA B, LEVEL 1, RM B 1319	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-60	AREA B, LEVEL 1, RM B1332	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-61	AREA B, LEVEL 1, RM 1350	AHU-3	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-62	AREA B, LEVEL 1, RM B1117	AHU-4	24/1	5	4 #16, 1/2"C.	DIRECT					
1B-SD-63	AREA B, LEVEL 2, CORR B2002	AHU-4	24/1	5	4 #16, 1/2"C.	DIRECT					

ACTUATOR SUM 757

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Texas Registered Firm No. F-7489
500 North Central Expwy., Suite 310
Plano, TX 75074 469.467.0200
Email: mdengca@md-eng.com
Project Number: 17939

MD ENGINEERING

Collin County Justice Center
Upgrade Pneumatic to Electronic Actuators
4300 Community Ave. McKinney, Texas 75071

Revisions:

DATE	DESCRIPTION
04-25-18	△1 ADDENDUM #3

STATE OF TEXAS
DAVID P. MINDRUP
58909
REGISTERED PROFESSIONAL ENGINEER
04/25/18

ELECTRICAL SCHEDULES

Project No.
17939

Sheet No.
E0.1

CONTROL DAMPER SCHEDULE - AREA 'G' (EXISTING)

DESIG.	LOCATION	ASSOC. EQUIP.	VOLTS/PH	VA	WIRE & CONDUIT	TERMINATION	120V HEAD-IN EQUIP. SOURCE CIRCUIT	VOLTS/PH	LOCATION	WIRE & CONDUIT	TERMINATION
2G-AD-1	AREA G, LEVEL 2, MECH G2002	AHU-12	24/1	10	4#16, 1/2"C.	DIRECT	E1GL-39	120/1	AREA G, LEVEL 2, MECH G2002	2#10, 1#10G., 3/4"C.	DIRECT
2G-AD-2	AREA G, LEVEL 2, MECH G2002	AHU-12	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-3	AREA G, LEVEL 2, MECH G2002	EF-2G26	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-4	AREA G, LEVEL 2, MECH G2004	AHU-10,13	24/1	10	4#6, 1/2"C.	DIRECT	E1GL-39	120/1	AREA G, LEVEL 2, MECH G200	2#10, #10G., 3/4"C.	DIRECT
2G-AD-5	AREA G, LEVEL 2, MECH G2004	AHU-10,13	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-6	AREA G, LEVEL 2, MECH G2004	EF-2G27	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-7	AREA G, LEVEL 2, MECH G2004	AHU-10,15	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-8	AREA G, LEVEL 2, MECH G2004	AHU-10,15	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-9	AREA G, LEVEL 2, MECH G2004	EF-2G28	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-10	AREA G, LEVEL 2, MECH G2005	AHU-14	24/1	10	4#6, 1/2"C.	DIRECT	E1GL-39	120/1	AREA G, LEVEL 2, MECH G200	2#10, #10G., 3/4"C.	DIRECT
2G-AD-11	AREA G, LEVEL 2, MECH G2005	AHU-14	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-12	AREA G, LEVEL 2, MECH G2005	EF-2G29	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-13	AREA G, LEVEL 2, MECH G2002	SF-2G10	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-14	AREA G, LEVEL 1, NE DAY RM	SF-1G9	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-15	AREA G, LEVEL 2, MECH G2004	AHU-10	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-16	AREA G, LEVEL 2, MECH G2004	SF-2G18	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-17	AREA G, LEVEL 2, MECH G2004	EF-1G2	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-18	AREA G, LEVEL 2, MECH G2004	SF-2G8	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-19	AREA G, LEVEL 1, SE DAY RM	SF-1G9	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-20	AREA G, LEVEL 2, MECH G2004	SF-2G7	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-21	AREA G, LEVEL 1, SW DAY RM	SF-1G2	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-22	AREA G, LEVEL 2, MECH G2005	SF-2G10	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-23	AREA G, LEVEL 1, NW DAY RM	SF-1G9	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-24	AREA G, LEVEL 2, NE REC AREA	SF-2G15	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-25	NOT USED										
2G-AD-26	AREA G, LEVEL 2, NE REC AREA	AHU-12	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-27	AREA G, LEVEL 2, NE REC AREA	AHU-12	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-28	AREA G, LEVEL 2, NE DAY RM	EF-2G3	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-29	AREA G, LEVEL 2, NE DAY RM	EF-2G7	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-30	AREA G, LEVEL 2, NE DAY RM	EF-2G3	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-31	AREA G, LEVEL 2, NE DAY RM	SF-2G16	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-32	AREA G, LEVEL 2, SE REC AREA	EF-2G2	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-33	AREA G, LEVEL 2, SE REC AREA	AHU-13	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-34	AREA G, LEVEL 2, SE DAY RM	EF-2G2	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-35	AREA G, LEVEL 2, SE DAY RM	EF-2G6	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-36	AREA G, LEVEL 2, SE DAY RM	EF-2G2	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-37	AREA G, LEVEL 2, SE DAY RM	SF-2G12	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-38	AREA G, LEVEL 2, SW REC AREA	EF-2G1	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-39	AREA G, LEVEL 2, SW REC AREA	AHU-15	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-40	AREA G, LEVEL 2, SW DAY RM	EF-2G1	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-41	AREA G, LEVEL 2, SW DAY RM	EF-2G5	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-42	AREA G, LEVEL 2, SW DAY RM	EF-2G1	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-43	AREA G, LEVEL 2, SW DAY RM	SF-2G11	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-44	AREA G, LEVEL 2, NW REC AREA	EF-2G4	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-45	AREA G, LEVEL 2, NW REC AREA	AHU-14	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-46	AREA G, LEVEL 2, NW DAY RM	EF-2G4	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-47	AREA G, LEVEL 2, NW DAY RM	EF-2G8	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-48	AREA G, LEVEL 2, NW DAY RM	EF-2G4	24/1	10	4#6, 1/2"C.	DIRECT					
2G-AD-49	AREA G, LEVEL 2, NW DAY RM	SF-2G16	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-50	AREA G, LEVEL 1, CORE AREA	EF-1G2	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-51	AREA G, LEVEL 1, CORE AREA	EF-1G2	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-52	AREA G, LEVEL 1, CORE AREA	EF-1G2	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-53	AREA G, LEVEL 1, CORE AREA	EF-1G2	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-54	AREA G, LEVEL 1, CORE AREA	EF-1G2	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-55	AREA G, LEVEL 1, CORE AREA	EF-1G2	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-56	AREA G, LEVEL 1, CORE AREA	EF-1G2	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-57	AREA G, LEVEL 1, CORE AREA	EF-1G2	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-58	AREA G, LEVEL 1, NE DAY RM	SF-1G7	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-59	AREA G, LEVEL 1, NE DAY RM	SF-1G7	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-60	AREA G, LEVEL 1, NE DAY RM	SF-1G11	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-61	AREA G, LEVEL 1, NE DAY RM	SF-1G11	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-62	AREA G, LEVEL 1, SE DAY RM	SF-1G1	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-63	AREA G, LEVEL 1, SE DAY RM	SF-1G1	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-64	AREA G, LEVEL 1, SE DAY RM	SF-1G4	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-65	AREA G, LEVEL 1, SE DAY RM	SF-1G4	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-66	AREA G, LEVEL 1, SW DAY RM	SF-1G8	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-67	AREA G, LEVEL 1, SW DAY RM	SF-1G8	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-68	AREA G, LEVEL 1, SW DAY RM	SF-1G1	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-69	AREA G, LEVEL 1, SW DAY RM	SF-1G1	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-70	AREA G, LEVEL 1, NW DAY RM	SF-1G10	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-71	AREA G, LEVEL 1, NW DAY RM	SF-1G10	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-72	AREA G, LEVEL 1, NW DAY RM	SF-1G8	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-73	AREA G, LEVEL 1, NW DAY RM	SF-1G8	24/1	10	4#6, 1/2"C.	DIRECT					
1G-AD-74	AREA G, LEVEL 1, CORE AREA	SF-2G18	24/1	10	4#6, 1/2"C.	DIRECT					
2G-SD-1	AREA G, LEVEL 2, MECH G2002	AHU-10	24/1	5	4#6, 1/2"C.	DIRECT					
2G-SD-2	AREA G, LEVEL 2, MECH G2002	AHU-12	24/1	24	4#6, 1/2"C.	DIRECT					
2G-SD-3	AREA G, LEVEL 2, MECH G2004	AHU-10	24/1	35	4#6, 1/2"C.	DIRECT					
2G-SD-4	AREA G, LEVEL 2, MECH G2004	AHU-13	24/1	24	4#6, 1/2"C.	DIRECT					
2G-SD-5	AREA G, LEVEL 2, MECH G2004	AHU-15	24/1	24	4#6, 1/2"C.	DIRECT					
2G-SD-6	AREA G, LEVEL 2, MECH G2005	AHU-14	24/1	24	4#6, 1/2"C.	DIRECT					
2G-SD-7	AREA G, LEVEL 2, MECH G2004	EF-1G1	24/1	15	4#6, 1/2"C.	DIRECT					
2G-SD-8	AREA G, LEVEL 2, MECH G2004	EF-1G2	24/1	24	4#6, 1/2"C.	DIRECT					
2G-SD-9	AREA G, LEVEL 2, MECH G2004	SF-2G18	24/1	24	4#6, 1/2"C.	DIRECT					
			ACTUATOR SUM	959							

NOTES
1. DESIGATION ; 1-2-3 ; 1=BUILDING LEVEL / AREA ; 2=AD (AUTO DMPR) / SD (SMOKE DMPR) ; 3=DAMPER I.D. NUMBER
2. SERVICE ; OA=OUTSIDE AIR ; SA=SUPPLY AIR ; RA=RETURN AIR ; RE= RELIEF AIR ; EA=EXHAUST AIR ; TA= TRANSFER AIR
~~3. ALL DAMPER ACTUATORS ARE CURRENTLY PNEUMATIC AND NEED TO BE CHANGED TO ELECTRONIC.~~
4. CONTRACTOR SHALL PROVIDE AT EACH CIRCUIT A 1200VA 120V UPS MODEL APC BR1200G OR EQUIVALENT.

1

CONTROL DAMPER SCHEDULE - AREA 'H' (EXISTING)

DESIG.	LOCATION	ASSOC. EQUIP.	VOLT/PH	VA	WIRE & CONDUIT	TERMINATION	120V HEAD-IN EQUIP. SOURCE CIRCUIT	VOLTS/PH	LOCATION	WIRE & CONDUIT	TERMINATION
2H-AD-1	AREA H, LEVEL 2, MECH H2002	AHU-16	24/1	10	4# 10, 1/2"C.	DIRECT	E1HL-35	120/1	AREA H, LEVEL 2, MECH H200	2#10, 1#10G., 3/4"C.	DIRECT
2H-AD-2	AREA H, LEVEL 2, MECH H2002	AHU-16	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-3	AREA H, LEVEL 2, MECH H2002	EF-2H21	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-4	AREA H, LEVEL 2, MECH H2004	AHU-11,17	24/1	10	4# 10, 1/2"C.	DIRECT	E1HL-35	120/1	AREA H, LEVEL 2, MECH H200	2#10, 1#10G., 3/4"C.	DIRECT
2H-AD-5	AREA H, LEVEL 2, MECH H2004	AHU-11,17	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-6	AREA H, LEVEL 2, MECH H2004	EF-2H28	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-7	AREA H, LEVEL 2, MECH H2004	AHU-11,19	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-8	AREA H, LEVEL 2, MECH H2004	AHU-11,19	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-9	AREA H, LEVEL 2, MECH H2004	EF-2H29	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-10	AREA H, LEVEL 2, MECH H2005	AHU-18	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-11	AREA H, LEVEL 2, MECH H2005	AHU-18	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-12	AREA H, LEVEL 2, MECH H2005	EF-2H30	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-13	AREA H, LEVEL 2, MECH H2002	SF-2H10	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-14	AREA H, LEVEL 1, NE DAY RM	SF-1H9	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-15	AREA H, LEVEL 2, MECH H2004	AHU-11	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-16	AREA H, LEVEL 2, MECH H2004	SF-2H18	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-17	AREA H, LEVEL 2, MECH H2004	EF-1H2	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-18	AREA H, LEVEL 2, MECH H2004	SF-2H8	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-19	AREA H, LEVEL 1, SE DAY RM	SF-1H9	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-20	AREA H, LEVEL 2, MECH H2004	SF-2H7	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-21	AREA H, LEVEL 1, SW DAY RM	SF-1H2	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-22	AREA H, LEVEL 1, CONTROL RM	SF-1H14	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-23	AREA H, LEVEL 1, NW DAY RM	SF-1H10	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-24	AREA H, LEVEL 2, NE REC AREA	EF-2H7	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-25	AREA H, LEVEL 2, NE REC AREA	AHU-16	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-26	AREA H, LEVEL 2, NW REC AREA	AHU-18	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-27	AREA H, LEVEL 2, NW REC AREA	AHU-18	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-28	AREA H, LEVEL 2, NE DAY RM	EF-2H7	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-29	AREA H, LEVEL 2, NE DAY RM	EF-2H3	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-30	AREA H, LEVEL 2, NE DAY RM	EF-2H7	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-31	AREA H, LEVEL 2, NE DAY RM	SF-2H16	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-32	AREA H, LEVEL 2, SE REC AREA	EF-2H6	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-33	AREA H, LEVEL 2, SE REC AREA	AHU-17	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-34	AREA H, LEVEL 2, SE DAY RM	EF-2H6	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-35	AREA H, LEVEL 2, SE DAY RM	EF-2H2	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-36	AREA H, LEVEL 2, SE DAY RM	EF-2H6	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-37	AREA H, LEVEL 2, SE DAY RM	SF-2H12	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-38	AREA H, LEVEL 2, SW REC AREA	EF-2H5	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-39	AREA H, LEVEL 2, SW REC AREA	AHU-19	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-40	AREA H, LEVEL 2, SW DAY RM	EF-2H5	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-41	AREA H, LEVEL 2, SW DAY RM	EF-2H1	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-42	AREA H, LEVEL 2, SW DAY RM	EF-2H5	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-43	AREA H, LEVEL 2, SW DAY RM	SF-2H11	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-44	AREA H, LEVEL 2, NW REC AREA	AHU-18	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-45	AREA H, LEVEL 2, NW REC AREA	AHU-18	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-46	AREA H, LEVEL 2, NW DAY RM	EF-2H8	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-47	AREA H, LEVEL 2, NNW DAY RM	EF-2H11	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-48	AREA H, LEVEL 2, NNW DAY RM	EF-2H8	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-AD-49	AREA H, LEVEL 2, NW DAY RM	SF-2H14	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-50	AREA H, LEVEL 1, CORE AREA	EF-1H2	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-51	AREA H, LEVEL 1, CORE AREA	EF-1H2	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-52	AREA H, LEVEL 1, CORE AREA	EF-1H2	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-53	AREA H, LEVEL 1, CORE AREA	EF-1H2	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-54	AREA H, LEVEL 1, CORE AREA	EF-1H2	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-55	AREA H, LEVEL 1, CORE AREA	EF-1H2	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-56	AREA H, LEVEL 1, CORE AREA	EF-1H2	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-57	AREA H, LEVEL 1, CORE AREA	EF-1H2	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-58	AREA H, LEVEL 1, NE DAY RM	SF-1H8	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-59	AREA H, LEVEL 1, NE DAY RM	SF-1H8	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-60	AREA H, LEVEL 1, NE DAY RM	SF-1H7	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-61	AREA H, LEVEL 1, NE DAY RM	SF-1H7	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-62	AREA H, LEVEL 1, SE DAY RM	SF-1H6	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-63	AREA H, LEVEL 1, SE DAY RM	SF-1H6	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-64	AREA H, LEVEL 1, SE DAY RM	SF-1H4	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-65	AREA H, LEVEL 1, SE DAY RM	SF-1H4	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-66	AREA H, LEVEL 1, SW DAY RM	SF-1H8	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-67	AREA H, LEVEL 1, SW DAY RM	SF-1H8	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-68	AREA H, LEVEL 1, SW DAY RM	SF-1H1	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-69	AREA H, LEVEL 1, SW DAY RM	SF-1H1	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-70	AREA H, LEVEL 1, NW DAY RM	SF-1H11	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-71	AREA H, LEVEL 1, NW DAY RM	SF-1H11	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-72	AREA H, LEVEL 1, NW DAY RM	SF-1H12	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-73	AREA H, LEVEL 1, NW DAY RM	SF-1H3	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-74	AREA H, LEVEL 1, CORE AREA	SF-2H18	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-75	AREA H, LEVEL 2, WNW DAY RM	EF-2H12	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-76	AREA H, LEVEL 2, WNW DAY RM	EF-2H27	24/1	10	4# 10, 1/2"C.	DIRECT					
1H-AD-77	AREA H, LEVEL 2, NW CONTROL R	AHU-18	24/1	10	4# 10, 1/2"C.	DIRECT					
2H-SD-1	AREA H, LEVEL 2, MECH H2002	AHU-11	24/1	5	4# 10, 1/2"C.	DIRECT					
2H-SD-2	AREA H, LEVEL 2, MECH H2002	AHU-16	24/1	24	4# 10, 1/2"C.	DIRECT					
2H-SD-3	AREA H, LEVEL 2, MECH H2004	AHU-11	24/1	35	4# 10, 1/2"C.	DIRECT					
2H-SD-4	AREA H, LEVEL 2, MECH H2004	AHU-17	24/1	24	4# 10, 1/2"C.	DIRECT					
2H-SD-5	AREA H, LEVEL 2, MECH H2004	AHU-19	24/1	24	4# 10, 1/2"C.	DIRECT					
2H-SD-6	AREA H, LEVEL 2, MECH H2005	AHU-18	24/1	24	4# 10, 1/2"C.	DIRECT					
2H-SD-7	AREA H, LEVEL 2, MECH H2004	EF-1H1	24/1	24	4# 10, 1/2"C.	DIRECT					
2H-SD-8	AREA H, LEVEL 2, MECH H2004	EF-1H2	24/1	24	4# 10, 1/2"C.	DIRECT					
2H-SD-9	AREA H, LEVEL 2, MECH H2004	SF-2H18	24/1	24	4# 10, 1/2"C.	DIRECT					
			ACTUATOR SUM=	978							ACTUATOR SUM =

NOTES
1. DESIGATION ; 1-2-3 ; 1=BUILDING LEVEL / AREA ; 2=AD (AUTO DMPR) / SD (SMOKE DMPR) ; 3=DAMPER I.D. NUMBER
2. SERVICE ; OA=OUTSIDE AIR ; SA=SUPPLY AIR ; RA=RETURN AIR ; RE= RELIEF AIR ; EA=EXHAUST AIR ; TA= TRANSFER AIR
~~3. ALL DAMPER ACTUATORS ARE CURRENTLY PNEUMATIC AND NEED TO BE CHANGED TO ELECTRONIC.~~
4. CONTRACTOR SHALL PROVIDE AT EACH CIRCUIT A 1200VA 120V UPS MODEL APC BR1200G OR EQUIVALENT.

1

Texas Registered Firm No. F-7489
500 North Central Expwy., Suite 310
Plano, TX 75074 469.467.0200
Email: mdeng@md-eng.com
Project Number: 17939

MD ENGINEERING

Collin County Justice Center
Upgrade Pneumatic to Electronic Actuators
4300 Community Ave. McKinney, Texas 75071

Revisions:

DATE	DESCRIPTION
04-25-18	1 ADDENDUM #3

STATE OF TEXAS
DAVID P. MINDRUP
58909
REGISTERED PROFESSIONAL ENGINEER
04/25/18

ELECTRICAL SCHEDULES

Project No.
17939

Sheet No.
E0.2

MEP ABBREVIATIONS

ABV.	ABOVE
AC.	ALTERNATING CURRENT
A/C	AIR CONDITIONER
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AG	ABOVE GRADE AND GFI
AHAP	AS HIGH AS POSSIBLE
AHU	AIR HANDLING UNIT
ALT.	ALTERNATE
AMB.	AMBIENT TEMPERATURE (F. DEGREE)
AMP.	AMPERE
APPROX.	APPROXIMATELY
ARCH.	ARCHITECTURAL
AVG.	AVERAGE
B	BOILER
B.G.	BELOW GRADE
BMS	BUILDING MANAGEMENT SYSTEM
BRD.	BAROMETRIC RELIEF DAMPER
BTU	BRITISH THERMAL UNIT
CD	CONSTRUCTION DOCUMENTS
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CH.	CHILLER
CHEM.	CHEMICAL
CHP	CHILLED WATER PUMP
CKT.	CIRCUIT
CLG.	CEILING
CMPR.	COMPRESSOR
CT	COOLING TOWER
CWP	CONDENSER WATER PUMP
CU	CONDENSING UNIT
DB	DRY BULB
DEFL.	DEFLECTION
DEG. F	DEGREES FAHRENHEIT
DET.	DETAIL
DD	DESIGN DEVELOPMENT
DIA.	DIAMETER
DISC.	DISCONNECT SWITCH
DIM.	DIMENSION
EA.	EXHAUST AIR
EDB	ENTERING DRY BULB
EF	EXHAUST FAN
ELEC.	ELECTRICAL
ELEV.	ELEVATION
EMCS.	ENERGY MGMT. CONTROL SYSTEM
E.S.P.	EXTERNAL STATIC PRESS. (IN. W.G.)
EWB	ENTERING WET BULB
EWT.	ENTERING WATER TEMPERATURE
EXH.	EXHAUST
EXIST.	EXISTING
F/A	FREE AREA OPENING (SQ. FT.)
FCO	FLOOR CLEAN OUT
FCU	FAN COIL UNIT
FHP	FRACTIONAL HORSE POWER
FLR.	FLOOR
FPI	COIL FINS PER INCH.
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT.	FOOT OR FEET
GFI	GROUND FAULT INTERRUPTER
GPM	GALLONS PER MINUTE
HD.	HEAD
HOA	HANDS/OFF/AUTO. MOTOR STARTER
HP	HORSE POWER
HPU	HEAT PUMP UNIT
HR.	HOUR(S)
HT.	HEIGHT
HTG.	HEATING
HTR.	HEATER
HVAC	HEAT,VENT AND AIR CONDITIONING
HWP	HOT WATER PUMP
HX	HEAT EXCHANGER
HZ.	FREQUENCY (HERTZ)
ID	INSIDE DIAMETER OR DIMENSION
IN.	INCHES
KW	KILOWATT
KWH	KILOWATT HOUR
LAT	LEAVING AIR TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
MAX.	MAXIMUM
MCA	MINIMUM CURRENT AMPS.
MOCP.	MAX. OVER CURRENT PROTECTION
MBH	1000 BTU PER HOUR
MECH.	MECHANICAL
MFR.	MANUFACTURER
MIN.	MINIMUM
MVD	MANUAL VOLUME DAMPER
N/A	NOT APPLICABLE
NC	NOISE CRITERIA
NIC	NOT IN CONSTRUCTION
NK	NECK DIMENSION
NO.	NUMBER
OA	OUTSIDE AIR
OAR	OWNERS AUTHORIZED REPRESENTATIVE
OBD	OPPOSED BLADE DAMPER
OD	OUTSIDE DIAMETER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
ORIG.	ORIGINAL
P.D.	PRESSURE DROP (FT)
PH.	PHASE
PMB	POWERED MIXING BOX
PLBG.	PLUMBING
PNL.	PANEL
PRESS.	PRESSURE
RA	RETURN AIR
RAG	RETURN AIR GRILLE
RD.	RADIUS
RE.	REFERENCE
RPM	REVOLUTIONS PER MINUTE
RTU	ROOF TOP UNIT
S/S	SINGLE SPEED MOTOR
S/S/S	START/STOP/STATUS
SA	SUPPLY AIR
SAG	SUPPLY AIR GRILLE
SDC	STAND ALONE DIGITAL CONTROLLER
SEER	SEASON ENERGY EFFICIENCY RATIO
SENS.	SENSIBLE
SP	STATIC PRESSURE
SQ.	SQUARE
STR.	MOTOR STARTER
TEMP.	TEMPERATURE
T.S.P.	TOTAL STATIC PRESSURE (IN. W.G.)
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
V	VOLT
VAV	VARIABLE AIR VALVE
VEL.	VELOCITY
W	WATT
W/	WITH
W/O	WITHOUT
W.G.	WATER GUAGE
WB	WET BULB
WCO	WALL CLEAN OUT
WP.	WEATHERPROOF
WPD	WATER PRESSURE DROP
WPG	WEATHERPROOF GFI
XFMR.	TRANSFORMER

DUCTWORK LEGEND

16X12	SHEET METAL DUCT	16"x12"
	DIRECTION OF FLOW	
	INTERNALLY INSULATED SHEET METAL DUCT	16"x12"
	HIDDEN SHEET METAL DUCT	16"x12"
	ROUND ELBOW DOWN (R/A SIMILAR)	
	ROUND ELBOW UP (R/A SIMILAR)	
	RADIUS ELBOW (R=1.5 MIN.)	
	45 DEGREE ELBOW (R=1.5 MIN.)	
	SIZE OR SHAPE TRANSITION	
	TURNING VANES (RECTANGULAR), SMOOTH RADIUS	
	FLEXIBLE DUCT CONN. W/DAMPER	
	BRANCH TAKE-OFF	
	WYE JUNCTION	
	SUPPLY DUCT SECTION UP	
	SUPPLY DUCT SECTION DOWN	
	RETURN DUCT SECTION UP	
	RETURN DUCT SECTION DOWN	
	EXHAUST DUCT SECTION UP	
	90 DEGREE S/A ELBOW DOWN	
	90 DEGREE S/A ELBOW UP	
	90 DEGREE R/A ELBOW DOWN	
	EXHAUST DUCT SECTION DOWN	
	90 DEGREE R/A ELBOW UP	
	RADIUS ELBOW (R=1.5 MIN.)	
	SQUARE ELBOW WITH DOUBLE WALL TURNING VANES	
	BRANCH TAKE-OFF WITH VANED EXTRACTOR	
	SPIN-IN TAP WITH DAMPER	
	TEE WITH SQUARE ELBOWS, TURNING VANES & SPLITTER DAMPER	
	SIDEWALL SUPPLY GRILLE OR REGISTER WITH AIR EXTRACTOR	
	S/A GRILLE/REGISTER W/ ROUND NECK & FLEX CONNECTION. 4-WAY THROW (U.N.O.)	
	S/A GRILLE/REGISTER W/ SQUARE NECK. 4-WAY THROW (U.N.O.)	
	R/A GRILLE OR REGISTER	
	VOLUME DAMPER	
BD	COUNTER WEIGHTED BACKDRAFT DAMPER	BD
FD	FIRE DAMPER	FD
FSD	FIRE/SMOKE DAMPER (WITH SM. DET.)	FSD
SD	SMOKE DAMPER (WITH SM. DET.)	SD
M	MOTORIZED DAMPER	M
SP	STATIC PRESSURE SENSOR	SP
AF	AIRFLOW MEASURE STATION	AF
AI	AIRFLOW IONIZER STATION	AI
T / H / C	THERMOSTAT OR TEMP SENSOR)/ HUMIDISTAT/CARBON DIOXIDE SENSOR	T / H / C
AD	ACCESS DOOR	AD
P	DUCT MOUNTED SMOKE DETECTOR (TUBE SENSING TYPE)	P

ALL SYMBOLS ON THIS LIST ARE NOT NECESSARILY USED ON THIS PROJECT.

HVAC & PLUMBING, VALVE & FITTINGS SYMBOLS

TEE
TEE, UP
TEE, DOWN
SINGLE SWEEP TEE
CROSS
LATERAL
45 DEGREE ELBOW
90 DEGREE ELBOW
90 DEGREE ELBOW UP
90 DEGREE ELBOW DOWN
CAP
SINGLE W.F. LATERAL STUB
DOUBLE W.F. LATERAL STUB
SINGLE W.F. LAT. & TRAP
DOUBLE W.F. LAT & TRAP
FLOOR DRAIN RISER W/TRAP
FLOOR CLEAN OUT
CLEAN OUT
FLOOR DRAIN
HUB DRAIN
DOWN SPOUT
FIRE HOSE CABINET
VENT THRU ROOF
OVERFLOW ROOF DRAIN
ROOF DRAIN
GAS PRESSURE REDUCING VALVE
CHECK VALVE
OS & Y VALVE
GLOBE VALVE
GATE VALVE
BALANCING VALVE (WITH PETE'S PLUG EITHER SIDE)
BUTTERFLY VALVE
BALL VALVE
SOLENOID VALVE
PLUG VALVE
PRESSURE REDUCING VALVE
PRESSURE RELIEF VALVE
CONTROL, 2 WAY VALVE
CONTROL, 3 WAY VALVE
MOTORIZED ISOLATION VALVE (2-POSITION-24v)
MOTORIZED CONTROL VALVE (MODULATING-24v)
FLOOR CONTROL VALVE
ANGLE GATE VALVE
ANGLE GLOBE VALVE
MANUALLY CALIBRATED BALANCING VALVE
AUTOMATIC FLOW CONTROL VALVE
STRAINER & BLOW OFF VALVE
PRESSURE GAUGE & COCK
UNION OR COMPANION FLANGES
THERMOMETER
PRESSURE & TEMPERATURE TAP (PETES PLUG)
THERMOSTAT
HUMIDISTAT
FLOW METER
ANCHOR (PIPE)
EXPANSION JOINT
PIPE GUIDE
MANUAL AIR VENT
AUTOMATIC AIR VENT
HOSE END DRAIN
HOSE BIBB
THERMOMETER & WELL
TEMPERATURE SENSOR
FLOW SWITCH
PRESSURE SENSOR
COMPRESSED AIR TAP
FLOAT AND THERM. TRAP
BUCKET STEAM TRAP
PIPE SIZE REDUCER (CONCENTRIC)
PIPE SIZE REDUCER (ECCENTRIC)

ALL SYMBOLS ON THIS LIST ARE NOT NECESSARILY USED ON THIS JOB.

GENERAL HVAC NOTES:

1. ALL CONDUIT IN FINISHED ROOMS OR SPACES SHALL BE CONCEALED WITHIN FURRED CHASES OR ABOVE SUSPENDED CEILINGS.
2. CONTRACTOR SHALL VERIFY THE EQUIPMENT CLEARANCE REQUIREMENTS WITH THE MANUFACTURER'S RECOMMENDATIONS. EXACT LOCATION OF SELECTED EQUIPMENT SHALL BE COORDINATED WITH THE EXISTING MECHANICAL EQUIPMENT AND DUCTWORK TO PROVIDE RECOMMENDED CLEARANCES FOR MAINTENANCE.
3. VERIFY THAT ALL EXISTING MECHANICAL EQUIPMENT MAINTAIN UNOBSTRUCTED MAINTENANCE ACCESS FOR ALL PANELS, CONTROLS AND CONDUIT.
4. THE INSTALLING CONTRACTOR SHALL DEMO THE PNEUMATIC ACTUATOR ONLY AFTER THE ELECTRICAL INFRASTRUCTURE TO THE NEW ELECTRONIC ACTUATOR IS IN PLACE IN AN EFFORT TO REDUCE OPERATIONAL DOWN TIME OF THE EXISTING HVAC SYSTEMS AND LIFE SAFETY SYSTEMS.
5. THIS CONTRACTOR SHALL REPORT AND REPAIR ANY DEFICIENCIES FOUND IN THE EXISTING EQUIPMENT IN AN EFFORT TO PROVIDE THE OWNER WITH A FULLY OPERATIONAL HVAC, LIFE SAFETY AND DDC CONTROLS SYSTEM.
6. AFTER THE NEW ELECTRONIC ACTUATOR IS INSTALLED ON AN EXISTING DAMPER, THE INSTALLING CONTRACTOR SHALL CHECK THE OPERATIONAL SIGNAL TO THE DDC SYSTEM TO CONFIRM THE POINT(S) AND TO ADJUST/ CALIBRATE THE DAMPER / ACTUATOR LINKAGE ACCORDINGLY. THE DAMPER SHALL THEN BE CYCLED AND VISUALLY INSPECTED FOR COMPLIANCE WITH THE EXISTING LIFE SAFETY AND NORMAL 'SEQUENCES OF OPERATION'.

GENERAL PROJECT NOTES:

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEM AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY ALL NATIONAL, STATE AND LOCAL CODES.
2. CONTRACT DRAWINGS FOR MECHANICAL WORK (HVAC, AND FIRE PROTECTION) ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY. IT IS THE CONTRACTORS RESPONSIBILITY FOR INSTALLING ALL MATERIALS PER SMANACA AND THE MANUFACTURER'S STANDARDS.
3. COORDINATE INSTALLATION OF ALL MECHANICAL WORK WITH ELECTRICAL WORK, ETC., SHOWN ON THE OTHER CONTRACT DRAWINGS.
4. WHEN TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURE SHALL BE USED.
5. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE LATEST EDITION NATIONAL ELECTRIC CODE AND DIVISION 16 (23) OF THE SPECIFICATION.
6. ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN DETAILS FOR PIPING AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
7. PRESSURIZED LIQUID, GAS, AIR SYSTEM PIPE AND ELECTRICAL CONDUIT SHALL NOT BE ROUTED BENEATH ANY SUSPENDED EQUIPMENT, FIRE PROTECTION, ELECTRICAL AND MECHANICAL CONTRACTORS SHALL COORDINATE TRADES.

GENERAL HVAC DEMOLITION NOTES

1. REFER TO MP0.0 FOR GENERAL MECHANICAL NOTES, ABBREVIATIONS, AND SYMBOLS.
2. REFER TO SPECIFICATION DIVISIONS 01 AND 02 FOR DEMOLITION REQUIREMENTS AND PROCEDURES.
3. TOUR THE PROJECT SITE WITH THE OWNER'S REPRESENTATIVE TO IDENTIFY AND MARK THOSE ITEMS SCHEDULED FOR DEMOLITION, THAT THE OWNER WISHES TO RETAIN. DELIVER THOSE ITEMS SO MARKED, TO THE OWNER'S STORAGE, WITHIN THE PROJECT SITE AS DIRECTED.
4. ALL REMAINING DEMOLITION ITEMS SHALL BECOME THE CONTRACTORS PROPERTY AND SHALL BE REMOVED FROM THE SITE. HAZARDOUS MATERIALS SHALL BE DISPOSED OF IN ACCORDANCE WITH FEDERAL REGULATIONS AND THE CONTRACT DOCUMENTS.
5. REMOVE PNEUMATIC ACTUATORS AND APPURTENANCES, SEAL PNEUMATIC PIPING SYSTEMS AND REMOVE ANY DEVICES, CONTROLS, CONDUIT, UNI-STRUT, ALL THREAD, WIRE CLIPS AND HANGERS WITHIN AREA OF WORK UNLESS NOTED OTHERWISE. FLOOR STRUCTURE SHOULD BE CLEAN AND CLEAR OF ANY DEMOLITION DEBRIS. REMOVE AND CAP AIRTIGHT ALL PNEUMATIC COPPER LINES AND APPURTENANCES WITHIN MECHANICAL ROOMS BACK TO MECHANICAL ROOM WALLS. REMOVE AND CAP AIRTIGHT ALL PNEUMATIC COPPER LINES AND APPURTENANCES ABOVE CEILINGS. IF SOME LINES ARE INCAPABLE OF REMOVING, TAG OR IDENTIFY COPPER TUBE AS A "DEAD LINE".
6. THE MECHANICAL SERVICE TO AREAS NOT WITHIN THE DEMOLITION SCOPE OF WORK SHALL NOT LOSE FUNCTION UNLESS SCHEDULED AND AGREED TO BY THE OWNER.
7. CONTRACTOR SHALL LEAVE THE DEMISED AREAS IN A CLEAN AND ORDERLY CONDITION.
8. ALL DEMOLITION ACTIVITIES SHALL BE PERFORMED SO AS TO PROVIDE MINIMAL DISRUPTION TO NORMAL FACILITY OPERATIONS.
9. ALL HVAC EQUIPMENT AND DUCTWORK (INCLUDING DAMPERS) ARE 'EXISTING TO REMAIN'.

FIRE PROTECTION SYMBOLS

(ALL SYMBOLS MAY NOT APPEAR ON DRAWINGS.)

- FLOW SWITCH
- POST INDICATOR VALVES (PIV)
- OPEN SCREW AND YOKE VALVE (OS&Y)
- FIRE DEPARTMENT CONNECTION
- A — UP AND DOWN SPRINKLER AT SAME LOCATION
- UP SPRINKLER
- SYSTEM RISER
- HOSE VALVE (ANGLE VALVE)
- RISE UP ON PIPING
- DROP IN PIPING
- TAMPER SWITCH FOR VALVES
- PENDANT SPRINKLER
- UPRIGHT SPRINKLER OR RISE(SPRIG)
- PENDANT SPRINKLER ON DROP
- SIDEWALL SPRINKLER

PIPING DESIGNATIONS

(ALL DESIGNATIONS MAY NOT APPEAR ON DRAWINGS.)

SYMBOL	DESCRIPTION
	SANITARY SEWER
	SUBSOIL DRAIN PIPING
SD	STORM DRAIN
OD	OVERFLOW DRAIN
	PLUMBING VENT
	DOMESTIC COLD WATER
	DOMESTIC HOT WATER (120 F)
	DOMESTIC HOT WATER RECIRC.
140	DOMESTIC HOT WATER (140 F)
F	FIRE LINE
	BRANCH FIRE LINE WITH SPRINKLER HEADS
MG	MEDIUM PRESSURE NATURAL GAS LINE
G	LOW PRESSURE NATURAL GAS LINE
RL	REFRIGERANT LIQUID LINE
RS	REFRIGERATED SUCTION LINE
CD	CONDENSATE DRAIN LINE (HVAC)
PC	PUMPED CONDENSATE
RS/L	REFRIGERANT SUCTION & LIQUID LINES
RS/L/H	REFRIG. SUCTION, LIQUID, HOT GAS LINES

SYMBOL	DESCRIPTION
	DIRECTION OF FLOW
D	EQUIP. OR FIXTURE DRAIN LINE
PR	PRESSURE RELIEF DISCHARGE
	EXISTING PIPING
X X X	EXISTING PIPING TO BE REMOVED
	UNDERFLOOR
	CONNECT TO NEW OR EXISTING
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
CHS	CHILLED WATER SUPPLY
CHR	CHILLED WATER RETURN
CS	TEMPERED CHILLED WATER SUPPLY
CR	TEMPERED CHILLED WATER RETURN
HWS	HOT WATER FOR HEATING SUPPLY
HWR	HOT WATER FOR HEATING RETURN
D	DISCHARGE DRAIN

DRAWING SYMBOLS

(ALL SYMBOLS MAY NOT APPEAR ON DRAWINGS)

SUBTITLE — XX NUMBER, XX DESCRIPTION, X SCALE

NOTE BY SYMBOL — 12

DETAIL SYMBOL — XX DETAIL #, XX DRAWING NO. TO REFER TO

RISER DIAGRAM SYMBOL — XX XX RISER NUMBER, POINTS TO RISER AREA

SECTION — XX XX SECTION NUMBER, DRAWING NUMBER WHERE SECTION IS LOCATED

AIR DISTRIBUTION DEVICE — AIR QUANTITY, ARROWS INDICATE THROW PATTERN, G-R-D DESIGNATION

Texas Registered Firm No. F-7489
500 North Central Expwy., Suite 310
Plano, TX 75074 469.467.0200
Email: mail@md-eng.com
Project Number: 17939

MD ENGINEERING

Collin County Justice Center
Upgrade Pneumatic to Electronic Actuators
4300 Community Ave. McKinney, Texas 75071

Revisions:

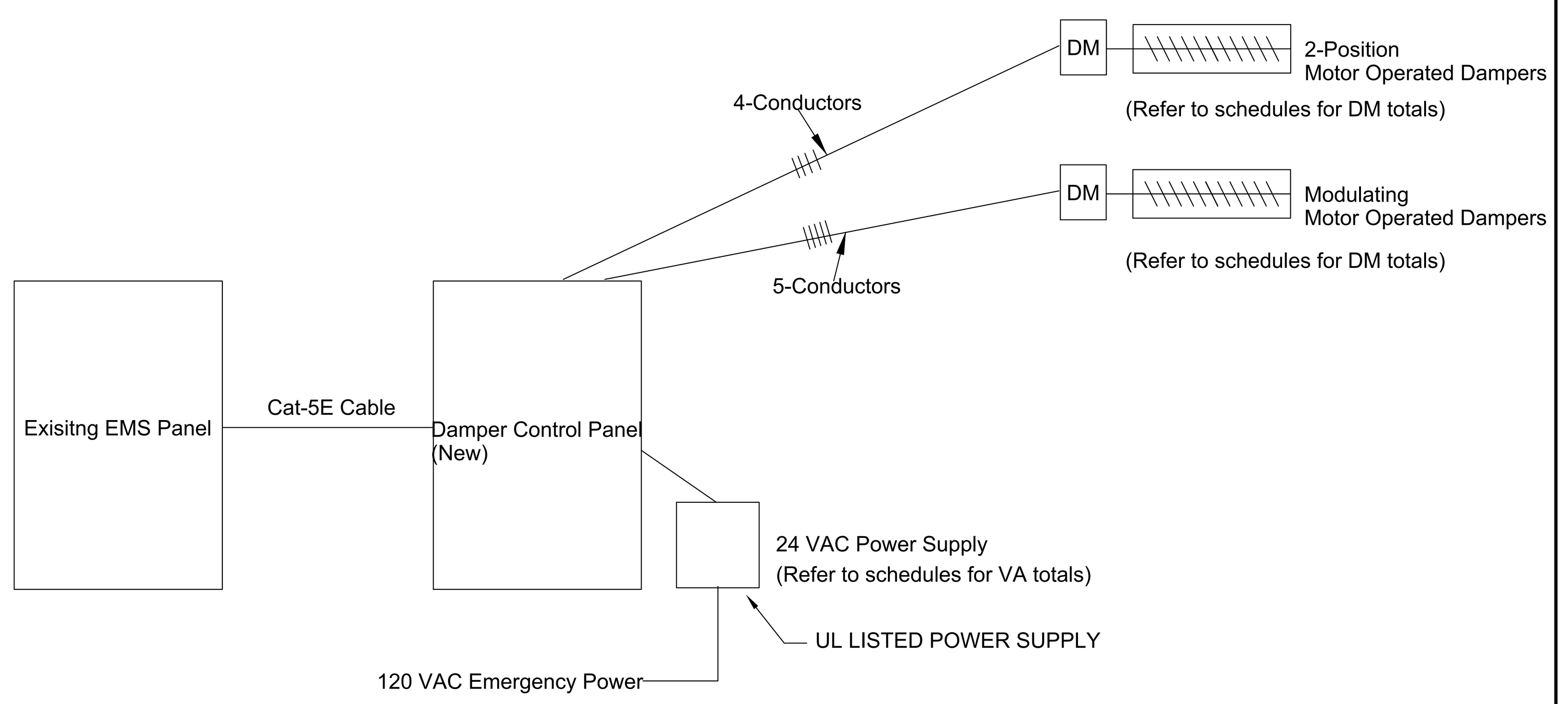
DESCRIPTION	DATE
ADDENDUM #3	04-25-18

MICHAEL JOSEPH SMITH 87333 LICENSED PROFESSIONAL ENGINEER — 4/25/18

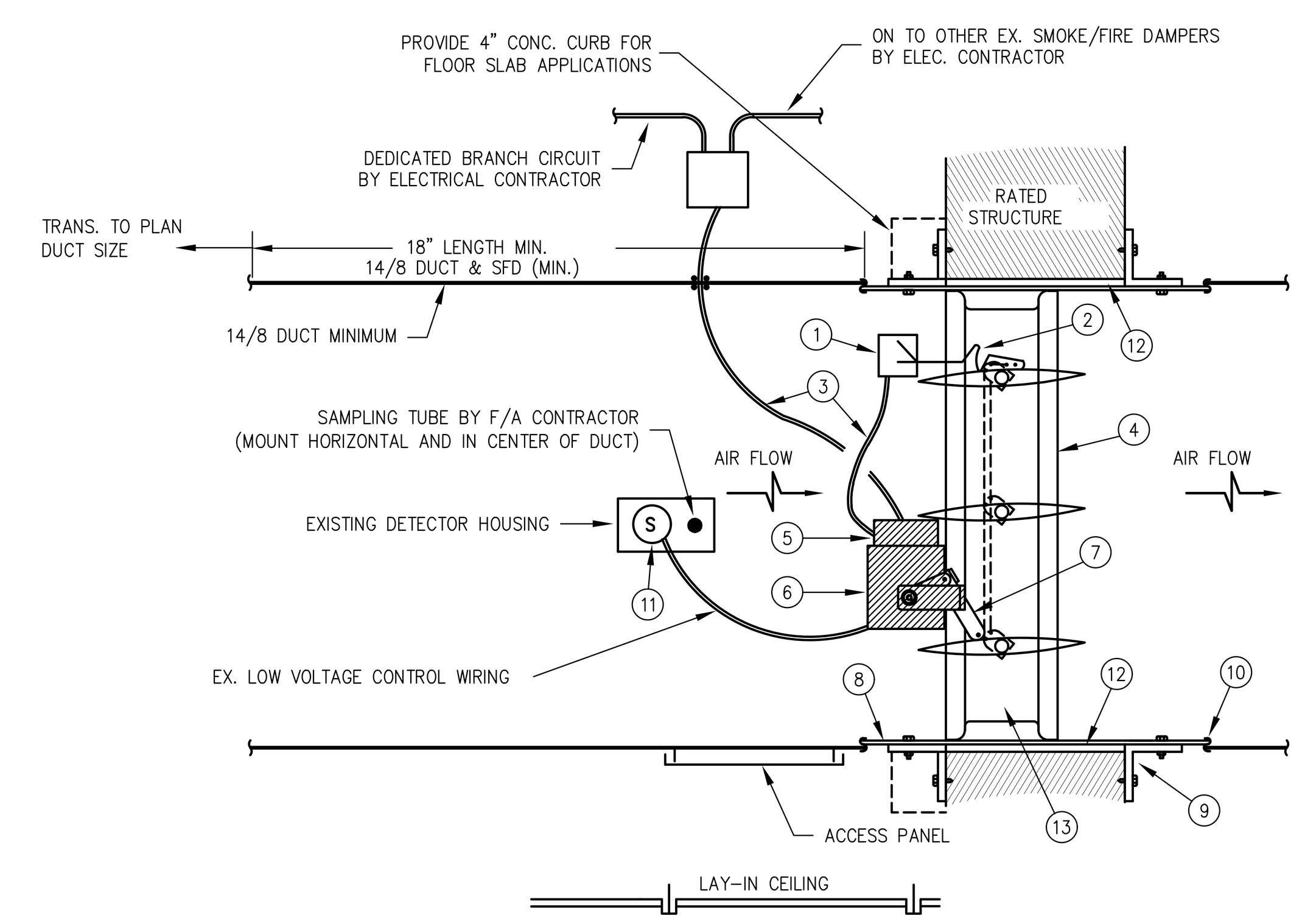
MECHANICAL LEGEND

Project No. 17939

Sheet No. M0.0



1 TYPICAL MECHANICAL ROOM - CONTROL FORMAT



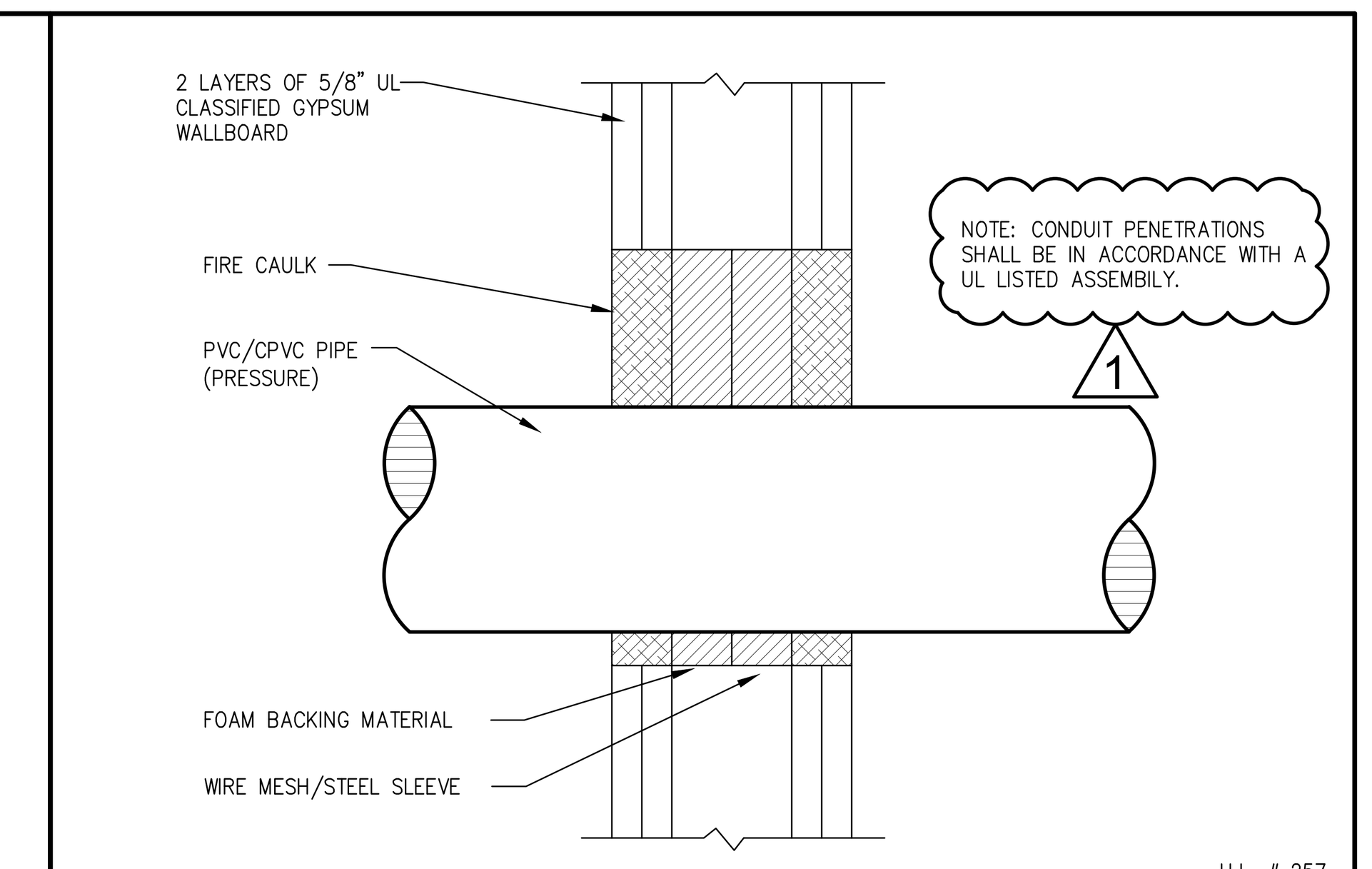
NOTES BY SYMBOL:

1. EX. TS-150 FIRESTAT
2. EX. ADJUSTABLE CONNECTING ROD
3. EX. METAL FLEX CONDUIT
4. EX. DAMPER FRAME
5. NEW JUNCTION BOX (E.C. SHALL NOT CONNECT TO GENERAL POWER)
6. OPERATOR/ NEW ELECTRONIC ACTUATOR REPLACING THE OLD PNEUMATIC ACTUATOR
7. EX. OVER CENTER LOCK
8. EX. SLEEVE
9. EX. MOUNTING ANGLES
10. EX. SLEEVE TO DUCT CONNECTION WITH S-LINKS.
11. EX. DUCT MOUNTED SMOKE DETECTOR EX. HOUSING AND SAMPLING TUBE. FIRE ALARM PANEL TO MONITOR.
12. MINERAL WOOL BETWEEN SLEEVE AND STRUCTURE. 1/2" MAXIMUM CLEARANCE BETWEEN SLEEVE AND RATED WALL OPENING.
13. EXISTING FIRE/SMOKE DAMPER. EXISTING SMOKE DAMPER SIMILAR BUT WITHOUT FIRE STAT AND CONNECTION ROD

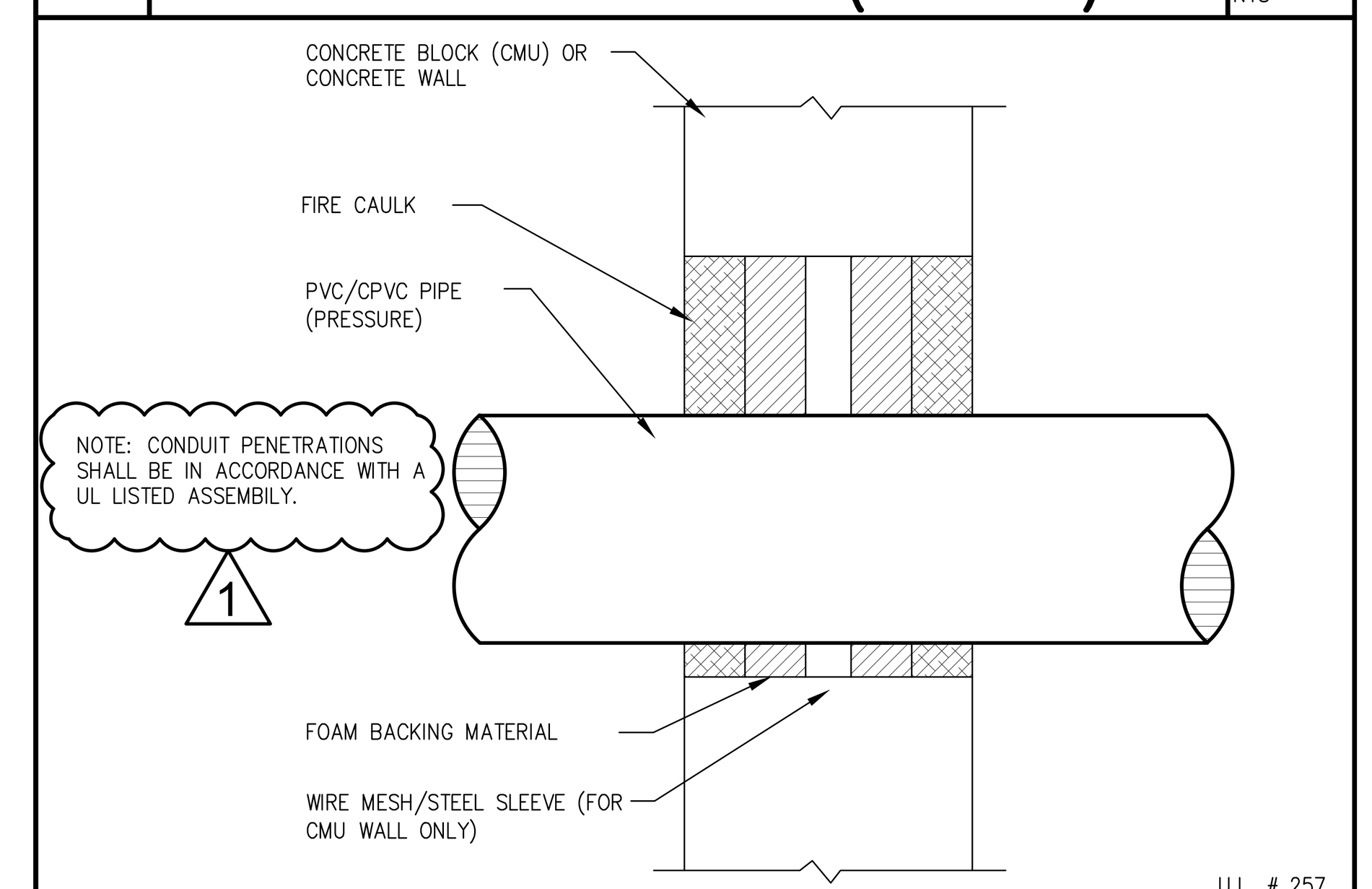
THE EX. TS150 FIRESTAT SYSTEM, USED IN CONJUNCTION WITH A COMBINATION FIRE SMOKE DAMPER, CLOSES AND LOCKS THE DAMPER WHEN TEMPERATURES IN EXCESS OF 165°F (212°F OPTIONAL) ARE DETECTED. THE SYSTEM IS EQUIPPED WITH SMOKE DETECTION. THE DAMPER CLOSES AND REMAINS CLOSED AS LONG AS A SMOKE SIGNAL IS PRESENT.

NOTES:
1) BASED ON RUSKIN (UL 555S) CLASS 11 MIN. LEAK RATING.
2) TYPICAL FOR HORIZONTAL AND VERTICAL APPLICATIONS.

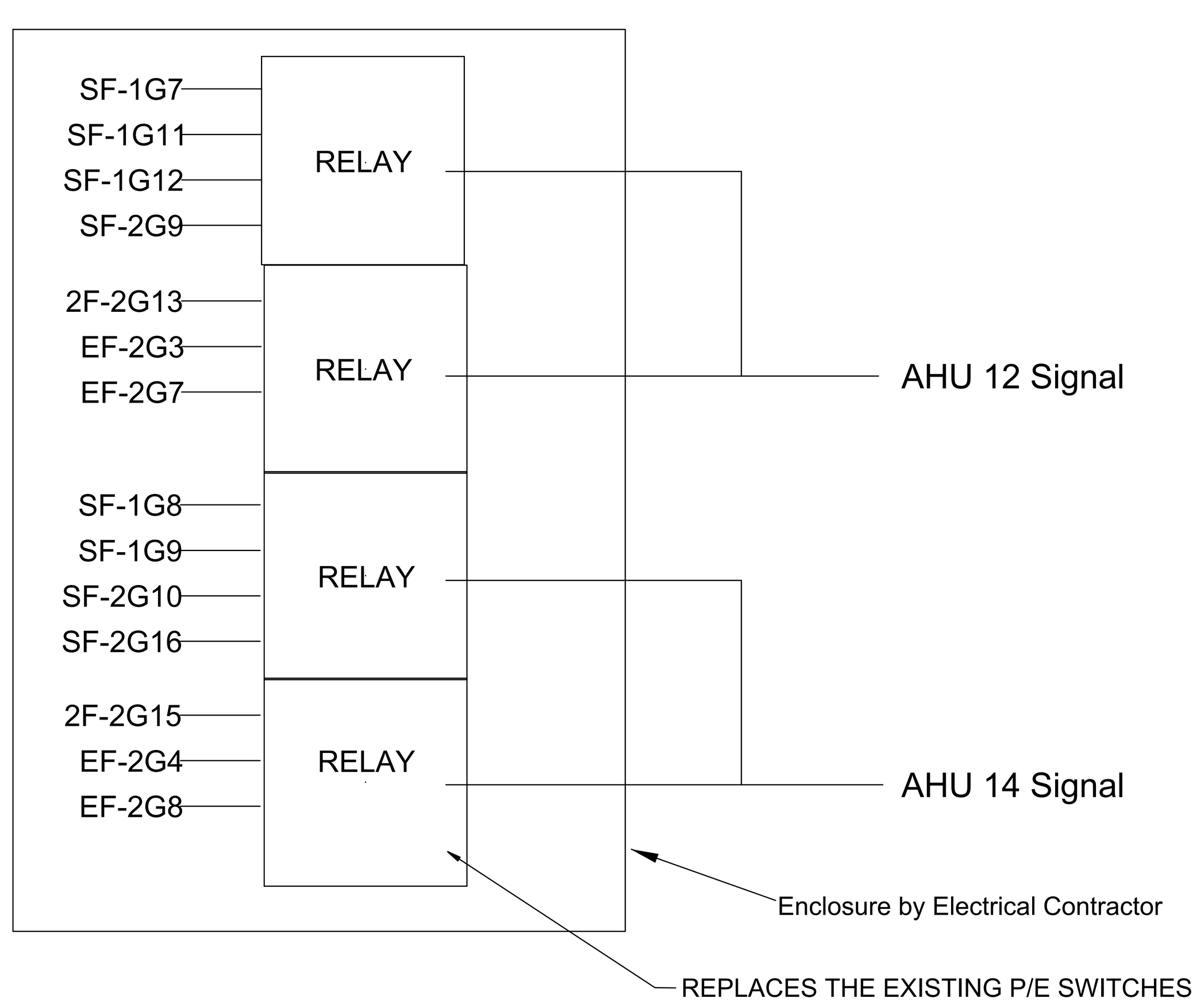
03 COMBINATION FIRE/SMOKE DAMPER — SCALE: NTS



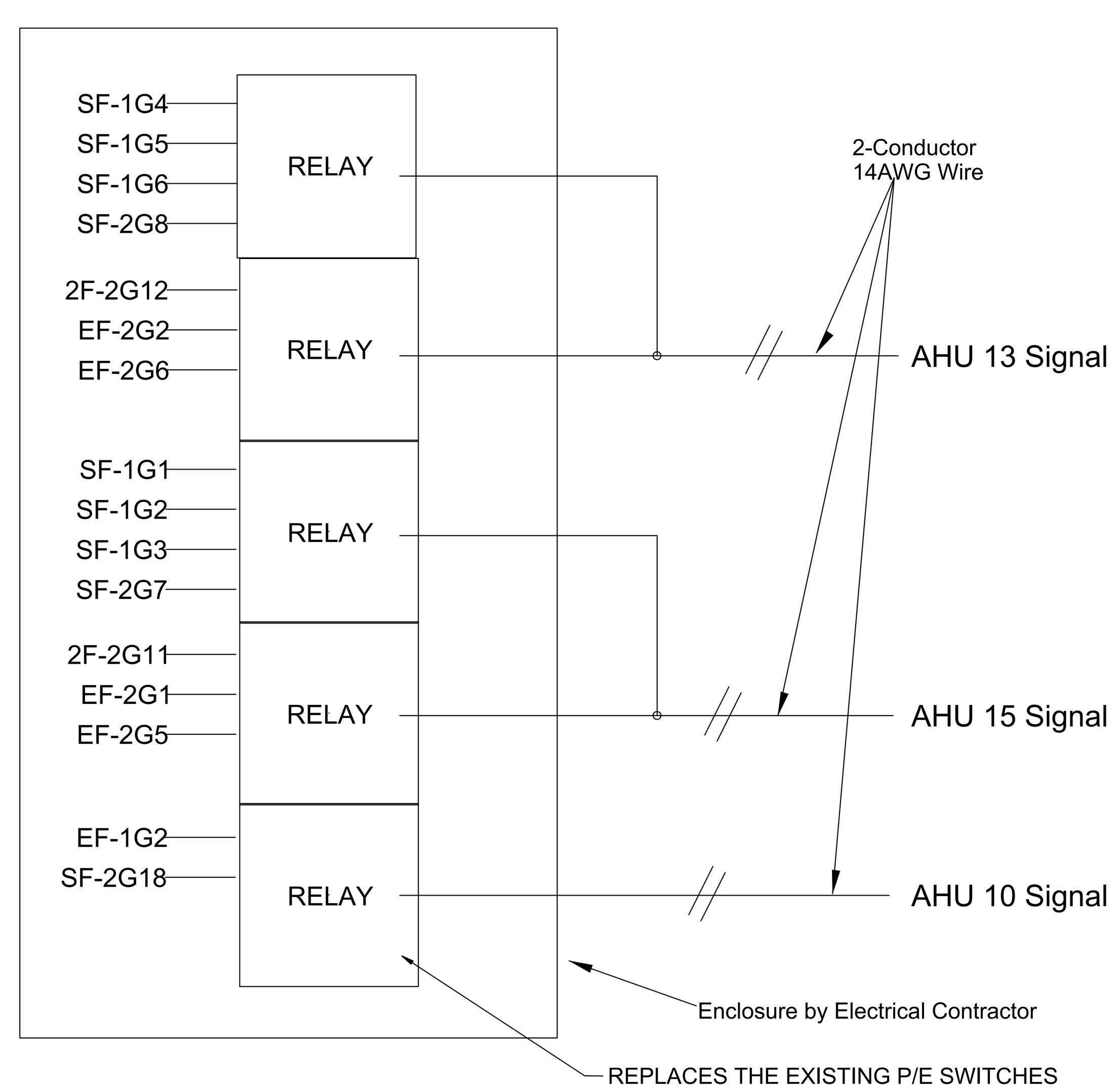
01 PIPE FIRE WALL PENETRATION (DRY WALL) — SCALE: NTS



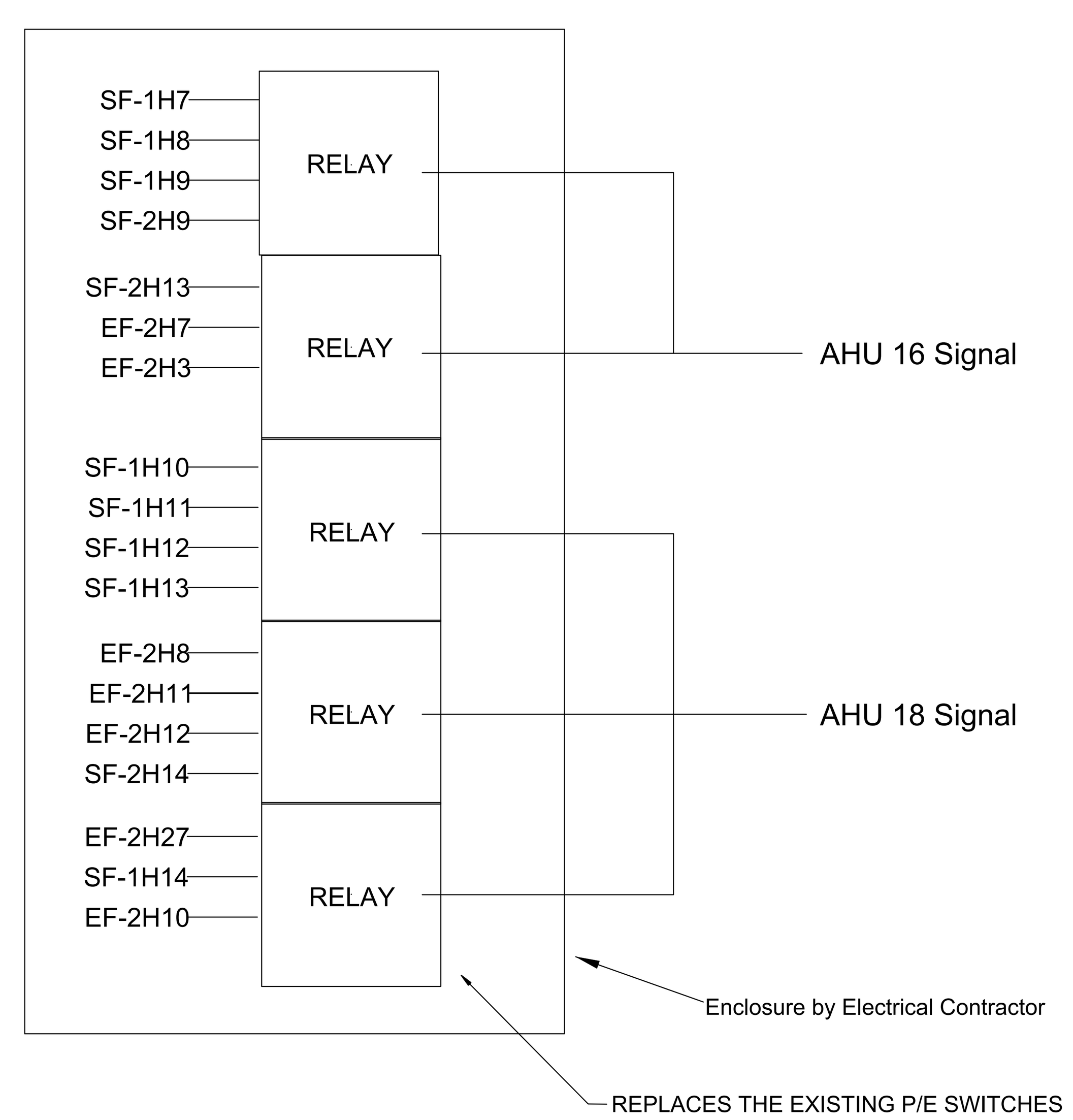
02 PIPE FIRE WALL PEN. (CONCRETE BLOCK) — SCALE: NTS



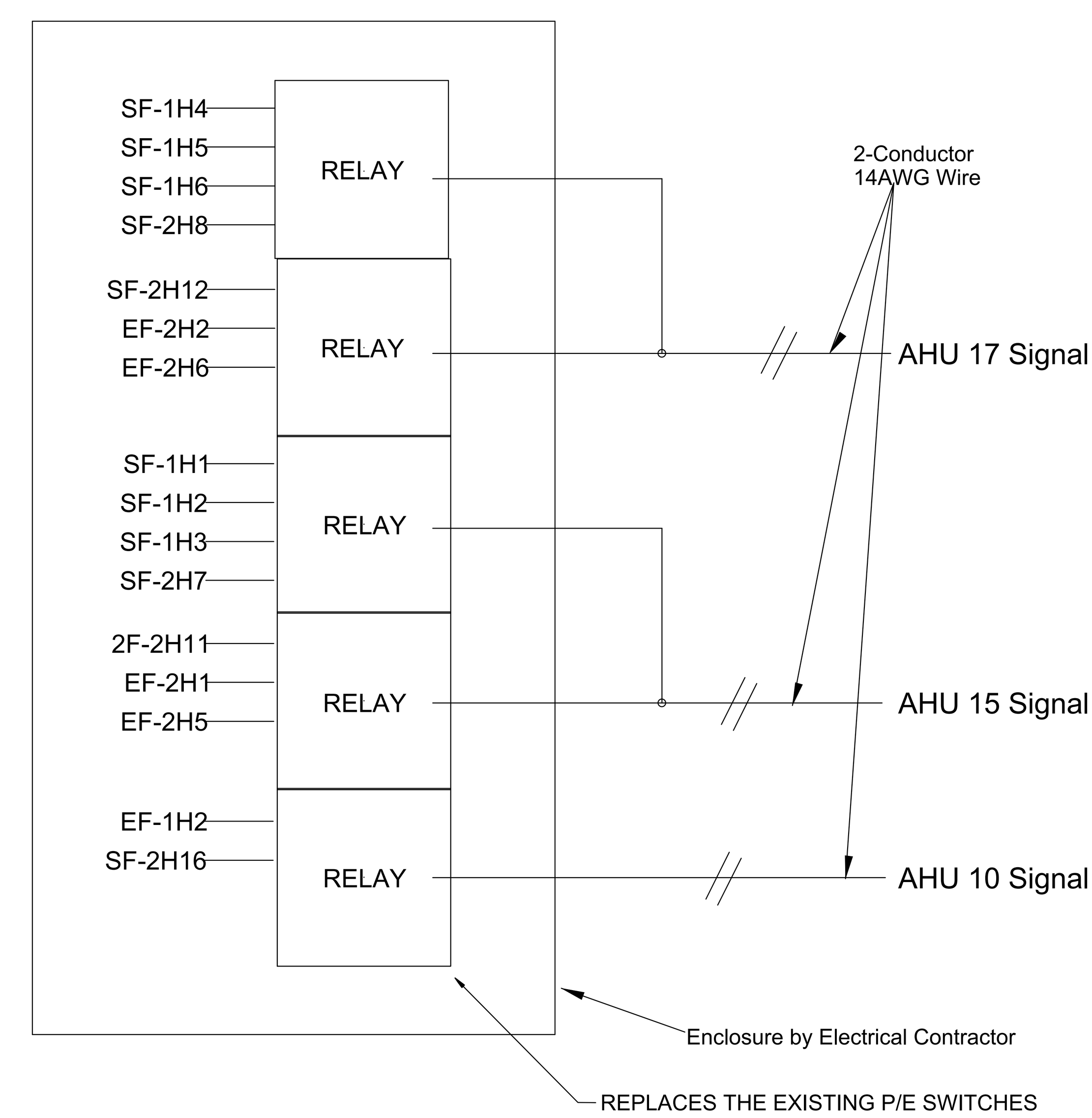
1 Electrical Room G1202 One-line



1 Electrical Room G1402 One-line



1 Electrical Room H1202 One-line



1 Electrical Room H1402 One-line

1 THIS CONTRACTOR SHALL PROVIDE SERVICES OF A LICENSED FIRE ALARM COMPANY FOR COMMISSIONING THE NEW ACTUATOR CONNECTIONS (FOR CORRECT OPERATIONAL CONFORMANCE) FOR THE EXISTING FIRE ALARM SYSTEM.

Texas Registered Firm No. F-7489
500 North Central Expwy., Suite 310
Plano, TX 75074 469.467.0200
Email: mdengca@md-eng.com
Project Number: 17939
MD ENGINEERING

Collin County Justice Center
Upgrade Pneumatic to Electronic Actuators
4300 Community Ave. McKinney, Texas 75071

Revisions:

DATE	DESCRIPTION
04-25-18	1 ADDENDUM #3

STATE OF TEXAS
MICHAEL JOSEPH SMITH
87333
LICENSED
PROFESSIONAL ENGINEER
4/25/18

MECHANICAL ELECTRICAL DETAILS

Project No. 17939

Sheet No. ME3.1

Section 004100-Bid Form Addendum 3
Collin County, Texas

Bid Information

Bid Owner	JD Griffin, CPPB Buyer II
Email	jgriffin@co.collin.tx.us
Phone	(972) 548-4116 x
Fax	(972) 548-4694 x
Bid Number	2018-162 Addendum 3
Title	Construction, Collin County Justice Center, Upgrade Pneumatic to Electronic Actuators
Bid Type	IFB
Issue Date	03/20/2018
Close Date	5/24/2018 02:00:00 PM (CT)

Contact Information

Address	2300 Bloomdale Rd. Ste. 3160 McKinney, TX 75071
Contact	JD Griffin, CPPB Buyer II
Department	Purchasing
Building	Admin. Building
Floor/Room	Ste.3160
Telephone	(972) 548-4116 x
Fax	(972) 548-4694 x
Email	jgriffin@co.collin.tx.us

Ship to Information

Address	4300 Community Ave. McKinney, TX 75071
Contact	
Department	
Building	Justice Center
Floor/Room	
Telephone	
Fax	
Email	

Supplier Information

Company Name _____
Contact Name _____
Address _____
_____
_____
Telephone _____
Fax _____
Email _____

Supplier Notes

_____
_____
_____
_____
_____
_____
_____
_____

The undersigned hereby certifies the foregoing bid submitted by the company listed below hereinafter called “bidder” is the duly authorized agent of said company and the person signing said bid has been duly authorized to execute same. Bidder affirms that they are duly authorized to execute this contract; this company; corporation, firm, partnership or individual has not prepared this bid in collusion with any other bidder or other person or persons engaged in the same line of business; and that the contents of this bid as to prices, terms and conditions of said bid 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.

Signature _____ Date ___/___/___

Bid Notes

Please log in to view bid documents.
Collin County exclusively uses IonWave Technologies, Inc. (Collin County eBid) for the notification and dissemination of all solicitations. The receipt of solicitations through any other means may result in your receipt of incomplete specifications and/or addendums which could ultimately render your bid/proposal non-compliant. Collin County accepts no responsibility for the receipt and/or notification of solicitations through any other means.

Bid Activities

Date	Name	Description
4/3/2018 02:00 PM (CT)	Mandatory Pre-Bid Conference	A MANDATORY PRE-BID CONFERENCE will be held by Collin County in the Collin County Justice Center Jail Lobby located at 4300 Community Ave, McKinney, TX 75071 on Tuesday, April 3, 2018, at 2:00 PM in order for bidders to ask questions regarding the proposed work. All bidders desiring to bid the work should have a representative at the pre-bid conference; bidders that do no attend the pre-bid conference shall not be considered in the evaluation for award of a contract per Texas Local Government Code 262.0256. Attendance shall be mandatory at the pre-bid conference.

4/24/2018 10:00 AM (CT)	Mandatory Pre-Bid Conference (Attendance at one pre-bid is required)	A MANDATORY PRE-BID CONFERENCE will be held by Collin County in the Collin County Justice Center Jail Lobby located at 4300 Community Ave, McKinney, TX 75071 on Tuesday, April 24, 2018, at 10:00 AM in order for bidders to ask questions regarding the proposed work. All bidders desiring to bid the work should have a representative at one pre-bid conference; bidders that do no attend one pre-bid conference shall not be considered in the evaluation for award of a contract per Texas Local Government Code 262.0256. ATTENDANCE AT BOTH PRE-BID CONFERENCES IS NOT REQUIRED.
5/18/2018 05:00 PM (CT)	Intent to Bid	Do you intend to submit a bid?

Bid Messages

Bid Attachments

The following attachments are associated with this opportunity and will need to be retrieved separately

#	Filename	Description
Header	Addendum 3_2018-162.doc	Addendum 3
Header	Pre-Bid Sign-In Sheet_4-24-18.pdf	April 24, 2018 Pre-Bid Sign-In Sheet
Header	4-24-18_Pre-bid Conference Clarifications.docx	April 24, 2018 Pre-Bid Clarifications
Header	MD Engineering Addendum #3.pdf	Engineer's Addendum 3
Header	23 09 00 INSTRUMENTATION AND CONTROL FOR HVAC_Rev.2.PDF	Section 23 09 00 Rev. 2
Header	23 09 00 Supplemental Information .pdf	Section 23 09 00 Supplemental Information
Header	Drawing E0.1 Rev. 1.pdf	Drawing EO.1 Rev. 1
Header	Drawing E0.2 Rev. 1.pdf	Drawing EO.2 Rev. 1
Header	Drawing M0.0 Rev. 1.pdf	Drawing MO.0 Rev, 1
Header	Drawing ME3.1 Rev. 1.pdf	Drawing ME3.1 Rev. 1
Header	Addendum 2_2018-162.doc	Addendum 2
Header	012500 Product substitution Procedures.pdf	Section 01 25 00
Header	23 09 93-SEQUENCE OF OPERATIONS FOR HVAC CONTROLS.PDF	Revised Section 23 09 93
Header	Addendum 1_2018-162.doc	Addendum 1
Header	Pre-Bid Sign-In Sheet_4-3-18.pdf	April 3, 2018 Pre-Bid Sign-In Sheet
Header	LEGAL NOTICE-2018-162.doc	Legal Notice
Header	Collin County Justice Center Upgrade.pdf	Specifications

Header	Collin ADC DDC Upgrade CD's.pdf	Drawings

Bid Attachments Requested

The following attachments are requested with this opportunity

#	Required	Specified Attachment
1	YES	Bid Bond : BID SECURITY: All Bidders must submit, prior to the bid opening time, a Cashier's Check or acceptable Bid Bond payable without recourse to Collin County in the amount of not less than five percent (5%) of the total bid plus alternates as submitted. 1. Bid Bond or Cashier's Check may be mailed or hand delivered to the Office of the Collin County Purchasing Agent, Collin County Administration Building, 2300 Bloomdale Road, Ste 3160, McKinney, TX 75071 and shall be delivered in an envelope, marked plainly on the outside with the Bid Name and Number. 2. Bidders submitting a bid via Collin County eBid shall upload a Bid Bond at https://collincountytx.ionwave.net Regardless of delivery method, all Bid Bonds shall be received prior to the bid opening time to be considered. The original Bid Bond shall be received in the Collin County Purchasing Department no later than close of business on the third working day after the bid opening. Late receipt of original Bid Bond shall be cause for rejection of bid.
2	NO	Conflict of Interest Questionnaire
3	YES	W-9

Bid Attributes

Please review the following and respond where necessary

#	Name	Note	Response
1	Calendar Days Bid	Please state the consecutive calendar days bid.	_____ (Required)
2	Exceptions	Do you take exceptions to the specifications. If so, by separate attachment, please state your exceptions. Valid Responses: [Please Select], Yes, No	_____ (Required)
3	Insurance	I understand that the insurance requirements of this solicitation are required and a certificate of insurance shall be submitted to the Purchasing department if I am awarded all or a portion of the resulting contract. Please initial.	_____ (Required)
4	Subcontractors	State the business name of all subcontractors and the type of work they will be performing under this contract. If you are fully qualified to self-perform the entire contract, please respond with "Not Applicable-Self Perform".	_____ (Required)
5	Reference No. 1	List a company or governmental agency where these same/like products /services, as stated herein, have been provided. Include the following: Company/Entity, Contact, Address, City/State/Zip, Phone, and E-Mail.	_____ (Required)
6	Reference No. 2	List a company or governmental agency where these same/like products /services, as stated herein, have been provided.	_____ (Required)

		Include the following: Company/Entity, Contact, Address, City/State/Zip, Phone, and E-Mail.	
7	Reference No. 3	List a company or governmental agency where these same/like products /services, as stated herein, have been provided. Include the following: Company/Entity, Contact, Address, City/State/Zip, Phone, and E-Mail.	_____ (Required)
8	Cooperative Contracts	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 inter-local 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? Valid Responses: [Please Select], Yes, No	_____ (Required)
9	Preferential Treatment	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). 1. Is your principal place of business in the State of Texas? 2. If your principal place of business is not in Texas, in which State is your principal place of business? 3. If your principal place of business is not in Texas, does your state favor resident bidders (bidders in your state) by some dollar increment or percentage? 4. If your state favors resident bidders, state by what dollar amount or percentage.	_____ (Required)
10	Debarment Certification	I certify that neither my company nor an owner or principal of my company has been debarred, suspended or otherwise made ineligible for participation in Federal Assistance programs under Executive Order 12549, “Debarment and Suspension,” as described in the Federal Register and Rules and Regulations. Please initial.	_____ (Required)
11	Immigration and Reform Act	I 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.	_____ (Required)

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 by Collin County.

Please initial.

12 Disclosure of Certain Relationships

Chapter 176 of the Texas Local Government Code requires that any vendor considering doing business with a local government entity disclose the vendor's affiliation or business relationship that might cause a conflict of interest with a local government entity. Subchapter 6 of the code requires a vendor to file a conflict of interest questionnaire (CIQ) if a conflict exists. By law this questionnaire must be filed with the records administrator of Collin County no later than the 7th business day after the date the vendor becomes aware of an event that requires the statement to be filed. A vendor commits an offense if the vendor knowingly violates the code. An offense under this section is a misdemeanor.

By submitting a response to this request, the vendor represents that it is in compliance with the requirements of Chapter 176 of the Texas Local Government Code.

Please send completed forms to the Collin County County Clerk's Office located at 2300 Bloomdale Rd., Suite 2104, McKinney, TX 75071.

Please initial.

_____ (Required)

13 Anti-Collusion Statement

Bidder certifies that its Bid/Proposal is made without prior understanding, agreement, or connection with any corporation, firm, or person submitting a Bid/Proposal for the same materials, services, supplies, or equipment and is in all respects fair and without collusion or fraud.

No premiums, rebates or gratuities permitted; either with, prior to, or after any delivery of material or provision of services. Any such violation may result in Agreement cancellation, return of materials or discontinuation of services and the possible removal from bidders list.

Please initial.

_____ (Required)

14 Disclosure of Interested Parties

Section 2252.908 of the Texas Government Code requires a business entity entering into certain contracts with a governmental entity to file with the governmental entity a disclosure of interested parties at the time the business entity submits the signed contract to the governmental entity. Section 2252.908 requires the disclosure form (Form 1295) to be signed by the authorized agent of the contracting business entity, acknowledging that the disclosure is made under oath and under penalty of perjury. Section 2252.908 applies only to a contract that requires an action or vote by the governing body of the governmental entity before the contract may be signed or has a value of at least $1 million. Section 2252.908 provides definitions of certain terms occurring in the section.

Section 2252.908 applies only to a contract entered into on or after January 1, 2016.

Please initial.

_____ (Required)

15 Notification Survey

In order to better serve our offerors, the Collin County Purchasing Department is conducting the following survey.

_____ (Required)

		We appreciate your time and effort expended to submit your bid. Should you have any questions or require more information please call (972) 548-4165. How did you receive notice of this request? Valid Responses: [Please Select], Plano Star Courier, Plan Room, Collin County eBid Notification, Collin County Website, Other	
16	Bid Bond Acknowledgement	Accompanying this bid, is a certified check, cashier's check or Bid Bond in the amount of five percent (5%) of the total amount bid. Also accompanying this bid, all the information required in Section 00200 – Instructions to Bidders. Please initial.	_____ (Required)
17	Construction Acknowledgement	Bidder, declares that the only person or parties interested in this bid are those principals named herein, that his/her bid is made without collusion with any other person, firm or corporation, that he/she has carefully examined the Contract Documents including the Advertisement for Bids, Instruction to Bidders, Construction Agreement, Specifications and the Drawings, therein referred to and has carefully examined the locations, conditions and classes of materials for the proposed work, and agrees that he/she will provide all the necessary labor, machinery, tools, equipment, apparatus and other items incidental to construction and will do all the work and furnish all the materials called for in the Contract Documents in the manner prescribed therein. Bidder hereby declares that he/she has visited the site of the Work and has carefully examined the Contract Documents pertaining to the Work covered by the above Bid, and he/she further agrees to commence work within ten (10) consecutive calendar days after date of written Notice to Proceed and to substantially complete the work on which he/she has bid within the number of days specified subject to such extensions of time allowed by Specifications. Bidder certifies that the bid prices contained in this bid have been carefully checked and are submitted as correct and final. The prices have been shown in words and figures for each item listed in this bid and it is understood that in the event of a discrepancy, the words shall govern. Please initial.	_____ (Required)
18	Addendum 1 Acknowledgement	Bidder acknowledges receipt of Addendum 1. Please initial.	_____ (Required)
19	Addendum 2 Acknowledgement	Bidder acknowledges receipt of Addendum 1. Please initial.	_____ (Required)
20	Addendum 3 Acknowledgement	Bidder acknowledges receipt of Addendum 3. Please initial.	_____ (Required)

Line Items

#	Qty	UOM	Description	Response
1	1	lump sum	Bid Grand Total	$_____ (Required) Price

Supplier Notes: _____

Item Attributes: Please review the following and respond where necessary

#	Name	Note	Response
1	Bid Grand Total- Written in Words	The contract award will be based on the total bid price.	_____ (Required)
2	Total Material Cost Incorporated in Project		$_____ (Required)
3	Total Material Cost Incorporated in Project- Written in Words		_____ (Required)
4	Total Labor Cost Incorporated in Project		$_____ (Required)
5	Total Labor Cost Incorporated in Project- Written in Words		_____ (Required)