



Addendum No. 4

Architectural and Mechanical Energy Upgrades at Pine Street School – Phase 4 McMillan Pazdan Smith Project No. 018441 December 5, 2019

The following clarifications, amendments, additions, deletions, revisions, and/or modifications are hereby made a part of the Contract Documents, and change the original documents only in the manner and to the extent stated below:

- Item No. 1: **Project Manual Section 00 00 06 Proposal:**
Delete the previously issued Section 00 00 06 in its entirety and replace it with the attached Section 00 00 06 to be inserted into the contract documents.
- Item No. 2: **Project Manual Section 01 23 00 Alternates:**
Add the following to Part 3.1
B. Alternate No. 2 – Contractor shall quote the change in the contract price to use polypropylene for underground Hot Water and Chilled Water piping in lieu of steel.
- Item No. 3: **Project Manual Section 23 00 01 HVAC Specifications:**
Make the following changes:
- ALTERNATES section, page 23001-5: insert Alternate #2:
Alternate #2 (added 12/5/19): Contractor shall quote the change in the contract price to use polypropylene for underground Hot Water and Chilled Water piping (in lieu of steel).
 - PIPING section, E: Hot Water and Chilled Water Piping, 1. Piping and Valves, a. 2" and smaller (threaded and screwed joints), page 23001-12, add the following sentence to the "Pipe" section:
Pipe shall be manufactured in the U.S. of domestically sourced materials.
 - PIPING section, E: Hot Water and Chilled Water Piping, 1. Piping and Valves, b. 2 ½" and larger, page 23001-13, add the following items:
 - 11. Pipe: Schedule 40, carbon steel, ASTM 53 or A106 Grade A or B welded or seamless. Pipe shall be manufactured in the U.S. of domestically sourced materials.
 - 12. Butterfly Valve: 150 pound WOG, fully lugged ductile iron body. Valves shall be bubble-tight shut-off, stainless steel or bronze disc, stainless steel stem, EPDMN seat, bronze bushing, worm gear operator on valves 8" and larger, latch-lock throttling handle with memory stop on valves 6" and smaller. Valves shall have 2" extended neck and stem for insulation. Valves shall be U.S. made: Demco, Jenkins, Crane, Muller,

Nibco, Stockham, Hammond, Grinnell, Watts, Milwaukee, Victaulic 300 Masterseal, Conbraco/Apollo.

- PIPING section, E: Hot Water and Chilled Water Piping, page 23001-14, insert item #3:
 - 3. Underground Piping (Polypropylene Alternate #2):
 - a. Manufacturer's Standards: ASTM F-2389-17a for pipe systems, CSA B137.11 for piping and fittings, ANSI 14 for piping system components. Piping and fittings shall carry a 30 year factory warranty.
 - b. Material: Pipe and fittings shall be manufactured from a beta crystalline PP-RCT resin meeting the short-term properties and long-term strength requirements of ASTM F 2389 and CSA B137.11. Pipe and fittings made from a PP-RCT (PPRP) material that is made from a terpolymer, or made from standard PPR material are unacceptable.
 - c. Pipe: Pipe shall be Niron Clima Pipe and shall be listed for potable water (shall have listings to NSF 14 and 61g), regardless of the whether the pipe and fittings are to be used for potable water service or HVAC service. All pipe shall be made in an extrusion process and shall be pigmented as solid steel grey in color. The piping shall be extruded with a middle layer that has glass fiber content to restrict thermal expansion. Specified pipe is Niron Clima PP-RCT piping, SDR-11, suitable for continuous 180°F temperature and 100 PSI pressure ratings at 50 year service life.
 - d. Fittings: Fittings shall be manufactured from a PP-RCT resin meeting the short-term properties and long-term strength requirements of ASTM F 2389. All fittings shall comply with NSF 14, ASTM F 2389 and CSA B137.11. The approved fittings shall be Niron Clima PP-RCT.
 - e. Joints: Joints shall be electrofusion type. Transition fittings and mechanical "couplers" shall be proof-tested and approved by manufacturer. Proof of joining method qualification training is required by the construction crew staff, and shall be included with shop drawings.
 - f. Packaging, Handling and Storage: The Pipe and fittings shall be packaged, handled and stored in accordance with manufacturer's recommended procedures. Piping shall be protected from exposure to UV light at all times.
 - g. Installation: Install pipe materials and joints according to manufacturer's instructions and ASTM D2774 (underground piping) or ASTM F2389 (aboveground piping). All persons conducting fusion of piping shall be certified by the pipe manufacturer and equipment manufacturer for the type and size piping being installed.
 - 1. At the contractor's option, pipe headers may be installed full size, without reducers.
 - 2. All piping shall be bedded in an 18" deep clean sand bed. See detail on drawings.

3. Pipe Marking/Locating: One foot (1 ft.) below grade and directly above each underground pipe, lay a polyethylene marking tape in the trench during the backfill. The tape shall be inscribed with a warning of "caution, underground piping below". Additionally, adjacent to each pipe and at the same elevation as the pipe, lay a single strand, 14 gauge, bare copper wire for signal location. Terminate the wire (from both directions) in the valve pit so that it will be accessible for connection to signal generator.

h. Hydrotesting: Test per paragraph D.2; Hydrostatic Test @ 150 psig. (prior to insulating pipe).

- PIPING section, G: Natural Gas Piping, 1., Aboveground Piping and Valves, page 23001-16, add the following item:

Flexible Connectors: Provide flexible connectors at final connections to equipment. 300 series stainless steel corrugated hose with 304 stainless steel braided cover. UL listed and CSA/AGA certified. 175 working pressure at 70°F. Maximum 18" length. By Flex-Hose, Metraflex, Mason

- EQUIPMENT, item K.: Ductless Split System Heat Pump (page 23001-41):
Revise specified manufacturer to "LG". Remove all substitute manufacturers.
- CONTROLS section, J: Sequence of Operation, add item 9 (page 23001-55):
9. Carbon Monoxide Detection: Upon detection of carbon monoxide, associated gas-fired equipment shall be disabled by the Building Control System and an alarm shall be indicated. Carbon monoxide detectors are provided under electrical division (refer to electrical plans).

<u>EQUIPMENT TAG</u>	<u>SENSOR LOCATION</u>
B-1	B073 Boiler Room
B-2	F020 Mechanical Room
OAU-1	B001 Kindergarten
OAU-2	B042 First Grade
SSOAU-3	B079 Art
OAU-4	S035 Classroom
OAU-5	F064 Classroom
OAU-6	S017 Science Lab
OAU-7	F004 Band

Item No. 4: **Architectural Drawings – Sheet A10.21 Door Frame Types, Schedule & Details – Door Schedule:**

All doors shown as door type "U" should be door type "A".

Item No. 5: **Architectural Drawings – Sheet A3.11 – Ground Floor RCP Area – Detail A1/A3.11 Ground Floor RCP:**

Include the attached drawing AD4.1 into the contract documents.

Item No. 6: **Architectural Drawings – Sheet A3.11 – Ground Floor RCP Area:**

General Contractor shall remove all acoustical tile ceilings, grid, and supports completely in all rooms shown to get new acoustical tile and grid.

Item No. 7: **Mechanical Drawings**

Delete the following previously issued Mechanical Drawings and replace them with the attached revised Mechanical Drawings:

- HVAC-2 – HVAC Plan – Ground Floor
- HVAC-5 – Enlarged Mechanical Room Plan and Sections
- HVAC-6 – 1929 Plant Schematic Diagrams
- HVAC-7 – HVAC Schedules
- HVAC-8 – HVAC Details

Item No. 8: **Electrical Drawings:**

Insert the attached Electrical drawings into the contract Documents:

- E400 Fire Alarm Plan Area 2
- E401 Fire Alarm Plan Areas F1 & F4
- E402 Fire Alarm Plan Area S3

End of Addendum No. 4

This addendum contains	<u> 4 </u>	Summary Pages
	<u> 1 </u>	8.5x11 Sketch
	<u> 8 </u>	30x42 Drawing Sheets

PROPOSAL BY

Name of General Contractor Submitting Proposal

Board of Trustees
Spartanburg School District Seven
Spartanburg, South Carolina

Reference: Architectural and Mechanical Energy Upgrades at
Pine Street School – Phase 3
Spartanburg School District Seven
Spartanburg, South Carolina

ADDENDA

The following addenda have been received by this contractor:

Addendum #1 _____	Dated: _____
Addendum #2 _____	Dated: _____
Addendum #3 _____	Dated: _____
Addendum #4 _____	Dated: _____
Addendum #5 _____	Dated: _____
Addendum #6 _____	Dated: _____
Addendum #7 _____	Dated: _____
Addendum #8 _____	Dated: _____

The undersigned, having familiarized themselves with the local conditions affecting the cost of the work, and with the drawings and specifications, including all addenda prepared by McMillan Pazdan Smith hereby propose to furnish all labor, material, equipment and services necessary for Phase 3 of the Architectural and Mechanical Energy Upgrades at Pine Street School for Spartanburg School District Seven, in Spartanburg, South Carolina in accordance with the above documents for the lump sum of:

BASE BID: _____
_____ Dollars (\$_____.)

Alternate No. 1: IEC Fan Coils _____
_____ Dollars (Deduct \$_____)

Alternate No. 2: Polypropylene Piping _____
_____ Dollars (Add/Deduct \$_____)

SUBCONTRACTORS

Listed below are the names of the subcontractors this contractor will employ on this project to install the applicable portion of the work.

Electrical: _____

Mechanical: _____

In submitting this bid, it is understood that:

The Owner reserves the right to reject any or all bids, and/or award the contract in accordance with their best interest.

This bid proposal may not be withdrawn for a period of thirty (30) days from the date of bid opening.

The bidder agrees to the conditions set forth in the paragraph titled "Time of Completion and Liquidated Damages" in the Supplementary General Conditions of the specifications.

Security, in the sum of 5% of the base bid, is submitted in accordance with the Supplementary Instructions to Bidders.

General Contractor: _____

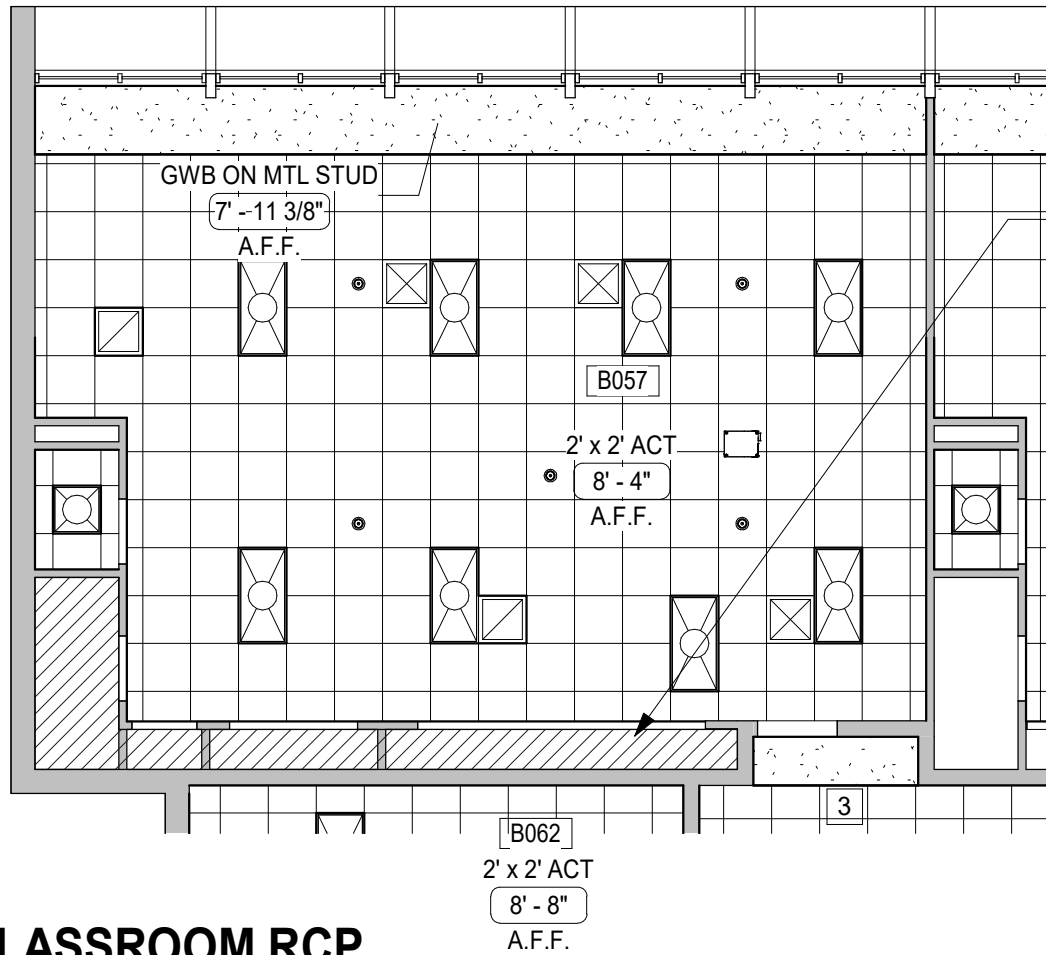
By: _____

Address: _____

Phone Number: _____

Fax Number: _____

Contractor's License Number: _____



NOTE:
 TYPICAL AT ALL 1ST GRADE CLASSROOMS STORAGE AREAS G.C. SHALL REMOVE THE EXISTING CEILING AS REQUIRED TO INSTALL MECHANICAL DUCT PER THE MECHANICAL DWG'S. INSTALL NEW ACOUSTICAL CEILING TILE AND GRID AFTER INSTALLATION OF DUCTWORK.

1
 AD-4.1

TYP. CLASSROOM RCP

1/8" = 1'-0"

B062
 2' x 2' ACT
 8' - 8"
 A.F.F.



mcmillan | pazdan | smith
 architecture
 asheville atlanta charleston greenville spartanburg
 po box 5331 spartanburg, sc 29304 o:864 585 5678 f:864 542 9451
 www.mcmillanpazdansmith.com

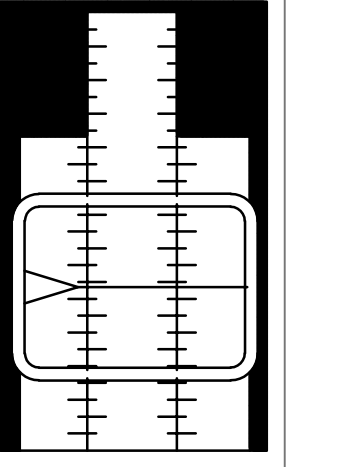
**ARCHITECTURAL AND MECHANICAL UPGRADES TO
 PINE STREET SCHOOL PHASE 3**

PROJ. NO.	014141
DATE:	12/03/19
REV NO:	
REV DESCRIPTION: MODIFIES	A1/A3.11
DTL/SHT:	
SKETCH NO.	AD-4.1

SHEET NOTES

1) SEE GENERAL NOTES ON SHEET HVAC-1

**CROW & BULMAN
ENGINEERING, INC.**
800 EAST MAIN STREET, SPARTANBURG, SC 29302
PHONE: 864-585-9903, WWW.CBENGR.COM



SPARTANBURG SCHOOL DISTRICT SEVEN
PHASE THREE ARCHITECTURAL AND
MECHANICAL UPGRADES
TO PINE STREET SCHOOL

500 S. Pine St., Spartanburg, SC 29302

SHEET ISSUE:

NO.	DATE	DESCRIPTION	BY
1	11/27/19	ADDENDUM #3	WHC
2	12/5/19	ADDENDUM #4	WHC

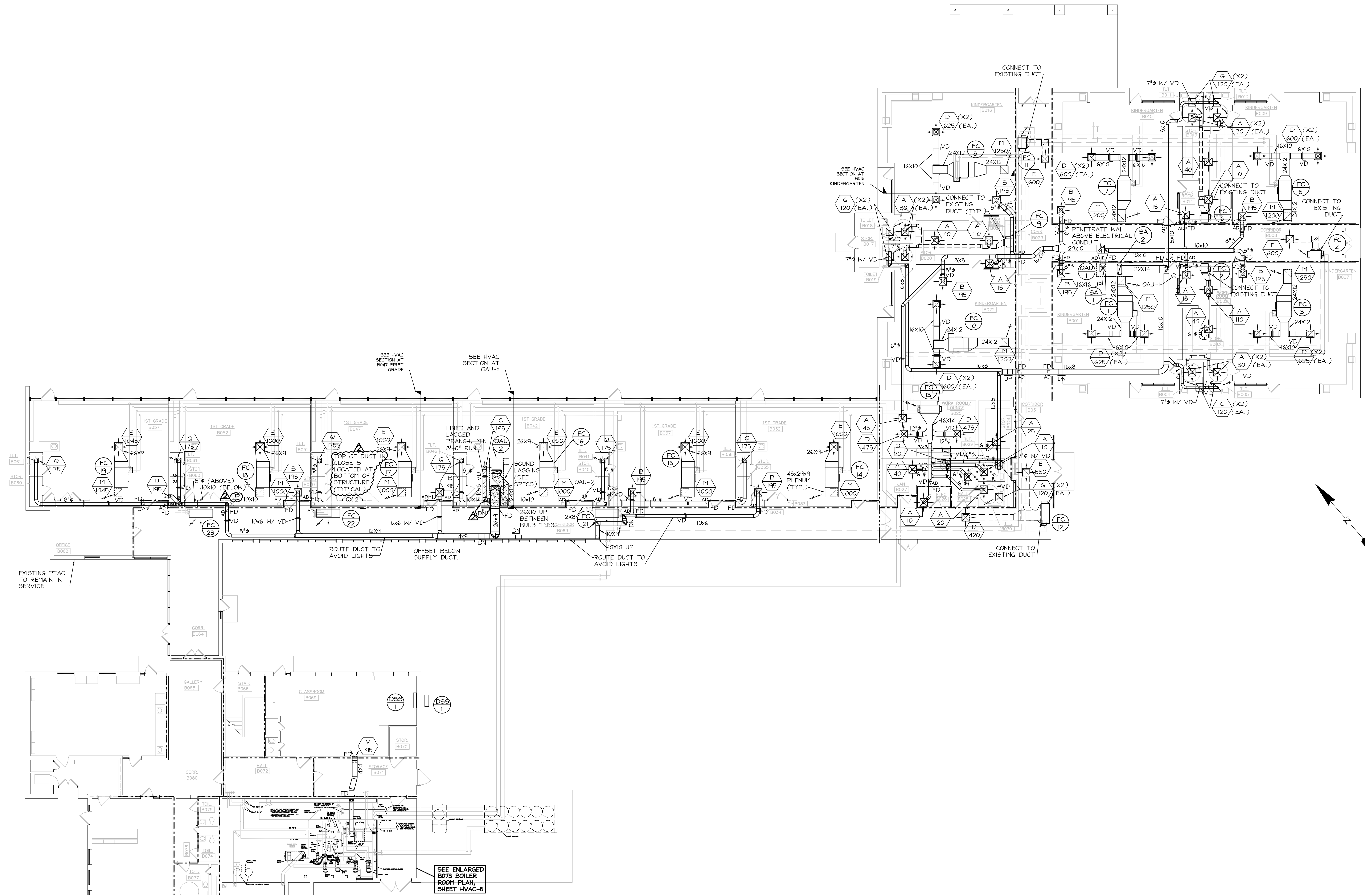
CONSTRUCTION DRAWINGS 11/04/2019

PRINCIPAL IN CHARGE: WHC
PROJECT ENGINEER: WHC
DRAWN BY: WHC

SHEET TITLE:
HVAC PLAN - GROUND
FLOOR

SHEET NO. 1345.5
CBE PROJ. NO. 1345.5

HVAC-2

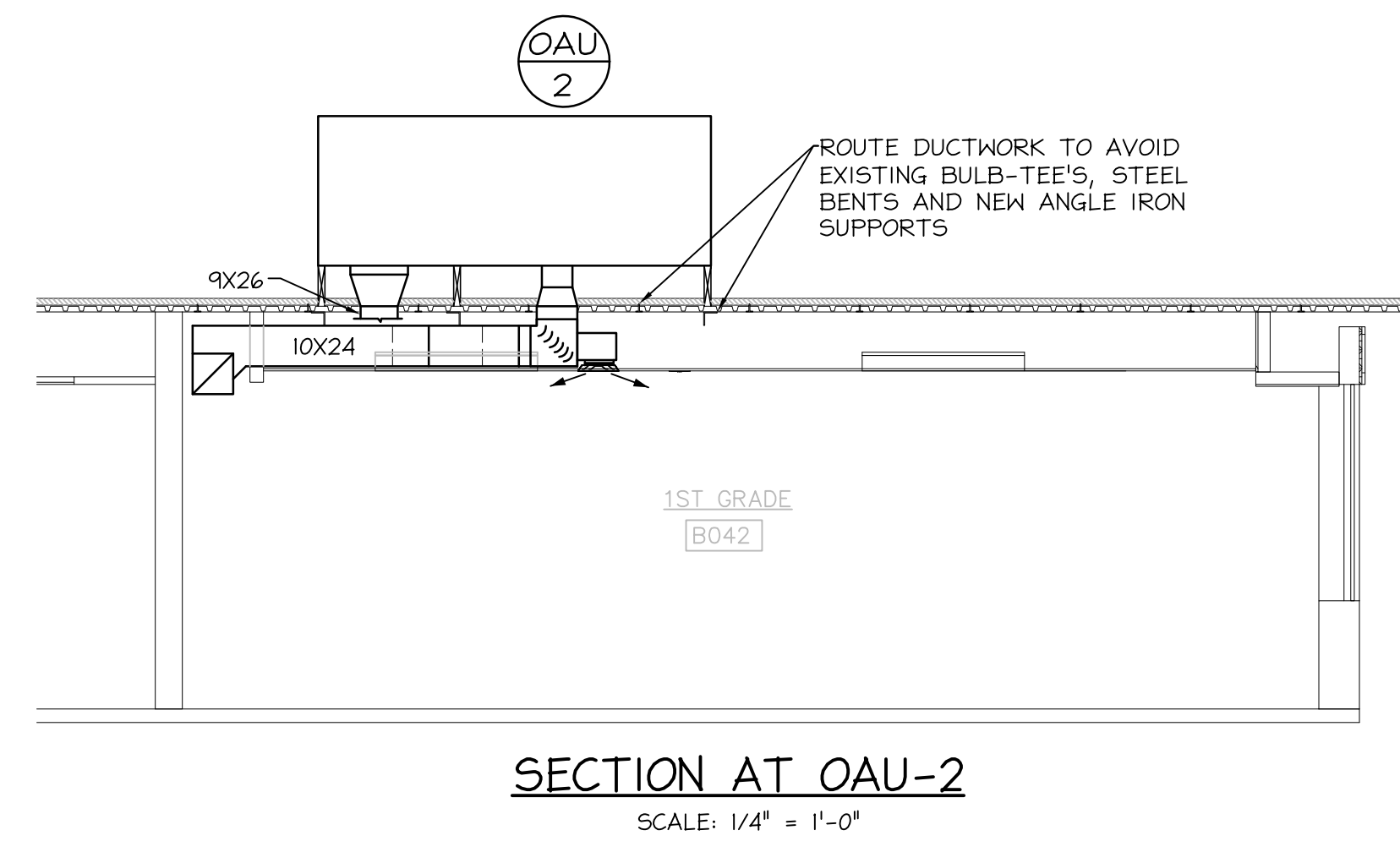


GROUND FLOOR HVAC PLAN
SCALE: 3/32" = 1'-0"

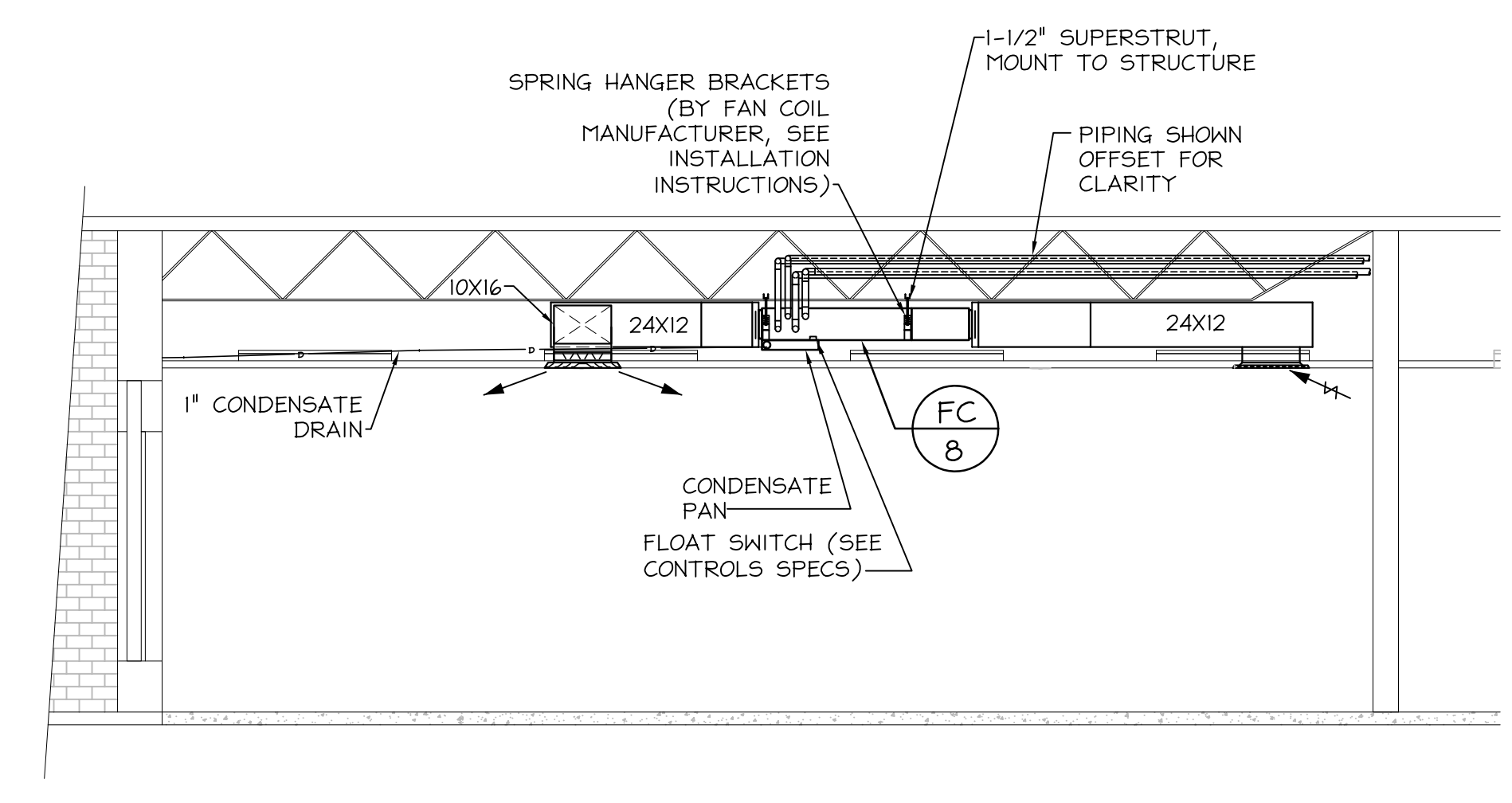
SEE ENLARGED
B073 BOILER
ROOM PLAN,
SHEET HVAC-5

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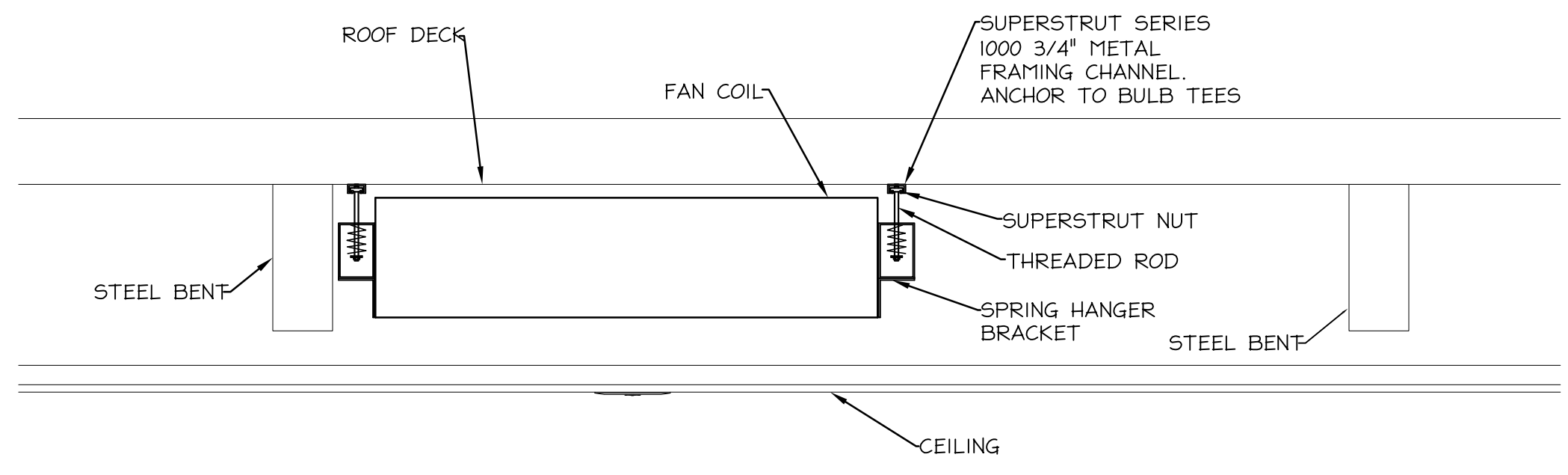
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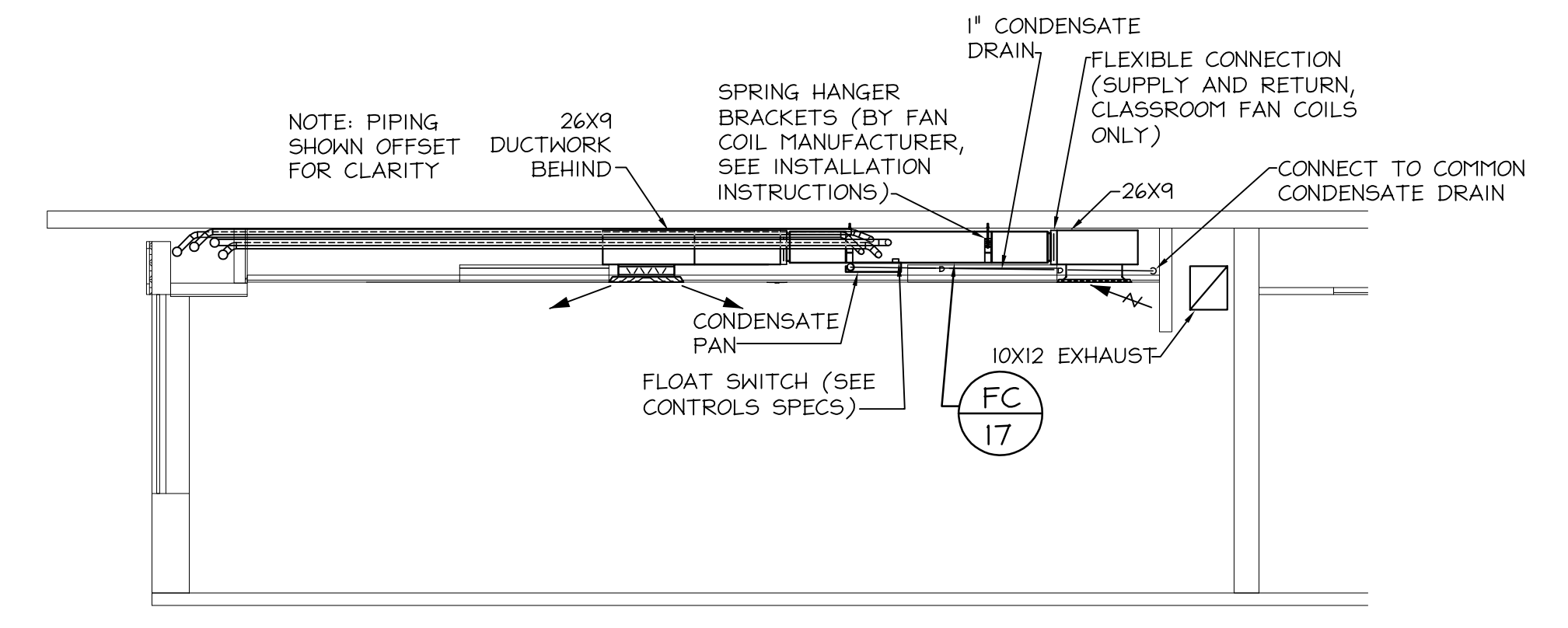
SECTION AT OAU-2
SCALE: 1/4" = 1'-0"



SECTION AT B016 KINDERGARTEN
SCALE: 1/4" = 1'-0"
(SIMILAR FOR KINDERGARTEN WING)



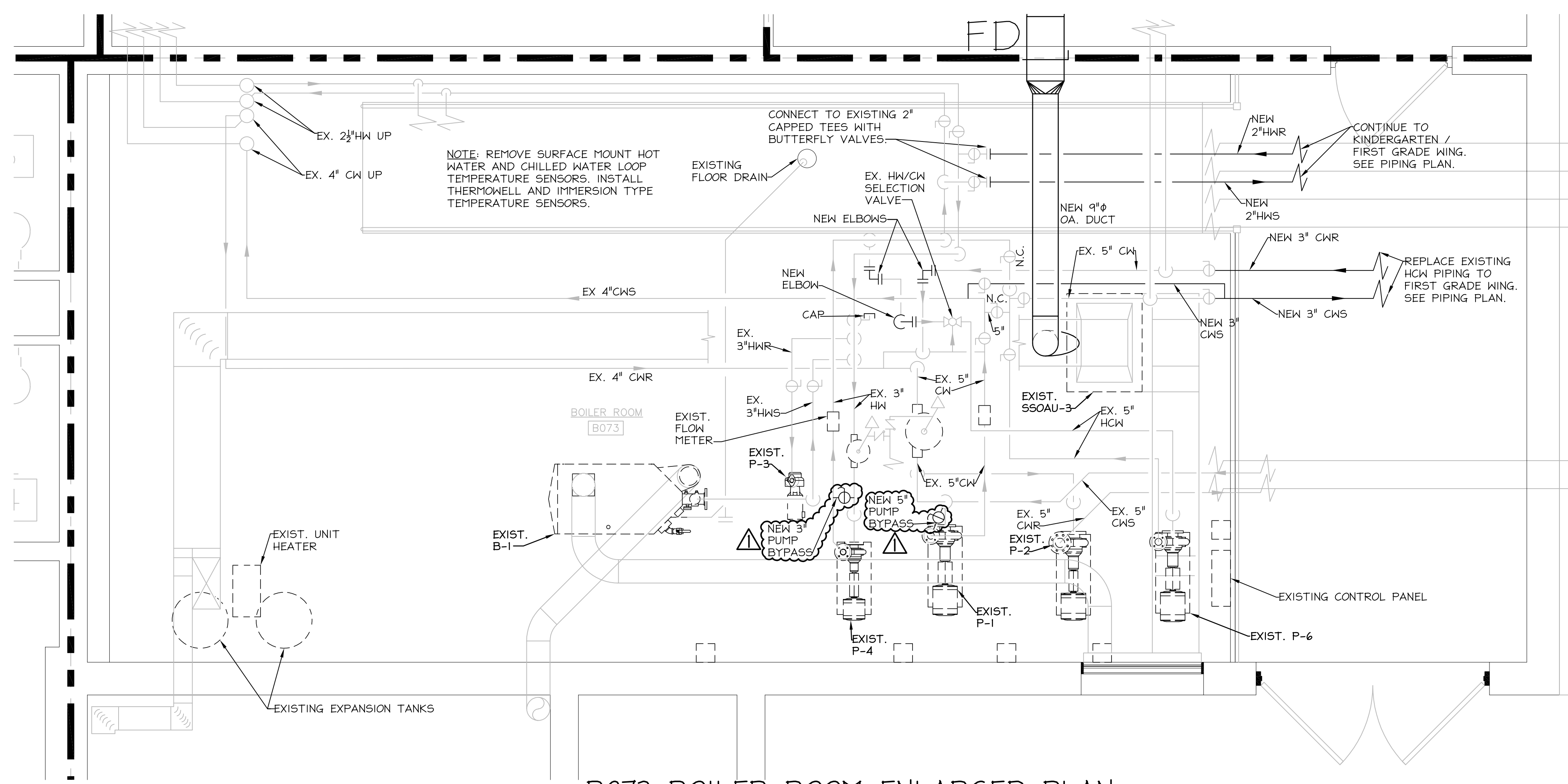
SECTION THROUGH FAN COIL AT FIRST GRADE WING
SCALE: 1" = 1'-0"



SECTION AT B047 FIRST GRADE
SCALE: 1/4" = 1'-0"
(SIMILAR FOR FIRST GRADE WING)

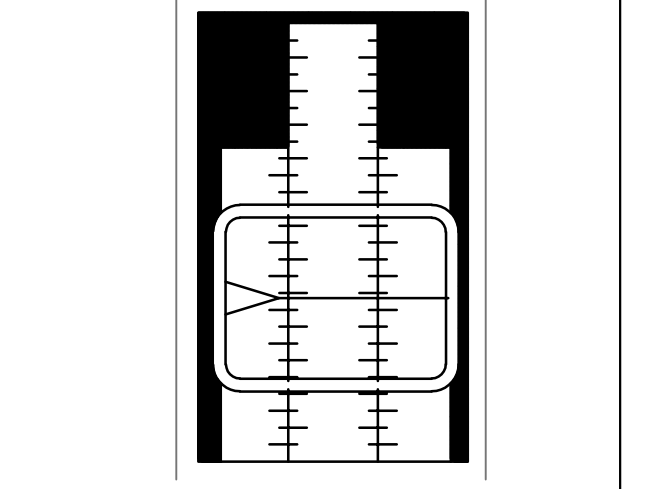
SHEET NOTES

- 1) SEE GENERAL NOTES ON SHEET HVAC-1
- 2) MINIMUM OVERHEAD PIPE/DUCT CLEARANCE SHALL BE 7'-0"
- 3) PROVIDE ALL NECESSARY PIPE NIPPLES FOR CONNECTIONS TO ACCOMMODATE THE CHEMICAL TREATMENT HARDWARE.
- 4) THERMOMETERS: ROTATE AND TILT THERMOMETERS IN PIPING TO WHERE THE THERMOMETER FACE IS READABLE FROM FLOOR LEVEL.
- 5) EXISTING PUMPS REMAINING IN SERVICE: REPLACE EXISTING STRAINER WITH FINE MESH STRAINER DURING CONSTRUCTION. REPLACE ORIGINAL STRAINER AT THE END OF CONSTRUCTION.
- 6) PROTECT ALL PENETRATIONS OF FIRE RATED CEILINGS. SEE SPECS.
- 7) AT CONTRACTOR'S OPTION, ALTERNATE LOCATION FOR BTU FLOW METERS MAY BE IN SUPPLY RISERS AT PUMPS, PROVIDED MINIMUM REQUIRED DISTANCES TO FITTINGS IS MET (SEE MANUFACTURER'S INSTALLATION INSTRUCTIONS)
- 8) AT CONTRACTOR'S OPTION, STAND MAY BE SUBSTITUTED FOR PIPE OR DUCT HANGER, PROVIDED EQUIPMENT ACCESS IS MAINTAINED IN MECHANICAL ROOM. SEE DETAIL FOR PIPE STAND.



B073 BOILER ROOM ENLARGED PLAN
SCALE: 3/8" = 1'-0"

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SPARTANBURG SCHOOL DISTRICT SEVEN
 PHASE THREE ARCHITECTURAL AND MECHANICAL UPGRADES TO PINE STREET SCHOOL
 500 S. Pine St., Spartanburg, SC 29302

SHEET ISSUE:			
NO.	DATE	DESCRIPTION	BY
1	12/5/19	ADDENDUM #4	WHC

CONSTRUCTION DRAWINGS 11/04/2019
 PRINCIPAL IN CHARGE: WHC
 PROJECT ENGINEER: WHC
 DRAWN BY: WHC

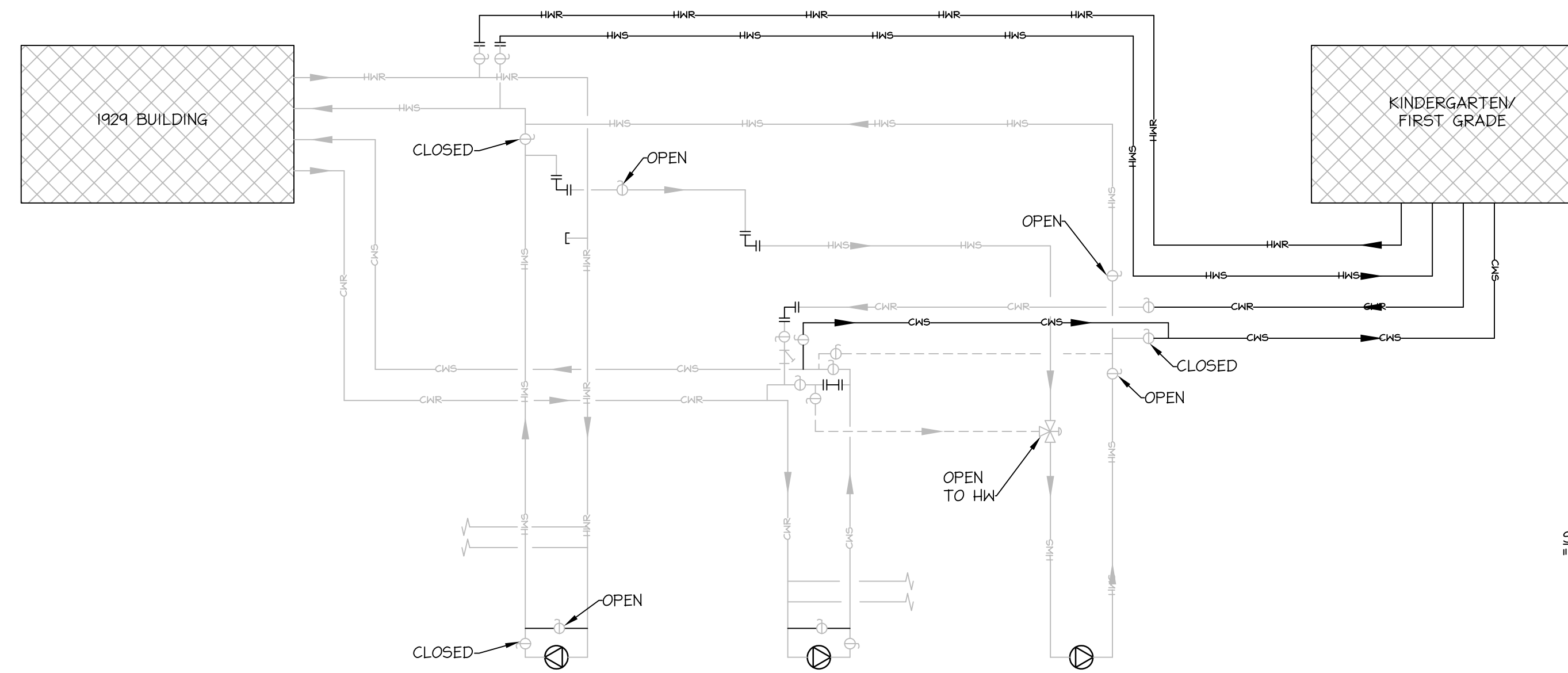
SHEET TITLE:
ENLARGED MECHANICAL ROOM PLAN AND SECTIONS

SHEET NO. 1345.5
 CBE PROJ. NO. 1345.5

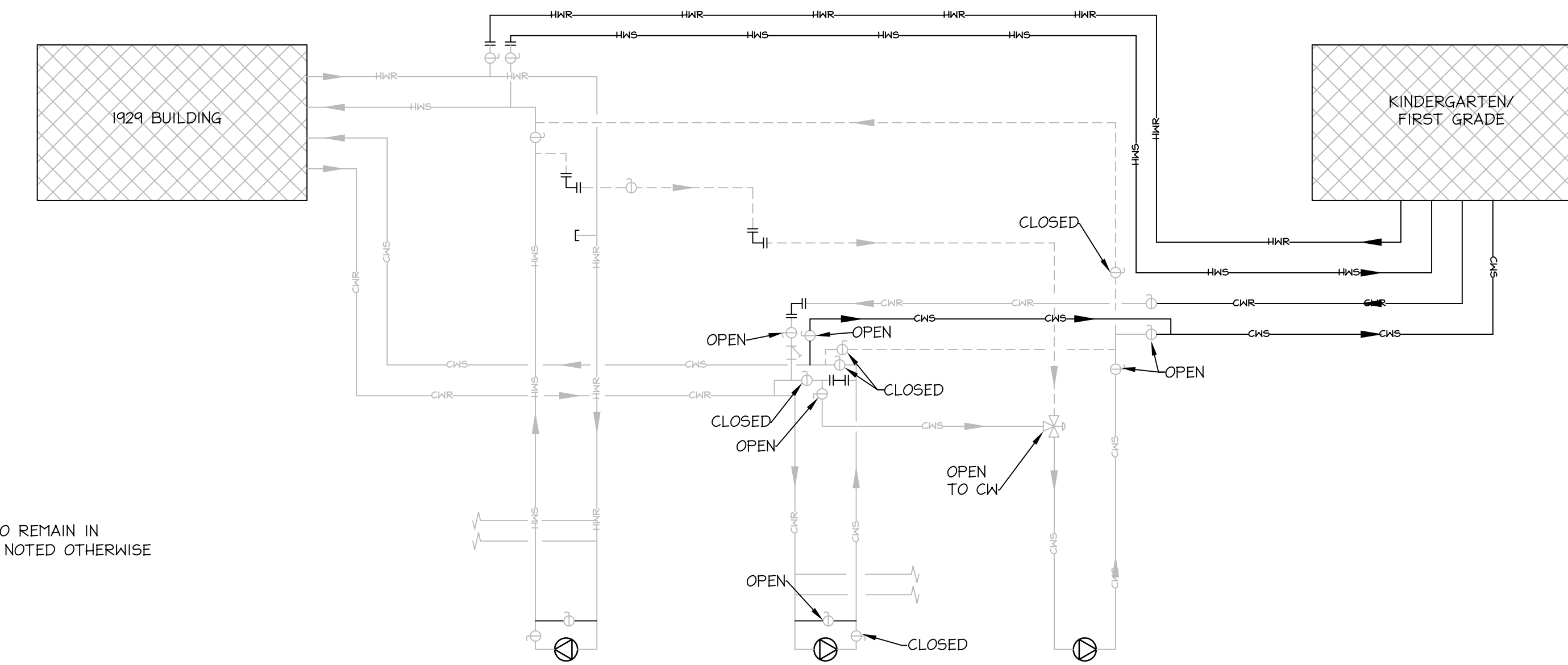
HVAC-5

SHEET NOTES

1) SEE GENERAL NOTES ON SHEET HVAC-1.

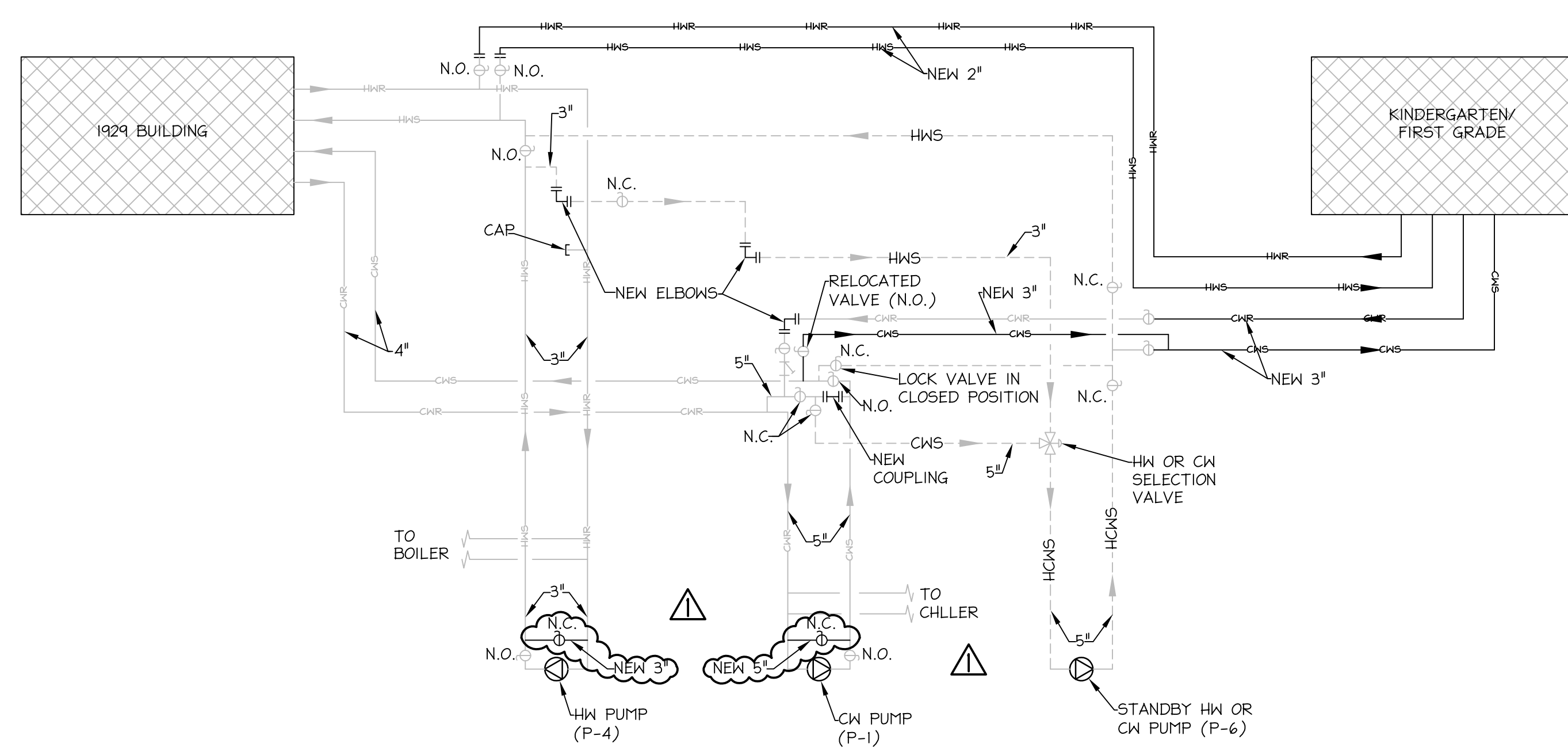


HW STANDBY
NO SCALE



CW STANDBY
NO SCALE

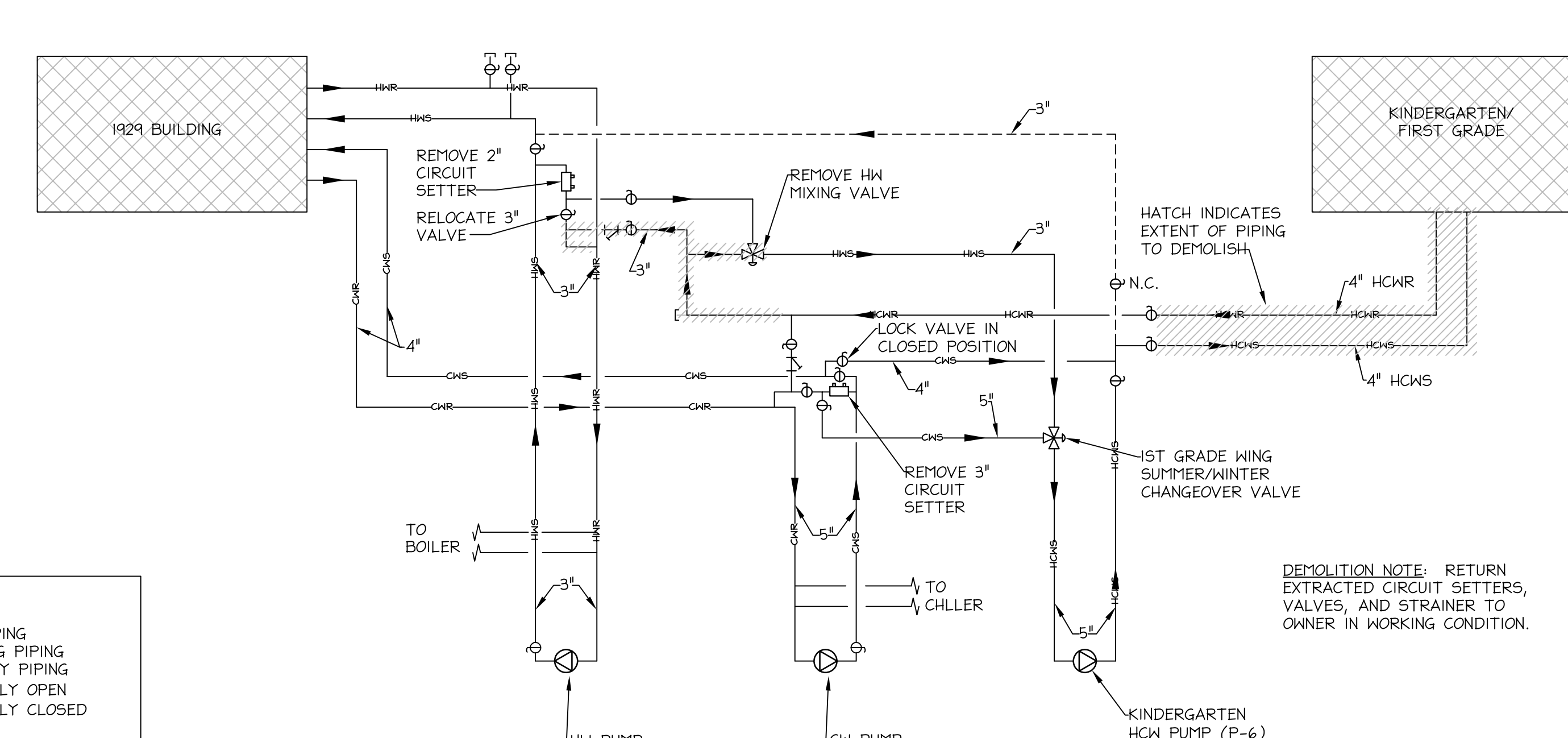
STANDBY NOTE: VALVES TO REMAIN IN "NORMAL" POSITION UNLESS NOTED OTHERWISE



NEW SCHEMATIC PIPING DIAGRAM
NORMAL OPERATION
NO SCALE

LEGEND

—	NEW PIPING
- - -	EXISTING PIPING
- - -	STANDBY PIPING
N.O.	NORMALLY OPEN
N.C.	NORMALLY CLOSED



EXISTING SCHEMATIC PIPING DIAGRAM
NO SCALE

DEMOLITION NOTE: RETURN EXTRACTED CIRCUIT SETTERS, VALVES, AND STRAINER TO OWNER IN WORKING CONDITION.

SPARTANBURG SCHOOL DISTRICT SEVEN
PHASE THREE ARCHITECTURAL AND MECHANICAL UPGRADES TO PINE STREET SCHOOL

500 S. Pine St., Spartanburg, SC 29302

SHEET ISSUE:

NO.	DATE	DESCRIPTION	BY
1	12/5/19	ADDENDUM #4	WHC

CONSTRUCTION DRAWINGS 11/04/2019

PRINCIPAL IN CHARGE: WHC
PROJECT ENGINEER: WHC
DRAWN BY: WHC

SHEET TITLE:
1929 PLANT SCHEMATIC DIAGRAMS

SHEET NO. CBE PROJ. NO. 1345.5

HVAC-6



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SHEET NOTES
 1) SEE GENERAL NOTES ON SHEET HVAC-1

FAN COIL SCHEDULE

TAG	AREA SERVED	MANUFACTURER AND MODEL	CABINET STYLE	FAN DATA						COOLING COIL DATA @ 45°F EWT						REHEAT COIL DATA @ 140°F EWT						OCTAVE BAND SOUND POWER RATINGS ^⑤ (DB RE: 10 WATTS) ^⑥										ION GENERATOR	REMARKS	TAG														
				CFM	ESP (IN. H2O)	VOLTAGE	MOTOR HP	MOTOR POWER W	MOTOR SPEED RPM	MOTOR TYPE	MOTOR SPEED	COIL ROWS/FPI	EPB °F	ENB °F	SENSIBLE CAPACITY MBH	TOTAL CAPACITY MBH	WATER DELTA T °F	WATER PD (FT. H2O)	FLOW RATE GPM	P.I.C. VALVE MAX. ΔP	EAT °F	LAT °F	COIL ROWS/FPI	WATER DELTA T °F	HEATING CAPACITY MBH	WATER PD (FT. H2O)	FLOW RATE GPM	P.I.C. VALVE MAX. ΔP	DISCHARGE						RADIATED													
FC-1	B001 KIND	PRICE FCHG 60	HORIZONTAL CONCEALED	1250	0.35	277/60/1	2 x 1/2	--	--	ECH1	--	6 / --	74	62	26.0	34.2	11.4	6.27	5.98	6 PSI	72	92.7	2	37.4	28.0	0.22	1.51	6 PSI	--	74	70	68	69	66	64	--	73	65	61	61	57	55	--			GPS FC	① ② ③ ④	FC-1

- REMARKS:** ① FIBERGLASS INLET SILENCER
 ② AUXILIARY DRAIN PAN FOR PIPING PACKAGE
 ③ FOIL FACED FIBERBOARD LINER
 ④ VARIABLE SPEED FAN CONTROLS (SEE SPECIFICATIONS FOR SEQUENCE)
 ⑤ MANUAL FAN SPEED ADJUSTMENT

- ⑥ FIBERGLASS DISCHARGE SILENCER
 ⑦ PROVIDE UNITS WITH 3-WAY CONTROL VALVES IN LIEU OF 2-WAY VALVES
 ⑧ NOT USED
 ⑨ CONDENSATE PUMP (SEE SPECS)

- NOTES:** • PRICE SOUND POWER RATINGS DETERMINED ACCORDING TO AHRI 880
 • TRANE SOUND POWER RATINGS DETERMINED ACCORDING TO AHRI 350
 • SUBSTITUTE MANUFACTURER MUST RATE SOUND ACCORDING TO SPECIFIED RATING SYSTEM
 • MAXIMUM PRESSURE DROP OF PRESS. INDEPENDENT VALVE SHALL BE 6 PSI.
 • RATING INCLUDES EFFECT OF SILENCER, WHERE APPLICABLE.

- HORIZONTAL CABINET UNITS: PROVIDE WITH BOTTOM STAMPED LOUVERED INLET / DOUBLE DEFLECTION OUTLET.
 HORIZONTAL RECESSED UNITS: PROVIDE WITH BOTTOM STAMPED, TELESCOPING, LOUVERED INLET



SPARTANBURG SCHOOL DISTRICT SEVEN
PHASE THREE ARCHITECTURAL AND MECHANICAL UPGRADES TO PINE STREET SCHOOL

500 S. Pine St., Spartanburg, SC 29302

EXISTING PUMP SCHEDULE

TAG	SERVICE	EXISTING		NEW		TYPE	MOTOR HP	ELECT.	RPM	MFR. & MODEL	TRIPLE DUTY VALVE	
		GPM	FT. HD.	GPM	FT. HD.						SIZE	Q
P-6	HV OR CH. STANDBY	81	81	309	81	CENTRIFUGAL BASE MOUNTED	10	208/3	1750	B + G #1510-3BD	4"	365

- REMARKS / ACCESSORIES:**
 -- ALL EQUIPMENT IS EXISTING. INFORMATION SHOWN FOR REFERENCE ONLY.
 T4B CONTRACTOR TO SET PUMP SPEED BASED ON NEW OPERATING CONDITION.

AIR DEVICE SCHEDULE

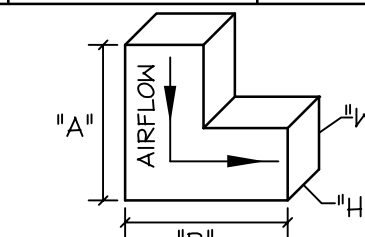
TAG	NECK SIZE	NOMINAL FACE SIZE	SERVICE	MOUNTING	MFR. & MODEL NO.	REMARKS
A	6 x 6	24 x 24	SUPPLY	LAY-IN, T-BAR	CARNES SKTA	
B	9 x 9	24 x 24	SUPPLY	LAY-IN, T-BAR	CARNES SKTA	
C	9 x 9	18 x 18	SUPPLY	CEILING, SURFACE	CARNES SKSA	
D	15 x 15	24 x 24	SUPPLY	LAY-IN, T-BAR	CARNES SKTA	
E	18 x 18	24 x 24	SUPPLY	LAY-IN, T-BAR	CARNES SKTA	
F						NOT USED
G	10 x 10	24 x 24	RETURN	LAY IN, T-BAR	CARNES SPJB	
H	12 x 12	24 x 24	RETURN	LAY IN, T-BAR	CARNES SPJB	
J						NOT USED
K						NOT USED
L	18 x 18	24 x 24	RETURN	LAY IN, T-BAR	CARNES SPJB	
M	20 x 20	24 x 24	RETURN	LAY IN, T-BAR	CARNES RSFA	①
N						NOT USED
P						NOT USED
Q	10 X 10	12 X 12	RETURN	CEILING, SURFACE	CARNES RSFA	
R						NOT USED
S						NOT USED
T						NOT USED
U	9 x 8	11 X 10	SUPPLY	HIGH SIDEMALL	CARNES RTDAV	
V	9 x 8	17 X 6	SUPPLY	HIGH SIDEMALL	CARNES RTDAV	

- NOTES:**
 1) BLOW TYPE SHALL BE 4-WAY UNLESS INDICATED OTHERWISE ON THE FLOOR PLANS
 2) COORDINATE EXACT LOCATIONS WITH REFLECTED CEILING PLANS
 3) PROVIDE SQUARE TO ROUND TRANSITION AS REQUIRED
 4) ADJUST HORIZONTAL BLADES FOR 15 DEGREES UPWARDS, ALL SIDEMALL SUPPLY REGISTERS.
 ① PERFORATED RETURN FILTER GRILLE WITH 20"x20"x2" FILTER, PIANO HINGE, QUARTER TURN FASTENER

SOUND ATTENUATOR SCHEDULE

TAG	UNIT SERVED	CFM	VELOCITY (FPM)	SIZE (IN.Ø)	LENGTH	AIRFLOW DIRECTION	ΔP IN P.I.C.	ΔP WITH SYSTEM EFFECT. IN P.I.C.	DYNAMIC INSERTION LOSS (db 10 ⁻¹² WATTS) @ -2000 FPM							CONFIGURATION	MFR. & MODEL	
									63Hz	125Hz	250Hz	500Hz	1K Hz	2K Hz	4K Hz	8K Hz		
SA-1	OAU-1	1260	709	16"x16"	A-37", B-24"	FORWARD	0.08	0.15	8	13	22	30	39	38	32	27	ELBOW	PRICE ERM46/2D
SA-2	OAU-1	1050	491	14"x22"	A-18", B-31-2"	REVERSE	0.06	0.08	8	15	24	32	42	39	31	26	ELBOW	PRICE ERM34/2E
SA-3																		NOT USED
SA-4																		NOT USED

- NOTES:**
 • CONTRACTOR TO VERIFY DIMENSIONAL FIT
 • SOUND ATTENUATORS DESIGNED FOR NC-35 CRITERIA
 • INSERTION LOSSES DERIVED FROM TEST VALUES IN ACCORDANCE WITH ASTM E477-13



DUCTLESS SPLIT SYSTEM SCHEDULE

TAG	TYPE	AIR HANDLING UNIT					COOLING CAPACITY			HEATING CAPACITY			CONDENSING UNIT				REFRIG. LINES		REMARKS
		CFM	VOLTAGE	MFR. & MODEL	MOUNTING	EAT ΔT (°F)	AMBIENT SH	TG	MBH	HSPF	SEAS PER YEAR	VOLT	M.C.A. CIR. PROTECT	MFR. & MODEL	LIQ.	GAS			
PSS-1	HEAT PUMP	450	208/1	LG LSN303HLV	WALL	80/67	45	--	30	32	10	208/1	14	30	LSU303HLV	3/8	5/8	①	

- ① FURNISH WITH WIRED, WALL MOUNTED THERMOSTAT

ROOF TOP OUTSIDE AIR HEAT PUMP SCHEDULE

TAG	SERVICE	EVAPORATOR FAN					ERV SUPPLY SIDE						ERV EXHAUST SIDE						COOLING CAPACITY						HEATING CAPACITY						ELECTRICAL		FILTER DATA		REMARKS							
		CFM	ESP (IN. H2O)	ISF	FAN HP	DRIVE	CFM	MHEP PRESS. DROP	SUPPLIER FAT (DRAFT)	SUPPLIER FAT (DRAFT)	WINTER FAT (DRAFT)	WINTER FAT (DRAFT)	CFM	EXT. ST. PRESS.	ISF	FAN HP	DRIVE	SUPPLIER FAT (DRAFT)	SUPPLIER FAT (DRAFT)	WINTER FAT (DRAFT)	WINTER FAT (DRAFT)	EAT ΔT (°F)	AMBIENT	NET SENS.	NET TOTAL	LAT (COIL) ΔT (°F)	LAT (UNIT) ΔT (°F)	SEAS PER YEAR	VOLT	M.C.A. CIR. PROTECT	MFR. & MODEL	CLEAN AFD	DIRTY AFD									
OAU-1	KINDERGARTEN	1260	1260	0.6	2.7	VFD	1050	1.38	94.0/74.0	84.2/68.9	19.0/18.0	43.7/40.9	1050	0.6	1.7	1	VFD	74.0/62.0	84.9/68.5	72.0/62.0	43.5/43.3	85.2/69.6	94	37.6	57.2	53.5/53.3	55.9/54.3	13.1	43.9	43.4	43.9	140	113.4	22	70.0/59.6/55%	460/3	17	20	AAON RQ-005	0.08	0.35	② ③ ④ ⑤ ⑥ ⑦ ⑧
OAU-2	FIRST GRADE	1185	1185	0.6	2.6	VFD	1050	1.38	94.0/74.0	83.6/68.6	19.0/18.0	43.3/42.1	1050	0.6	1.7	1	VFD	74.0/62.0	84.9/68.5	72.0/62.0	43.4/43.3	84.7/69.4	94	36.3	56.2	52.4/52.2	54.8/53.2	13.2	43.5	43.5	43.9	140	113.4	22	70.0/59.1/53%	460/3	17	20	AAON RQ-005	0.08	0.35	② ③ ④ ⑤ ⑥ ⑦ ⑧

- NOTES:** - EXT. STATIC PRESS. INCLUDES ALL LOSSES EXTERNAL TO THE CABINET. TOTAL STATIC PRESS. INCLUDES E.S.P., INTERNAL LOSSES, AND DIRTY FILTER.
 - FILTER HOUSING SHALL HAVE 4" FILTER CAPABILITY (SEE SPECIFICATIONS FOR SIZE/TYP OF FILTERS REQUIRED.)
 - SUPPLY / EXHAUST FANS SHALL BE PLENUM TYPE

- REMARKS:** ① NOT USED
 ② SINGLE POINT WIRING w/ FACTORY DISCONNECT AND THRU-BASE ELECTRICAL CONNECTIONS
 ③ MODULATING HOT GAS REHEAT
 ④ NON-POWERED GFI RECEPTAL (POWER BY ELEC.)
 ⑤ NOT USED
 ⑥ BYPASS DAMPER FOR RECIRCULATION OF INDOOR AIR.

- ⑦ NOT USED
 ⑧ NOT USED
 ⑨ VARIABLE CAPACITY COMPRESSORS
 ⑩ SPRING VIBRATION ISOLATED, WIND & SEISMIC RATED, ROOF CURB TO MATCH ROOF SLOPE

SHEET ISSUE:
 NO. DATE DESCRIPTION BY
 1 12/5/19 ADDENDUM #4 WHC

CONSTRUCTION DRAWINGS 11/04/2019

PROJECT ENGINEER: WHC
 PROJECT ENGINEER: WHC
 DRAWN BY: WHC

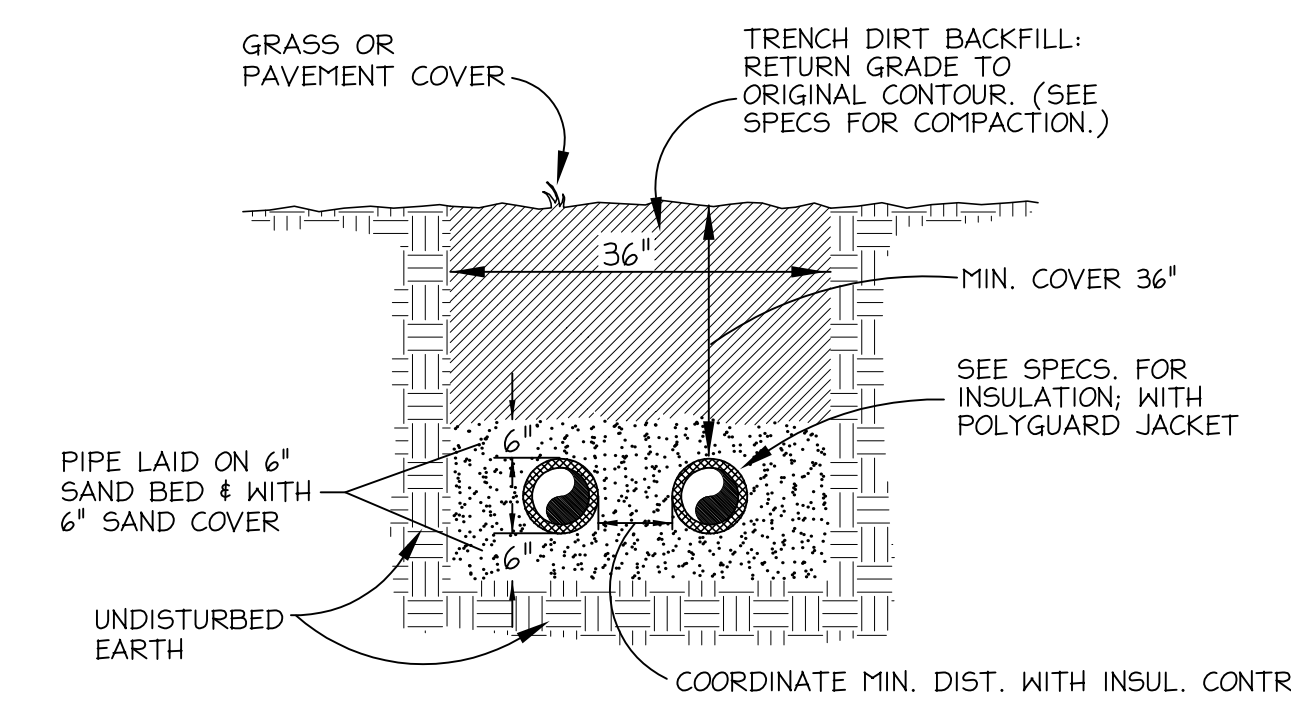
SHEET TITLE:
HVAC SCHEDULES

SHEET NO. 1345.5
 CBE PROJ. NO.

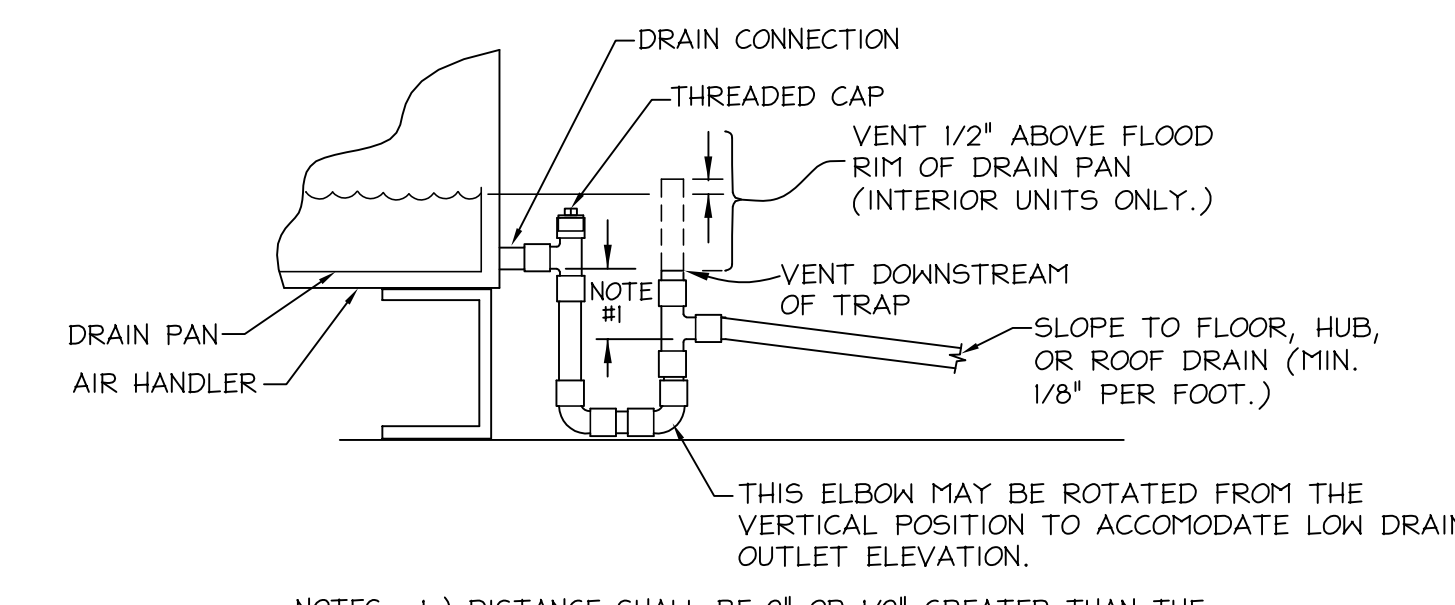
HVAC-7

SHEET NOTES

1) SEE GENERAL NOTES ON SHEET HVAC-1

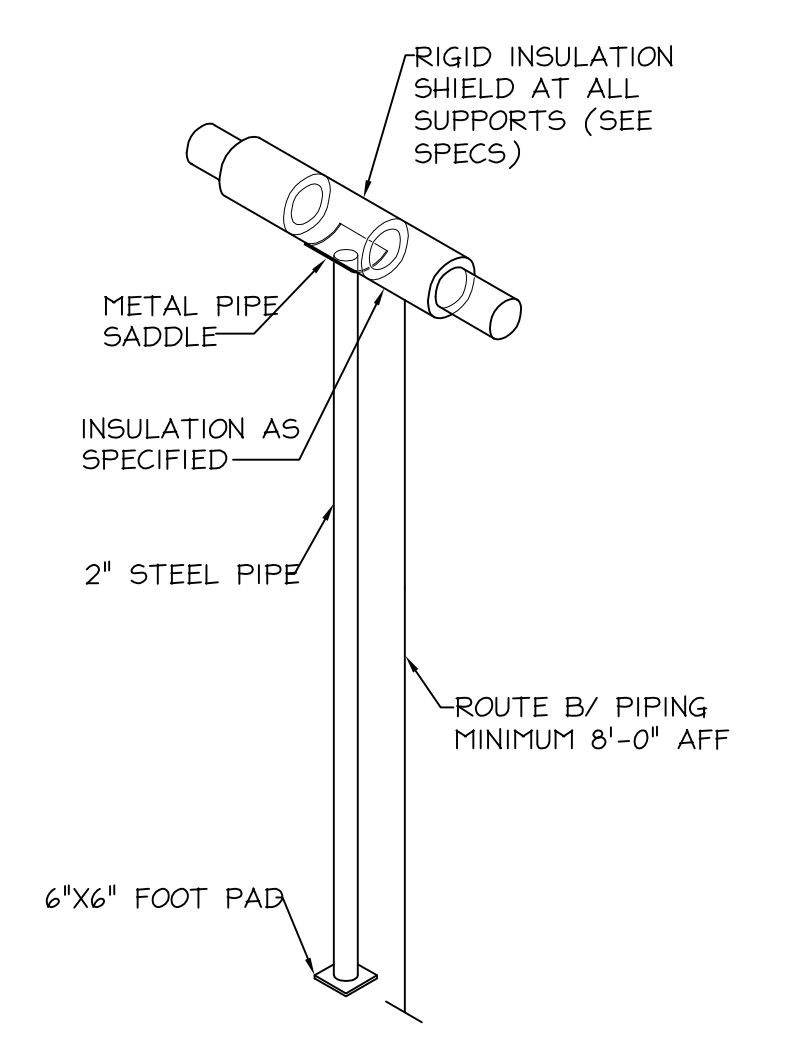


SECTION THRU PIPE TRENCH
NO SCALE

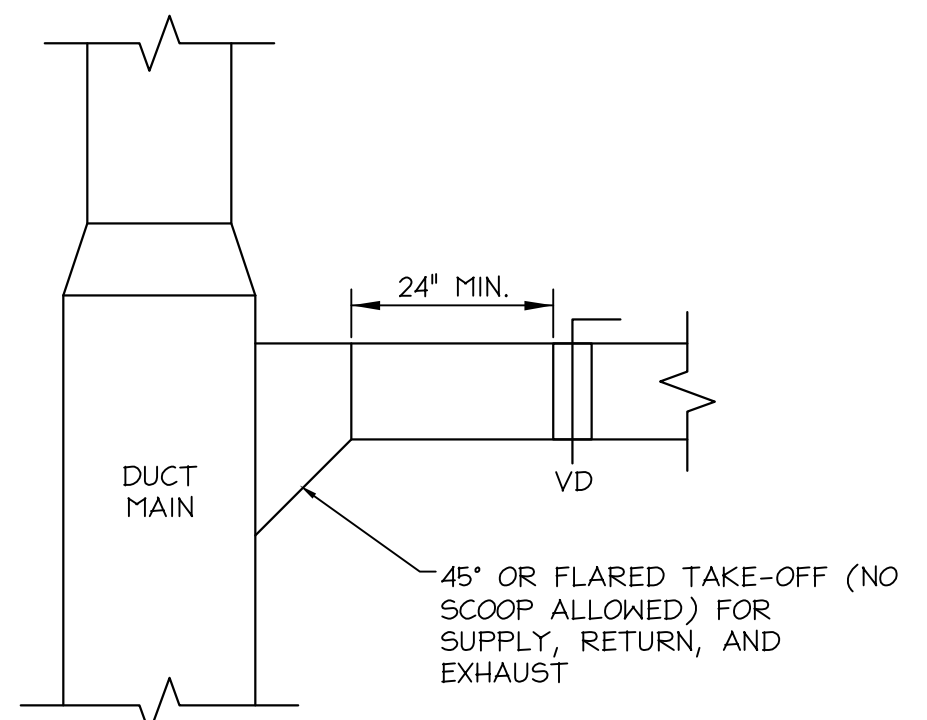


NOTES: 1.) DISTANCE SHALL BE 2" OR 1/2" GREATER THAN THE FAN SUCTION PRESSURE (WHICH EVER IS GREATER).
2.) DRAIN SHALL BE COPPER TUBING OF SIZE NOTED OR EQUAL TO AIR HANDLER DRAIN CONNECTION.
3.) TRAP/VENT NOT REQUIRED FOR PUMPED CONDENSATE.

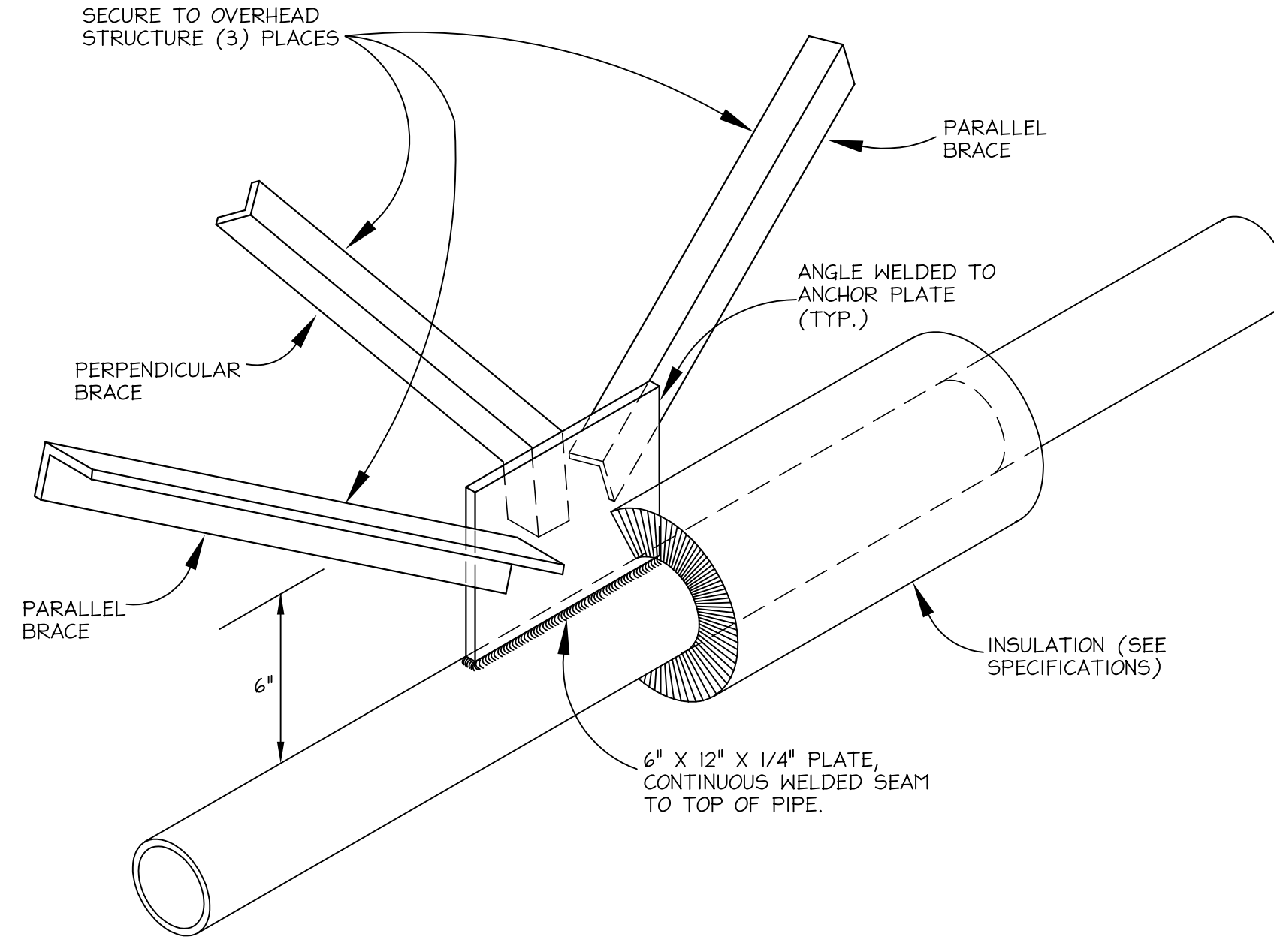
CONDENSATE DRAIN TRAP AND VENT DETAIL
NO SCALE



PIPE SUPPORT COLUMN DETAIL
NO SCALE

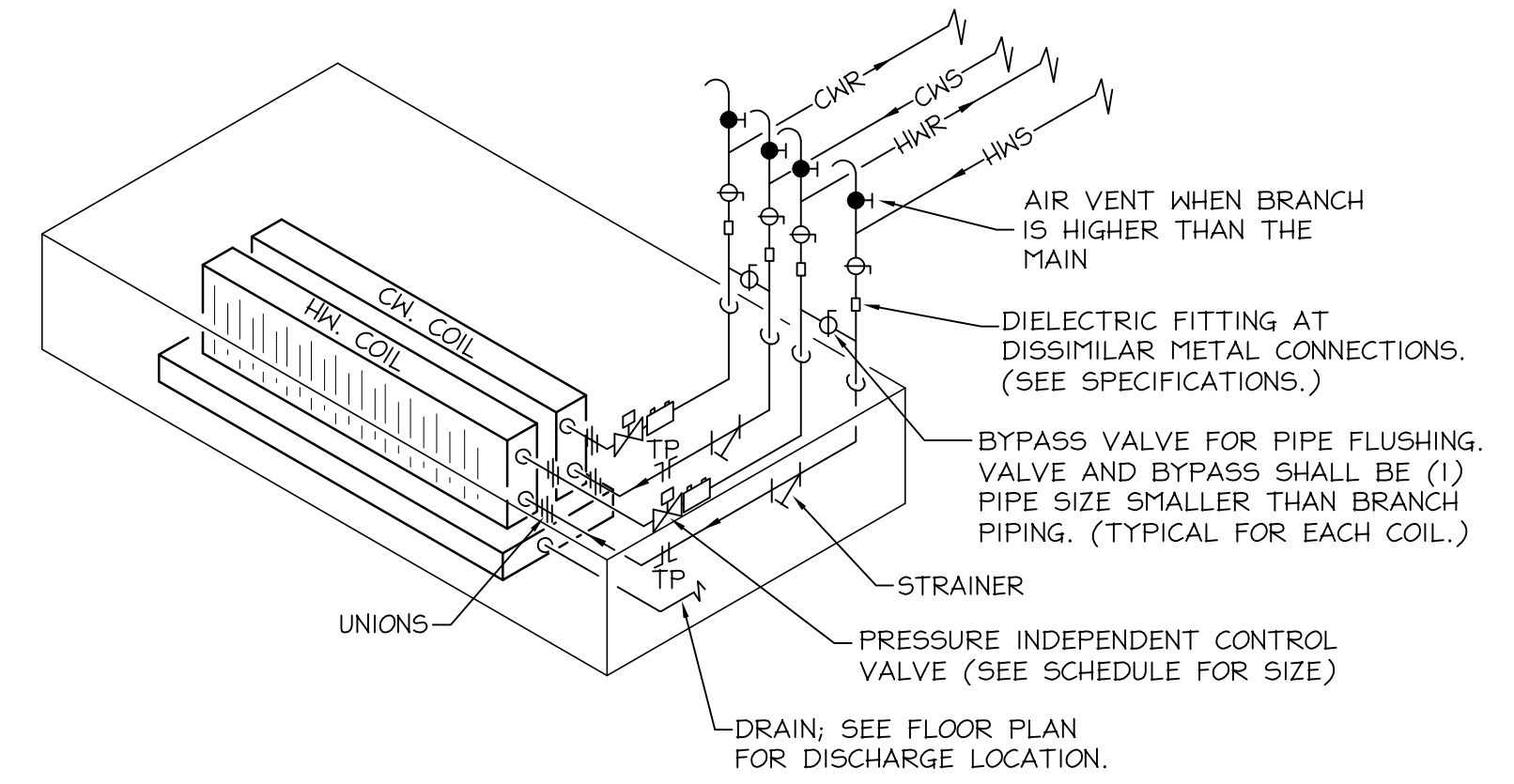


BRANCH DUCT TAKE-OFF DETAIL
NO SCALE

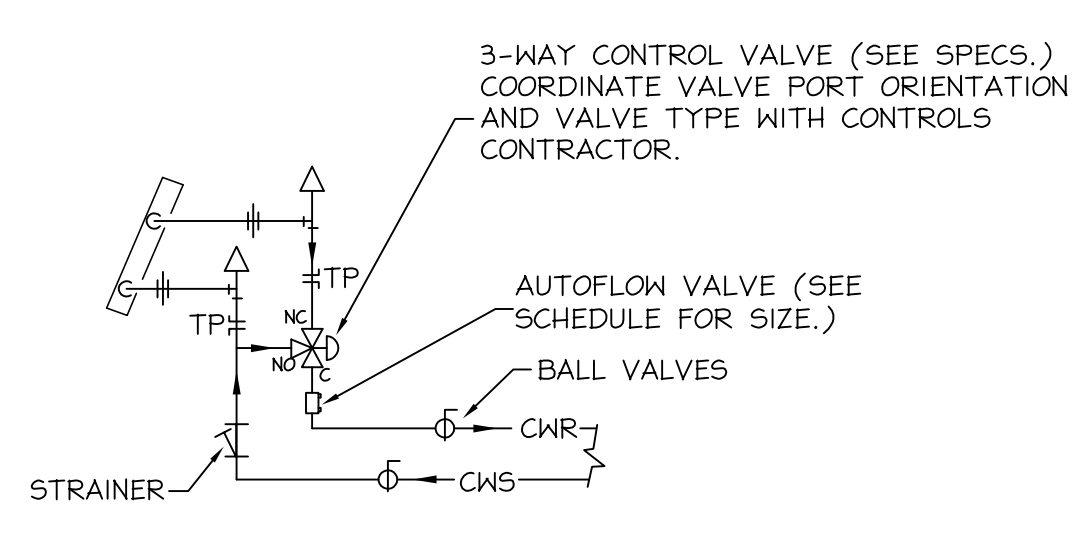


NOTE: INSULATE PLATE & ANGLES AS REQUIRED TO PREVENT SWEATING.

SUSPENDED PIPING ANCHOR DETAIL
NO SCALE

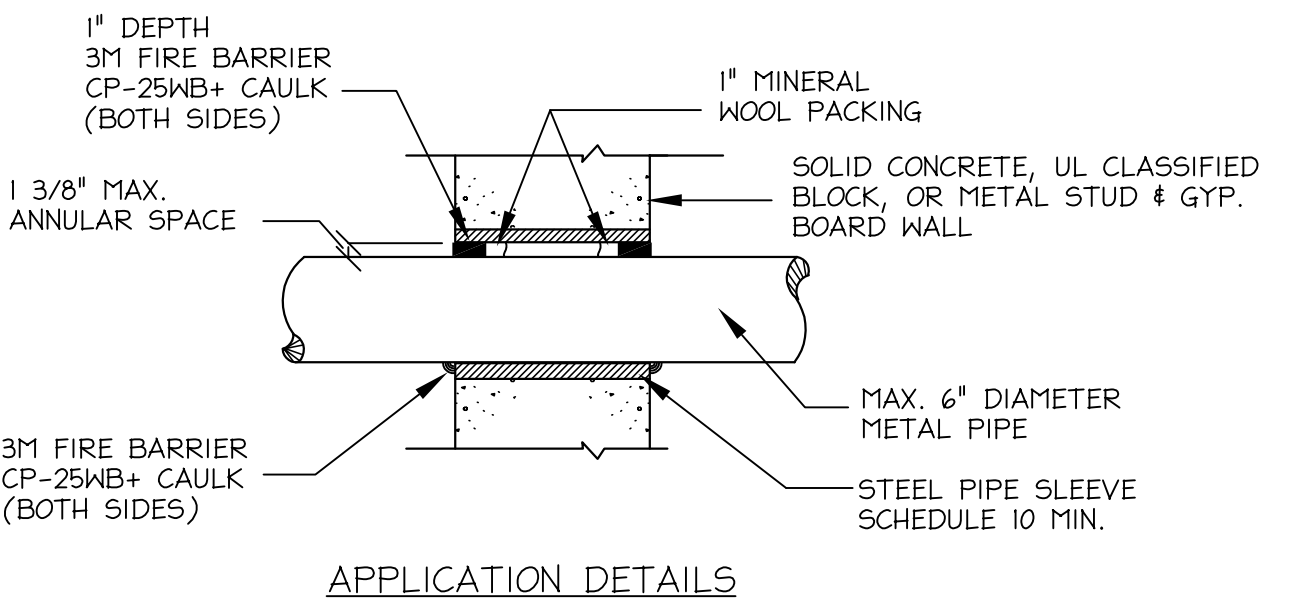


HORIZONTAL FAN COIL UNITS & UNIT VENTILATORS (REHEAT CONFIGURATION)



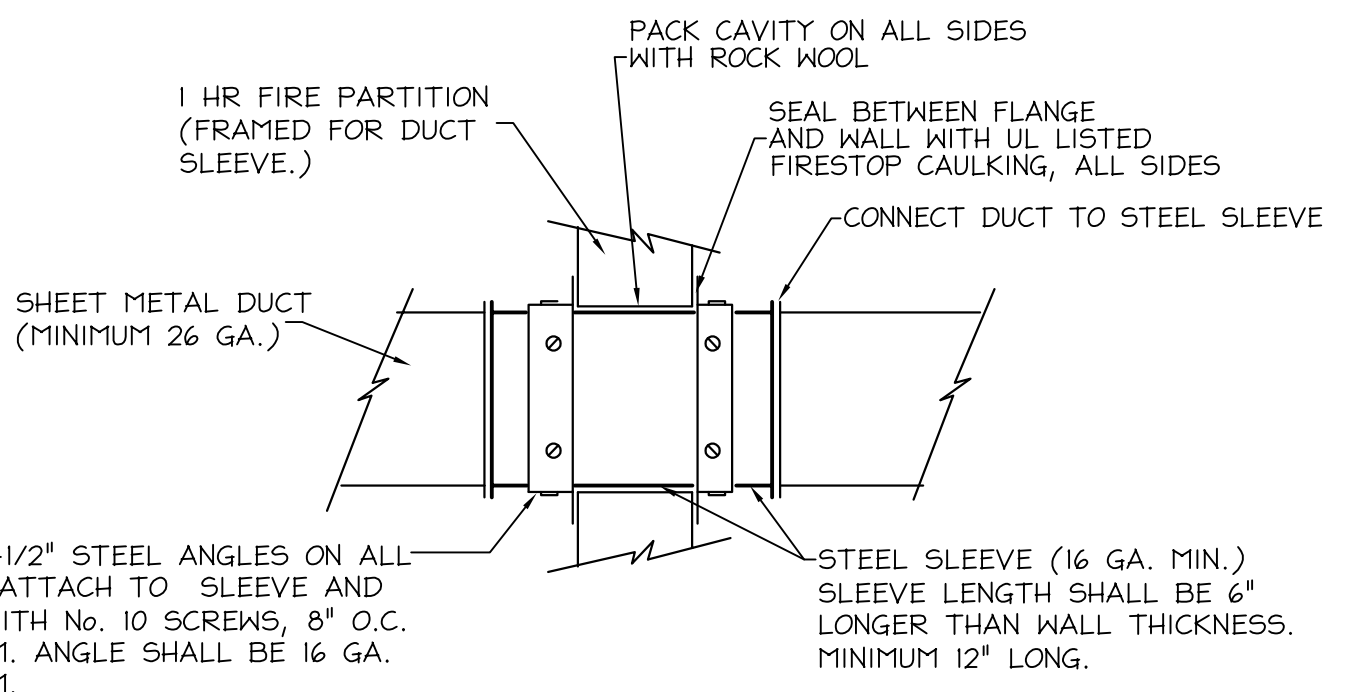
SEE SCHEDULE FOR COILS REQUIRING 3-WAY VALVES
FAN COIL 3-WAY VALVE
NO SCALE

TERMINAL PIPING DETAIL
NO SCALE



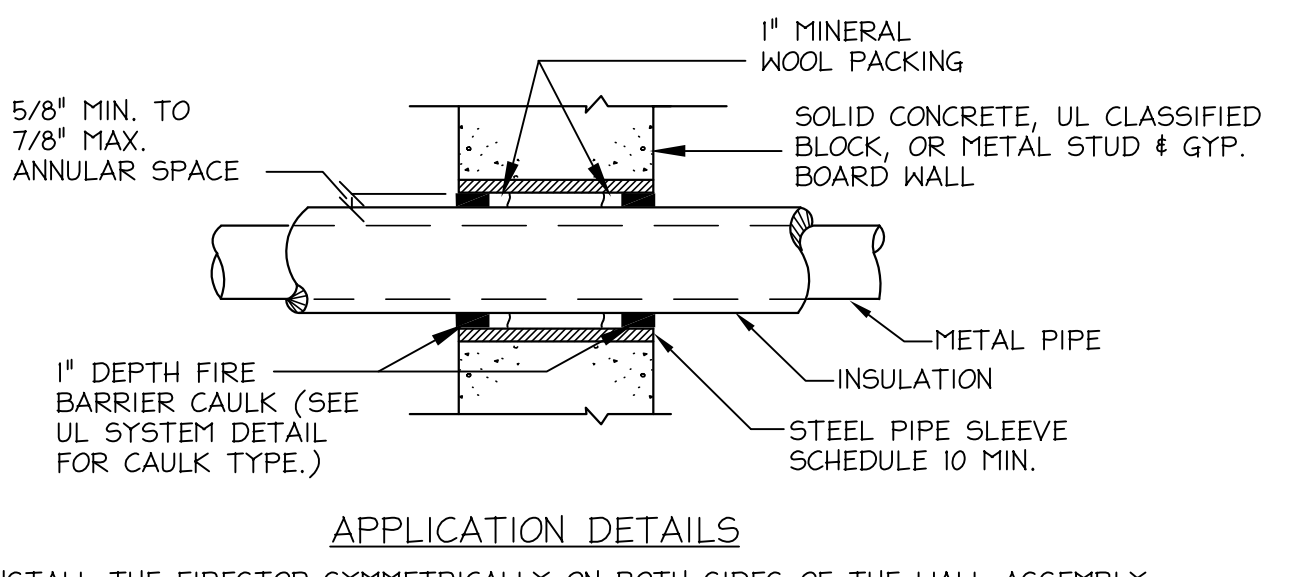
1. INSTALL THE FIRESTOP SYMMETRICALLY ON BOTH SIDES OF THE WALL ASSEMBLY.
2. MINIMUM ANNULAR SPACE REQUIREMENT IS ZERO, POINT CONTACT. MAXIMUM ANNULAR SPACE ALLOWABLE IS 1 3/8".
3. RECESS A NOMINAL 1" THICKNESS OF TIGHTLY PACKED MINERAL WOOL FIRE SAFING, 1" FROM THE WALL SURFACE.
4. FILL THE ANNULAR SPACE AROUND THE PIPE WITH A MINIMUM 1" DEPTH OF 3/4" FIRE BARRIER CP-25W+ CAULK.

UNINSULATED PIPE (1, 2, 3, OR 4 HR)
(UL SYSTEM #CAJ1044)
DETAIL OF PIPE PENETRATION OF ALL FIRE RATED FLOORS & PARTITIONS
NO SCALE



1-1/2"x1-1/2" STEEL ANGLES ON ALL SIDES: ATTACH TO SLEEVE AND WALL WITH NO. 10 SCREWS, 8" O.C. MINIMUM. ANGLE SHALL BE 16 GA. MINIMUM.

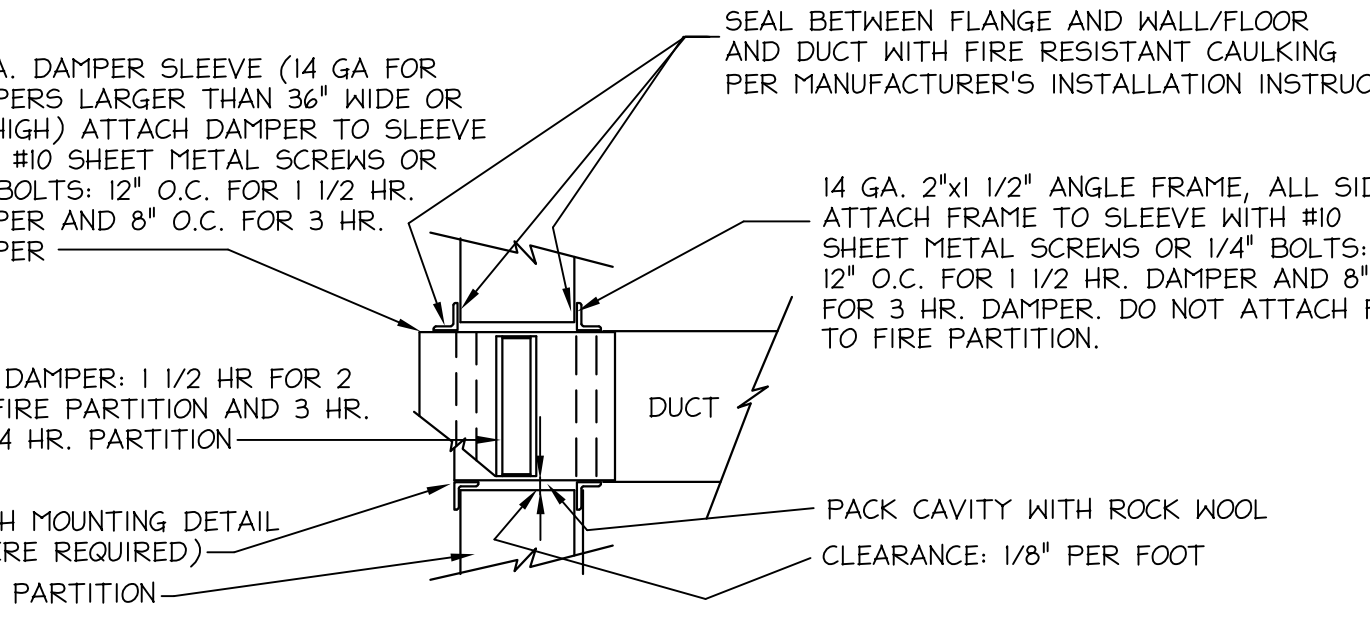
DUCT CLOSURE DETAIL AT ALL PENETRATIONS OF ONE HOUR FIRE PARTITIONS NOT REQUIRING DAMPERS, PENETRATIONS OF SMOKE BARRIERS, OR PENETRATIONS OF SOUND WALLS.
NO SCALE



1. INSTALL THE FIRESTOP SYMMETRICALLY ON BOTH SIDES OF THE WALL ASSEMBLY.
2. MINIMUM ANNULAR SPACE REQUIREMENT IS 5/8". MAXIMUM ANNULAR SPACE ALLOWABLE IS 7/8".
3. RECESS A NOMINAL 1" THICKNESS OF TIGHTLY PACKED MINERAL WOOL FIRE SAFING, 1" FROM THE WALL SURFACE.
4. FILL THE ANNULAR SPACE AROUND THE PIPE WITH A MINIMUM 1" DEPTH OF FIRE BARRIER CAULK. (SEE UL SYSTEM DETAIL FOR CAULK TYPE.)

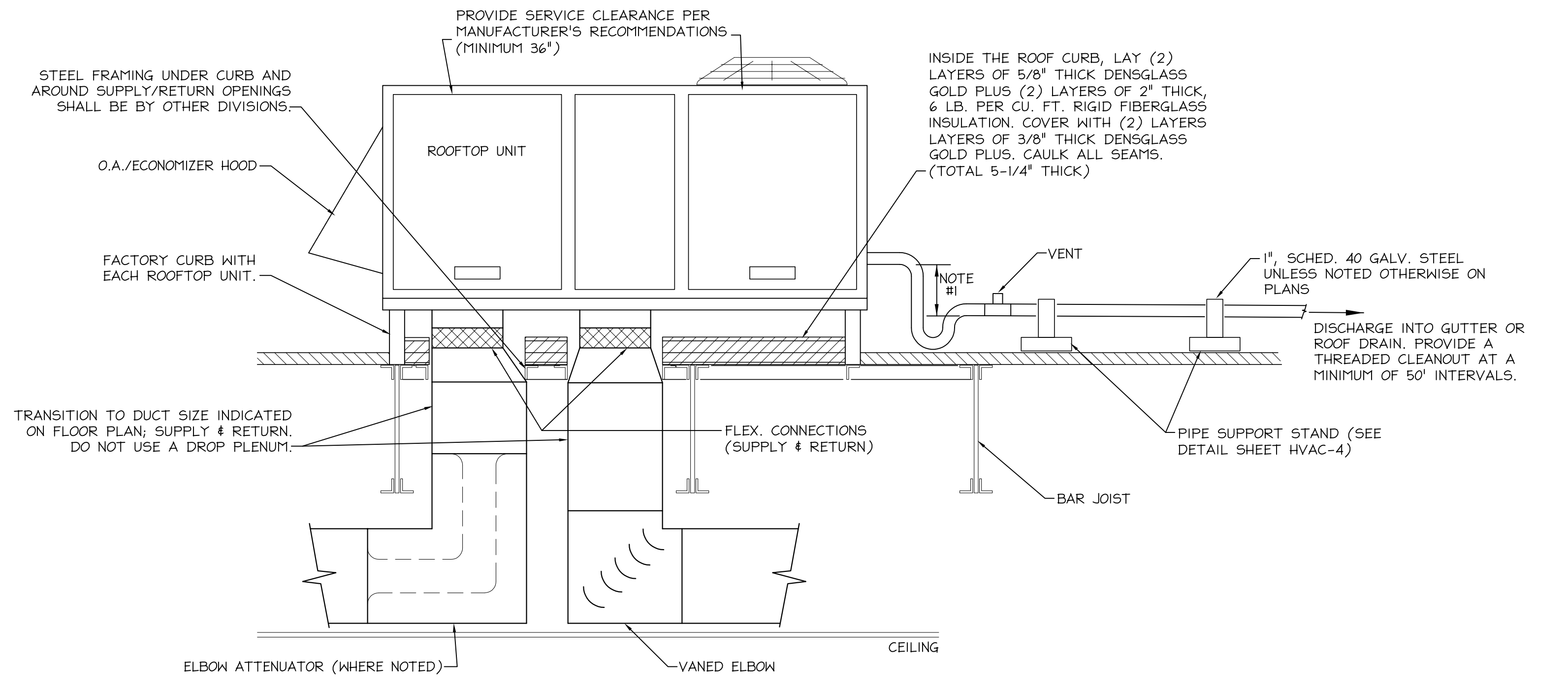
NOTE: FOR PIPE INSULATED WITH RUBBER BASED FLEXIBLE INSULATION, INSTALL A FIBERGLASS INSERT AT THE FIRE WALL PENETRATION IN LIEU OF THE FLEXIBLE RUBBER INSULATION. (THE FIBERGLASS INSERT SHALL BE THE SAME THICKNESS AS THE RUBBER BASED INSULATION.) THE FIBERGLASS INSERT SHALL EXTEND 6" (MIN.) ON EACH SIDE OF FIRE WALL.

INSULATED PIPE (1, 2, 3 OR 4 HR)
(UL SYSTEM #CBJ5002 (FOR PIPING LARGER THAN 6" USE UL SYSTEM #CBJ5003))
DETAIL OF PIPE PENETRATION OF ALL FIRE RATED FLOORS & PARTITIONS
NO SCALE



NOTES:
1) FIRE DAMPER SHALL BE SIZED FOR METAL TO METAL DUCT DIMENSIONS. PARTITION OPENING SHALL BE SIZED FOR 1/8" CLEARANCE PER FOOT OF WIDTH OR HEIGHT.
2) REFER TO MANUFACTURER'S RECOMMENDATIONS FOR ADDITIONAL DETAIL.
3) ALTERNATE INSTALLATION DETAILS SHALL BE ACCEPTABLE IF SHOWN TO BE IN COMPLIANCE WITH NFPA 90A & IFC'S LISTING.
4) FOR INSULATED DUCTS: WRAP EXPOSED PORTION OF SLEEVE WITH 2" THICK, 3/4 PCF DENSITY FIBERGLASS INSULATION WITH FOIL FACING, STAPLE AND SEAL WITH FABRIC AND MASTIC.
5) ACCESS DOOR WHERE REQUIRED, SEE SPECIFICATIONS.

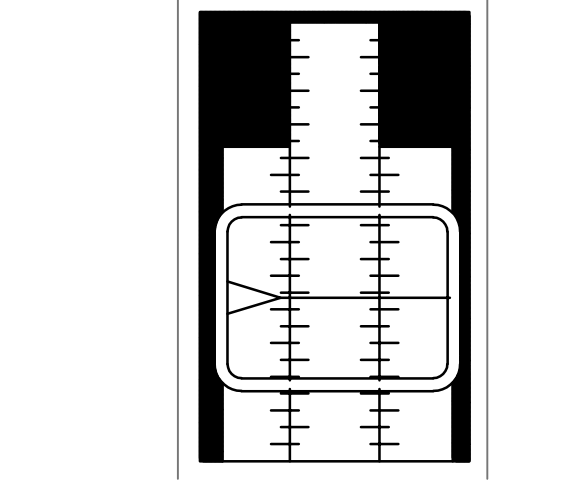
FIRE DAMPER INSTALLATION DETAIL
APPLIES TO FIRE WALL, FIRE BARRIER, OR FIRE PARTITION.
NO SCALE



TYPICAL ROOFTOP UNIT DETAIL
NO SCALE

NOTES: 1.) DISTANCE SHALL BE 2" OR 1/2" GREATER THAN THE FAN SUCTION PRESSURE (WHICH EVER IS GREATER).

CROW & BULMAN ENGINEERING, INC.
800 EAST MAIN STREET, SPARTANBURG, SC 29302
PHONE: 864-585-9903, WWW.CBENGR.COM



SPARTANBURG SCHOOL DISTRICT SEVEN
PHASE THREE ARCHITECTURAL AND MECHANICAL UPGRADES TO PINE STREET SCHOOL
500 S. Pine St., Spartanburg, SC 29302

NO.	DATE	DESCRIPTION	BY
1	11/27/19	ADDENDUM #3	WHC
2	12/5/19	ADDENDUM #4	WHC

CONSTRUCTION DRAWINGS 11/04/2019

PROJECT ENGINEER: WHC
DRAWN BY: WHC

SHEET TITLE:
HVAC DETAILS

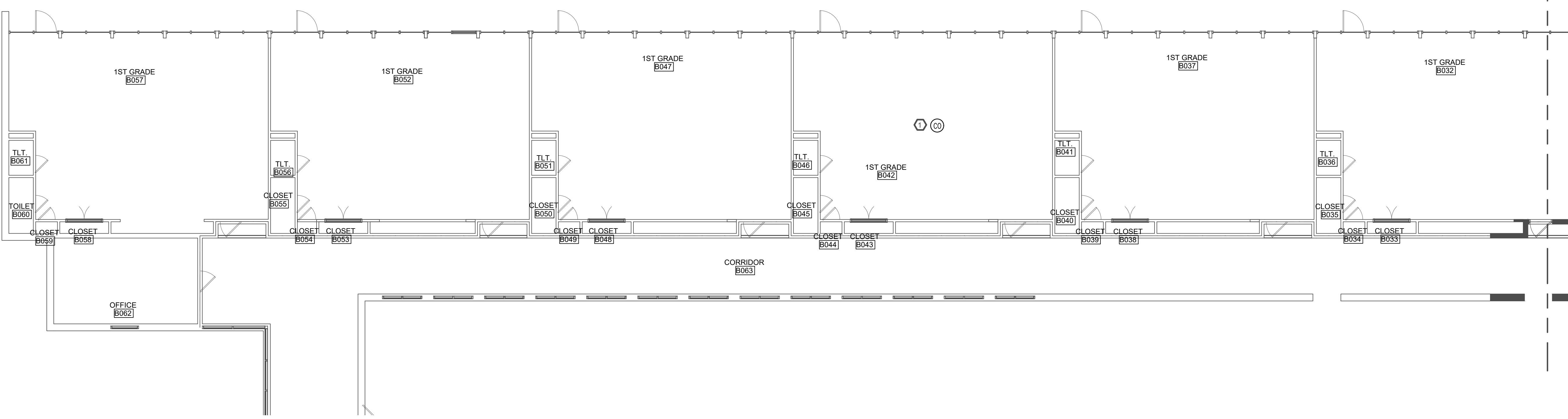
SHEET NO. CBE PROJ. NO. 1345.5

HVAC-8

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1 FIRE ALARM PLAN AREA 2
1/8" = 1'-0"



2 FIRE ALARM PLAN AREA 2
1/8" = 1'-0"

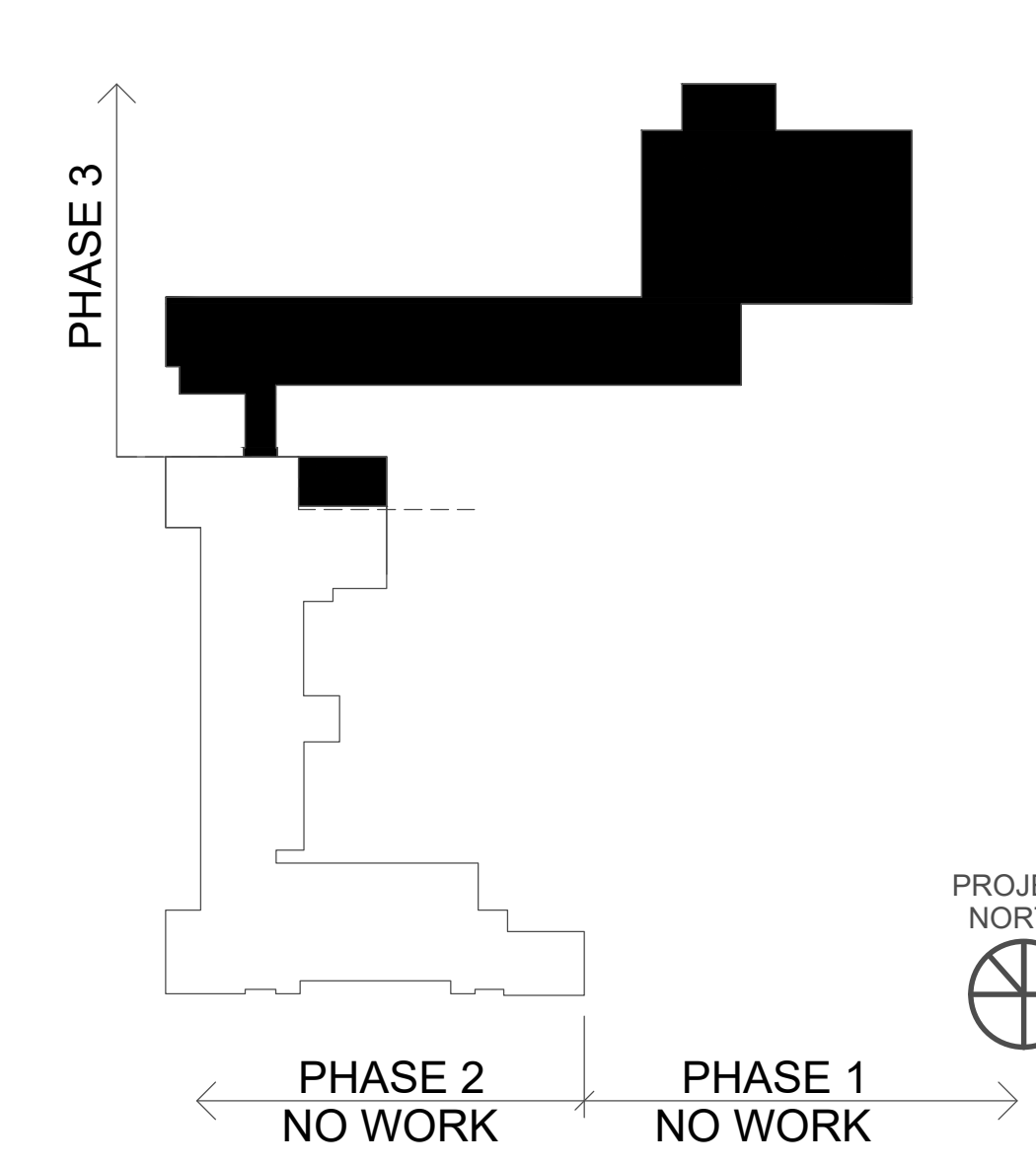
GENERAL NOTES:

- FACILITY HAS EXISTING SIMPLEX 4020 ADDRESSABLE FIRE ALARM CONTROL PANEL.
- ELECTRICAL CONTRACTOR TO COORDINATE ALL FIRE ALARM WORK WITH FIRE ALARM CONTRACTOR.
- ALL FIRE ALARM WIRING SHALL BE ROUTED IN TYPE EMT CONDUIT. ELECTRICAL CONTRACTOR TO IDENTIFY FIRE ALARM CONDUIT AND JUNCTION BOXES. PAINT JUNCTION BOX COVERS RED. PAINT IDENTIFIABLE RED STRIPE ON CONDUIT A MINIMUM OF EVERY 10 FEET.
- WIRE NEW COMPONENTS TO THE NEAREST INITIATION CIRCUIT.
- ALL STROBE LIGHTS TO BE SYNCHRONIZED.
- WHERE A FIRE WALL IS PENETRATED FOR AN ELECTRICAL INSTALLATION, A UL APPROVED FIRE STOP SYSTEM SHALL BE INSTALLED AS REQUIRED. A DETAIL OF THE SYSTEM INSTALLED SHALL BE AVAILABLE DURING ALL THIRD PARTY INSPECTIONS.
- FIRE ALARM CONTRACTOR TO PROVIDE AN OUTPUT FROM THE FIRE ALARM CONTROL PANEL TO BE UTILIZED AS AN INPUT TO THE HVAC CONTROL PANEL WHEN A CARBON MONOXIDE LEAK IS DETECTED. INTERCONNECTION WIRING TO BE BY HVAC CONTROLS CONTRACTOR. COORDINATE WITH HVAC CONTROLS CONTRACTOR.

KEYED NOTES:

- Ⓢ FIRE ALARM CONTRACTOR TO PROVIDE AND INSTALL CARBON MONOXIDE DETECTION IN ROOM AS SHOWN (1ST GRADE B042, KINDERGARTEN B001)

KEY PLAN



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 architects
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 po box 5331 spartanburg, sc 29304 o: 864.585.5678 f: 864.542.9451
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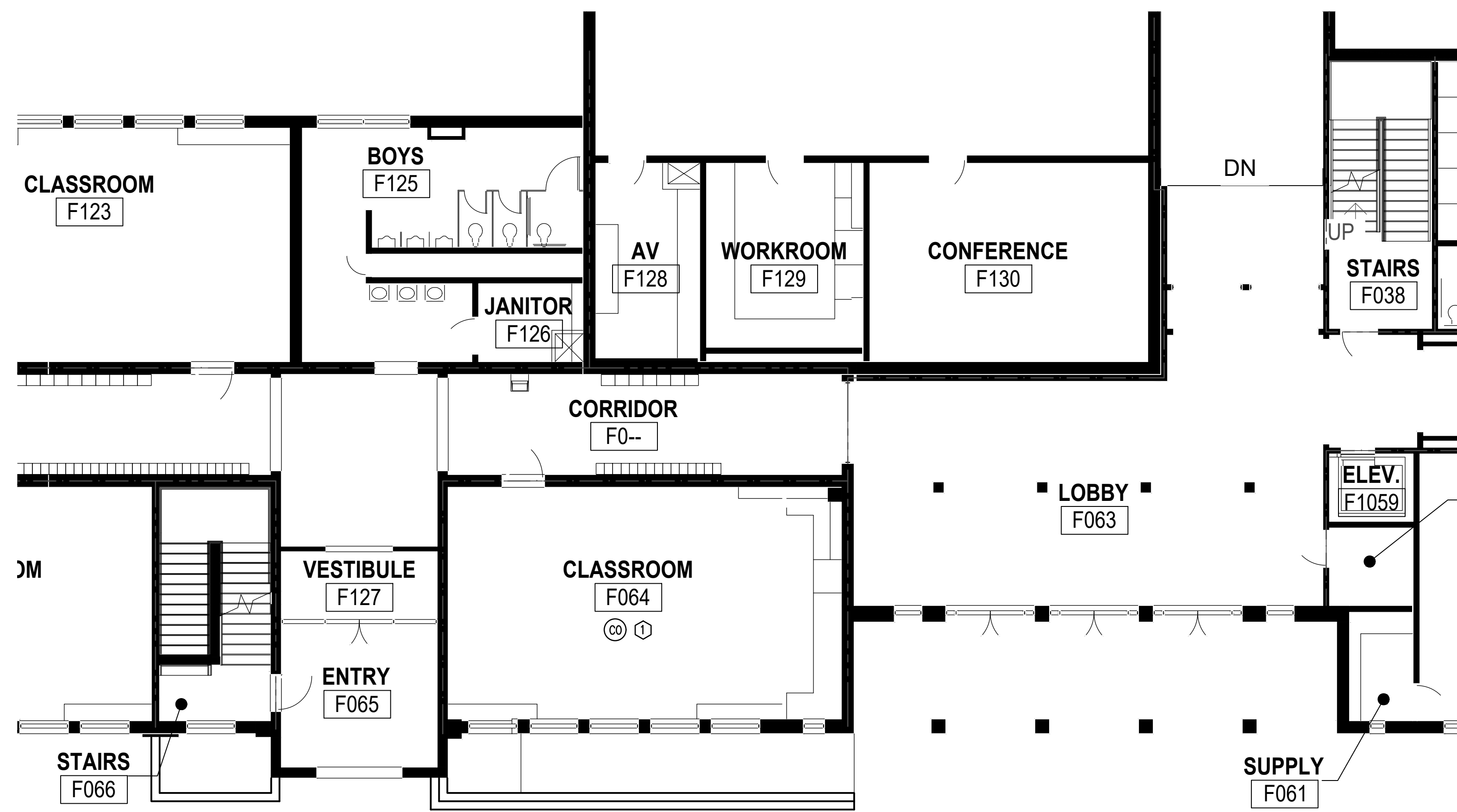
MATRIX
 ENGINEERING, INC.
 912 South Pine Street
 Spartanburg, South Carolina, 29302
 864.583.6274
 Project Number: 2019-114
 REGISTERED PROFESSIONAL ENGINEER
 STATE OF SOUTH CAROLINA
 No. 8001
 11-04-2019

SPARTANBURG SCHOOL DISTRICT SEVEN
 ARCHITECTURAL AND MECHANICAL
 UPGRADES TO PINE STREET SCHOOL
 PHASE 3
 500 S PINE ST., SPARTANBURG, SC 29302

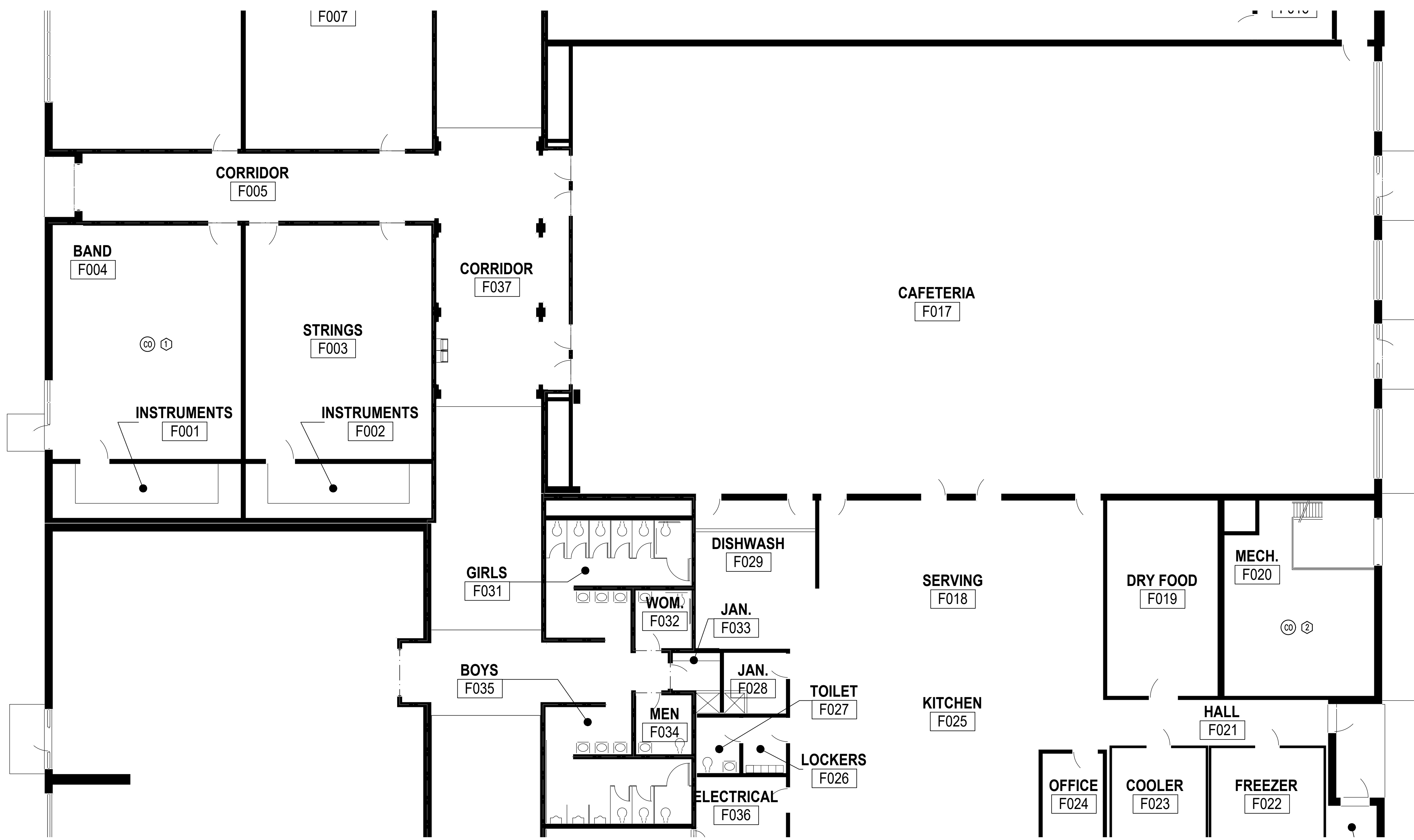
SHEET NO.	DATE	DESCRIPTION	BY
1	12/05/19	ADDENDUM #3	SS

CONSTRUCTION DRAWINGS	11.04.19
PRINCIPAL IN CHARGE:	WFS
PROJECT ENGINEER:	SS
DRAWN BY:	RB, SS

SHEET TITLE:
FIRE ALARM PLAN AREA 2
 SHEET NO. **E-400** PROJ. NO. **014141**



1 FIRE ALARM PLAN - AREA F1
E401 1/8" = 1'-0"

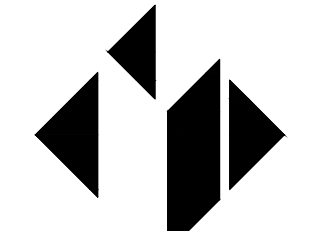


2 FIRE ALARM PLAN - AREA F4
E401 1/8" = 1'-0"

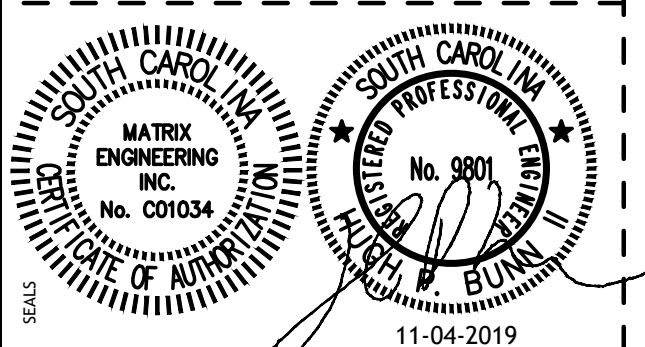
GENERAL NOTES:

- FACILITY HAS EXISTING SIMPLEX 4020 ADDRESSABLE FIRE ALARM CONTROL PANEL.
- ELECTRICAL CONTRACTOR TO COORDINATE ALL FIRE ALARM WORK WITH FIRE ALARM CONTRACTOR.
- ALL FIRE ALARM WIRING SHALL BE ROUTED IN TYPE EMT CONDUIT. ELECTRICAL CONTRACTOR TO IDENTIFY FIRE ALARM CONDUIT AND JUNCTION BOXES. PAINT JUNCTION BOX COVERS RED. PAINT IDENTIFIABLE RED STRIPE ON CONDUIT A MINIMUM OF EVERY 10 FEET.
- WIRE NEW COMPONENTS TO THE NEAREST INITIATION CIRCUIT.
- ALL STROBE LIGHTS TO BE SYNCHRONIZED.
- WHERE A FIRE WALL IS PENETRATED FOR AN ELECTRICAL INSTALLATION, A UL APPROVED FIRE FIRE STOP SYSTEM SHALL BE INSTALLED AS REQUIRED. A DETAIL OF THE SYSTEM INSTALLED SHALL BE LABELED ADJACENT TO THE PENETRATION AND A COPY OF THE FIRE STOP SYSTEM DETAIL SHALL BE AVAILABLE DURING ALL THIRD PARTY INSPECTIONS.
- FIRE ALARM CONTRACTOR TO PROVIDE AN OUTPUT FROM THE FIRE ALARM CONTROL PANEL TO BE UTILIZED AS AN INPUT TO THE HVAC CONTROL PANEL WHEN A CARBON MONOXIDE LEAK IS DETECTED. INTERCONNECTION WIRING TO BE BY HVAC CONTROLS CONTRACTOR. COORDINATE WITH HVAC CONTROLS CONTRACTOR.

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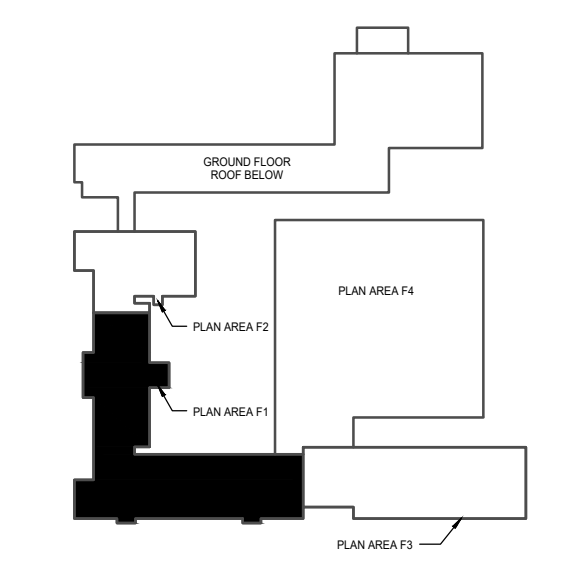
MATRIX ENGINEERING, INC.
912 South Pine Street
Spartanburg, South Carolina, 29302
864.583.6274
Project Number: 2019-114



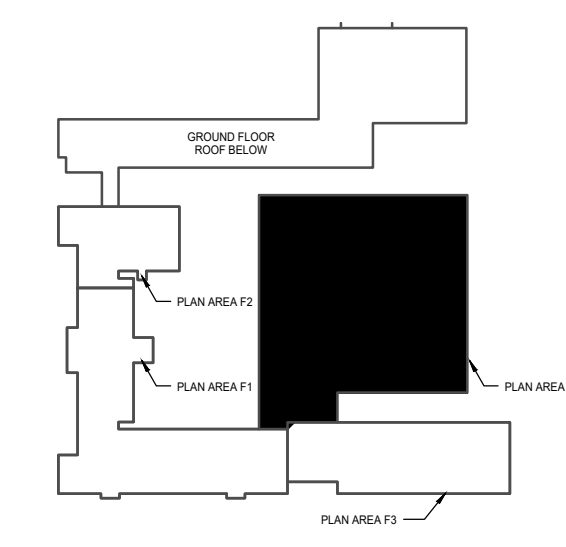
KEYED NOTES:

- FIRE ALARM CONTRACTOR TO PROVIDE AND INSTALL CARBON MONOXIDE DETECTION IN ROOM AS SHOWN. (CLASSROOM F064, BAND F004, MECHANICAL F020)

KEY PLANS



KEY PLAN - AREA F1



KEY PLAN - AREA F4

SHEET NO.	DATE	DESCRIPTION	BY
1	12/05/19	ADDENDUM #3	SS

CONSTRUCTION DRAWINGS	DATE
11.04.19	

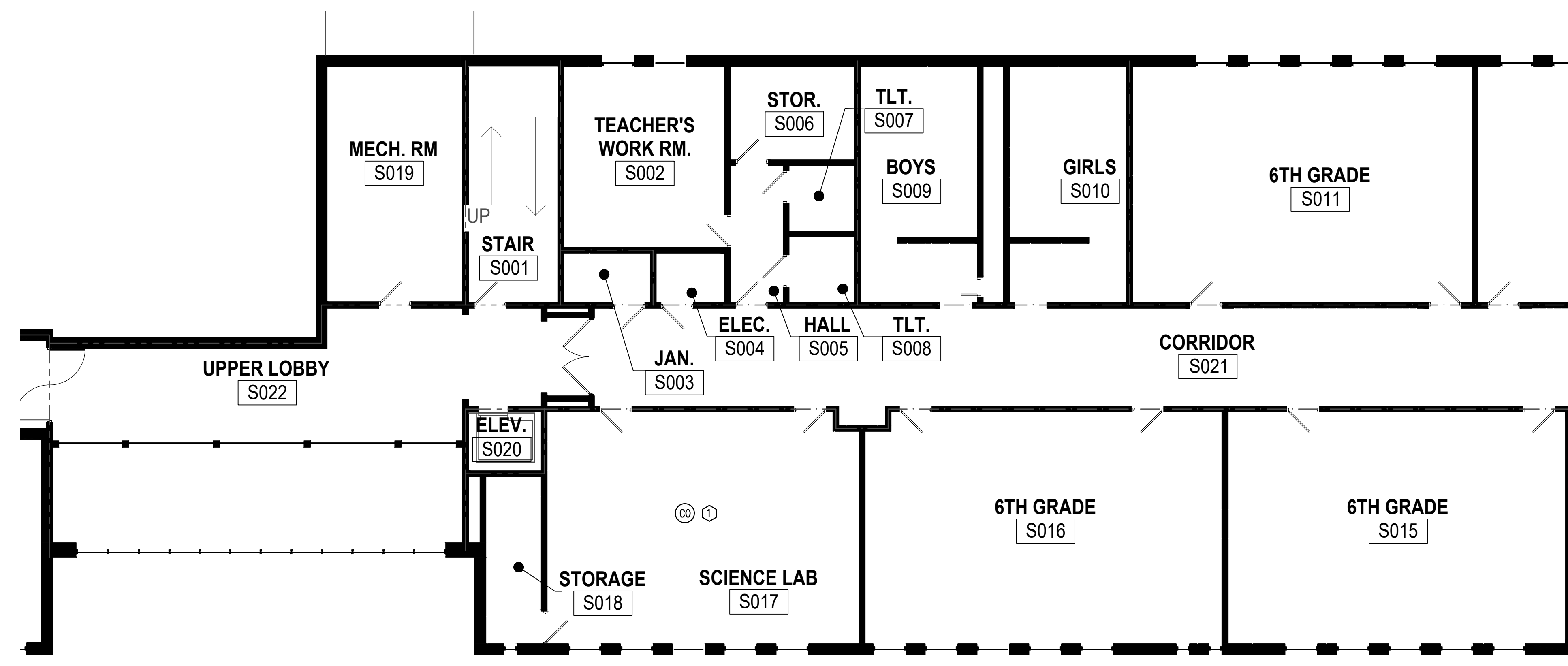
SHEET TITLE:
FIRE ALARM PLAN
AREAS F1 & F4

SHEET NO. 1
PROJ. NO. 014141

E-401

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1 FIRE ALARM PLAN - AREA S3
 1/8" = 1'-0"

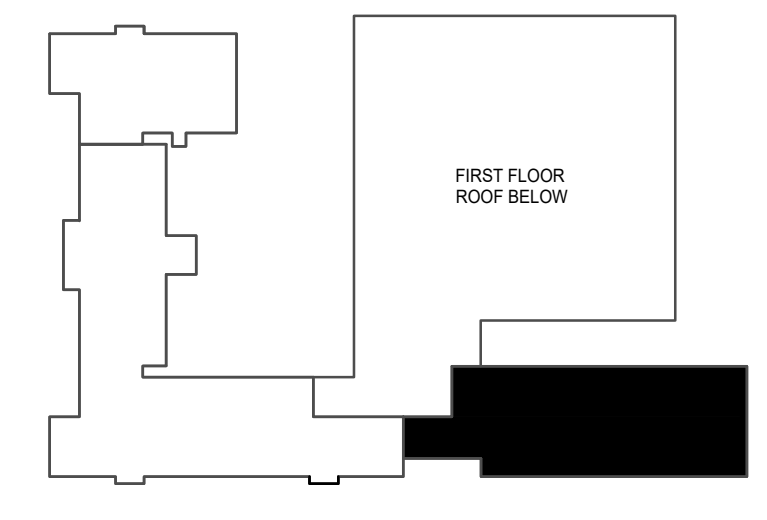
GENERAL NOTES:

1. FACILITY HAS EXISTING SIMPLEX 4020 ADDRESSABLE FIRE ALARM CONTROL PANEL.
2. ELECTRICAL CONTRACTOR TO COORDINATE ALL FIRE ALARM WORK WITH FIRE ALARM CONTRACTOR.
3. ALL FIRE ALARM WIRING SHALL BE ROUTED IN TYPE EMT CONDUIT. ELECTRICAL CONTRACTOR TO IDENTIFY FIRE ALARM CONDUIT AND JUNCTION BOXES. PAINT JUNCTION BOX COVERS RED. PAINT IDENTIFIABLE RED STRIPE ON CONDUIT A MINIMUM OF EVERY 10 FEET.
4. WIRE NEW COMPONENTS TO THE NEAREST INITIATION CIRCUIT.
5. ALL STROBE LIGHTS TO BE SYNCHRONIZED.
6. WHERE A FIRE WALL IS PENETRATED FOR AN ELECTRICAL INSTALLATION, A UL APPROVED FIRE FIRE STOP SYSTEM SHALL BE INSTALLED AS REQUIRED. A DETAIL OF THE SYSTEM INSTALLED SHALL BE LABELED ADJACENT TO THE PENETRATION AND A COPY OF THE FIRE STOP SYSTEM DETAIL SHALL BE AVAILABLE DURING ALL THIRD PARTY INSPECTIONS.
7. FIRE ALARM CONTRACTOR TO PROVIDE AN OUTPUT FROM THE FIRE ALARM CONTROL PANEL TO BE UTILIZED AS AN INPUT TO THE HVAC CONTROL PANEL WHEN A CARBON MONOXIDE LEAK IS DETECTED. INTERCONNECTION WIRING TO BE BY HVAC CONTROLS CONTRACTOR. COORDINATE WITH HVAC CONTROLS CONTRACTOR.

KEYED NOTES:

- CO FIRE ALARM CONTRACTOR TO PROVIDE AND INSTALL CARBON MONOXIDE DETECTION IN ROOM AS SHOWN. (SCIENCE LAB S017)

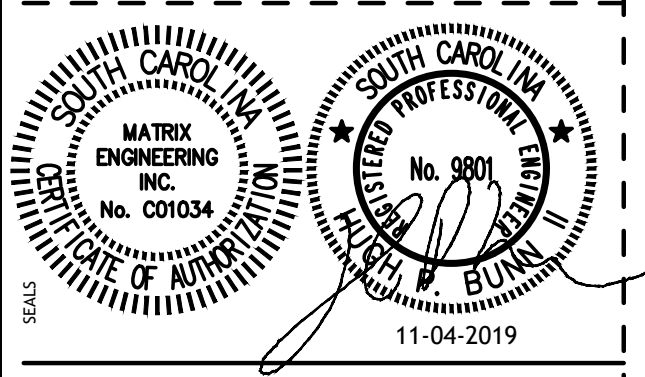
KEY PLAN



KEY PLAN - AREA S3

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 864.583.6274
 Project Number: 2019-114



SPARTANBURG SCHOOL DISTRICT SEVEN
 ARCHITECTURAL AND MECHANICAL
 UPGRADES TO PINE STREET SCHOOL
 PHASE 3
 500 S PINE ST., SPARTANBURG, SC 29302

SHEET NO.	DATE	DESCRIPTION	BY
1	12/05/19	ADDENDUM #3	SS

CONSTRUCTION DRAWINGS 11.04.19
 PROJECT ENGINEER: SS
 DRAWN BY: BS, SS

SHEET TITLE:
**FIRE ALARM PLAN
 AREA S3**
 SHEET NO. PROJ. NO.
E-402 014141