



ADDENDUM

ADDENDUM NO. 01

DATE 06.19.2014

PROJECT VMDO Project No.1115, Renovation of Three Residence Halls
PC# 217-17565-001

TO ALL BIDDERS: The following constitutes Addendum No. 01 to the Contract Documents dated May 19, 2014, for the Renovation of Three Residence Halls. This addendum shall be attached to the Contract Documents and shall be part thereof to the same extent as if it were originally included. The contractor shall be responsible for coordinating these changes as they affect other work in the Contract Documents. Bidders shall acknowledge receipt of this addendum on their bid form.

11 TOTAL FORM PAGES

21 TOTAL SPECIFICATION PAGES ATTACHED

21 TOTAL DRAWING SHEETS ATTACHED AS FOLLOWS: 14 8.5X11 00 11X17 07 30X42 00 OTHER

REVISIONS TO SPECIFICATIONS:

For the provision of materials, products or assemblies by manufacturers not listed in the Contract Documents, please refer to the General Conditions of the Construction Contract, Section 26, "Equals". Evaluation of non-listed manufacturers and products will not be undertaken by the A/E during the bidding period

Section No. 08 7100

- 1.1 Revise section 3.8-A1-a. to read 'Products listed in the door hardware sets below indicate quantity, item, size, finish, etc. Refer to Part 2 above for list of available manufacturers.'
- 1.2 Revise section 3.8-B to read 'Hardware Sets: The manufacturers listed below are representative only. Refer to hardware component listings in Part 2 above for available manufacturers for each component'
- 1.3 Add Section 1.6.C to read as follows:

Section No. 21 1000

"C. Submittal to the Authorities Having Jurisdiction: The A/E shall review and attach his approval to the fire protection sprinkler submittal, then send one complete copy of the "approved" submittal to the authority having jurisdiction for review. The Contractor shall revise and resubmit, through the A/E for approval, to the authority having jurisdiction as required for acceptance. The authority having jurisdiction is the Director, Division of Engineering and Buildings, c/o Bureau of Capital Outlay Management."

Section No. 23 0000

- 1.4 Revise portion of Section 3.1.A.5 that reads: "Where thermostats and switches are shown in proximity, rough in thermostats above switch and align vertically. Wall-mounted thermostats shall be mounted 5'-4" above finished floor to bottom of thermostat, unless noted otherwise", to read as

follows: "**Thermostats shall be mounted so that the top of the thermostat is 48" above finished floor and aligned with the top of the light switch plates and 8" from the light switch if shown on the drawings adjacent to a light switch. Room thermostat locations shall be coordinated with door swings, light switches and other wall-mounted items. Corridor thermostats shall be mounted 60" above finished floor.**"

1.5 Add a sentence at the end of Section 2.3.D.5 to read as follows:

"All required transformers, relays, etc., shall be provided by the Controls Contractor."

Section No. 23 0900

1.6 Add Section 3.2.D.7 to read as follows:

"The airflow monitoring stations in each unit shall report outside air quantities to the BAS. If airflow quantities vary by 10% or more from the design quantities, an alarm shall be sent to the BAS."

1.7 Modify Section 3.2.E.1.c to read as follows:

"c. Outdoor Air: The outdoor air damper shall remain in the minimum position, except to modulate open in the economizer cycle. The outdoor air damper shall also modulate according to the space CO₂ level. The outdoor air damper shall modulate the minimum outside air setting to maintain setpoint at 1000 PPM (adjustable) as sensed by the CO₂ sensor in the space. The "maximum" minimum outside air quantity is indicated in the Equipment Schedule. The duct-mounted airflow measuring station in the outside air ductwork shall report outside air quantities to the BAS. The airflow measuring station shall control the outside air quantity to an absolute minimum of 150 cfm and shall not allow the building static pressure to drop below setpoint. The airflow measuring station shall alarm the BAS if outside air quantities differ by 10% or more from the required quantity."

1.8 Add the following sentence to the end of Section 3.2.E.5:

"If space CO₂ levels rise above setpoint (adjustable) by 10% or more, an alarm shall be sent to the BAS."

1.9 Add Section 3.2.F.4 to read as follows:

"4. Window Contact: Provide a control switch with a normally closed control contact in each operable window. The contact shall be wired in the unit fan control circuit to allow normal operation of the unit fan when the window is closed, but de-energize the unit fan when the window is open. If multiple windows are in a room then they shall all be wired in series so if one window is open in any room served by the air handling unit then the unit fan is de-energized."

1.10 Remove Section 3.2.G.4.

1.11 Add the following to the end of Section 3.2.G.5 to read as follows:

"The duct-mounted airflow measuring station in the outside air ductwork shall report outside air quantities to the BAS. The airflow measuring station shall alarm the BAS if outside air quantities differ by 10% or more from design."

1.12 Modify Section 3.2.H.2 to read as follows:

"2. The BAS shall monitor unit status and room temperature."

1.13 Modify the third sentence of Section 3.2.I.1 to read as follows:

"The thermostat/sensor and controller shall operate as a complete system with the BAS to provide heating (through HWC-1), cooling, occupied/unoccupied operation, supply air fan speed control and adjustable temperature range at the thermostat (temperature range set by the BAS).

1.14 Modify the title of Section 3.2.I to read as follows:

"I. Split System Air Conditioning Unit and Hot Water Coil (FCU-1/HPU-1 and HWC-1)"

1.15 Modify Section 3.2.I.2.c to read as follows:

"c. Heating: On a call for heating, the 2-way heating water control valve for HWC-1 shall modulate to maintain space temperature setpoint."

1.16 Remove Section 3.2.I.2.d.

1.17 Modify the second sentence of Section 3.2.I.3 to read as follows:

"Indoor unit supply fan shall cycle and the compressor (cooling) or hot water coil (heating) shall modulate to maintain unoccupied setback temperature."

1.18 Remove the last sentence of Section 3.2.I.3.

1.19 Add a sentence at the end of Section 3.2.I.4 to read as follows:

"If the condensate pump fails, an alarm shall be sent to the BAS."

1.20 Modify the first sentence of Section 3.2.K.4 to read as follows:

"4. Window Contact: Provide a control switch with a normally closed control contact in each operable window in bedrooms and living room areas.

1.21 Modify Section 3.2.R.2 to read as follows:

"2. Electric Meters: The BAS shall monitor the owner provided BACNet enabled kW Meters as well as all sub-meters provided by the electrical contractor."

1.22 Add Section 3.2.T to read as follows:

"T. Space CO2 Sensor: The space CO2 sensor in Meeting 106 shall report space CO2 levels to the BAS and shall alarm the BAS if CO2 levels rise above setpoint (adjustable) by 10% or more."

1.23 Points Lists Modifications: See revised drawing M602 and revised specifications for points list modifications.

1.24 Add Section 3.2.U to read as follows:

"Elevator Shaft Motorized Damper: Motorized Damper at top of elevator shaft shall be interlocked with the fire and smoke alarm system to open in the event of fire or smoke development. Damper shall be normally open."

Section No. 23 3000

1.25 Add Section 1.6.A.1.l to read as follows:

"I. Duct-mounted airflow measuring stations"

1.26 Add Section 2.12. See revised specifications.

1.27 Modify Section 2.11.A to read as follows:

"Dryer vents shall be round smooth surface aluminum duct, 4" diameter. Tap ducts into main exhaust duct connected to dryer exhaust fan."

Section No. 23 7000

1.28 Delete Section 2.1.P.

Section No. 23 8100

1.29 Modify Section 1.6.A.1.b. to read as follows:

"b. Split System Air Conditioning Unit"

1.30 Remove first sentence of Section 2.1.I.

1.31 Add Section 2.1.K to read as follows:

"Provide with interface for BAS connection."

1.32 Modify title of Section 2.3 to read as follows:

"SPLIT SYSTEM AIR CONDITIONING UNIT (FCU-1/HPU-1)"

1.33 Modify the fourth sentence of Section 2.3.C to read as follows:

"Condensing unit controls and accessories shall provide automatic capacity modulation and condenser and evaporator pressure control for operation down to 30°F outside air temperature."

1.34 Modify Section 2.3.I to read as follows:

"Provide a condensate pump for the fan coil unit (indoor). Pump shall be powered by the unit and shall be integral to the unit. Provide a high condensate level switch in the condensate drain pan to shut off the unit and alarm the BAS in the event of a high level alarm."

1.35 Add Section 2.3.K to read as follows:

"Provide with interface for BAS connection."

Section No. 23 8200

1.36 Modify Section 2.1.B to read as follows:

"Casing shall be constructed of heavy-gauge furniture steel. It shall be phosphatized and completely dip painted with a heavy-duty baked enamel, color as selected by Architect from full range. Cast brass supply and return pipe tap connections shall be bolted to corners of the back."

1.37 Modify title of Section 2.2 to read as follows:

"VERTICAL FLOOR-MOUNT CONSOLE AND VERTICAL RECESSED FAN COIL UNITS"

6.3 Add the words "or equal" immediately after the words "General – Fan coil units shall be Price, Titus, Trane" in Section 2.2.A.

1.38 Modify Section 2.2.D to read as follows:

"Unit Finish: All cabinet parts exposed shall be cleaned, bonderized, phosphatized, and painted with a baked powder finish, color as selected by Architect from full range."

6.5 Add the words "or equal" immediately after the words "Provide Price, Titus, Temspec, Whalen" in Section 2.3.A.

1.39 Modify Section 2.5.D to read as follows:

"Each unit shall be surface-mounted type unless noted otherwise. Mount units nominal 12" above floor, except in toilet rooms mount units nominal 6" below ceiling."

1.40 Add Section 2.3.S to read as follows:

"Two-Way Control Valves: Shall be provided by the BAS contractor and factory installed by the fan coil manufacturer. Fan coil manufacturer shall coordinate with BAS contractor to assure that all

required controllers, transformers or other control devices are provided for unit operation. Piping packages shall be factory installed.”

1.41 Modify title of Section 2.4 to read as follows:

“HORIZONTAL CONCEALED FAN COIL UNITS (HFC)”

1.42 Remove all instances of the word “packages” from Section 2.4.H.

1.43 Add the following sentence to the end of Section 2.2.F:

“A fused service disconnect switch shall be included, mounted inside the unit. The switch shall be rated in accordance with the electrical load.”

1.44 Add the following sentence to the end of Section 2.4.E:

“A fused service disconnect switch shall be included, mounted inside the unit. The switch shall be rated in accordance with the electrical load.”

1.45 Modify Section 2.1.G to read as follows:

“The unit shall be controlled as indicated in the Sequences of Control. Thermostat location shall be as shown on drawings. Thermostats shall be low voltage. The aquastat bulb shall be located on the return runout.”

Section No. 28 3100

1.46 Revise Section 2.1.B.1 to read as follows:

1. FACU and Equipment:

- a. Simplex Grinnell LP; Tyco International Company.
- b. NOTIFIER; GE-Honeywell Company.
- c. Siemens Building Technology, Inc.

REVISIONS TO DRAWINGS:

Sheet No. D101

2.1 Revise general note 15 to include ‘**REMOVE ALL FLOOR SHELVES IN POCOHONTAS AND DRAPER HALLS.**’

2.2 Revise general note 17 to include read ‘SCOPE OF DEMOLITION IN CORRIDORS GENERALLY INCLUDES REMOVING ALL MISC. MIRRORS, TACKSTRIPS, TACKBOARDS, FIRE EXTINGUISHER CABINETS, ACCESS DOORS, CHAIRRAIL, CEILINGS, **ABOVE CEILING INSULATION**, VCT AND BASE ENTIRELY. PATCH WALL WHERE ITEMS

Sheet No. A010D
Sheet No. A101
Sheet No. A210

Sheet No. A760
Sheet No. FP001

Sheet No. FP101

No. FP101

Sheet No. SP101

Sheet No. M001
Sheet No. M002

Sheet No. M101

HAVE BEEN REMOVED AS NECESSARY TO PREPARE WALL SURFACE TO BE PRIMED-SURFACED. PREPARE FLOOR TO RECEIVE NEW FINISH."

2.3 Add general note number 26 to read '**REMOVE VAULT WALLS AND SAFE DOOR IN EXISTING OFFICE IN THEIR ENTIRETY.**'

2.4 Change section tag on detail 1/A1010D from 08/A1010D to **04/A1010D**

2.5 Revise frame type for door 150A from S1 to **S4**

2.6 Add general note number 8 to read '**REFER TO FIRE PROTECTION SHEETS FOR FIRE RATED ASSEMBLIES.**'

2.7 Add note to section 09/A210 calling out '**EXISTING RATED CEILING, TYP.**' for plaster ceilings in typical bedrooms.

2.8 Add "**V.I.F.**" note to dimension strings on detail 01/A760. Coordinate enclosure dimensions with mechanical equipment.

2.9 Add following General Fire Partition notes, "**3. RATINGS SHOWN AT PARTITIONS APPLY TO NEW WORK, INCLUDING NEW PENETRATIONS AT THOSE PARTITIONS, PATCHING OF EXISTING PENETRATIONS AND FIRE RATED PARTITIONS EXPOSED DURING DEMOLITION, AND WHERE REQUIRED TO ACHIEVE CONTINUITY OF FIRE RATED DESIGN., 4. CONTRACTOR SHALL ASSUME THE EXISTING FIRE RATED PARTITIONS IN THE CORRIDORS AND STAIR WALLS BETWEEN HOUSEKEEPING, TRASH, AND ADJACENT BATHROOMS/CLOSETS BE EXTENDED TO THE UNDERSIDE OF THE DECK.**"

2.10 Revise two hour rated enclosure around STAIR 1 per attached sketch **FSK-01**

2.11 Revise $\frac{1}{2}$ hour rated wall around bathroom s 204 and 304 per attached Sketch **FSK-02.**

2.12 Add Sidewall Sprinkler Installation Detail and Positioning Table. Refer to attached sketch **SPSK-1.**

2.13 Modify general notes #33 and #35. Refer to attached sketch **MSK-9.**

2.14 Modify equipment schedules for ERV-1/ERV-2, FCU-1/HPU-1 and fan coil units. Refer to attached revised sheet M002.

2.15 Remove fire dampers from ductwork penetrating stairs. Refer to attached Sketch **MSK-1.**

2.16 Add fire damper at a floor penetration per attached sketch **MSK-2.**

2.17 Add fire damper at ductwork penetration through chase wall. Refer to attached sketch **MSK-3.**

2.18 Add a fire damper at the 50 cfm sidewall exhaust register in room TRASH 112.

2.19 Add a fire damper at the sidewall exhaust registers in BATH D 110B and BATH A 114. Fire dampers shall be all 304 stainless steel construction.

In lieu of adding fire dampers, the contractor may route the ductwork in

Sheet No. M102

these two bathrooms similar to the routing shown on "TYPICAL BATHROOM DUCTWORK – PLAN NORTH ROOMS" on revised sheet M301P, with ceiling registers instead of sidewall registers.

2.20 Add fire dampers on floors 2 and 3 and modify ductwork routing on second floor. Refer to attached revised Sheet **M102**.

2.21 Modify airflow quantities in third floor apartment. Refer to attached revised sheet M102

2.22 Extend 6x4 exhaust duct to ceiling exhaust register in lieu of sidewall exhaust register in rooms BATH F 304A and BATH F 204A

2.23 Provide fire dampers at 18x6 duct penetrations down to apartment bedrooms below.

2.24 Provide fire dampers at 18x6 duct penetrations down to apartment bedrooms below.

2.25 Remove wall-mounted humidistat in Commons 007. Refer to attached sketch **MSK-4**.

2.26 Add CO₂ sensors in Rooms 102 and 106. Refer to attached sketch **MSK-5**.

Sheet No. M103P

Sheet No. M103D

Sheet No. M201

Sheet No. M202

Sheet No. M301P

Sheet No. M301B

Sheet No. M301D

Sheet No. M401

2.27 Remove fire dampers and add ductwork sizes to AHU-1 ductwork. Refer to attached revised drawing **M301P**.

2.28 Add airflow measuring station in AHU-1 outside air duct and modified duct routing. Refer to attached revised drawing M301P.

2.29 Add airflow measuring station in ERV-3 outside air ductwork. Refer to attached revised drawing **M301P**.

2.30 Modify ductwork routing in typical bathroom ductwork plans. Refer to attached revised drawing **M301P**.

2.31 Remove fire dampers and added ductwork sizes to AHU-1 ductwork. Refer to attached revised drawing **M301B**.

2.32 Add airflow measuring station in AHU-1 outside air ductwork and modified plenum box size and duct routing. Refer to attached revised drawing **M301B**.

2.34 Add airflow measuring station in ERV-3 outside air ductwork. Refer to attached revised drawing **M301B**.

2.35 Remove fire dampers and added ductwork sizes to AHU-1 ductwork. Refer to attached revised drawing **M301D**.

2.36 Add airflow measuring station in AHU-1 outside air ductwork and modified plenum box size and duct routing. Refer to attached revised drawing **M301D**.

2.37 Add airflow measuring station in ERV-3 outside air ductwork. Refer to attached revised drawing **M301D**.

2.38 Note 3/8" graphic scale on revised drawing **M301D**.

2.39 Add autoflow valves and strainers to horizontal fan coil unit coil connection detail. Refer to attached sketch MSK-7.

Sheet No. M402

2.40 Add strainer to fin tube radiator detail. Refer to attached sketch **MSK-8**.

Sheet No. M601

2.41 Remove window contact from horizontal fan coil unit control diagram.

Refer to attached revised drawing M601.

2.42 Add airflow measuring stations to control diagrams for ERV-1/ERV-2, ERV-3 and AHU-1. Refer to attached revised drawing **M601**.

2.43 Revise combination humidistat/thermostat for EF-4 to be line voltage. Refer to attached revised drawing **M601**.

2.44 Revise cooling thermostat for EF-2 to be low voltage. Refer to attached revised drawing **M601**.

2.45 Modify split system air conditioner control diagram title. Refer to revised drawings and specifications.

2.46 Add window contact to AHU-2/AHU-3 control diagram. Refer to attached revised drawing **M601**.

2.47 Add miscellaneous point for space CO₂ sensors. Refer to attached revise drawing **M601**.

2.48 Add elevator shaft damper to miscellaneous control diagram. Refer to attached revised drawing **M601**.

Sheet No. M602

2.49 Various points lists have been modified. Refer to attached revised sheet M602 and attached revised system point list.

Sheet No. E201

2.50 Refer to Basement Floor Power Plan. For EF-4, route indicated circuit via line-voltage thermostat. Coordinate thermostat location with fan installer.

Sheet No. E302

2.51 Refer to Attic Floor Fire Alarm and Telecommunications Plan. Provide relay base in smoke detector at top of elevator shaft and route circuit to motorized damper in elevator shaft via relay base (damper and circuit indicated on E202). Damper is normally open. Smoke detector relay base shall have normally closed contacts such that the damper opens when smoke is detected in the elevator shaft or power to the building is lost. Provide all required hardware and programming for interfacing damper with fire alarm.

PRE-BID QUESTIONS:

1. Are pre-bid substitutions requests being considered?

No substitutions will be reviewed during bidding, but products or equipment that is equal to that specified may be bid.

2. Appendix C Asbestos Report indicates a positive result for mastic (FM-15.1), but does not indicate the location.

Is abatement of floor tile mastic included in the base bid?

Additional sampling of floor tile mastic in Draper Hall was tested and found to contain <1% asbestos. Refer to report dated July 12, 2013. After further investigation it was determined that the positive sample (FM-

15.1) taken July 1, 2013 was of a residual amount of asbestos remaining from a previous abatement project and abatement of floor tile and mastic is not included in the base bid.

3. Is the GC responsible for sidewalk repair for Installation of new Fire Main?

Yes, the contractor shall remove and replace sidewalk in complete sections where removed for installation of underground utilities.

4. Detail of sump pump does not indicate what the pit is constructed of. Are they located in all three buildings?

The sump pit is constructed of concrete; refer to Partial Plan #23 on Drawing P402. This sump pump installation does occur in all 3 buildings.

5. Can a holeless jack elevator be substituted for the specified holed hydraulic elevator?

Manufacturers that can provide custom sized holed hydraulic elevators equal to the specified manufacturers may be bid.

6. Partition general note 3 refers to structural for reinforcing of masonry walls. Please clarify spacing and type of reinforcing needed?

Please refer to sheet S200 for the rebar required in the elevator shaft wall.

7. Sheet S103 Attic floor plan references mechanical drawings for ERV unit rail details. Please clarify location and detail of the unit rails.

The reference rails are specified and provided integral to the ERV units.

8. Please clarify which doors are going to be replaced in the base bid.

The bedroom doors in all three buildings and the closet doors in Pocahontas Hall are being replaced in the base bid. Refer to the Bid Form and Door schedule regarding Additive Bid Item #1 for new closet doors in Bolling & Draper Halls and Additive Bid Item #2 for new bathroom, doors in all three buildings.

9. Are the existing metal access doors in the corridors going to be abated?

No, the access doors in the corridors are to be demolished and replaced with new rated access doors. The Fire-Rated Doors to be abated are typically located at the Stairs.

10. Is Radford providing the IT cabling?

The telecommunication cables, terminations and faceplates are Owner furnished, contractor installed.

Refer to Specification section 271000-1.2.

11. Will the existing furniture remain?

Radford has removed all salvaged furniture. All remaining miscellaneous furniture, theater props and abandoned items located throughout the building and in the attic shall be removed by the contractor. Refer to attached Remaining Items photographs.

12. Where does type A1 window detail 20/A500 occur?

Type A1 all glass window is located between the basement SEATING 001B area and the LAUNDRY 002 room. Refer to sheets A101 and A701.

13. Door 150A is called out as type S1 on sheet A101 and type S4 on sheet A500. Please clarify the door frame type and sidelight material.

Door 150a is type S4. Sidelights shall be insulated glass.

14. Is there a spec for the upholstery shown in detail 14/A760?

Refer to Ornamental Woodwork specification section 064400-2.5D for banquette upholstery.

15. What is the deadline for touring the buildings?

The buildings will be available for inspection until Wednesday the 25th of June. Contact Bobby Dunn for an appointment.

ADDITIONAL INFORMATION:

Pre-Bid meeting minutes
Remaining Items photographs

END OF ADDENDUM
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VMDO ARCHITECTS

MEETING MINUTES

PROJECT Renovation of Moffett Hall 13 1115
Radford University 217-17565

MEETING Pre-Bid Conference
DATE 06.10.14

REPORTING Rebecca Shealy, VMDO Architects
ISSUED 06.17.14

SENT TO All Attendees
File,

ATTACHED Sign In sheet

PRESENT	Name, Title	Representing
Roy Saville		Radford University
Paul Ely		Radford University
Bobby Dunn		Radford University
Rebecca Shealy		VMDO Architects
Mallory White		VMDO Architects
Rick Hughes		LPA
All potential Bidders		(See attached attendance list)

NEW BUSINESS	Item Number	Description
PB-01		Rebecca welcomed all attendees to the pre bid meeting. She noted the mandatory nature of the meeting and urged everyone to sign the attendance sheet that was passed around.
PB-02		Rebecca introduced Paul Ely and Bobby Dunn, Radford's Project Managers and the A/E team. She described the scope of the project as the Renovation of three similar Residence Halls in two phases and noted the bid documents represent one building with separate sheets designated for work specific to each building. The scope of work includes interior demolition and selective asbestos abatement, replacement of the MEP systems including a new sprinkler system, the addition of ADA ramps, a new elevator, apartments and lounges, and new interior finishes.
PB-03		Rebecca stated that the Notice of Invitation to Bid was included in the project manual along with the pre bid question form. All pre bid questions should be emailed to rshealy@vmdo.com by Thursday, June 19th. Paul stated that all addenda must be issued six days before the bid date. The bid date may not be postponed in order to answer late questions, so it is important to review the documents and submit questions as soon as possible.

- PB-04 Paul noted that Radford would conduct site visits until June 17th, and bidders and subcontractors should contact Bobby Dunn at 540-831-7815 to arrange a building tour.
- PB-05 The bid forms shall be submitted to Radford no later 2pm Tuesday, July 1st, 2014. The Bid Form found in the project manual must be signed acknowledging the receipt of all addenda. Roy noted the importance of using the State bid bond form included in the project manual.
- PB-06 Rebecca noted that this project uses the State of Virginia's CO-7 general conditions, located in the project manual. The schedule of values and all proposed changes must be submitted on the state forms.
- PB-07 Rebecca noted that the supplemental conditions lists Radford's SWAM goals for minority, women and small business contracts. This information is recorded on the schedule of values.
- PB-08 The Project is a registered LEED project with a goal of Gold certification. Radford has hired a commissioning agent and that contractor is responsible for coordinating the commissioning work within the project schedule.
- PB-09 Paul confirmed that the power will remain on in the buildings and the power for Buchanan House is fed from the basement of Bolling Hall and must be maintained.
- PB-10 After the meeting adjourned, all attendees toured Bolling Hall. The building was opened for inspection by the bidders.

Notify the reporter of these minutes of any discrepancies or omissions, within 5 business days of receipt of this document. Otherwise, these minutes will be considered an accurate record of the issues discussed during the meeting.

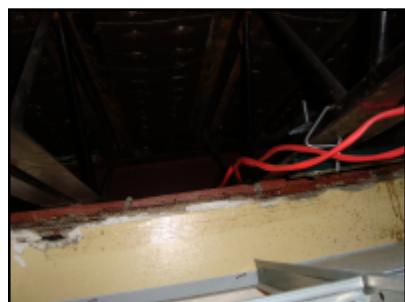
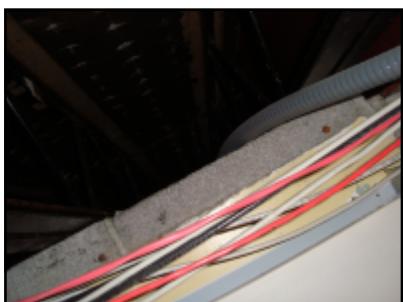
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VMDO ARCHITECTS

VMDO ARCHITECTS			Pre Bid Meeting 06.10.14	
Name	Company	Phone Number		
			Email	
1. PAUL ELY	PCU	540.831.7808	plely@radford.edu	
2. Ryan Cunningham	Barton Malow	434.984.8800	ryan.cunningham@bartonmalow.com	
3. John Dunnin	Bartec USA Inc	434.566.3387	johndunnin@bartonmalow.com	
4. Ricky Sweet	Kreider Ayers & Associates	540-343-7613 ext 104	Ricky.S@KAACTIVECAT.COM	
5. Rhonda Finley	Turner Long Construction	540-343-6179	aphillippe@turnerlongconstruction.com	
6. SHANE DURFLINGER	IPI	660.287.0683	SDURFLINGER@GMAIL.COM	
7. IGNACIO FERNANDEZ	SEMII USA CORPORATION	202.330.3512	ignacio.fernandez@semi-group.com	
8. Delaine Deer	SEMI USA	202.765.6060	delaine@semi-group.com	
9. Michelle Wallace	TES	540.342.5498	MICHELLE.WALLACE@TES-COM	
10. John Loftus	Bell Roofing	540-981-2430	jloftus@bellerofting.com	
11. Paul Sanik	Red	540.831.7810	rsanik@redfield.edu	
12. BRANDON SPANGER	MB CONTRACTORS INC	540.342.16958	bspanger@mbcontractors.com	
13. Ewell Moraw	MB Contractors Inc	540.342.6758	Ewell@MBcontractors.com	
14. Doug Chidress	BRANCH ASSOC	540.283.8546	doug.chidress@branch-associates.com	
15. Jerry Green	IES COMMERCIAL	540-342-3498	JERRY.GREEN@IES-CO.COM	
16. Claude Patchford	Panuke Sprinkler, Inc	540-981-0009	claudie@rs.roccoxmail.com	
17. Tim Gundliff	WACO INC	540.633.6311	tcundliff@wacoinc.net	
18. Maury Altizer	E. LUKE GREENE CO.	423-926-1151	maury@elukegreene.com	
19. Rob Wilson	FRANK L. BURN CONSTRUCTION	336.748-4413	twilson@fburnm.com	
2. JEFF AUSTIN	F&S BUILDING INNOVATIONS	540-985-9160	JEFF@FSBUILDINGINC.COM	
3. TROY THUNDERSON	G+H CONTRACTING INC.	540-387-5059	tthunderson@ghcontracting.com	
4. Daniel Richard	Completion - Vert	540-774-0681	drichard@completion-vert.com	
5. Beate Hartmann	Burwell Construction	423-956-6384	Beate@vt-edu	
6. Todd Quigley	PCS (Dems & ASB)	717-939-8224	Tquigley@PowerComponentsSystems.com	
7. Wes Hart	Theo Inc	540-563-0567	withe@therconstruction.com	
8. KEVIN DANKE	G-T HOPKINS	540-932-1873	KEVIN.D@GT-HOPKINS.COM	
9.				
10.				
11.				



TYPICAL FURNITURE REMAINING IN BUILDING



TYPICAL CORRIDOR WALLS ABOVE CEILING

ADD 01 06.19.2014

VMDO ARCHITECTS

200 E MARKET ST
CHARLOTTESVILLE, VA 22902
P 434.296.5684 F 434.296.4496
www.vmdo.com

Pocahontas Hall - Remaining Items

1115, PC# 217-17565

RADFORD UNIVERSITY, RENOVATION OF THREE RESIDENCE HALLS



TYPICAL FURNITURE REMAINING IN BUILDING



ADD 01 06.19.2014

VMDO ARCHITECTS

200 E MARKET ST
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Pocahontas Hall - Remaining Items

1115, PC# 217-17565
RADFORD UNIVERSITY, RENOVATION OF THREE RESIDENCE HALLS

SYSTEM POINT LIST

SYSTEM POINT DESCRIPTION	SYSTEM FEATURES				PROGRAMS	NOTES	
	ANALOG		BINARY				
INPUT	OUTPUT	INPUT	OUTPUT	ALARMS			
COOLING WATER SYSTEM							
CHILLED WATER PUMPS (CWP-1 & 2)	x	x		TEMPERATURE			
BUILDING LEAVING CHILLED WATER		x		PRESSURE			
BUILDING ENTERING CHILLED WATER		x		DIFF PRESSURE			
MODULATING CONTROL (CHOKE VALVE)		x		KW			
SYSTEM PRESSURE	x		x	GPM			
VFD CW PUMP (CWP-1 & 2)		x	x	CFM			
VFD FAIL (CWP-1 & 2)		x	x	PPM			
CHILLED WATER FLOW		x	x	PERCENT			
		x	x	PERCENT RLA			
		x		DDC (4-20 mA or 0-10 VDC)			
		x		VFD			
		x		SETPOINT ADJ.			
		x		PNEU. TRANSDUCER			
		x		STATUS ON/OFF			
		x		FILTER STATUS			
		x		STATUS OPEN/CLOSED			
		x		STATUS			
		x		VFD FAULT			
		x		OFF/ON			
		x		OPEN/CLOSE			
		x		MAX CAPACITY			
		x		ENABLE/DISABLE			
		x		LIMIT WARNING			
		x		HIGH ANALOG			
		x		LOW ANALOG			
		x		BINARY			
		x		INTER PROCESS FAIL			
		x		SENSOR FAIL			
		x		FLOW FAIL			
		x		COMM. FAIL			
		x		DIAGNOSTICS			
		x		PROOF			
		x		TIME SCHEDULING			
		x		OPT. START/STOP			
		x		DEMAND LIMITING			
		x		RESET			
		x		EVENT PROGRAM			
		x		DDC			
		x		ALARM INSTRUCT			
		x		MAINT. WK. ORD.			
		x		RUN TIME			
		x		EXP. MESSAGE			
		x		SET BACK/SET UP			
		x		NIGHT PURGE			
		x		TENANT BILLING			
		x		TOTALIZING			
		x		TIMED OVERRIDE			

SYSTEM POINT LIST

SYSTEM POINT DESCRIPTION	ANALOG		BINARY		SYSTEM FEATURES		PROGRAMS	NOTES
	INPUT	OUTPUT	INPUT	OUTPUT	ALARMS			
HEATING WATER SYSTEM	GRAPHIC							
HEATING WATER SUPPLY	X		TEMPERATURE					
HEATING WATER RETURN	X		PRESSURE					
HEATING WATER SUPPLY SETPOINT			RH					
H/W PUMP (1 & 2)			KW					
OUTDOOR AIR	X		GPM					
VFD H/W PUMP (1 & 2)			CFM					
VFD FAIL (HWP-1 & 2)			PPM					
CONVERTER STEAM VALVES		X	PERCENT					
SYSTEM PRESSURE	X		PERCENT RLA					
			DDC (4-20mA or 0-10 VDC)					
			VFD					
			SETPOINT ADJ.					
			PNEU. TRANSDUCER					
			STAUS ON/OFF					
			FILTER STATUS					
			STATUS OPEN/CLOSED					
			STATUS					
			OFF/ON					
			OPEN/CLOSE					
			LOCK OUT					
			ENABLE/DISABLE					
			HIGH ANALOG					
			LOW ANALOG					
			BINARY					
			PROOF					
			SENSOR FAIL					
			FLOW FAIL					
			COMM. FAIL					
			DIAGNOSTICS					
			TIME SCHEDULING					
			OPT. START/STOP					
			DEMAND LIMITING					
			RESET					
			EVENT PROGRAM					
			DDC					
			ALARM INSTRUCT					
			MAINT. WK. ORD.					
			RUN TIME					
			EXP. MESSAGE					
			SET BACK/SET UP					
			NIGHT PURGE					
			TENANT BILLING					
			BOILER SEQUENCING					
			TOTALIZING					
			TIMED OVERRIDE					
			LEAD/LAG					

GENERAL NOTES: PROVIDE ONE COLOR GRAPHIC EACH UNIT WITH ALL DYNAMIC DATA SHOWN.

SYSTEM POINT LIST

SYSTEM POINT DESCRIPTION	ANALOG		BINARY		ALARMS	PROGRAMS	NOTES
	INPUT	OUTPUT	INPUT	OUTPUT			
ENERGY RECOVERY VENTILATION UNITS (ERV-1 AND ERV-2)							
SUPPLY AND EXHAUST FANS							
SUPPLY DISCHARGE AIR	X	X					
PREHEAT COIL VALVE			X	X			
COOLING COIL VALVE			X	X			
OUTDOOR AIR FILTER		X		X			
EXHAUST AIR FILTER		X		X			
EXHAUST AIR HUMIDISTAT		X					
WHEEL MOTOR (VFD)			X	X			
EXHAUST AIR ENTERING WHEEL	X			X	X		
EXHAUST AIR LEAVING WHEEL	X			X	X		
SUPPLY AIR ENTERING WHEEL	X			X	X		
SUPPLY AIR LEAVING WHEEL	X			X	X		
WHEEL EXHAUST AIR REHEAT COIL VALVE	X		X				
OA DAMPER EA DAMPER				X	X	X	
FREZEESTAT				X	X	X	
AIRFLOW MEASURING STATION			X X				

GENERAL NOTES:

PROVIDE ONE COLOR GRAPHIC EACH UNIT WITH ALL DYNAMIC DATA SHOWN.

SYSTEM POINT LIST

SYSTEM POINT DESCRIPTION	ANALOG		BINARY		SYSTEM FEATURES		NOTES
	INPUT	OUTPUT	INPUT	OUTPUT	ALARMS	PROGRAMS	
AIR HANDLING UNIT (AHU-1) AND RETURN FAN (RF-1)							
SUPPLY AND RETURN FANS							
VFD (SUPPLY AND RETURN FANS)		X					
VFD FAIL (SUPPLY AND RETURN FANS)							
SUPPLY AIR	X		X				
HEATING COIL (CONTROL VALVE)		X					
Cooling coil (control valve)		X					
MIXED AIR	X						
OUTSIDE AIR	X	X					
ECONOMIZER ACTUATION OR/AND EA FREEZESTAT			X				
REMOTE SETPOINT		X	X				
FILTER		X					
SPACE TEMP.	X		X				
COOLING COIL DISCHARGE	X						
RETURN AIR HUMIDISTAT		X					
CO2 SENSOR			X				
AIRFLOW MEASURING STATION	X		X				

GENERAL NOTES: PROVIDE ONE COLOR GRAPHIC PER UNIT WITH ALL DYNAMIC DATA SHOWN.

SYSTEM POINT LIST

SYSTEM POINT DESCRIPTION	ANALOG		BINARY		SYSTEM FEATURES		NOTES
	INPUT	OUTPUT	INPUT	OUTPUT	ALARMS	PROGRAMS	
AIR HANDLING UNIT (AHU-2 & AHU-3)	GRAPHIC						
SUPPLY FAN			TEMPERATURE				
SUPPLY AIR	X		PRESSURE				
HEATING COIL (CONTROL VALVE)			RH				
COOLING COIL (CONTROL VALVE)		X	KW				
RETURN AIR		X	KWH				
SPACE TEMP.		X	GPM				
COOLING COIL DISCHARGE	X	X	PERCENT				
WINDOW CONTACT		X	CFM				
			SETPOINT				
			DDC (4-20 mA or 0-10 vdc)				
			SETPOINT ADJ.				
		X	PNEU. TRANSDUCER				
			STATUS ON/OFF				
			FILTER STATUS				
			STATUS OPEN/CLOSED				
			STATUS				
			NO. OF STARTS				
			TIMED OVERRIDE				
		X	OFF/ON				
			OPEN/CLOSE				
			LOCK OUT				
			ENABLE/DISABLE				
			HIGH ANALOG				
			LOW ANALOG				
			HIGH BINARY				
			LOW BINARY				
			PROOF				
		X	SENSOR FAIL				
		X	FLOW FAIL				
		X	COMM. FAIL				
		X	DIAGNOSTICS				
			TIME SCHEDULING				
			DEMAND LIGHTING				
			OPTIMAL START/STOP				
			RESET				
			EVENT PROGRAM				
			DDC				
			ALARM INSTRUCT				
			MAINT. WK. ORD.				
			RUN TIME				
			EXP. MESSAGE				
			SET BACK/SET UP				
			NIGHT PURGE				
			TIMED OVERRIDE				

GENERAL NOTES: PROVIDE ONE COLOR GRAPHIC PER UNIT WITH ALL DYNAMIC DATA SHOWN.

SYSTEM POINT LIST

SYSTEM POINT DESCRIPTION	ANALOG		BINARY		SYSTEM FEATURES		NOTES
	INPUT	OUTPUT	INPUT	OUTPUT	ALARMS	PROGRAMS	
HORIZONTAL CONCEALED, VERTICAL CONSOLE AND VERTICAL CONCEALED FAN COIL UNITS							
CONTROL PANEL					TEMPERATURE		
FAN CONTROL					PRESSURE		
SPACE AIR	X				RH		
HEATING COIL VALVE			X		KW		
COOLING COIL VALVE	X				GPM		
COOLING COND. PAN			X		CFM		
			X		PPM		
					PERCENT		
					PERCENT RLA		
					4-20 Ma or 0-10 VDC		
					SETPOINT ADJ.		
					PNEU. TRANSDUCER		
		X			STAUS ON/OFF		
					FILTER STATUS		
					STATUS OPEN/CLOSED		
			X		STATUS		
					HIGH LIMIT		
					OFF/ON		
					OPEN/CLOSE		
					LOCK OUT		
					ENABLE/DISABLE		
					HIGH/LOW		
					HIGH ANALOG		
					LOW ANALOG		
					BINARY		
					PROOF		
					SENSOR FAIL		
					FLOW FAIL		
					X COMM. FAIL		
					X DIAGNOSTICS		
					LATCHING		
					X TIME SCHEDULING		
					X OPT. START/STOP		
					DEMAND LIMITING		
					RESET		
					EVENT PROGRAM		
					X DDC		
					ALARM INSTRUCT		
					MAINT. WK. ORD.		
					RUN TIME		
					EXP. MESSAGE		
				X	SET BACK/SET UP		
					NIGHT PURGE		
					TENANT BILLING		
					CHILLER SEQUENCING		
					TOTALIZING		
					X TIMED OVERRIDE		
					MODE CONTROL		

GENERAL NOTES:

PROVIDE ONE COLOR GRAPHIC PER UNIT WITH ALL DYNAMIC DATA SHOWN.

SYSTEM POINT LIST

SYSTEM POINT DESCRIPTION	ANALOG		BINARY		SYSTEM FEATURES		NOTES
	INPUT	OUTPUT	INPUT	OUTPUT	ALARMS	PROGRAMS	
VENTILATION UNIT (ERV-3)							
SUPPLY FAN					GRAPHIC		
EXHAUST FAN					TEMPERATURE		
SUPPLY AIR	X				PRESSURE		
OUTDOOR AIR	X				RH		
EA UPSTREAM	X				KW		
EA DOWNSTREAM	X				KWH		
OA DAMPER					BTU/HR		
EA DAMPER	X				GPM		
AIRFLOW MEASURING STATION	X				PERCENT		
					CFM		
					SETPOINT		
					DDC (4-20 mA 0-10 vdc)		
					SETPOINT ADJ.		
		X			PNEU. TRANSDUCER		
		X			STATUS ON/OFF		
					FILTER STATUS		
					STATUS OPEN/CLOSED		
					STATUS		
					NO. OF STARTS		
					TIMED OVERRIDE		
		X			OFF/ON		
		X			OPEN/CLOSE		
					LOCK OUT		
					ENABLE/DISABLE		
					HIGH ANALOG		
					LOW ANALOG		
					HIGH BINARY		
					LOW BINARY		
					PROOF		
					SENSOR FAIL		
					FLOW FAIL		
					COMM. FAIL		
					DIAGNOSTICS		
					TIME SCHEDULING		
					DEMAND LIGHTING		
					OPTIMAL START/STOP		
					RESET		
					EVENT PROGRAM		
					DDC		
					ALARM INSTRUCT		
					MAINT. WK. ORD.		
					RUN TIME		
					EXP. MESSAGE		
					SET BACK/SET UP		
					NIGHT PURGE		
					TENANT BILLING		

SYSTEM POINT LIST

SYSTEM POINT LIST					
SYSTEM POINT DESCRIPTION	ANALOG		BINARY		SYSTEM FEATURES
	INPUT	OUTPUT	INPUT	OUTPUT	
DUCTLESS SPLIT A.C. UNIT					
CONTROLLER					GRAPHIC
SUPPLY FAN					TEMPERATURE
COMPRESSOR					PRESSURE
SPACE TEMP.	X				RH
CONDENSATE LEVEL			X		KW
					KWH
					BTU/HR
					GPM
					PERCENT
					CFM
					SETPOINT
					DDC (4-20 mA 0-10 vdc)
					SETPOINT ADJ.
					PNEU. TRANSDUCER
			X	X	STATUS ON/OFF
					FILTER STATUS
					STATUS OPEN/CLOSED
			X		STATUS
					NO. OF STARTS
			X	X	TIMED OVERRIDE
					OFF/ON
			X		OPEN/CLOSE
					LOCK OUT
			X		ENABLE/DISABLE
			X	X	HIGH ANALOG
					LOW ANALOG
			X		HIGH BINARY
					LOW BINARY
				X	PROOF
					SENSOR FAIL
			X		FLOW FAIL
				X	COMM. FAIL
					DIAGNOSTICS
					TIME SCHEDULING
					DEMAND LIGHTING
					OPTIMAL START/STOP
					RESET
					EVENT PROGRAM
					DDC
			X		ALARM INSTRUCT
					MAINT. WK. ORD.
					RUN TIME
					EXP. MESSAGE
					SET BACK/SET UP
					NIGHT PURGE
					TENANT BILLING
					NOTES

GENERAL NOTES: PROVIDE ONE COLOR GRAPHIC WITH ALL DYNAMIC DATA SHOWN.

SYSTEM POINT LIST

SYSTEM POINT DESCRIPTION	ANALOG		BINARY		SYSTEM FEATURES		NOTES
	INPUT	OUTPUT	INPUT	OUTPUT	ALARMS	PROGRAMS	
SPLIT SYSTEM AIR CONDITIONING UNIT (FCU-1/HPU-1) AND HOT WATER COIL (HWC-1)							
CONTROLLER					GRAPHIC		
SUPPLY FAN	X				TEMPERATURE		
SUPPLY AIR					PRESSURE		
HEATING WATER COIL VALVE		X			RH		
COMPRESSOR			X		KW		
SPACE SENSOR	X				KWH		
WINDOW CONTACT			X		GPM		
CONDENSATE LEVEL		X	X		PERCENT		
CONDENSATE PUMP		X			CFM		
					SETPOINT		
					DDC (4-20 Ma or 0-10 VDC)		
					SETPOINT ADJ.		
					PNEU. TRANSDUCER		
					STATUS ON/OFF		
					FILTER STATUS		
					STATUS OPEN/CLOSED		
					STATUS		
					NO. OF STARTS		
					TIMED OVERRIDE		
					OFF/ON		
					OPEN/CLOSE		
					LOCK OUT		
					ENABLE/DISABLE		
					HIGH ANALOG		
					LOW ANALOG		
					HIGH BINARY		
					LOW BINARY		
					PROOF		
					SENSOR FAIL		
					FLOW FAIL		
					COMM. FAIL		
					DIAGNOSTICS		
					TIME SCHEDULING		
					DEMAND LIGHTING		
					OPTIMAL START/STOP		
					RESET		
					EVENT PROGRAM		
					DDC		
					ALARM INSTRUCT		
					MAINT. WK. ORD.		
					RUN TIME		
					EXP. MESSAGE		
					SET BACK/SET UP		
					NIGHT PURGE		
					TIMED OVERRIDE		

Radford University Renovation of Three Residence Halls PC# 217-17565

Addendum 1 06.19.2014

SYSTEM POINT LIST

SYSTEM POINT DESCRIPTION	ANALOG		BINARY		SYSTEM FEATURES		PROGRAMS
	INPUT	OUTPUT	INPUT	OUTPUT	ALARMS		
VERTICAL STACK FAN COIL UNITS							
FAN CONTROL					TEMPERATURE		
SPACE TEMPERATURE	X				PRESSURE		
HEATING COIL VALVE					RH		
COOLING COIL VALVE		X			KW		
COOLING COND. PAN			X		GPM		
WINDOW CONTACT			X		CFM		
ROOM OCCUPANCY			X		PPM		
FIN-TUBE RADIATOR CONTROL VALVE	X		X		PERCENT		
					PERCENT RLA		
					4-20 Ma or 0-10 VDC		
					SETPOINT ADJ.		
					PNEU. TRANSDUCER		
					STATUS ON/OFF		
					FILTER STATUS		
					STATUS OPEN/CLOSED		
					STATUS		
					HIGH LIMIT		
					OFF/ON		
					OPEN/CLOSE		
					LOCK OUT		
					ENABLE/DISABLE		
					HIGH/LOW		
					HIGH ANALOG		
					LOW ANALOG		
					BINARY		
					PROOF		
					SENSOR FAIL		
					FLOW FAIL		
					COMM. FAIL		
					DIAGNOSTICS		
					LATCHING		
					TIME SCHEDULING		
					OPT. START/STOP		
					DEMAND LIMITING		
					RESET		
					EVENT PROGRAM		
					DDC		
					ALARM INSTRUCT		
					MAINT. WK. ORD.		
					RUN TIME		
					EXP. MESSAGE		
					SET BACK/SET UP		
					NIGHT PURGE		
					TENANT BILLING		
					CHILLER SEQUENCING		
					TOTALIZING		
					TIMED OVERRIDE		
					MODE CONTROL		
					NOTES		

GENERAL NOTES:

PROVIDE ONE COLOR GRAPHIC PER UNIT WITH ALL DYNAMIC DATA SHOWN.

SYSTEM POINT LIST

SYSTEM POINT DESCRIPTION	ANALOG		BINARY		ALARMS	PROGRAMS	NOTES	SYSTEM FEATURES
	INPUT	OUTPUT	INPUT	OUTPUT				
MISCELLANEOUS								
EXHAUST FANS (EF-3)								GRAPHIC
VFD (EF-3)								TEMPERATURE
VFD FAIL (EF-3)		X						PRESSURE
EXHAUST FANS (EF-4)	X	X						RH
EXTERIOR LIGHTING								KW
GENERATOR								KWH
POWER FAILURE								BTU/HR
AUTOMATIC TRANSFER SWITCH								GPM
DOMESTIC HW TEMP (SUPPLY AND RETURN)	X		X					PERCENT
DOMESTIC HW PUMP								CFM
OUTDOOR AIR	X	X						LBS/HR
DOMESTIC WATER FLOW METER		X						CO2 LEVEL (PPM)
STEAM FLOW METER		X						DDC (4-20 mA 0-10 vDC)
SEWAGE PUMP								VFD
DOMESTIC WATER HEATER (WHR-2)								SETPOINT ADJ.
SPACE CO2 SENSORS		X						
KW METER		X X						
ELECTRIC SUBMETERS		X X						
ELEVATOR SHAFT DAMPER		X	X					
GENERAL NOTES: <u>PROVIDE ONE COLOR GRAPHIC PER UNIT WITH ALL DYNAMIC DATA SHOWN.</u>								

SECTION 23 3000 - HVAC AIR DISTRIBUTION

PART 1 - GENERAL

1.1 CONDITIONS

- A. The applicable provisions of Section 23 0000, HEATING, VENTILATING AND AIR-CONDITIONING (HVAC) are hereby made a part of this section, and the Contractor is cautioned to read Section 23 0000 carefully as items of work applicable to this section are included in Section 23 0000.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specifications Sections, apply to this section.

1.3 DESCRIPTION OF WORK

- A. Ductwork and accessories for HVAC including the following:
 - 1. Supply air, return air, outdoor air and general exhaust systems
 - 2. Corrosion-resistant exhaust system
- B. Installation of control dampers referred to in other mechanical specification sections.
- C. Definitions:
 - 1. Seal or Sealing: Use of liquid or mastic sealant, with or without compatible tape overlay, or gasketing of flanged joints, to keep air leakage at duct joints, seams and connections to an acceptable minimum.
 - 2. SMACNA: Sheet Metal and Air Conditioning Contractors National Association, Inc. Publication entitled HVAC Duct Construction Standards Metal and Flexible, latest recognized edition.
 - 3. Duct Pressure Classifications: General Duct System: 2 inch water column pressure class unless noted otherwise.
 - 4. Exposed Duct: Exposed to view in a finished room.
 - 5. Outside Duct: Exposed to view beyond the exterior side of walls or above the roof.

1.4 RELATED WORK

- A. Section 23 0000, HEATING, VENTILATING AND AIR-CONDITIONING (HVAC)
- B. Section 23 0593, TESTING, ADJUSTING AND BALANCING FOR HVAC
- C. Section 23 0900, BUILDING AUTOMATION SYSTEM (BAS)
- D. Section 23 3400, HVAC FANS
- E. Section 23 7000, CENTRAL HVAC EQUIPMENT
- F. Section 23 8200, CONVECTION HEATING AND COOLING UNITS

1.5 QUALITY ASSURANCE

- A. Fire Safety Code: Comply with NFPA 90A.
- B. Duct System Construction: SMACNA standards are the minimum acceptable quality.
- C. Duct accessories exposed to the air stream, such as dampers of all types and access openings, shall be of the same material as the duct or provide at least the same level of corrosion resistance.

1.6 SUBMITTALS

- A. In accordance with Section 23 0000, HEATING, VENTILATING AND AIR-CONDITIONING (HVAC), furnish the following:
 1. Manufacturer's Literature and Data:
 - a. Access doors
 - b. Volume dampers, backdraft dampers.
 - c. Flexible ducts, connections fittings and clamps, with manufacturer's installation instructions.
 - d. Flexible connections
 - e. Registers, grilles and accessories
 - f. Diffusers
 - g. Wall Louvers
 - h. Fire dampers
 - i. Smoke dampers
 - j. Dryer vents
 - k. Wall caps
 - l. Duct-mounted airflow measuring stations

PART 2 - PRODUCTS

2.1 DUCT MATERIALS, COATINGS AND SEALANTS

- A. General: Except for systems specified otherwise, construct ducts, casings, and accessories of galvanized sheet steel, ASTM A527, coating G90.
- B. Corrosion-resistant exhaust systems: All exhaust ductwork associated with the Laundry Room shall be aluminum alloy sheets, ASTM B209, alloy 1100, 3003, or 5052. Ductwork shall be made watertight.
- C. Joint Sealing: Refer to SMACNA Table 1-2 for requirements. In addition all general duct systems shall meet Seal Class C.
 1. Sealant: Elastomeric compound, gun or brush grade, maximum 25 flame spread and 50 smoke developed (dry state) compounded specifically for sealing ductwork. Use products as recommended by the manufacturer for each applicable system pressure. Generally provide liquid sealant, with or without compatible tape, for low clearance slip joints and heavy, permanently elastic, mastic type where clearances are larger. Oil base caulking and glazing compounds are not acceptable because they do not retain elasticity and bond.

2. Tape: The use of pressure sensitive tape as a general duct sealant is not acceptable.
 3. A few of the many satisfactory sealants are as follows:
 - a. Moore Tuff-Bond, #29 for low pressure, #12 for high pressure.
 - b. Minnesota Mining and Manufacturing Company EC 800.
 - c. Hardcast R 6350 tape and activator/adhesive.
 - d. United Sheet Metal R-5966 (N), Listing #1.
 - e. Borden Arabol E-3806 lagging adhesive plus 6 ounce canvas.
 4. Gaskets in Flanged Joints: Soft neoprene.
- D. Approved factory made joints such as DUCTMATE SYSTEM may be used.

2.2 METAL DUCTS

- A. Gages, Reinforcement, Joints, Seams, Sealing, Fittings, Supports, and Other Details per SMACNA: Construct ducts not shown otherwise for 2 inches wg static pressure rating. Ductwork that is designed to operate at static pressures in excess of 3 inches wg shall be leak-tested according to industry accepted test procedures.
- B. Sealing: Seal Class A (4 inch wg static), Class B (3 inch wg static) or Class C (up to 2 inch wg static) in accordance with SMACNA Table 1-2 requirements.
- C. Volume Dampers: Single louver type and multi-louver type as detailed in SMACNA. Maximum blade louver width shall be 8 inch. Volume dampers exceeding 8 inch shall be multi-louver type. Dampers shall be a minimum two gauges heavier than duct in which installed.
 1. Manual dampers shall be opposed blade construction for modulating service. Manual operator mechanism shall be locking-type quadrant operator as manufactured by Young Regulator Company or equal. End of damper rod on each damper shall be grooved to show damper position. Quadrant operators shall be installed on 1-1/2" high 4-bend galvanized steel bracket allowing duct insulation to be extended and sealed under the quadrant operator. Where dampers occur behind or above finished portions of the building, operating rods shall be extended to 301 or 315 regulators installed flush with the finished surface.
 2. Motorized dampers shall be opposed blade construction for modulating service and parallel blade construction for two-position service. Motorized dampers shall be constructed with brass bearings, channel iron frame, interlocking blades and air-tight felt seals. Motor operators for dampers are specified in Section 23 0900, BUILDING AUTOMATION SYSTEM (BAS).
- D. Backdraft Dampers: Self-operating, multi-blade damper to open fully on 0.06 inch wg pressure difference and close by gravity. Aluminum, 16 gage frame, 0.023-inch blades of flat or elliptical shape, with tie-bar to connect blades for parallel operation. Provide resilient gasket for air seal and quiet operation. Blade pivots shall be in the nylon bushings. Provide adjustable counter-balance weight(s) as necessary for proper operation.
- E. Turning Vanes: Provide in all square elbows even though not shown on the drawings. Turning vanes shall be factory fabricated. Vanes shall be hollow, double thickness in all ducts 18" or larger.
- F. Air Deflectors: Factory fabricated for air diversion and volume control with operator as required for location in an accessible position. Adjustable deflectors shall be Young Air Extractor Model 890 with worm gear operator when behind grilles, with 301 operator when above plaster ceilings, and with 433 operator when it is accessible.

2.3 DUCT ACCESS DOORS, PANELS AND SECTIONS

- A. Provide access doors in accordance with NFPA 90A, sized and located for maintenance work, upstream where possible, in the following locations:
 1. Each automatic control damper.
 2. Each duct mounted smoke detector.
 3. Each fire damper and smoke damper.
 4. Each apparatus requiring service or inspection.
- B. Openings shall be 18" x 18" unless noted otherwise, except where size of duct will not accommodate this size, they shall be made as large as practical. Access doors shall be of rigid type and shall be provided with gasket to make air tight. Door shall be provided with galvanized hinges having bronze pins and two approved brass fasteners. Access doors in insulated ducts shall be of the insulated type. Doors shall swing so that fan pressure or suction and direction of air flow holds the door closed.
 1. For Rectangular Ducts: Refer to SMACNA and provide lock type 2 (door latch, not sash lock).
 2. For Round Ducts: Access sections shall be not less than 20 gage housing welded or riveted to a duct section.

2.4 FLEXIBLE AIR DUCT CONNECTORS

- A. General: Factory fabricated, complying with NFPA 90A for connectors up to 14 feet maximum length and not passing through floors of buildings. Flexible ducts shall not penetrate any fire or smoke barrier as defined in Section 23 0000, HEATING, VENTILATING AND AIR-CONDITIONING (HVAC). Provide approximate lengths indicated on the drawings. Provide insulated, acoustical air duct connectors in supply air duct systems and elsewhere as shown.
- B. Flexible duct runouts shall be factory fabricated, metal wire helix encapsulated with tough polyester fabric wrapped in fiberglass insulation and sheathed in tough metalized vapor barrier jacket. Connections between flexible duct and ductwork fittings or diffusers shall be made with draw bands and sealed with an approved pressure-sensitive tape. The rated positive pressure shall be 10" water gage per UL-181 and the recommended operating pressure for 90 degree bends shall be 6" water gage for 12" diameter duct. The minimum 'R' value shall be 4.2, except in unconditioned attic type spaces the minimum 'R' value shall be 5.5. Entire assembly shall have flame-spread rating not in excess of NFPA 90A requirements. Flexible duct shall be UL 181 listed, Class 1 and labeled.
- C. All round duct take-offs shall be made with SPIN-IN fittings. Units shall have a balancing damper and a factory-installed spring-loaded retractable bearing and a positive locking wing nut for easy readjustment.

2.5 FLEXIBLE CONNECTIONS

- A. Where duct connections are made to fans and air handling units, install a non-combustible flexible connection of 29 ounce neoprene coated fiberglass fabric approximately six inches wide. Burning characteristics shall conform to NFPA 90A. Securely fasten flexible connections to round ducts with stainless steel or zinc-coated iron draw bands with worm gear fastener. For rectangular connections, crimp fabric to sheet metal and fasten sheet metal to ducts by screws two inches on center. Fabric shall not be stressed other than by air pressure. Allow at least one inch slack to ensure that no vibration is transmitted.

2.6 INSTRUMENT TEST FITTINGS

- A. Manufactured type with a minimum two-inch length for insulated duct, and a minimum one-inch length for duct not insulated. Test hole shall have a flat gasket for rectangular ducts and a concave gasket for round ducts at the base, and a screw cap to prevent air leakage.
- B. Provide instrument test holes at each duct or casing mounted temperature sensor or transmitter, and at entering and leaving side of each heating coil and cooling coil.

2.7 AIR OUTLETS AND INLETS

- A. Materials:
 - 1. Aluminum or steel as indicated. Provide manufacturer's standard gasket.
 - 2. Exposed Fastenings: The same material as the respective inlet or outlet. Fasteners for aluminum may be stainless steel. Provide concealed method of fastening where available.
- B. Performance Test Data: In accordance with Air Diffusion Council Code 1062R4.
- C. Finish: White baked enamel for ceiling mounted units. Wall-mounted units shall be primed.
- D. Air Supply Outlets and Inlets: Manufacturer shall be Price, Tuttle and Bailey, or Metal-Aire. Price model numbers are listed.
 - 1. Supply grilles shall be Model 520 steel double deflection with $\frac{3}{4}$ " blade spacing and shall have free area of not less than 75%. Sponge rubber gasket shall be provided on frame.
 - 2. Return and exhaust grilles shall be Model 530 steel construction or Model 630 aluminum construction with 45 degree deflecting vanes on $\frac{3}{4}$ " centers and shall have free area not less than 75%. Sponge rubber gasket shall be provided on frame. Wall-mounted units shall be provided with horizontal face blades.
 - 3. Square cone ceiling diffusers shall be Model SCDA steel lay-in or surface-mounted type as indicated, complete with equalizing deflectors, adjustable air pattern, and volume control unit.
 - 4. Linear slot diffusers shall be extruded aluminum TBD Series adjustable pattern type complete with volume control, mounting frames, insulated duct plenum, and accessories.
 - 5. Linear bar grilles shall be Series LBP with volume control, mounting frames and accessories.
 - 6. Filter grilles shall be Series 630.

2.8 WALL LOUVERS

- A. Wall Louvers (4" aluminum): Louvers shall be Greenheck Model ESD-403, Louvers and Dampers, Inc. IL-23, or equal stationary drainable blade with 4" deep frame and 0.08" thick extruded aluminum construction. Blades shall be positioned at approximately 37 degree angle and spaced not to exceed 4 inches on center. A channel in each blade shall drain water to downspouts in jambs and mullions to prevent water cascade from blade to blade. Provide complete with $\frac{1}{2}$ " mesh matching bird screen in removable frame and extended sill. Louver shall be AMCA certified for air performance and water penetration. Water penetration shall not occur while the free area velocity is maintained less than 1,000 feet per minute. Louvers are basically sized at 400 cfm per square feet of louver face area, with a static pressure drop not to exceed 0.10 inches water column for a 48" x 48" louver. Finish shall be as selected by the Architect.

2.9 FIRE DAMPERS

- A. General - Fire dampers shall be dynamic type. Dampers shall meet local codes and the standards of the National Fire Protection Association contained in Bulletin 90A. Dampers in ductwork shall be sized so that the free air space is not less than the connected duct free air space. (Damper installed behind grilles or registers shall be the same size as the grille or register with blades in the air stream.) Location shall be as shown on drawings or as required by local code. Dampers shall possess a 1-1/2 hour standard fire protection rating in accordance with NFPA No. 555, except fire dampers located in 3-hour rated walls shall have a 3-hour fire protection rating to maintain the fire rating integrity of the wall.
- B. Material - The frame shall be constructed so as to be unaffected by corrosion or high heat. Mechanical parts shall have bronze non-corrosive pins. Vertical and horizontal dampers shall feature closure spring operation suitable for closure against the installed system air stream. When closed, the dampers shall be held closed by a catch arrangement. Blades installed in regular ductwork will not be accepted.
- C. Fuse Links - Fire curtains shall be arranged to close automatically and remain tightly closed upon the operation of an approved fusible link or other approved heat-actuated device, located where readily affected by an abnormal rise of temperature in the duct. Fusible links shall have a temperature rating approximately 50 Deg. F above the maximum temperature that would normally be encountered when the system is in operation or shut down.
- D. Access doors shall be provided in accordance with NFPA 90A. Suitable openings shall be provided to make fire dampers accessible for inspection and maintenance.

2.10 SMOKE DAMPERS

- A. General - Dampers shall meet local codes and the standards of the National Fire Protection Association contained in Bulletin 90A. Locations shall be as shown on the drawings.
- B. Performance - Each damper shall be classified by Underwriter's Laboratories as a leakage rated damper for use in smoke control systems under the latest version of UL 555S, and shall bear U.L. Label attesting to same. The leakage rating under UL 555S shall be Leakage Class II (10 CFM Sq. Ft. at 1" W.G.). As part of the U.L. qualification, dampers shall have demonstrated a capacity to operate under HVAC system operating conditions, with pressures of at least 4" W.G. in the closed position, and 2000 FPM air velocity in the open position. The dampers and their actuators shall be qualified under UL 555S to an elevated temperature of at least 250 Deg. F.
- C. Materials - Damper frames shall be a minimum of 16 gage galvanized steel formed into a structural hat channel shape with tapped corners for reinforcement. The blades shall be single skin 16 gage minimum galvanized with three longitudinal grooves for reinforcement. Bearings shall be stainless steel sleeve turning in an extruded hole in the frame. Blade edge seals shall be silicone rubber designed to withstand 450 Deg. F and jamb seal shall be silicone impregnated fiberglass with stainless steel flexible metal compression type cover. Appropriate electric (120V-1PH) actuators shall be furnished and installed by the damper manufacturer at time of damper fabrication. Damper and actuator shall be supplied as a single entity which meets all applicable UL 555S qualifications for both dampers and actuators. Factory supplied caulked sleeve shall be 20 gage. (.91) for dampers through 84" (2134) wide and 18 gage (1.21) above 84" (2134) wide. Damper and actuator assembly shall be factory cycled 10 times to assure operation. All wiring or piping material required to interconnect the actuator with detection and/or alarm or other systems shall be furnished by others as detailed elsewhere in the specification. Dampers shall be Ruskin Model SD36 or approved equal.

- D. Access holes - Suitable hand hole openings with tightly fitted covers shall be provided to make them accessible for inspection and maintenance.
- E. Operation - Damper motor shall de-energize to allow spring-loaded damper to close when smoke is detected by a space-mounted smoke detector. Smoke detectors will be provided under Division 26 of the specifications.

2.11 DRYER VENTS

- A. Dryer vents shall be round ~~aluminum ducts with Greenheck Model WCSP-6 wall cap smooth surface~~ aluminum duct, 4" diameter. Tap ducts into main exhaust duct connected to dryer exhaust fan.

2.12 DUCT-MOUNTED AIRFLOW MEASURING STATIONS

- A. Duct-mounted airflow measuring stations shall be Price Model RMS or equal of the sizes shown on the plans. Units shall be constructed of 22 gauge zinc-coated steel, mechanically sealed.
- B. The airflow sensor shall be of a cross configuration located at the inlet of the assembly. The sensor shall have twelve total pressure sensing ports and a center averaging chamber designed to accurately average the flow across the inlet of the assembly. Sensor shall provide accuracy within 5% with a 90° sheet metal elbow directly at the inlet of the assembly. The airflow sensor shall amplify the sensed airflow signal.
- C. Airflow measuring stations shall come with a pressure transducer capable of being interfaced with the building BAS system to report airflow quantities to the BAS.
- D. Provide duct collars on both ends of the units for easy connection to ductwork.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with provisions of Section 23 0000, HEATING, VENTILATING AND AIR-CONDITIONING (HVAC), particularly regarding coordination with other trades.
- B. Fabricate and install ductwork and accessories in accordance with SMACNA Standards:
 1. Duct clearance and lengths shall be established from measurements taken at the job site before any ducts are fabricated. The Contractor will not be allowed any extra costs for ducts fabricated and then found not to fit into the space intended. Duct sizes on the drawings are inside dimensions which shall be altered by the Contractor to other dimensions producing the same air handling characteristics where necessary to avoid interferences and clearance difficulties.
 2. Fire damper openings shall be established from measurements taken at the job site before any fire damper is fabricated. The Contractor will not be allowed any extra costs for dampers fabricated and then found not to fit into the space intended. The Contractor shall coordinate clearances for locating the damper blades out of the air stream as required.
 3. Provide duct transitions, offsets and connections to dampers, coils, and other equipment in accordance with SMACNA. Weld sheet metal in accordance with SMACNA, Guidelines for Welding Sheet Metal. Repair damaged galvanized areas with galvanizing repair compound.
 4. Provide bolted construction and tie-rod reinforcement in accordance with SMACNA.

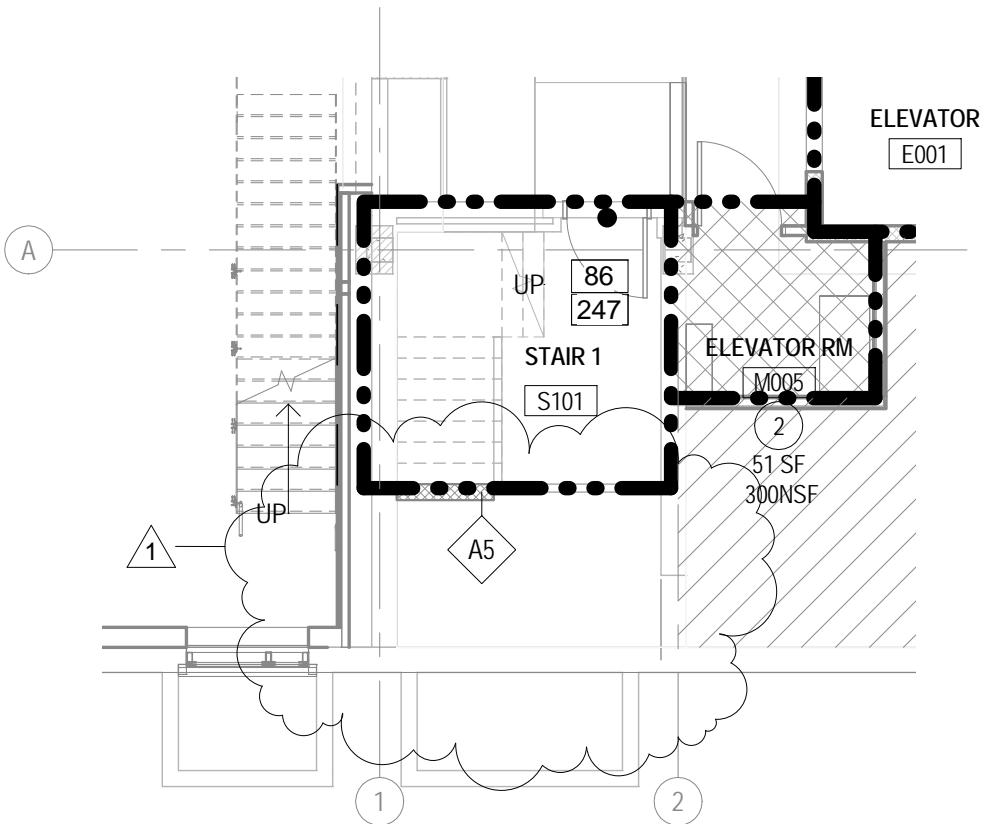
5. Construct casings and pipe penetrations in accordance with SMACNA. Design casing access doors to swing against air pressure so the pressure helps to maintain a tight seal.
- C. Install duct hangers and supports in accordance with SMACNA. Duct supports shall consist of not less than 1" x 16 ga. galvanized steel strap hangers spaced not over 8'-0" on center.
- D. Duct floor and wall openings - Rectangular and square ducts shall have openings 1" larger than the overall duct dimensions framed in place when the wall is constructed and 1/4" larger when floors are poured. Space between duct and structure shall be filled with duct insulation, except in fire partitions or floors they shall be packed tight with non-combustible fiber rope. Flanges constructed of 22-gauge galvanized sheet metal, not less than 3" wide, shall be installed at each opening in finished areas.
- E. Flexible Duct Installation: Continuous, single pieces not over fourteen feet long (NFPA 90A), as straight and short as feasible, adequately supported. Centerline radius of bends shall be not less than two duct diameters. Make connections with adhesive and clamps or screws as recommended by the duct manufacturer. Flexible ducts shall not penetrate any chase or partition designated as a fire or smoke barrier, including corridor partitions fire rated one hour or two hours.
- F. Where grilles cannot be installed to avoid seeing inside the duct, paint the inside of the duct with flat black paint to reduce visibility.
- G. Control Damper Installation:
 1. Provide necessary blank-off plates required to install dampers that are smaller than duct size. Provide necessary transitions required to install dampers larger than duct size.
 2. Assemble multiple section dampers with required interconnecting linkage and extend required number of shafts through duct for external mounting of damper motors.
 3. Provide necessary sheet metal baffle plates to eliminate stratification and provide air volumes specified. Locate baffles by experimentation, and affix and seal permanently in place, only after stratification problem has been eliminated.
- H. Protection and Cleaning: Adequately protect equipment and materials against physical damage. Place equipment in first class operating condition, or return to source of supply for repair or replacement. Protect equipment and ducts during construction against entry of foreign matter to the inside and clean both inside and outside before operation and painting.
- I. Installation of Grilles: Ducts shall be fastened securely to the building construction at each side of opening. Grilles shall be securely fastened thereto, snug against the wall.
- J. Installation of Fire and Smoke Dampers: Dampers shall be installed so as to provide the positive barrier to passage of air when in a closed position. Dampers shall be located and installed so that destruction of the duct on either side of the damper will not allow the damper to fall away from the opening to be protected. Dampers shall be located in the wall or ceiling, or as close thereto as possible, and securely fastened thereto. Where it is not possible to locate the damper directly adjacent to the wall or ceiling, it shall be located as close as possible and all ductwork between the damper and wall or ceiling shall be fireproofed with plaster or other approved methods to give a rating equal to the rating of the damper. Access doors in the duct and wall or ceiling where applicable shall be sized and located as required for inspection and maintenance of the damper. Damper installation shall be as recommended by the manufacturer for UL compliance and shall meet all requirements of NFPA Standard 90A. Dampers shall be installed with sufficient tension to prevent rattling or vibration. The installation of the dampers shall conform to the requirements of SMACNA.

- K. Smoke Detectors shall be provided and installed by the Electrical Contractor, as specified in Division 26.

3.2 DUCT LEAKAGE TESTS AND REPAIR

- A. Low Pressure Ducts: Seal visible openings and seal air leaks audible at operating conditions.

END OF SECTION 23 3000



STAIR 1

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

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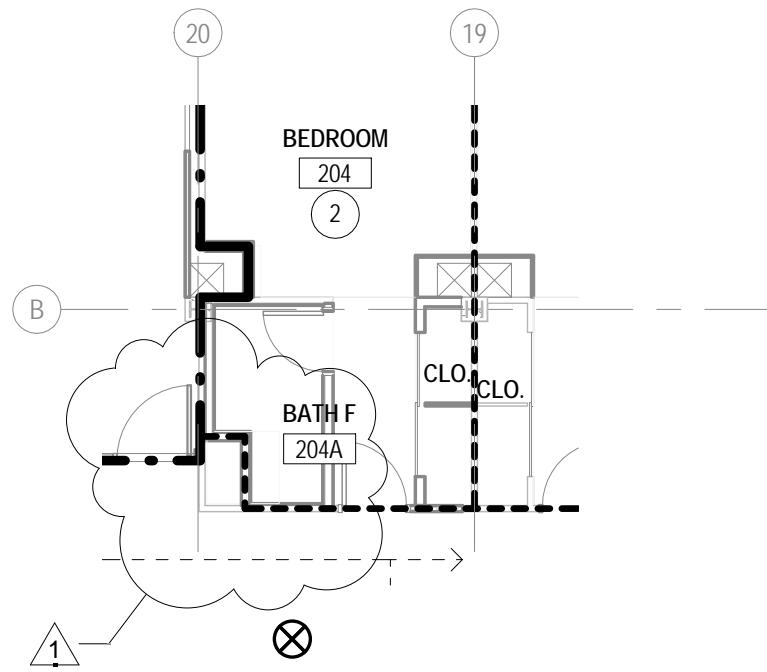
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Addendum 01

FSK-01

MBW/ARS
06/19/14

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SECOND AND THIRD FLOOR - 1/2 HR RATED CHASE

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

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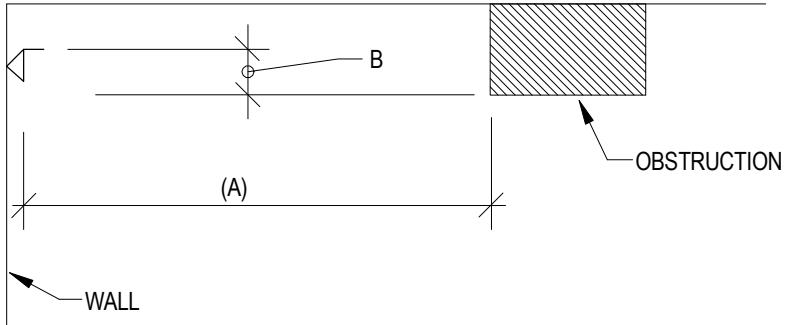
Addendum 01

FSK-02

Author

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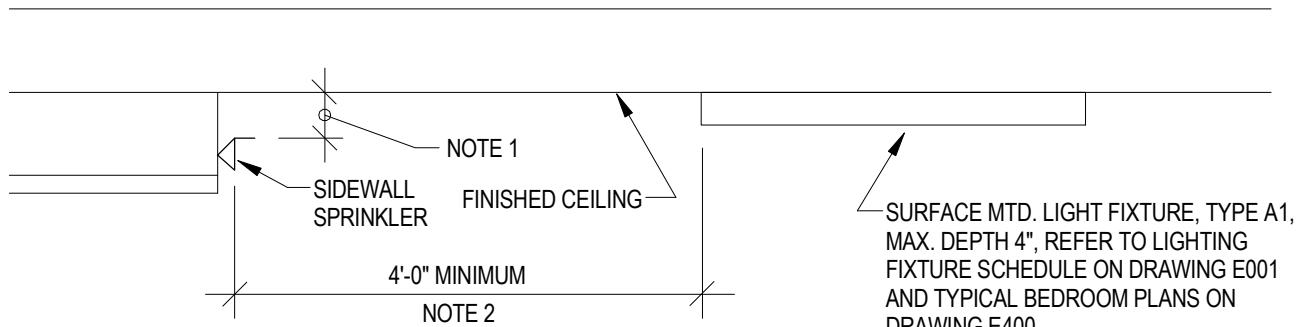
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NFPA 13 FIGURE 8.7.5.1.3: POSITIONING OF SPRINKLERS TO AVOID OBSTRUCTIONS (STANDARD SIDEWALL SPRINKLERS)

NFPA 13 TABLE 8.7.5.1.3: POSITIONING OF SPRINKLERS TO AVOID OBSTRUCTIONS (STANDARD SIDEWALL SPRINKLERS)

DISTANCE FROM SIDEWALL SPRINKLER TO SIDE OF OBSTRUCTION (A)	MAXIMUM ALLOWABLE DISTANCE OF DEFLECTOR ABOVE BOTTOM OF OBSTRUCTION, IN. (A)
LESS THAN 4 FT	NOT ALLOWED
4 FT TO LESS THAN 5 FT	1
5 FT TO LESS THAN 5 FT 6 IN	2
5 FT 6 IN TO LESS THAN 6 FT	3
6 FT TO LESS THAN 6 FT 6 IN	4
6 FT 6 IN TO LESS THAN 7 FT	6
7 FT TO LESS THAN 7 FT 6 IN	7
7 FT 6 IN TO LESS THAN 8 FT	9
8 FT TO LESS THAN 8 FT 6 IN	11
8 FT 6 IN OR GREATER	14



NOTE 1: SIDEWALL SPRINKLERS SHALL BE INSTALLED NO LESS THAN 4 INCHES AND NO MORE THAN 6 INCHES BELOW CEILING UNLESS APPROVED OTHERWISE BY THE A/E AND THE STATE BUILDING OFFICIAL.

NOTE 2: NO OBSTRUCTIONS, ONLY SMOOTH FLAT CEILING, IS ALLOWED WITHIN 4 LINEAL FOOT OF THE SPRINKLER.

SIDEWALL SPRINKLER INSTALLATION DETAIL

SCALE: SCHEMATIC

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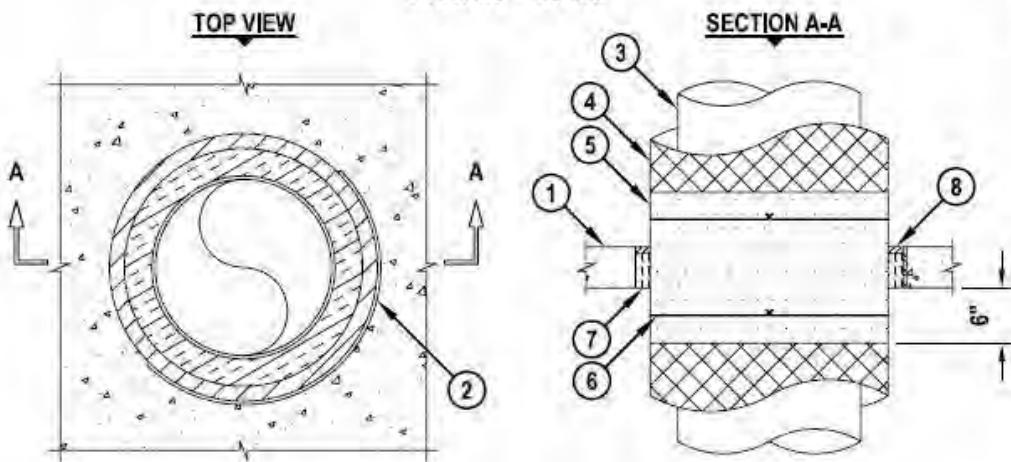
Date:

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**INSULATED METAL PIPE THROUGH OPTIONAL STEEL SLEEVE IN
CONCRETE FLOOR/WALL OR BLOCK WALL**

F-RATING = 3-HR.
T-RATING = 1/2-HR.

CAJ50611050106



1. CONCRETE FLOOR OR WALL ASSEMBLY (3-HR. FIRE-RATING) :

- A. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR OR WALL (MINIMUM 4-1/2" THICK).
- B. ANY UL/cUL CLASSIFIED CONCRETE BLOCK WALL.

2. [OPTIONAL] MAXIMUM 30" NOMINAL DIAMETER STEEL SLEEVE (SCHEDULE 10 OR HEAVIER).

3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:

- A. MAXIMUM 20" NOMINAL DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
- B. MAXIMUM 20" DIAMETER CAST OR DUCTILE IRON PIPE.
- C. MAXIMUM 6" DIAMETER COPPER PIPE OR TUBING.

4. MAXIMUM 3" THICK GLASS-FIBER PIPE INSULATION.

5. NOMINAL 3" THICK MINERAL FIBER PIPE INSULATION (MIN. 5 PCF DENSITY) (SEE NOTE NO. 4 BELOW).

6. MINIMUM 18 AWG STEEL TIE WIRE LOCATED 3" BEYOND EACH SURFACE OF FLOOR OR WALL.

7. MINIMUM 3" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) TIGHTLY PACKED.

8. MINIMUM 3/4" DEPTH HILTI INTUMESCENT FS-ONE FIRESTOP SEALANT.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 30".

2. ANNULAR SPACE [WITH SLEEVE] = MINIMUM 1/4", MAXIMUM 3".

3. ANNULAR SPACE [WITHOUT SLEEVE] = MINIMUM 1", MAXIMUM 2-1/4".

4. UL CLASSIFIED PIPE INSULATION TO EXTEND 6" ABOVE AND BELOW FLOOR, SECURE WITH TIE WIRE AS SHOWN. COVER WITH UL CLASSIFIED ALL SECURE JACKET AND PROPERLY JOINED WITH EXISTING INSULATION. LONGITUDINAL JOINTS SEALED WITH METAL FASTENERS.

5. MINIMUM 3/4" DEPTH HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT IS REQUIRED ON BOTH SIDES OF A WALL ASSEMBLY.



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Sheet	1 of 1	Drawing No.
Scale	1/16" = 1"	CAJ
Date	May 01, 2006	5061f

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NOTE: THIS DETAIL IS MEANT TO AID THE CONTRACTOR IN SELECTING AND APPROPRIATE FIRESTOPPING SYSTEM. THIS DETAIL IS NOT MEANT TO BE COMPREHENSIVE OF ALL FIRESTOP SYSTEMS REQUIRED. CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE APPLICABILITY OF THIS AND ALL OTHER FIRESTOP SYSTEMS TO THE PROJECT.

FIRESTOPPING FOR METAL PIPE PENETRATING RATED FLOORS

NO SCALE

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Addendum 01

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NMF

Date:

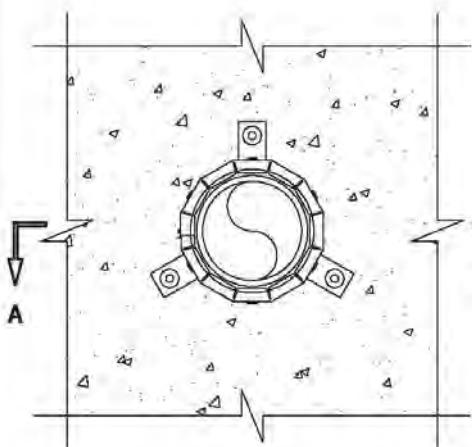
06/19/14

UL SYSTEM NO. F-A-2075
CLOSET FLANGE AND DRAIN PIPING THROUGH CONCRETE FLOOR ASSEMBLY

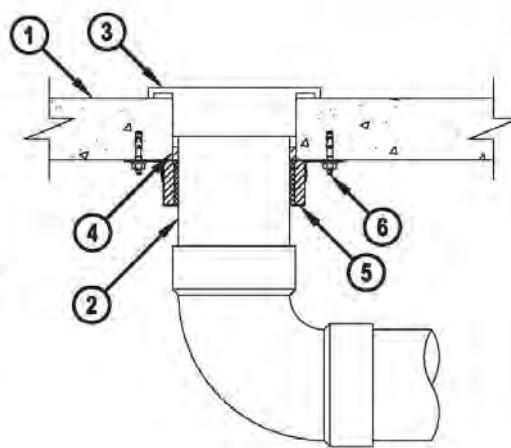
F-RATING = 2-HR.
 T-RATING = 0-HR.

FA2075d|080106

BOTTOM VIEW



SECTION A-A



1. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR ASSEMBLY (MINIMUM 2-1/2" THICK) (2-HR. FIRE-RATING).
2. NOMINAL 4" DIAMETER PVC PLASTIC DRAIN PIPE (SCHEDULE 40) (VENTED PIPING SYSTEM).
3. PVC CLOSET FLANGE SIZED TO ACCOMMODATE DRAIN PIPE. CLOSET FLANGE SECURED TO CONCRETE FLOOR WITH STEEL SCREWS.
4. MINIMUM 1/2" DEPTH HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT.
5. HILTI CP 643 110/4" N FIRESTOP COLLAR WITH FASTENING HOOKS.
6. EACH FASTENING HOOK SECURED TO BOTTOM OF FLOOR WITH 1/4" x 1-1/4" LONG STEEL EXPANSION BOLTS, MIN. 0.145" x 1-1/4" POWDER ACTUATED FASTENERS WITH 1-7/16" DIAMETER STEEL WASHER, 1/4" x 1-1/4" HILTI KWIK-CON II+ CONCRETE SCREW ANCHOR, 1/4" x 1-3/4" HILTI KWIK-BOLT 3 STEEL EXPANSION ANCHOR, OR HILTI X-DNI 27 P8 S15 POWDER ACTUATED FASTENER WITH INTEGRATED WASHER.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 5".
 2. ANNULAR SPACE = NOMINAL 1/4".



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Sheet 1 of 1	Drawing No. FA
Scale 11/64" = 1"	
Date Aug. 01, 2006	2075d

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NOTE: THIS DETAIL IS MEANT TO AID THE CONTRACTOR IN SELECTING AND APPROPRIATE FIRESTOPPING SYSTEM. THIS DETAIL IS NOT MEANT TO BE COMPREHENSIVE OF ALL FIRESTOP SYSTEMS REQUIRED. CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE APPLICABILITY OF THIS AND ALL OTHER FIRESTOP SYSTEMS TO THE PROJECT.

FIRESTOPPING FOR PVC PIPE PENETRATING RATED FLOORS

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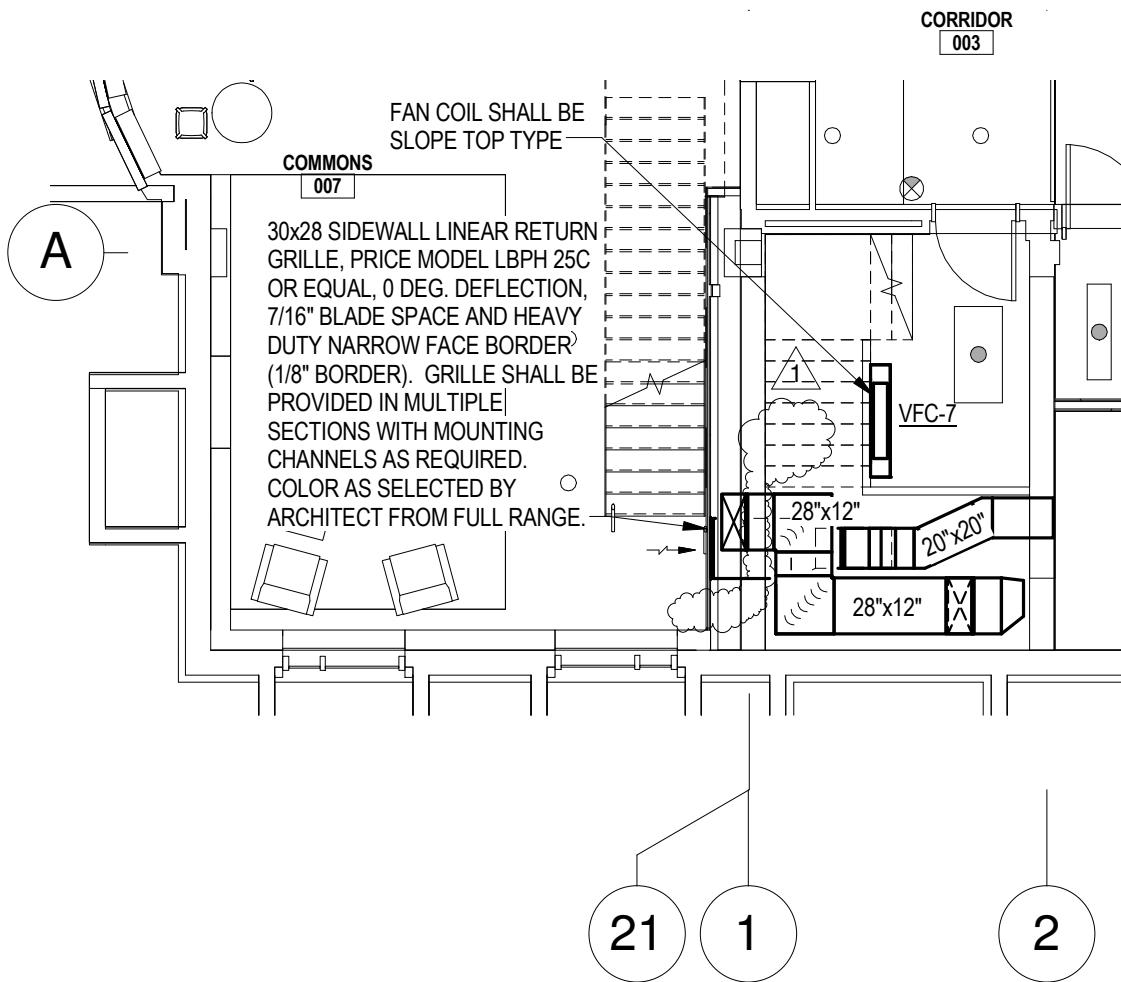
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PSK-2

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BASEMENT PARTIAL FLOOR PLAN - DUCTWORK

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



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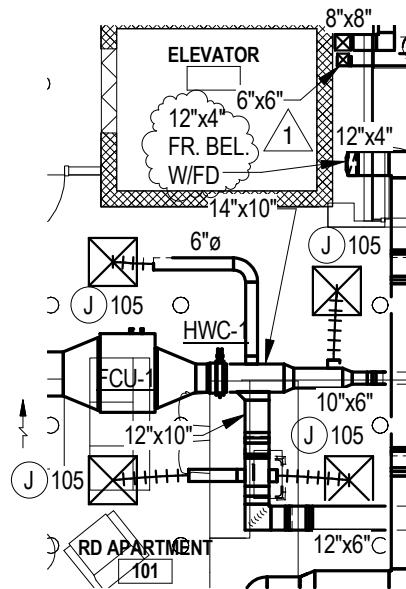
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3

PARTIAL FIRST FLOOR PLAN - DUCTWORK

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

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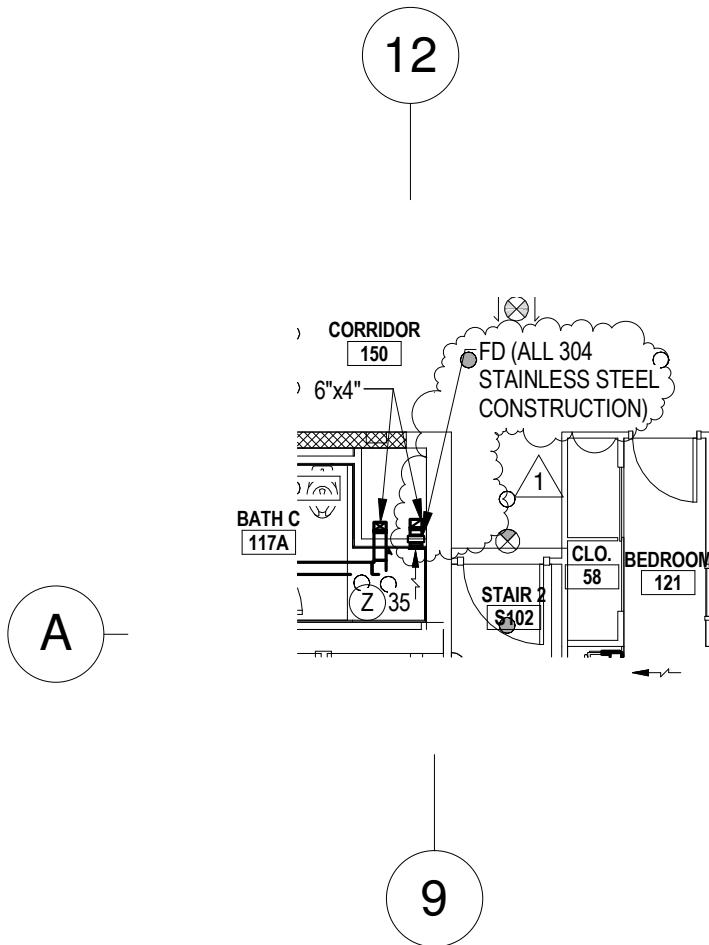
Addendum 01

MSK-2

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PARTIAL FIRST FLOOR PLAN - DUCTWORK

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

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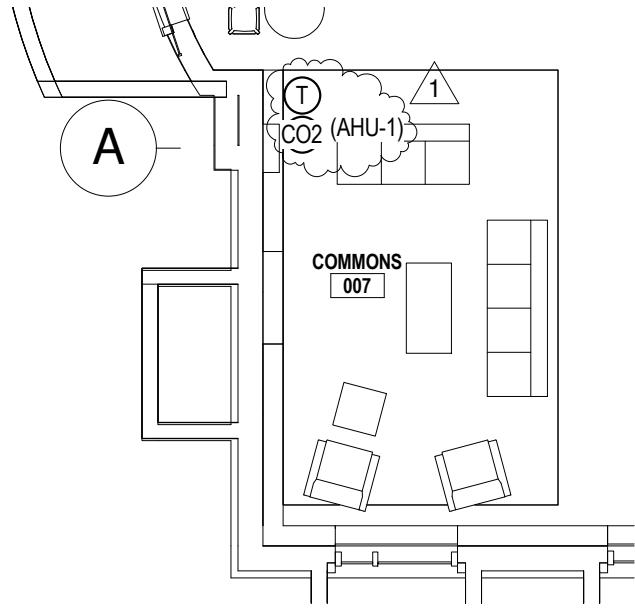
Addendum 01

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PARTIAL BASEMENT FLOOR PLAN - HVAC PIPING

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

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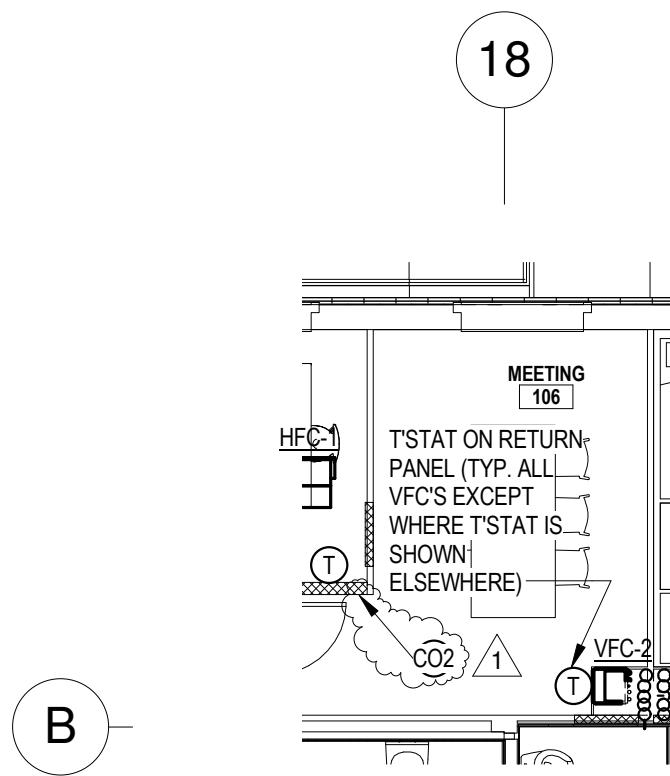
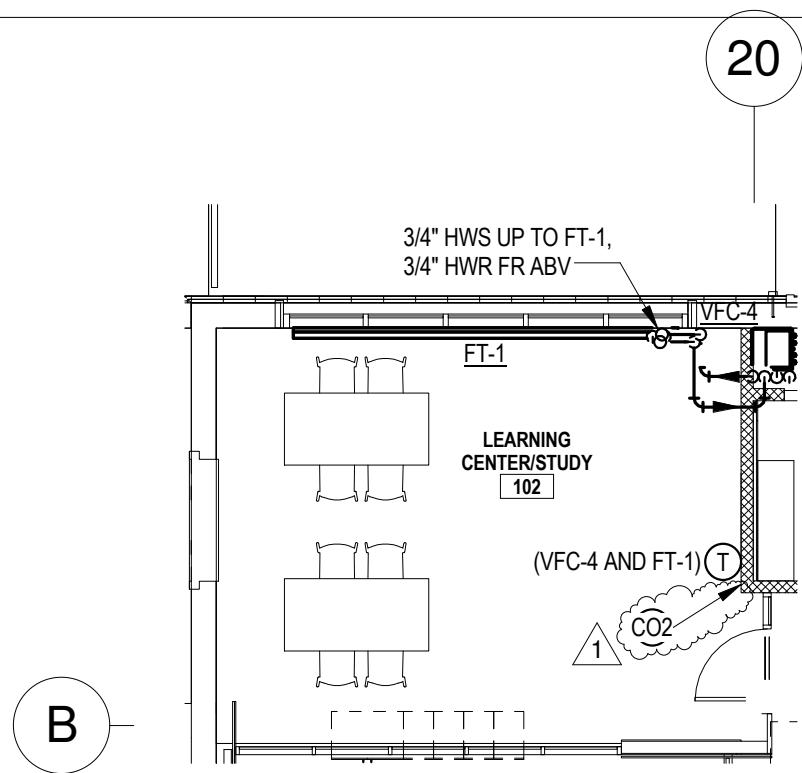
Addendum 01

MSK-4

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PARTIAL FIRST FLOOR PLANS - HVAC PIPING

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



RENOVATION OF THREE RESIDENCE HALLS

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VMDO Proj. No.: 1115

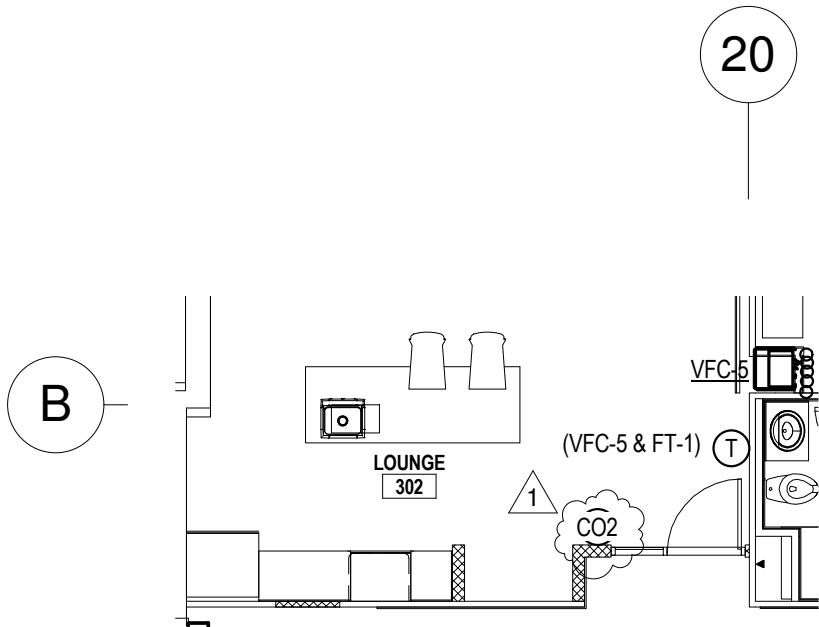
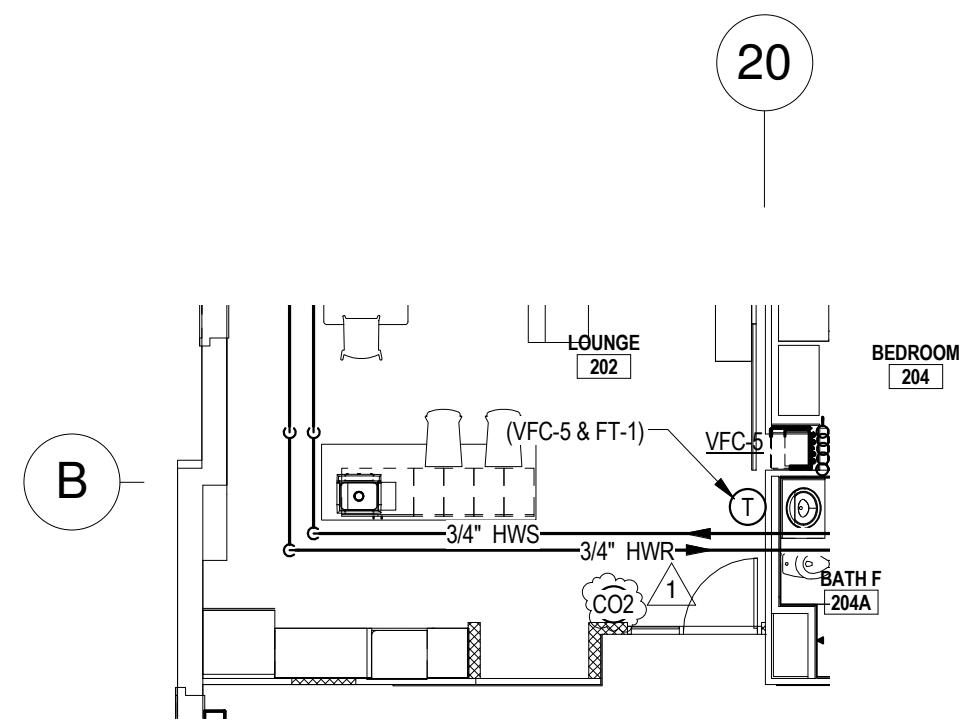
Addendum 01

MSK-5

PLH

06/19/14

Date:



PARTIAL SECOND AND THIRD FLOOR PLANS - HVAC PIPING

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

VMDO ARCHITECTS

200 E MARKET STREET
CHARLOTTESVILLE, VA 22902
P 434.296.5684 F 434.296.4496
www.vmdo.com

RENOVATION OF THREE RESIDENCE HALLS

RADFORD UNIVERSITY, RADFORD, VIRGINIA

PC# 217-17565-000
VMDO Proj. No.: 1115

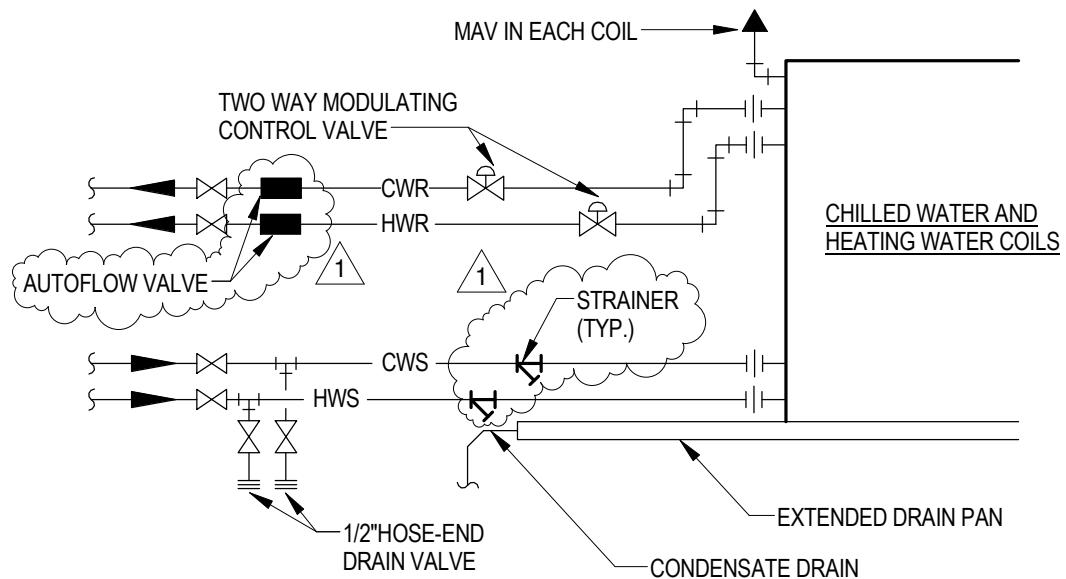
Addendum 01

MSK-6

PLH

06/19/14

Date:



HORIZONTAL FAN COIL UNIT COIL CONNECTION DETAIL

SCHEMATIC

REVISED HORIZONTAL FAN COIL UNIT COIL CONNECTION DETAIL

NO SCALE

VMDO ARCHITECTS
200 E MARKET STREET
CHARLOTTESVILLE, VA 22902
P 434.296.6684 F 434.296.4496
www.vmdo.com

RENOVATION OF THREE RESIDENCE HALLS

RADFORD UNIVERSITY, RADFORD, VIRGINIA

PC# 217-17565-000
VMDO Proj. No.: 1115

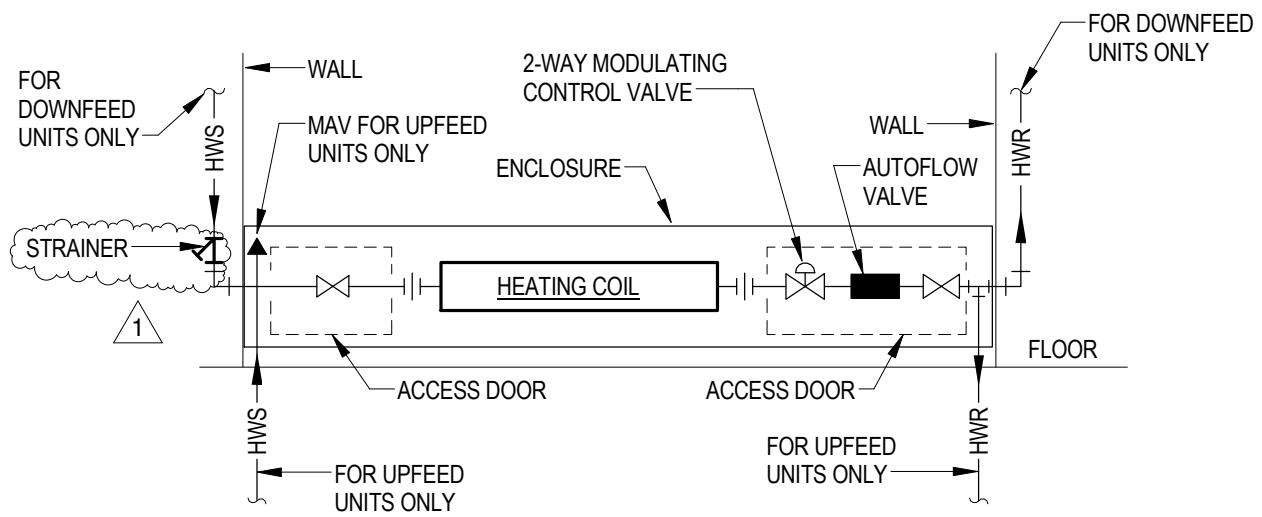
Addendum 01

MSK-7

PLH

06/19/14

Date:



FIN TUBE RADIATORS (FT) COIL CONNECTION DETAIL

NO SCALE

REVISED FIN TUBE RADIATOR COIL DETAIL

NO SCALE

VMDO ARCHITECTS

200 E MARKET STREET
CHARLOTTESVILLE, VA 22902
P 434.296.6684 F 434.296.4496
www.vmdo.com

RENOVATION OF THREE RESIDENCE HALLS

RADFORD UNIVERSITY, RADFORD, VIRGINIA

PC# 217-17565-000
VMDO Proj. No.: 1115

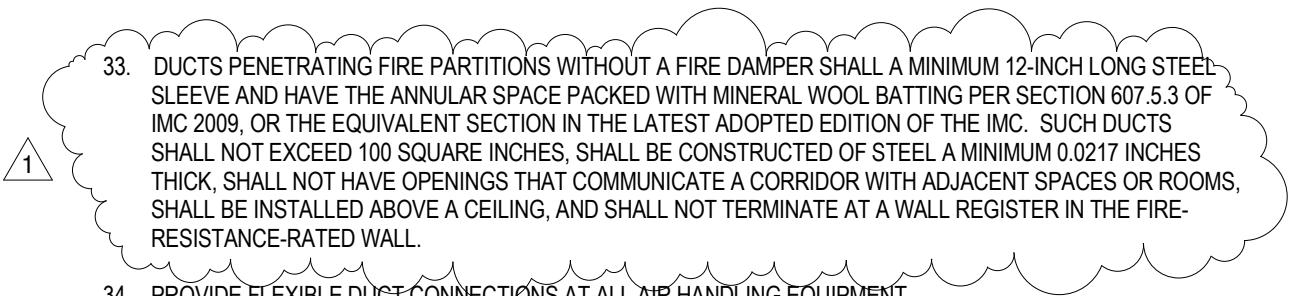
Addendum 01

MSK-8

PLH

06/19/14

Date:

- 
- 1
33. DUCTS PENETRATING FIRE PARTITIONS WITHOUT A FIRE DAMPER SHALL HAVE A MINIMUM 12-INCH LONG STEEL SLEEVE AND HAVE THE ANNULAR SPACE PACKED WITH MINERAL WOOL BATTING PER SECTION 607.5.3 OF IMC 2009, OR THE EQUIVALENT SECTION IN THE LATEST ADOPTED EDITION OF THE IMC. SUCH DUCTS SHALL NOT EXCEED 100 SQUARE INCHES, SHALL BE CONSTRUCTED OF STEEL A MINIMUM 0.0217 INCHES THICK, SHALL NOT HAVE OPENINGS THAT COMMUNICATE A CORRIDOR WITH ADJACENT SPACES OR ROOMS, SHALL BE INSTALLED ABOVE A CEILING, AND SHALL NOT TERMINATE AT A WALL REGISTER IN THE FIRE-RESISTANCE-RATED WALL.
 34. PROVIDE FLEXIBLE DUCT CONNECTIONS AT ALL AIR HANDLING EQUIPMENT.
 35. DUCTS PENETRATING THREE STORIES SHALL BE PROTECTED WITH FIRE DAMPERS AT EACH FLOOR PENETRATION, AND THE ANNULAR SPACE AROUND THE DUCT AT EACH FLOOR PENETRATION SHALL BE PROTECTED WITH AN APPROVED NON-COMBUSTIBLE MATERIAL THAT RESISTS THE FREE PASSAGE OF FLAME AND THE PRODUCTS OF COMBUSTION IN ACCORDANCE WITH 2009 VCC SECTION 716.6.3.
- 
- 1

REVISIONS TO HVAC GENERAL NOTES

NO SCALE



RENOVATION OF THREE RESIDENCE HALLS

RADFORD UNIVERSITY, RADFORD, VIRGINIA

PC# 217-17565-000
VMDO Proj. No.: 1115

Addendum 01

MSK-9

Date:

PLH
06/19/14



RENOVATION OF THREE
RESIDENCE HALLS
POCAHONTAS, BOLLING, &
DRAPER HALLS

RADFORD UNIVERSITY
RADFORD, VIRGINIA

Project Code
VMDO Project Number
217-17565
1115



Checked By
RCH
Drawn By
PLH

ISSUES AND REVISIONS
NO. SUBMITTAL
1 ADDENDUM 1
DATE
06.19.14

SECOND AND THIRD
FLOOR DUCTWORK
PLANS

PLAN NOTES:

(NOT ALL NOTES MAY APPLY TO THIS SHEET)

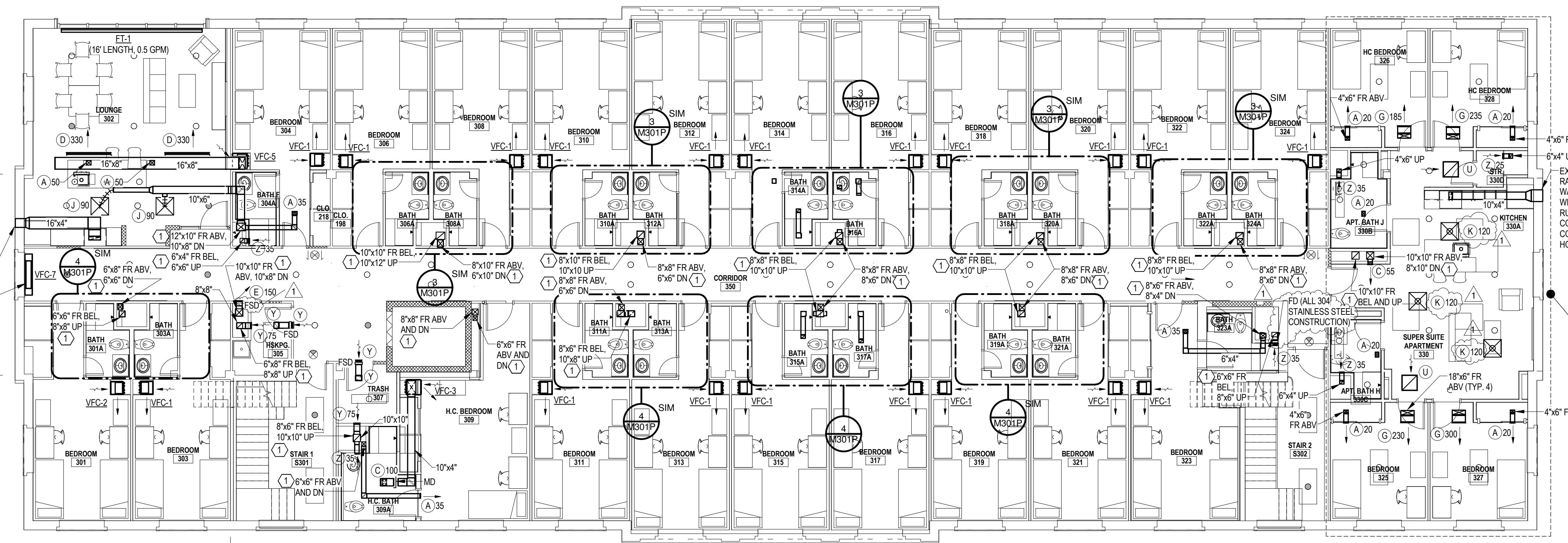
1. PROVIDE FIRE DAMPER AT FLOOR PENETRATION.

EXTEND 16"x4" DUCTWORK FROM RANGE HOOD TO EXTERIOR WALL. TERMINATE DUCTWORK WITH 12x7 3/4" BRICK VENT. RUSKIN MODEL BV100 OR EQUAL. COORDINATE DUCTWORK CONNECTION SIZE TO RANGE HOOD WITH HOOD SUPPLIER.

FAN COIL SHALL BE SLOPE TOP TYPE.

THIRD FLOOR PLAN - DUCTWORK

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



PLAN NOTES:

(NOT ALL NOTES MAY APPLY TO THIS SHEET)

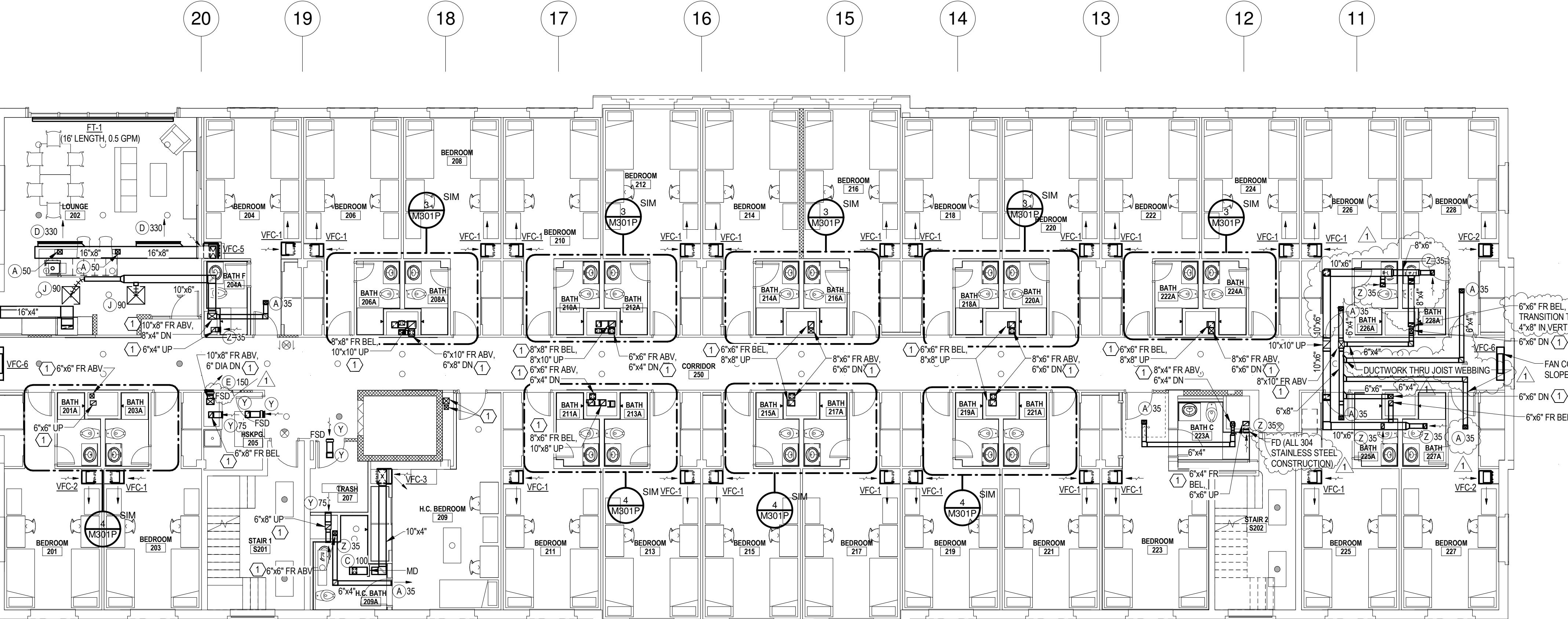
1. PROVIDE FIRE DAMPER AT FLOOR PENETRATION.

EXTEND 16"x4" DUCTWORK FROM RANGE HOOD TO EXTERIOR WALL. TERMINATE DUCTWORK WITH 12x7 3/4" BRICK VENT. RUSKIN MODEL BV100 OR EQUAL. COORDINATE DUCTWORK CONNECTION SIZE TO RANGE HOOD WITH HOOD SUPPLIER.

FAN COIL SHALL BE SLOPE TOP TYPE.

SECOND FLOOR PLAN - DUCTWORK

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



NOTE: ALL FLOOR PLANS ARE FOR POCAHONTAS HALL, BOLLING HALL SIMILAR, DRAPER HALL SIMILAR EXCEPT OPPOSITE HAND (EXCEPT WHERE INDICATED OTHERWISE).

GRAPHIC SCALE

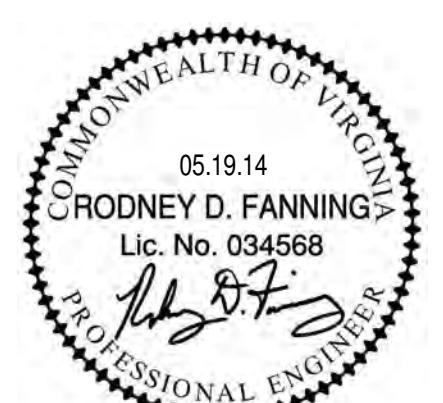
0 4' 8' 12'
16'=1'-0"

M102

RADFORD UNIVERSITY

RENOVATION OF THREE RESIDENCE HALLS
POCAHONTAS, BOLLING, & DRAPER HALLS
RADFORD UNIVERSITY
RADFORD, VIRGINIA

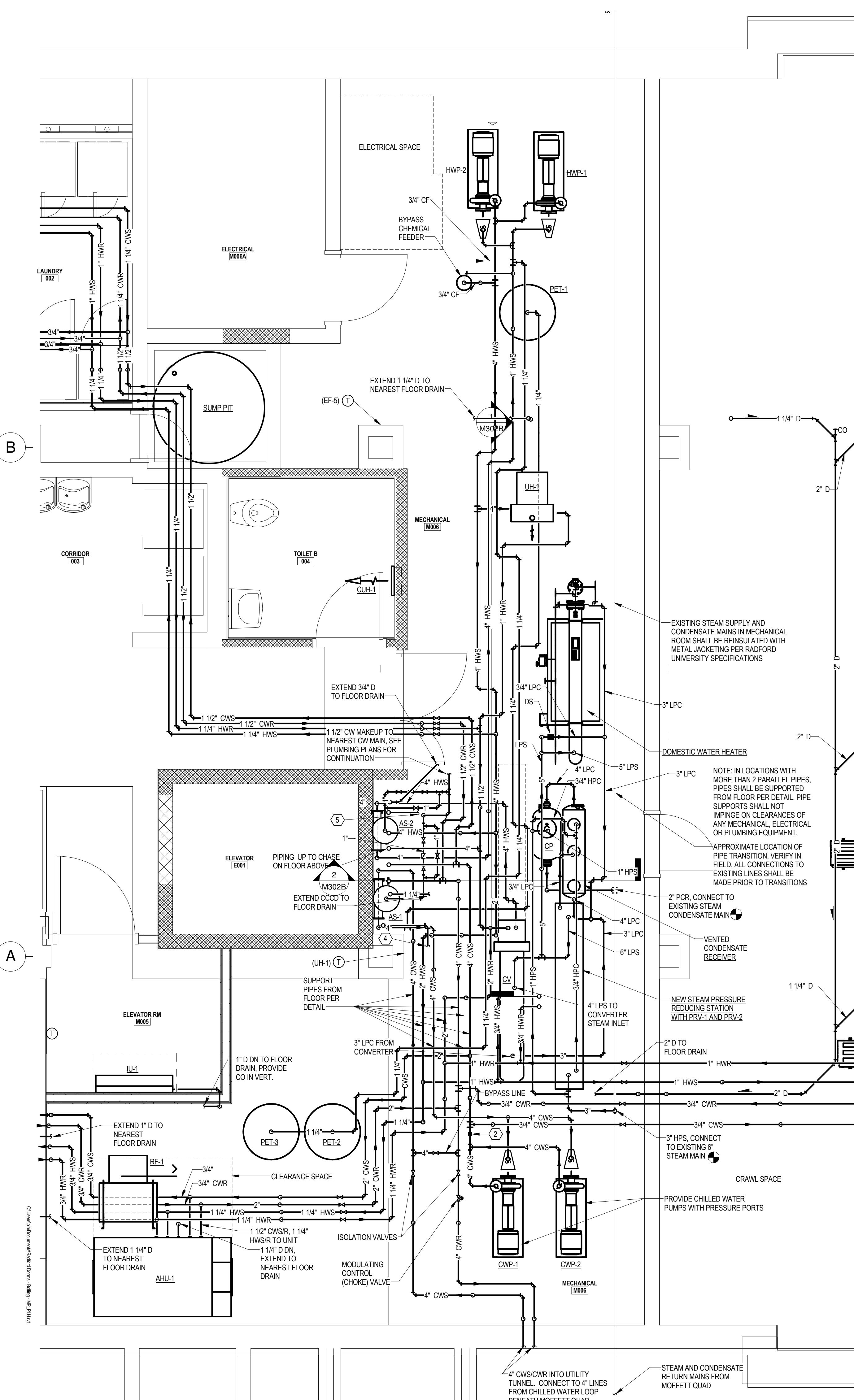
Project Code 217-16565
VMDO Project Number 1115



Checked By
Drawn By

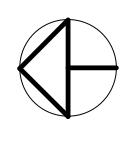
RCH
PLH

ISSUES AND REVISIONS
NO. SUBMITTAL
1 ADDENDUM 1
DATE
06.19.14

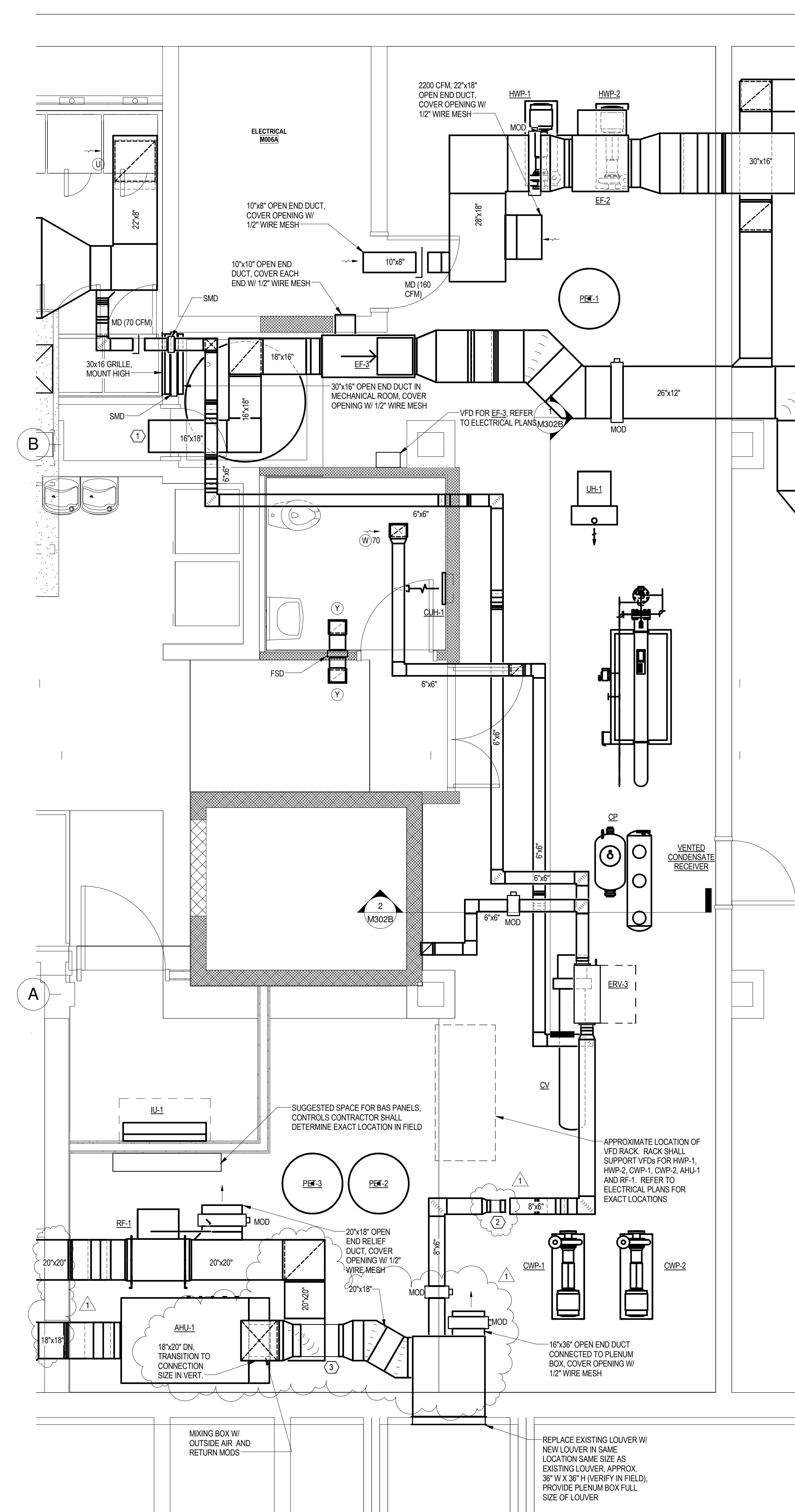


PLAN NOTES:

- (ALL NOTES MAY NOT APPLY TO THIS SHEET)
1. HEATING WATER PRESSURE SENSOR LOCATION FOR FLOW CONTROL OF HWP-1 AND HWP-2
 2. CHILLED WATER PRESSURE SENSOR LOCATION FOR FLOW CONTROL OF CWP-1 AND CWP-2
 3. 16'x18' DUCT INTO CHASE BEHIND DRYERS. CONNECT 4" DIA ROUND ALUMINUM DUCT FROM EACH DRYER TO 16'x18".
 4. 6' RELIEF VENT TO LOW PRESSURE STEAM RELIEF.
 5. 6' RELIEF VENT TO HIGH PRESSURE STEAM RELIEF.

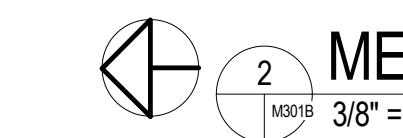


MECHANICAL ROOM M006 PARTIAL FLOOR PLAN - HVAC PIPING
M006 3/8" = 1'-0"



PLAN NOTES:

- (ALL NOTES MAY NOT APPLY TO THIS SHEET)
1. 16'x18' DUCT INTO CHASE BEHIND DRYERS. CONNECT 4" DIA ROUND ALUMINUM DUCT FROM EACH DRYER TO 16'x18".
 2. DUCT-MOUNTED REMOTE AIRFLOW MEASURING STATION, PRICE MODEL RMS OR EQUAL, SIZE 6 ROUND.
 3. DUCT-MOUNTED REMOTE AIRFLOW MEASURING STATION, PRICE MODEL RMS OR EQUAL, SIZE 6x6 SQUARE.



MECHANICAL ROOM M006 PARTIAL FLOOR PLAN - DUCTWORK
M006 3/8" = 1'-0"

GRAPHIC SCALE

0 2' 4' 6'

GRAPHIC SCALE

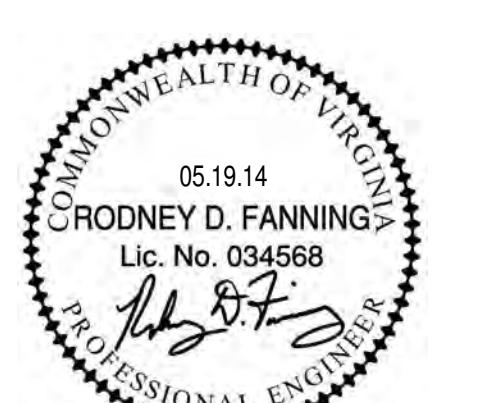
0 1' 2' 3' 4'

PARTIAL FLOOR PLANS -
HVAC - BOLLING

M301B

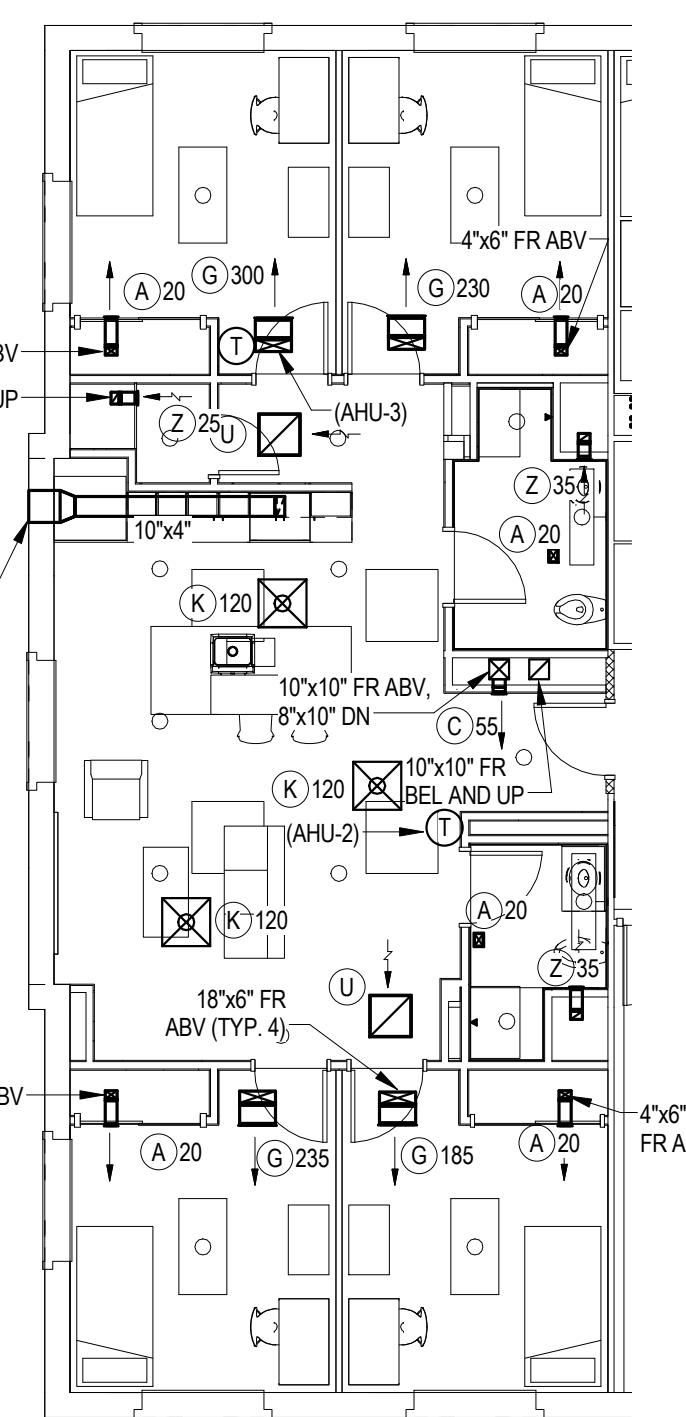
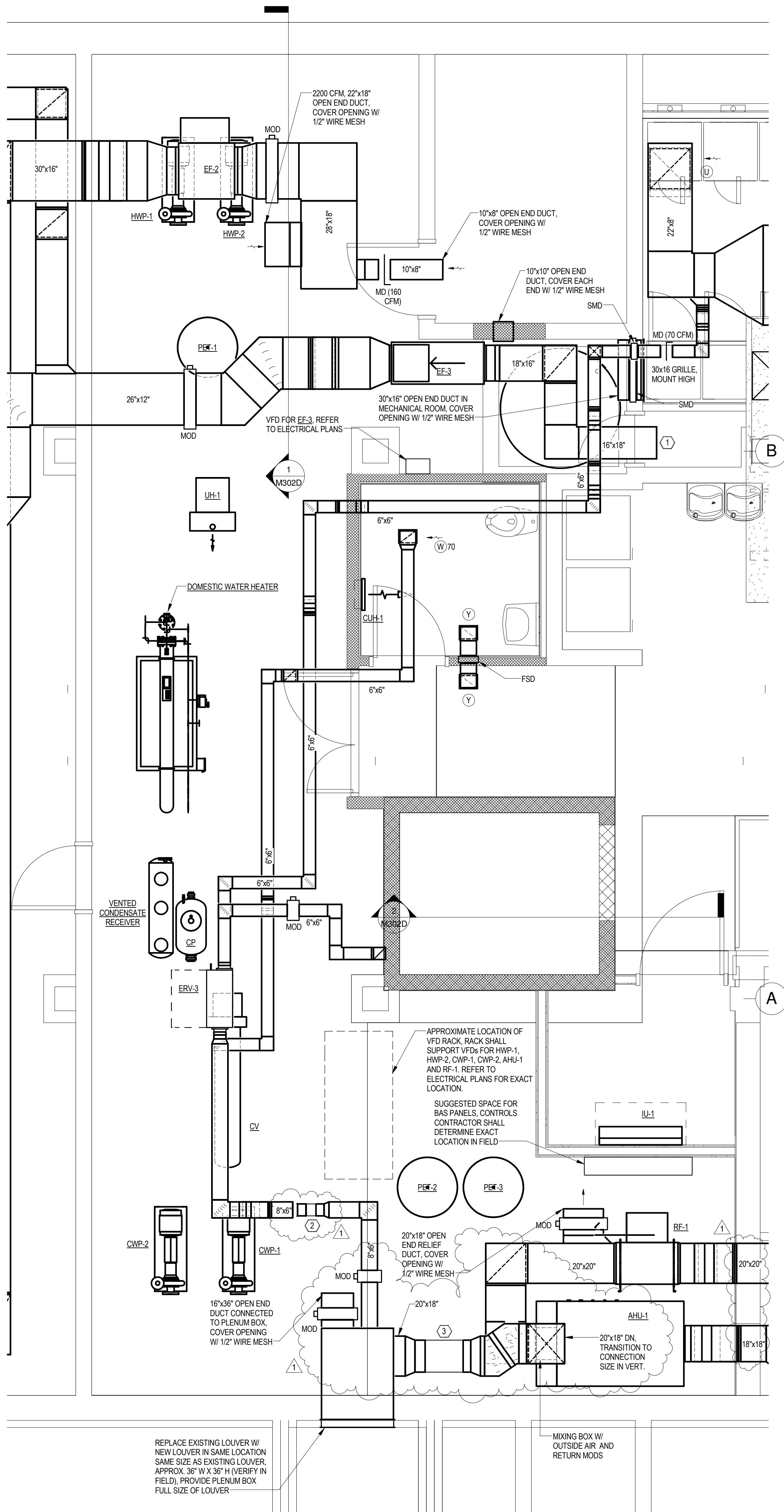
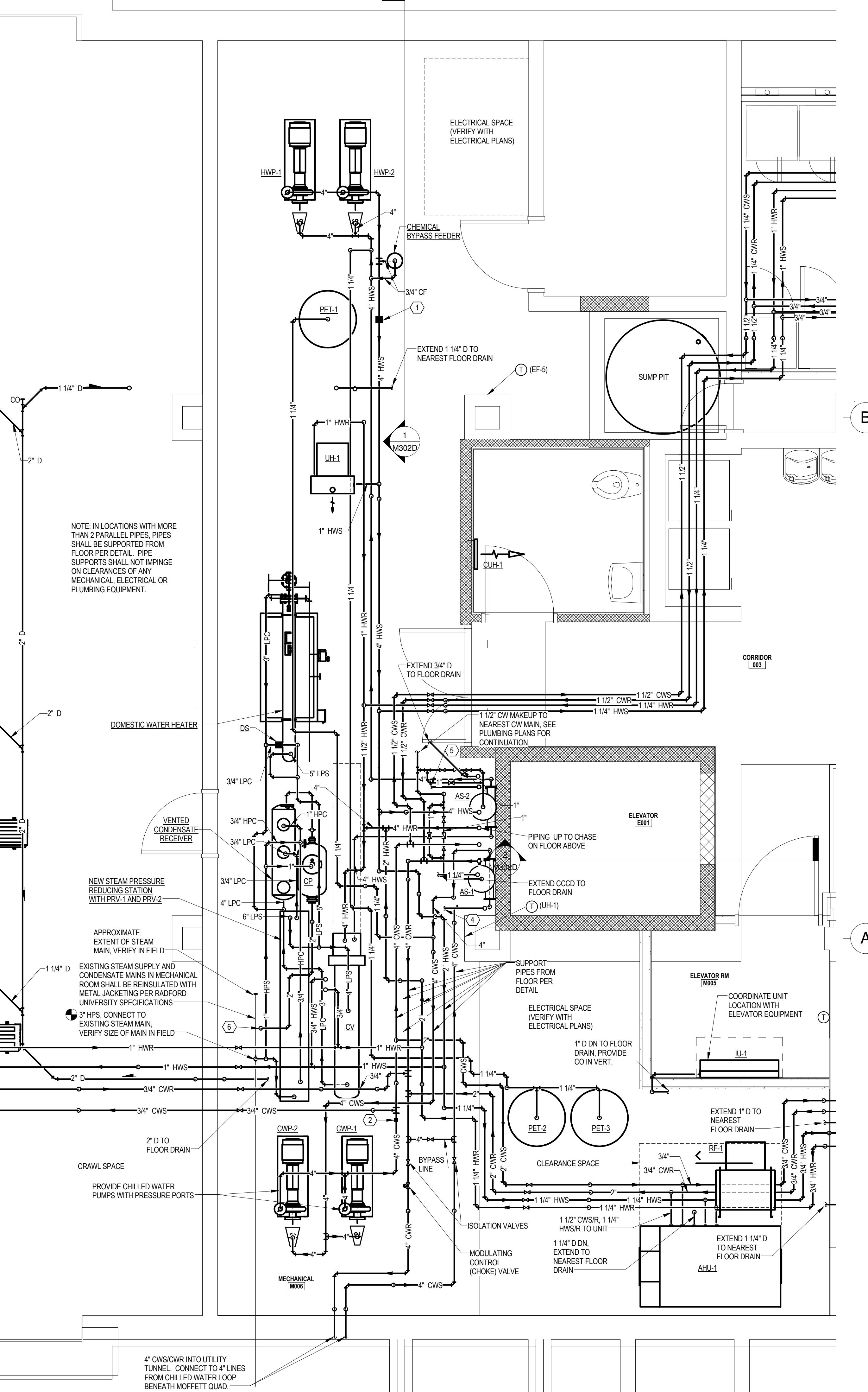


**RENOVATION OF THREE RESIDENCE HALLS
POCAHONTAS, BOLLING, & DRAPER HALLS**
RADFORD UNIVERSITY
RADFORD, VIRGINIA

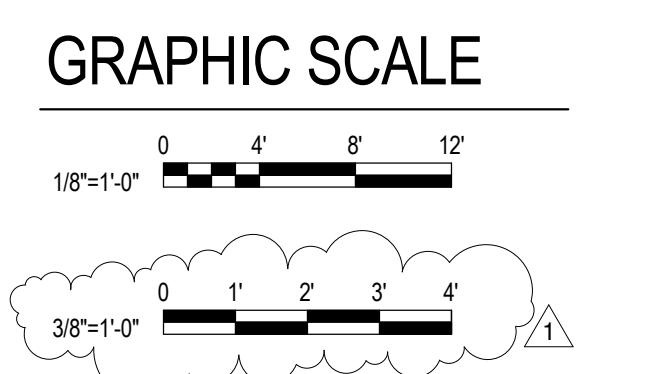
217-16565
1115

Checked By
Drawn By
RCH
PLH

ISSUES AND REVISIONS
NO. SUBMITTAL
1 ADDENDUM 1
DATE
06.19.14



PARTIAL THIRD FLOOR PLAN - DUCTWORK
SCALE: 1/8" = 1'-0"



PARTIAL FLOOR PLANS - HVAC - DRAPER

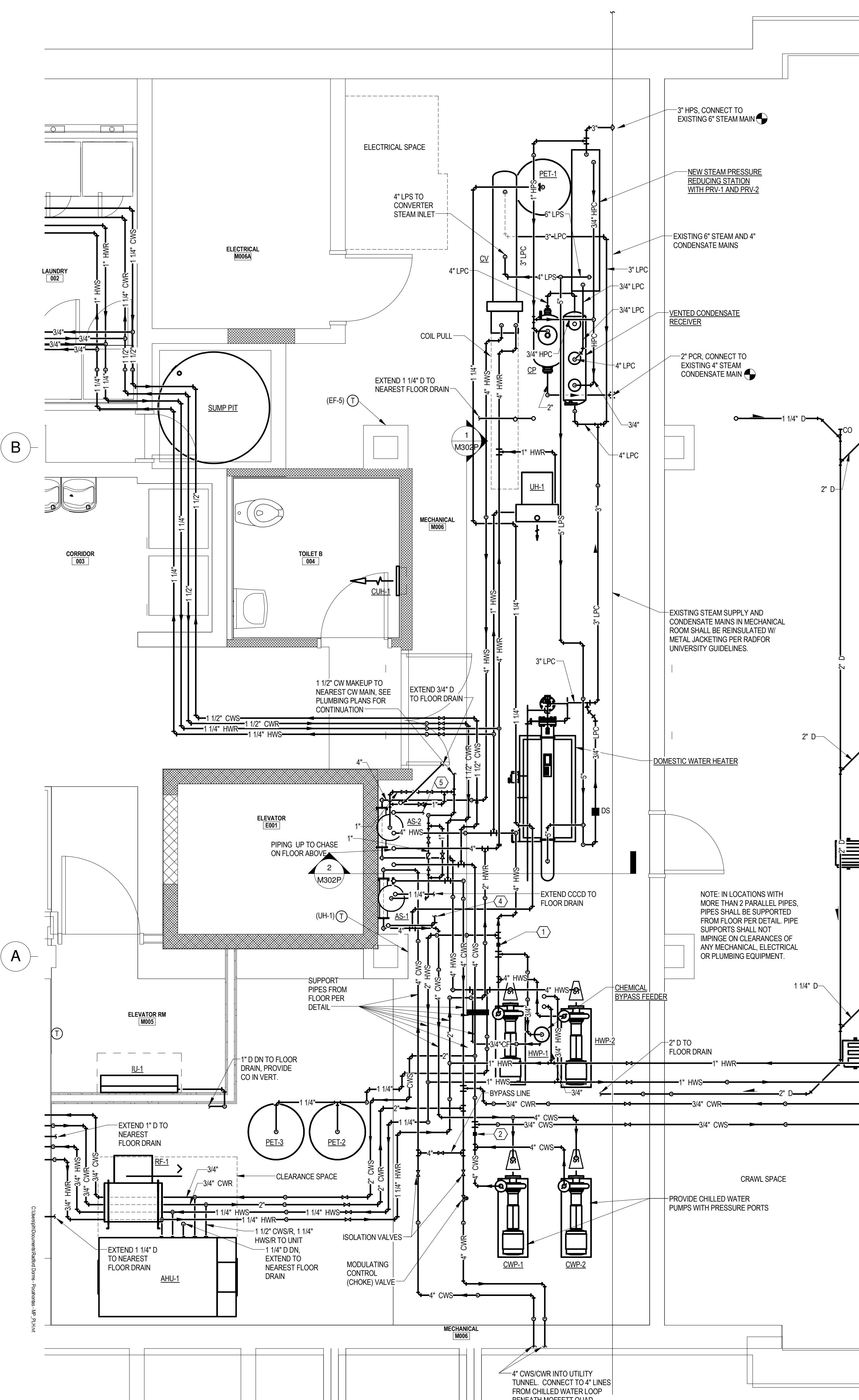
M301D



**RENOVATION OF THREE RESIDENCE HALLS
POCAHONTAS, BOLLING, &
DRAPER HALLS**
RADFORD UNIVERSITY
RADFORD, VIRGINIA

217-17565
1115Checked By
Drawn ByRCH
PLH

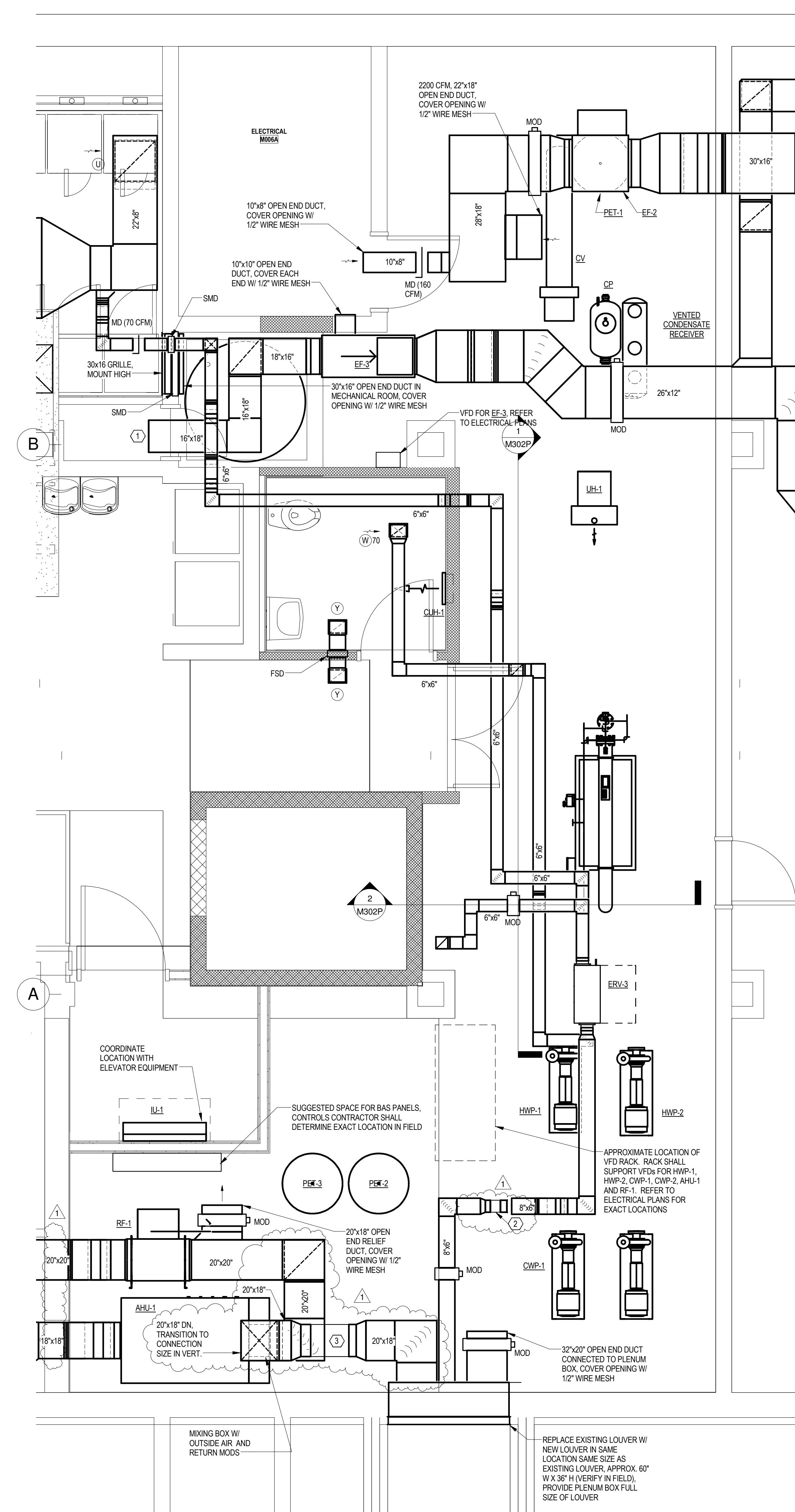
ISSUES AND REVISIONS
NO. SUBMITTAL
1 ADDENDUM 1
DATE
06.19.14



PLAN NOTES:

- (ALL NOTES MAY NOT APPLY TO THIS SHEET)
1. HEATING WATER PRESSURE SENSOR LOCATION FOR FLOW CONTROL OF HWP-1 AND HWP-2
 2. CHILLED WATER PRESSURE SENSOR LOCATION FOR FLOW CONTROL OF CWP-1 AND CWP-2
 3. 16'X10' DUCT INTO CHASE BEHIND DRYERS. CONNECT 4" Dia ROUND ALUMINUM DUCT FROM EACH DRYER TO 16'X10'.
 4. 6' RELIEF VENT TO LOW PRESSURE STEAM RELIEF.
 5. 6' RELIEF VENT TO HIGH PRESSURE STEAM RELIEF.

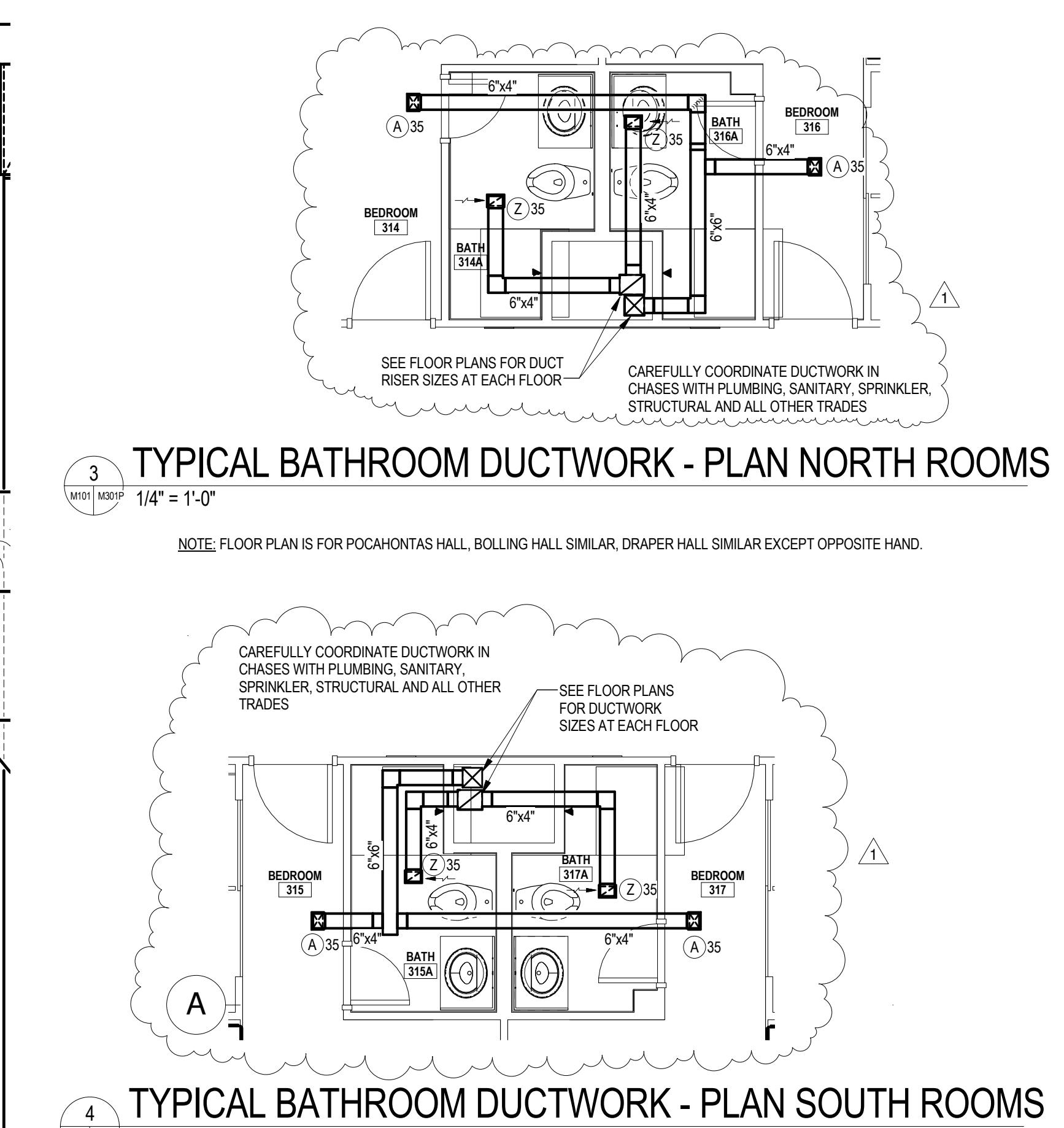
MECHANICAL ROOM M006 PARTIAL FLOOR PLAN - HVAC PIPING
1 M301P M301P 3/8" = 1'-0"



PLAN NOTES:

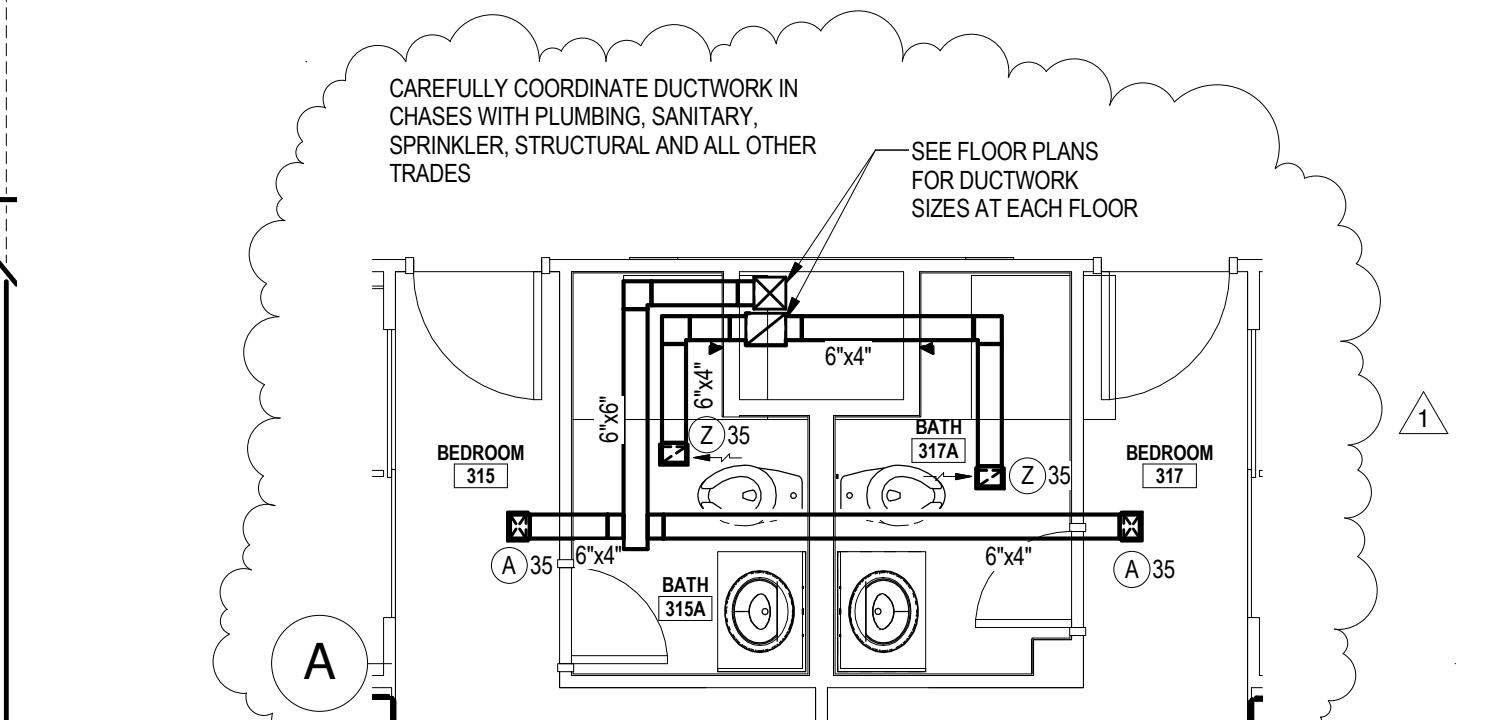
- (ALL NOTES MAY NOT APPLY TO THIS SHEET)
1. CHILLED WATER PRESSURE SENSOR LOCATION FOR FLOW CONTROL OF CWP-1 AND CWP-2
 2. 16'X10' DUCT INTO CHASE BEHIND DRYERS. CONNECT 4" Dia ROUND ALUMINUM DUCT FROM EACH DRYER TO 16'X10'.
 3. DUCT-MOUNTED REMOTE AIRFLOW MEASURING STATION, PRICE MODEL RMS OR EQUAL, SIZE 16x16 SQUARE.

MECHANICAL ROOM M006 PARTIAL FLOOR PLAN - DUCTWORK
2 M301P M301P 3/8" = 1'-0"



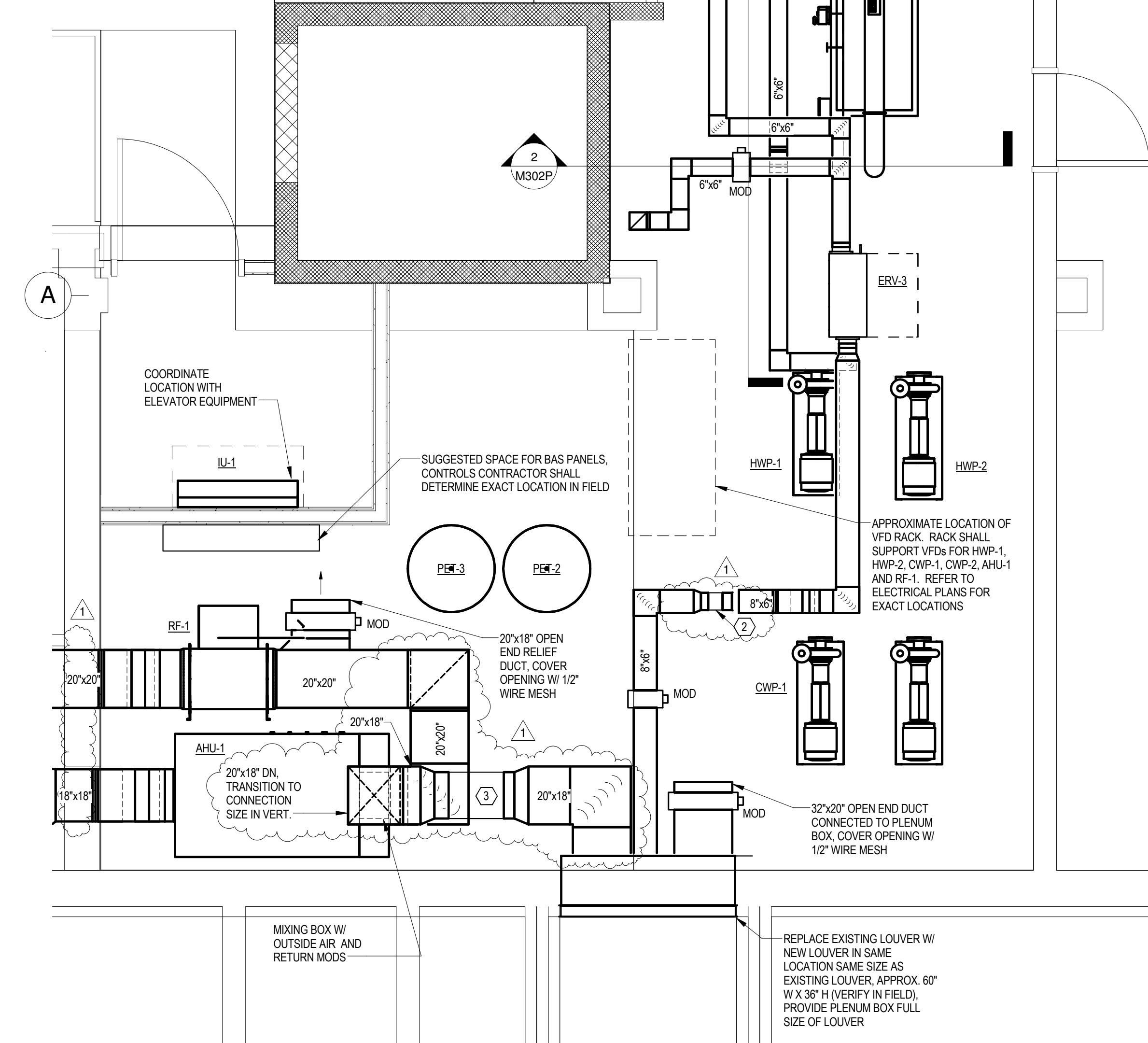
TYPICAL BATHROOM DUCTWORK - PLAN NORTH ROOMS

NOTE: FLOOR PLAN IS FOR POCAHONTAS HALL, BOLLING HALL SIMILAR, DRAPER HALL SIMILAR EXCEPT OPPOSITE HAND.



TYPICAL BATHROOM DUCTWORK - PLAN SOUTH ROOMS

NOTE: FLOOR PLAN IS FOR POCAHONTAS HALL, BOLLING HALL SIMILAR, DRAPER HALL SIMILAR EXCEPT OPPOSITE HAND.



**PARTIAL FLOOR PLANS -
HVAC - POCAHONTAS**

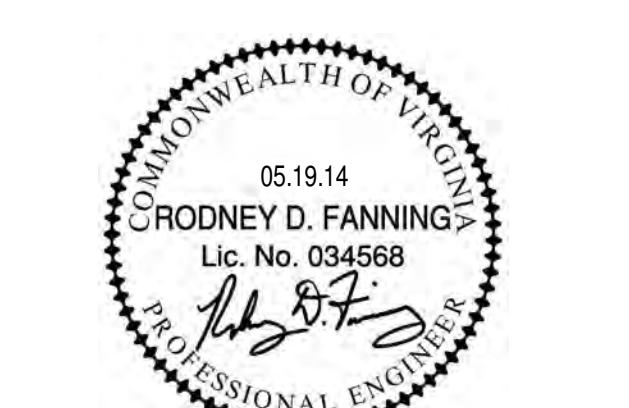
GRAPHIC SCALE

0 2' 4' 6'

GRAPHIC SCALE

0 1' 2' 3' 4'

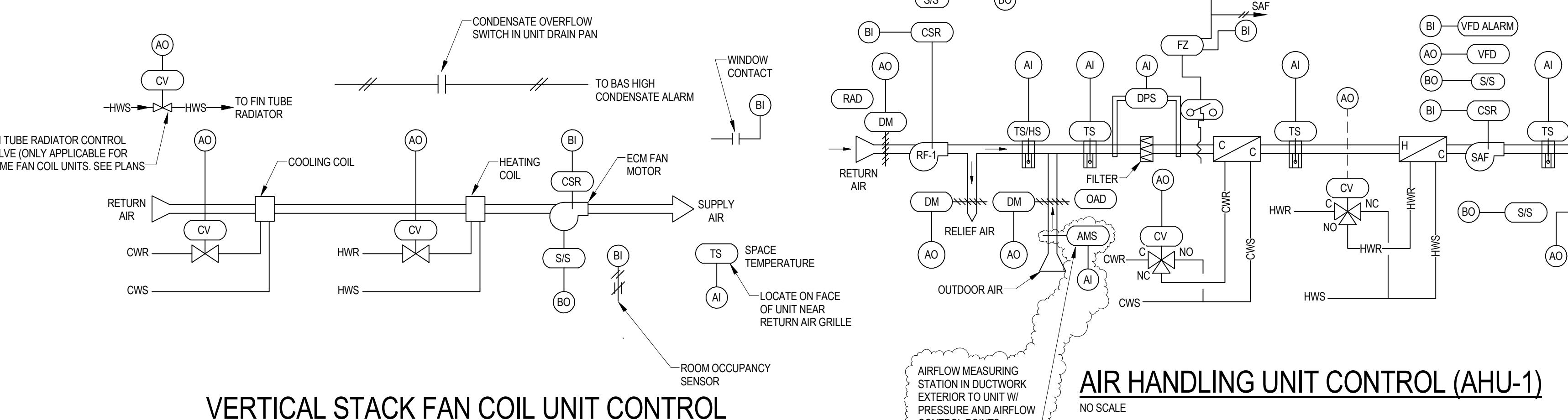
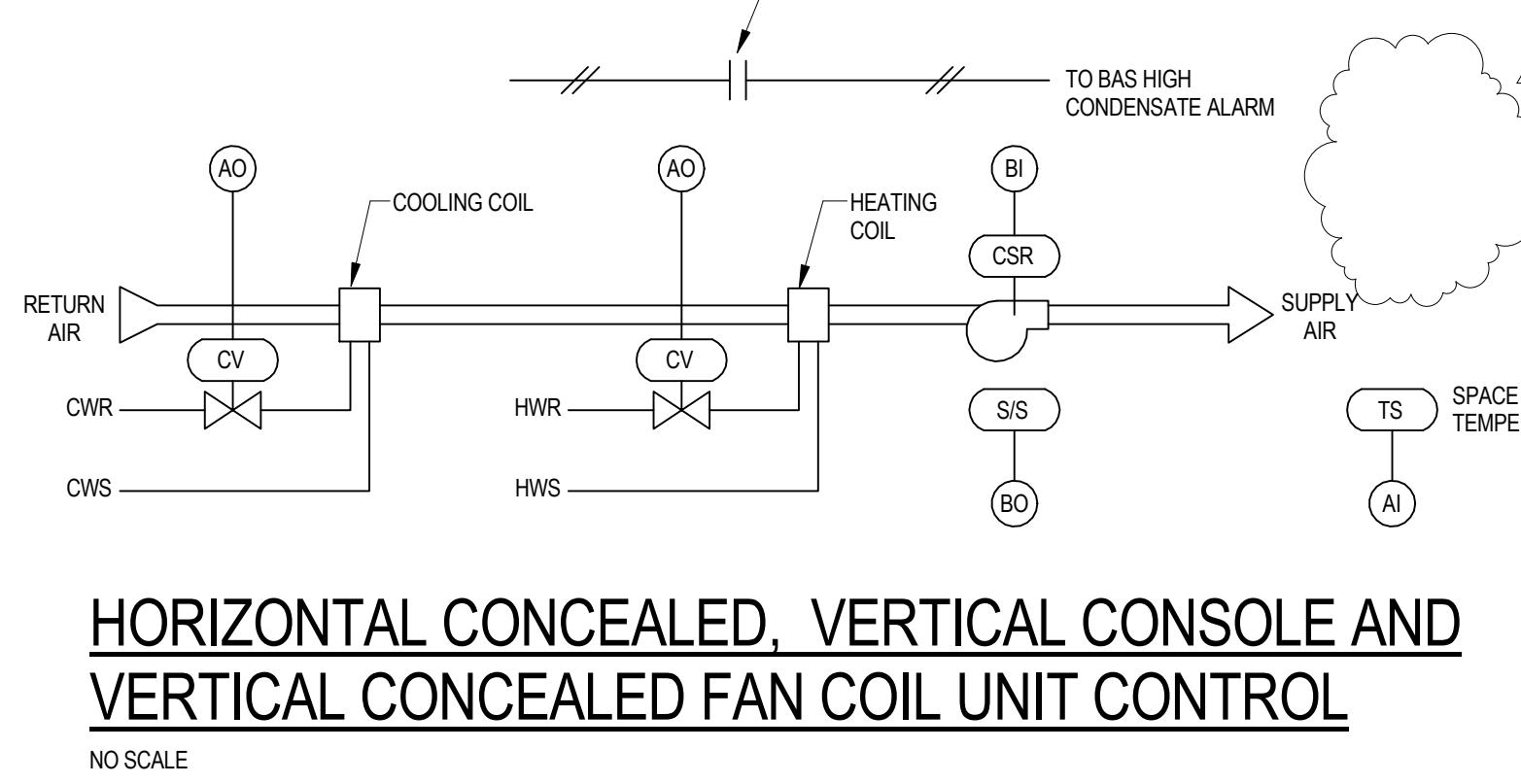
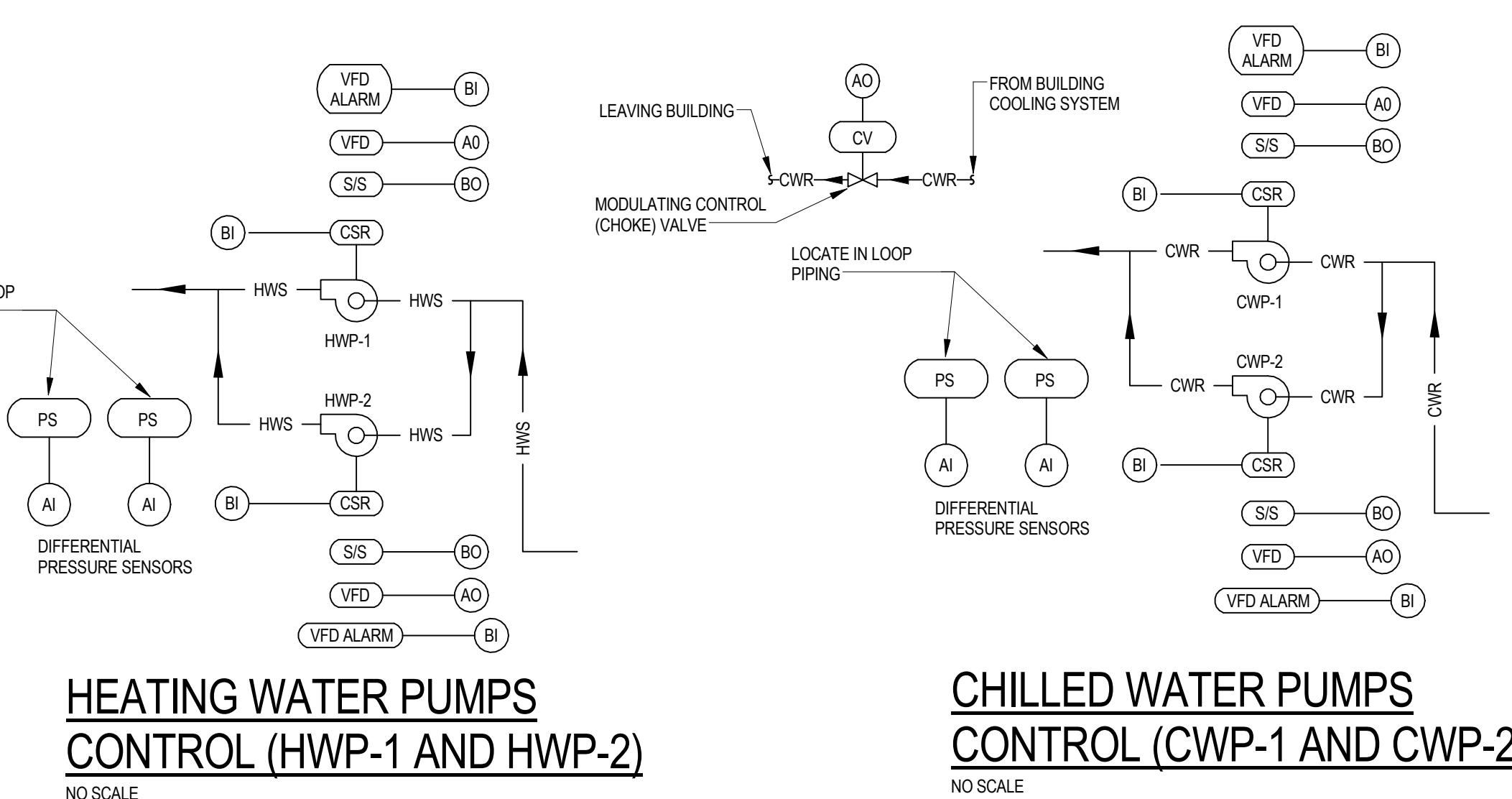
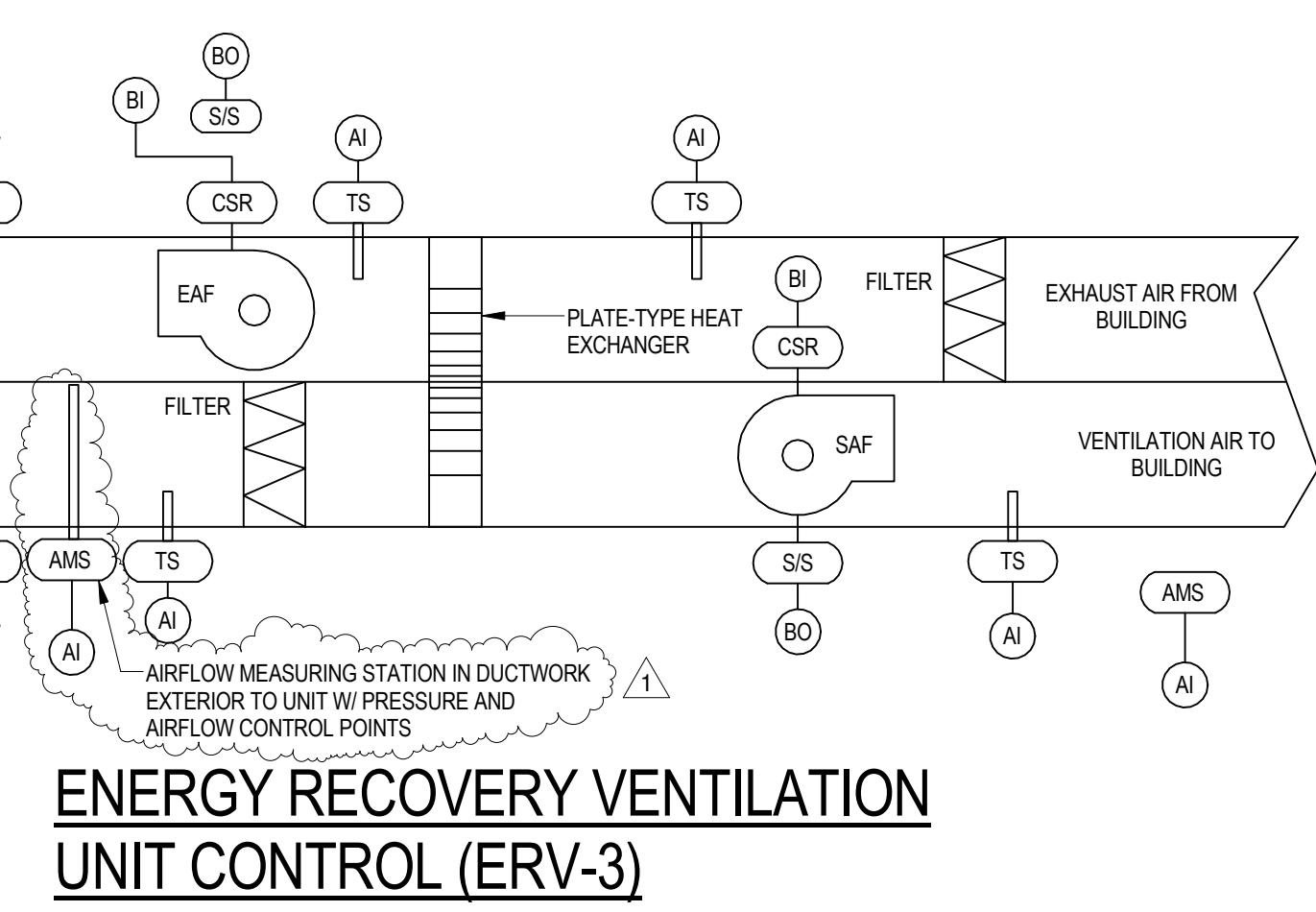
M301P

RENOVATION OF THREE RESIDENCE HALLS
POCAHONTAS, BOLLING, &
DRAPER HALLS
 RADFORD UNIVERSITY
 RADFORD, VIRGINIA
217-17565
1115Checked By _____
Drawn By _____

RCH PLH

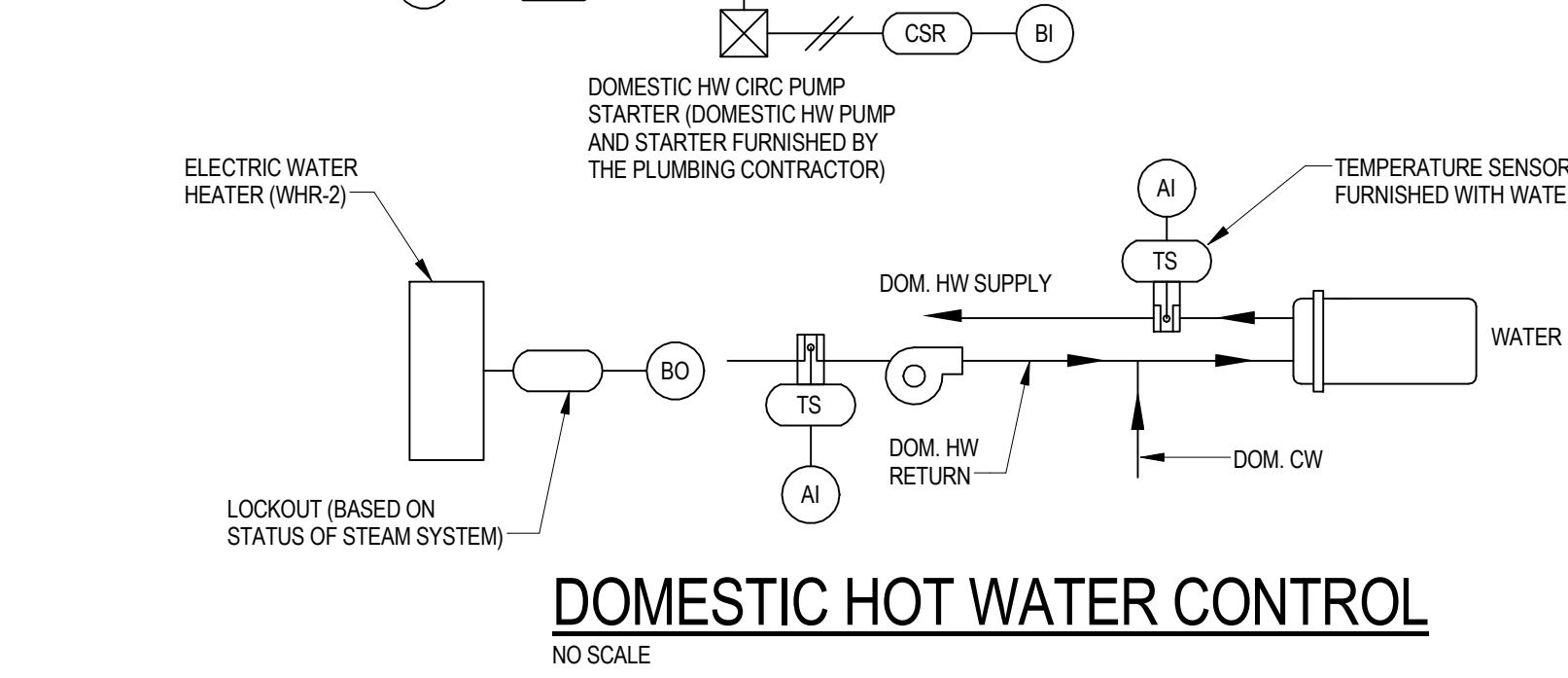
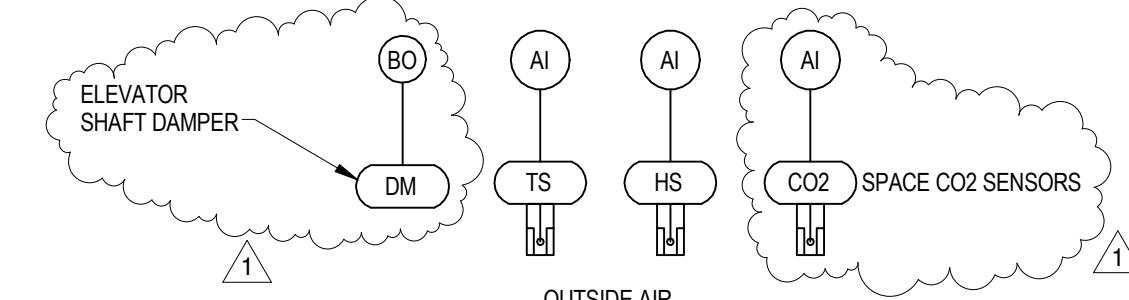
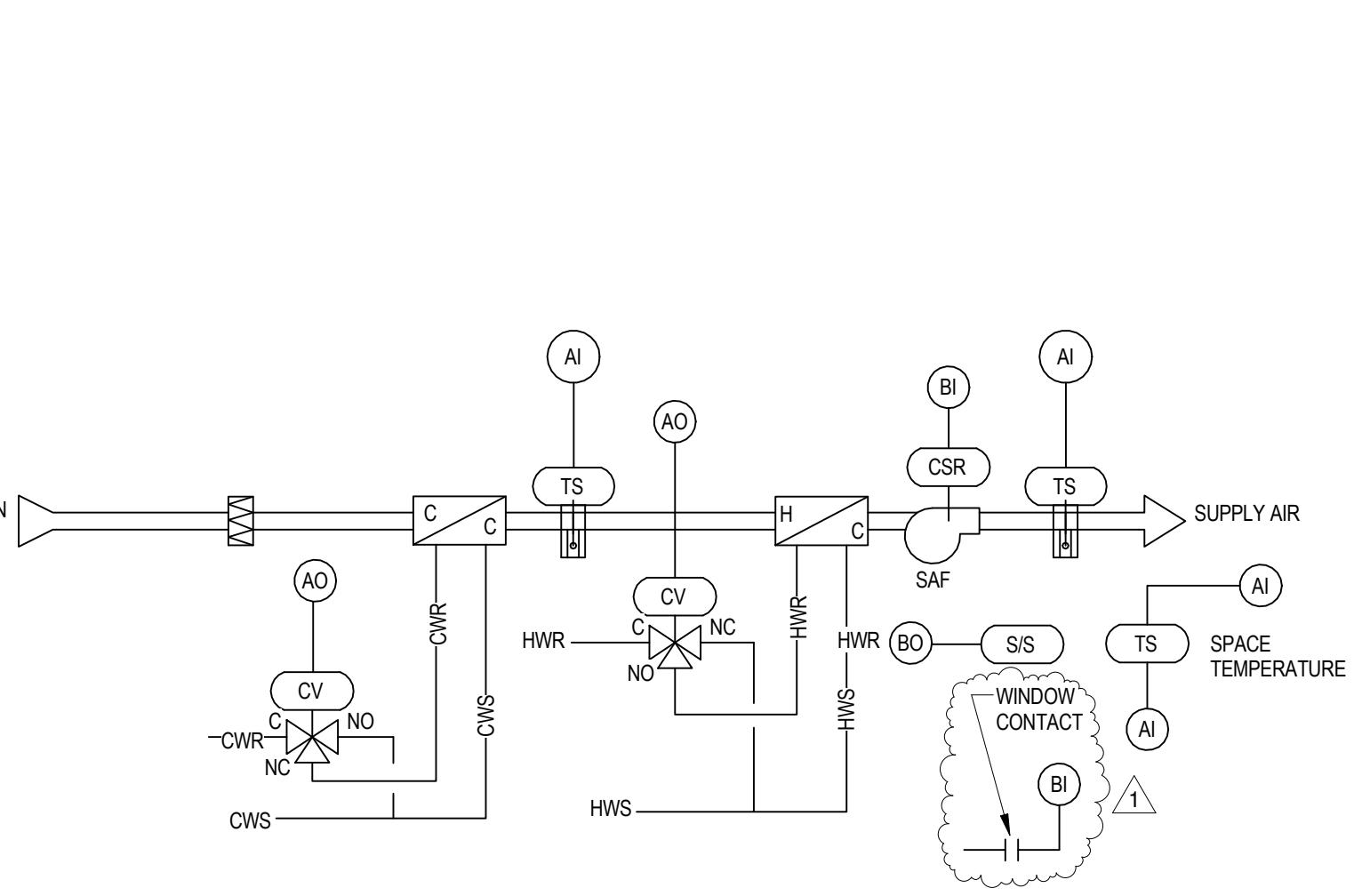
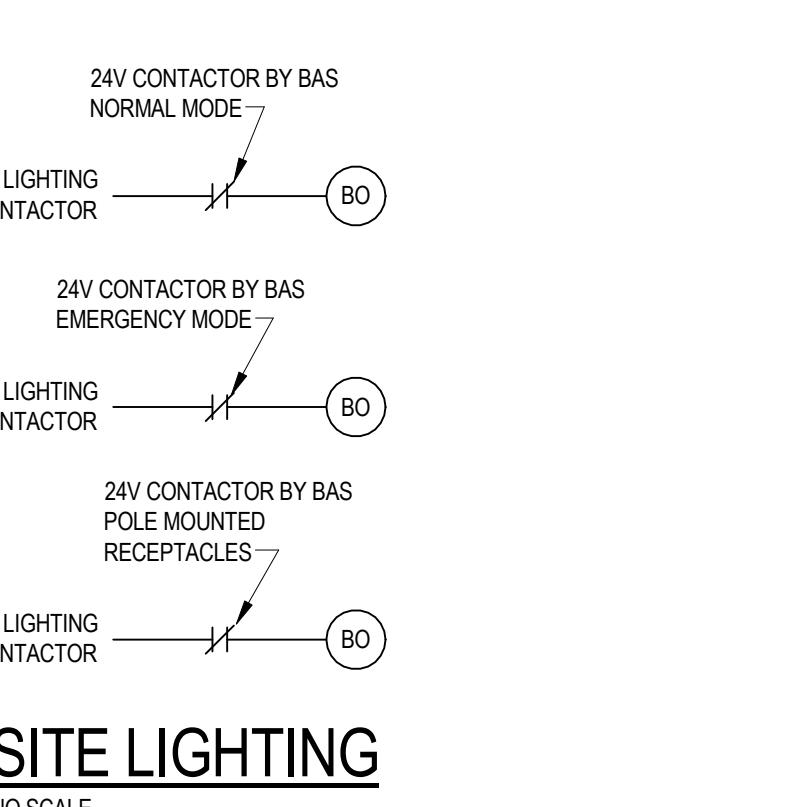
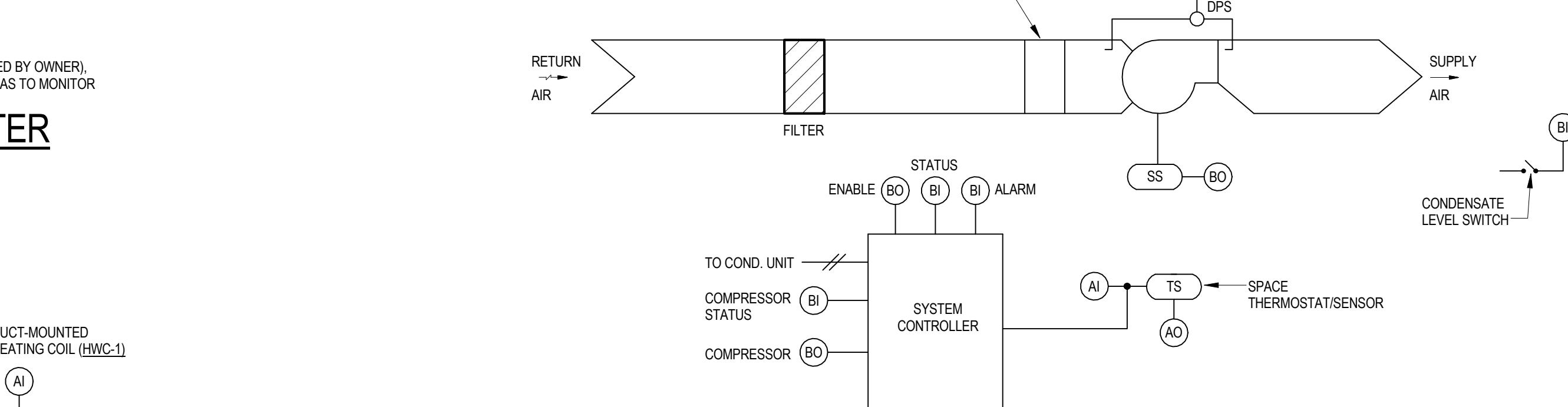
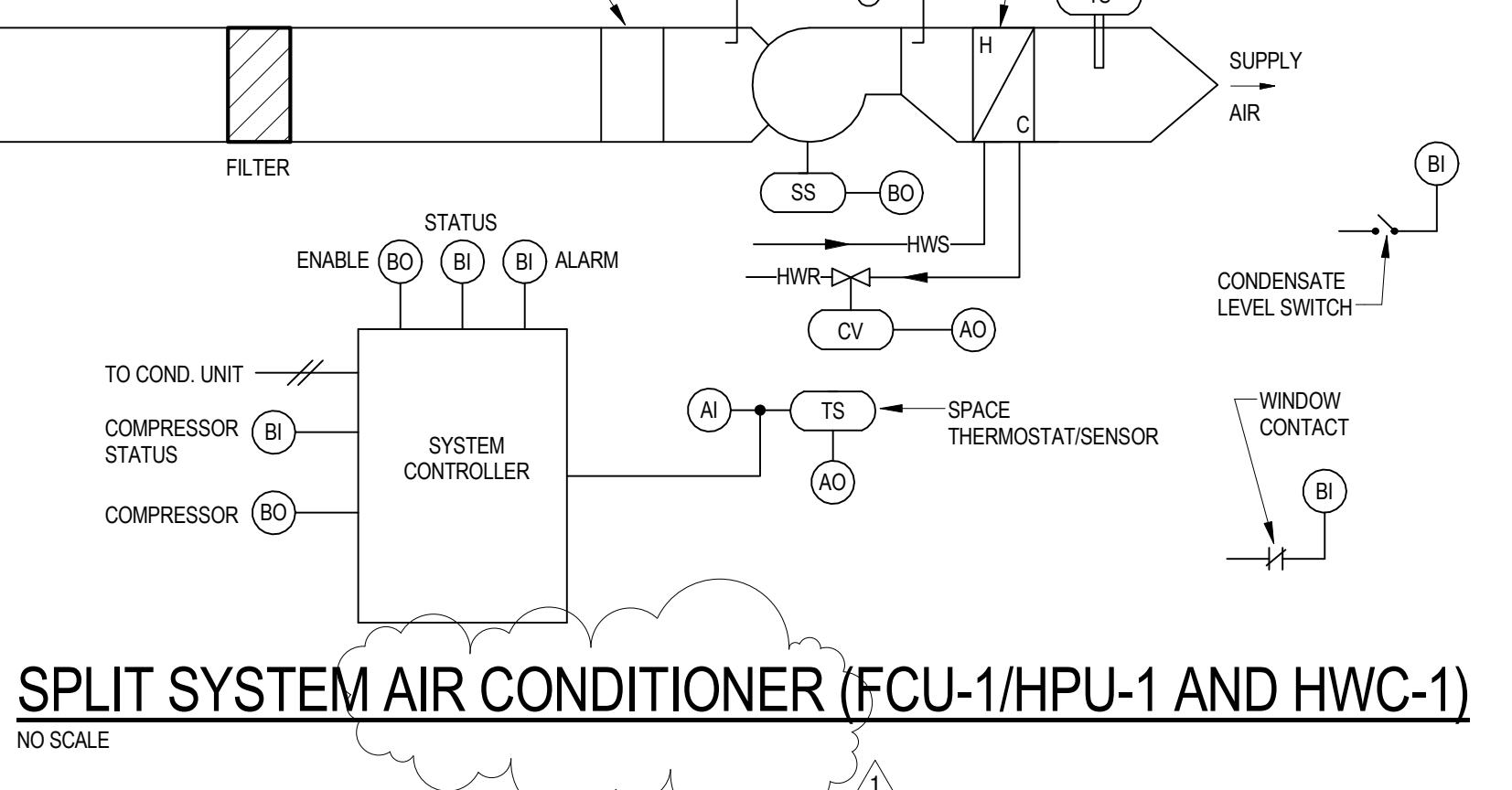
ISSUES AND REVISIONS
NO. SUBMITTAL 1 ADDENDUM 1
DATE 06.19.14**M601**

CONTROL LEGEND	
CV	CONTROL VALVE ACTUATOR
CSR	CURRENT SENSING RELAY
SAF	SUPPLY AIR FAN
RAF	RETURN AIR FAN
TS	VARIABLE SPEED DRIVE
PS	TEMPERATURE SENSOR
DPS	PRESSURE SENSOR
FZ	DIFFERENTIAL PRESSURE SENSOR
DM	FROZEN THERMISTOR
SD	DAMPER MOTOR
AO	SMOKE DETECTOR
AI	ANALOG OUTPUT
BO	BINARY INPUT
BI	BINARY OUTPUT
S/S	BINARY INPUT/OUTPUT
HS	HUMIDITY SENSOR
OAD	OUTDOOR AIR DAMPER
EAD	EXHAUST AIR DAMPER
RDG	RETURN AIR DAMPER
ES	EXHAUST END SWITCH
EAF	EXHAUST AIR FAN
CO2	CO2 SENSOR


ENERGY RECOVERY VENTILATION UNITS CONTROL (ERV-1 AND ERV-2)
NO SCALE

CHILLED WATER PUMPS CONTROL (CWP-1 AND CWP-2)
NO SCALE

HORIZONTAL HOT WATER UNIT HEATERS (UH-1 & UH-2)
NO SCALE

EXHAUST FAN (EF-4)
NO SCALE

EXHAUST FAN (EF-1)
NO SCALE

DOMESTIC WATER FLOW METER
NO SCALE

AIR HANDLING UNIT CONTROL (AHU-2, AHU-3)
NO SCALE

KW METER
NO SCALE

DUCTLESS SPLIT AIR CONDITIONING UNIT
NO SCALE


NOTE: THIS SHEET TYPICAL FOR POCAHONTAS, BOLLING AND DRAPER HALLS.

HVAC CONTROL DIAGRAMS

SYSTEM POINT LIST																			
SYSTEM POINT DESCRIPTION	ANALOG							BINARY				SYSTEM FEATURES							
	INPUT				OUTPUT			INPUT		OUTPUT		ALARMS				PROGRAMS			
	GRAPHIC	TEMPERATURE	PRESSURE	RH	KW	KWH	PPM	GPM	PERCENT	CFM	SETPOINT	DIFFERENTIAL PRESSURE	DIGITAL (4-20 mA or 0-10 vdc)	VFD	SETPOINT ADJ.	PNEU. TRANSDUCER	STATUS ON/OFF	FILTER STATUS	STATUS OPEN/CLOSED
AIR HANDLING UNIT (AHU-1) AND RETURN FAN (RF-1)														X		X			
SUPPLY AND RETURN FANS																			
VFD (SUPPLY AND RETURN FANS)														X					
VFD FAIL (SUPPLY AND RETURN FANS)																			
SUPPLY AIR	X					X													
HEATING COIL (CONTROL VALVE)														X					
COOLING COIL (CONTROL VALVE)																			
MIXED AIR	X																		
OUTSIDE AIR	X	X																	
ECONOMIZER ACTUATION OA/RA/EA														X					
FREEZESTAT														X					
REMOTE SETPOINT						X													X
FILTER							X												
SPACE TEMP.	X					X		X											X
COOLING COIL DISCHARGE	X														X	X			
RETURN AIR HUMIDISTAT		X						X							X				
CO2 SENSOR				X										X					
AIRFLOW MEASURING STATION		X			X									X	X				

GENERAL NOTES: PROVIDE ONE COLOR GRAPHIC PER UNIT WITH ALL DYNAMIC DATA SHOWN.

GENERAL NOTES: PROVIDE ONE COLOR GRAPHIC PER UNIT WITH ALL DYNAMIC DATA SHOWN

SYSTEM POINT LIST														
SYSTEM POINT DESCRIPTION	ANALOG					BINARY			SYSTEM FEATURES					
	INPUT		OUTPUT		INPUT	OUTPUT	ALARMS			PROGRAMS				
COOLING WATER SYSTEM	TEMPERATURE	PRESSURE	DIFF PRESSURE	KW	GPM	CFM	FPM	PERCENT	PERCENT RLA	DDC (4-20 mA or 0-10 VDC)	VFD	SETPOINT ADJ.	PANEL TRANSDUCER	STATUS ON/OFF
CHILLED WATER PUMPS (CWP-1 & 2)	X									X			FILTER STATUS	STATUS OPEN/CLOSED
BUILDING LEAVING CHILLED WATER	X									X	X		VFD FAULT	OFF/ON
BUILDING ENTERING CHILLED WATER	X									X	X		OPEN/CLOSE	MAX CAPACITY
MODULATING CONTROL (CHOKE) VALVE				X									ENABLE/DISABLE	LIMIT WARNING
SYSTEM PRESSURE	X												HIGH ANALOG	LOW ANALOG
VFD CW PUMP (CWP-1 & 2)		X	X	X			X						BINARY	INTER PROCESS FAIL
VFD FAIL (CWP-1 & 2)											X	X	SENSOR FAIL	FLOW FAIL
CHILLED WATER FLOW	X	X						X					COMM. FAIL	DIAGNOSTICS
													PROOF	TIME SCHEDULING
													OPT. START/STOP	Demand Limiting
													RESET	Event Program
													DDC	DDC
													ALARM INSTRUCT	Maint. Wk. Ord.
													Run Time	Tenant Billing
													Exp. Message	Totalizing
													Set Back Set Up	Timed Override
													Night Purge	

GENERAL NOTES: PROVIDE ONE COLOR GRAPHIC OF THE COOLING WATER SYSTEM WITH ALL DYNAMIC DATA SHOWN.

NOTES

GENERAL NOTES: PROVIDE ONE COLOR GRAPHIC OF THE COOLING WATER SYSTEM WITH ALL DYNAMIC DATA SHOWN

GENERAL NOTES: PROVIDE ONE COLOR GRAPHIC WITH ALL DYNAMIC DATA SHOWN.

GENERAL NOTES: PROVIDE ONE COLOR GRAPHIC EACH UNIT WITH ALL DYNAMIC DATA SHOWN

GENERAL NOTES: PROVIDE ONE COLOR GRAPHIC WITH ALL DYNAMIC DATA SHOWN

GENERAL NOTES: PROVIDE ONE COLOR GRAPHIC EACH UNIT WITH ALL DYNAMIC DATA SHOWN.

GENERAL NOTES: PROVIDE ONE COLOR GRAPHIC PER UNIT WITH ALL DYNAMIC DATA

GENERAL NOTES: PROVIDE ONE COLOR GRAPHIC PER UNIT WITH ALL DYNAMIC DATA

GENERAL NOTES: PROVIDE ONE COLOR GRAPHIC PER UNIT WITH ALL DYNAMIC DATA SHOWN.

ELECTRIC SUBMETERS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
ELEVATOR SHAFT					
DAMPER					

NOTE: ONE COLOR GRAPHIC IS TO BE PROVIDED FOR EACH LIGHTING CONTACTOR AT EACH BUILDING. ONE COLOR GRAPHIC IS TO BE PROVIDED FOR THE GENERATOR AT DRAPER HALL. ONE COLOR GRAPHIC IS TO BE SHOWN FOR POWER FAILURE AT DRAPER. ONE COLOR GRAPHIC IS TO

CONTROLS POINTS LISTS