### SIEMENS

Transmittal	Transmittal						
To: JOE LOMBARDO PLUMBING & HEATIN	NG Date: Our Job No.						
OF ROCKLAND INC	12/7/2023 44OP-366733						
321 SPOOK ROCK RD	Job Name						
SUFFERN, NY- 10901-5319	NANUET BOND PHASE 3 HIGH						
US.	SCHOOL						
	Your Order No.						
PHONE: (845) 357-6537							
WE ARE SENDING YOU							
UNDER SEPARATE COVER THE FOLLOWING ITEMS:							
SUBMITTALS FOR REVIEW/APPROVAL	ENGINEERING COMMENTS						
APPROVED SUBMITTALS	ORIGINAL DRAWINGS						
SUBMITTALS FOR YOUR USE	SHOP DRAWINGS						
MARKED PLANS & SPECIFICATIONS	CHANGE ORDER(S)						
THERMOSTAT LOCATION SUBMITTAL							
THESE ARE SUBMITTED	FOR YOUR USE						
	──						
	PLEASE RETURN1_ APPROVED COPY(S) FOR OUR USE						
FOR COMMENTS							
DESCRIPTION							
ONE ELECTRONIC COPY OF THERMOSTAT LOCATION	N SUBMITTAL FOR THE ABOVE MENTIONED PROJECT.						
IN ORDER TO PREPARE THE SUBMITTAL, WE HAVE F	FOLLOWED THE INFORMATION AS CHECKED BELOW						
ARCHITECTURAL PLANS	ELECTRICAL HEATING COIL WIRING						
MECHANICAL PLANS	CHILLER WIRING						
ELECTRICAL PLANS	TERMINAL UNIT CUT SHEETS						
MECHANICAL SPECIFICATIONS	HUMIDIFIER CUT SHEETS						
ELECTRICAL SPECIFICATIONS	DX COIL WIRING						
EXISTING AS BUILTS	COMPLETE SET(S) OF PLANS & SPECS.						
CUTSHEETS							
PLEASE BE ADVISED THAT WE MUST HAVE THIS INFORMAT	ION BEFORE WORK CAN BEGIN ON YOUR SUBMITTAL						
REMARKS							
SIEMENS INDUSTRY INC ATTENTION:							

PLEASE ADDRESS YOUR REMARKS TO:	ATTENTION:
SIEMENS INDUSTRY, INC.	OLIVER WRIGHT (PROJECT MANAGER)
SMART INFRASTRUCTURE	TELEPHONE NO:
412 MT KEMBLE AVE.	(973) 575-6300
MORRISTOWN, NJ 07960, USA	

## SIEMENS

SIEMENS INDUSTRY, INC. SMART INFRASTRUCTURE

412 MT KEMBLE AVE. MORRISTOWN, NJ. 07960 USA

PHONE: (973) 575-6300 FAX: (973) 575-7968

12/7/23

FOR INFORMATION CONTACT OLIVER WRIGHT (PROJECT MANAGER)

THERMOSTAT LOCATION SUBMITTAL FOR NANUET BOND PHASE3 HIGH SCHOOL

103 CHURCH ST NANUET, NY 10954-3030 USA

440P-366733

KSQ DESIGN ARCHITECT

SAGE ENGINEERING ASSOCIATES, LLP ENGINEER

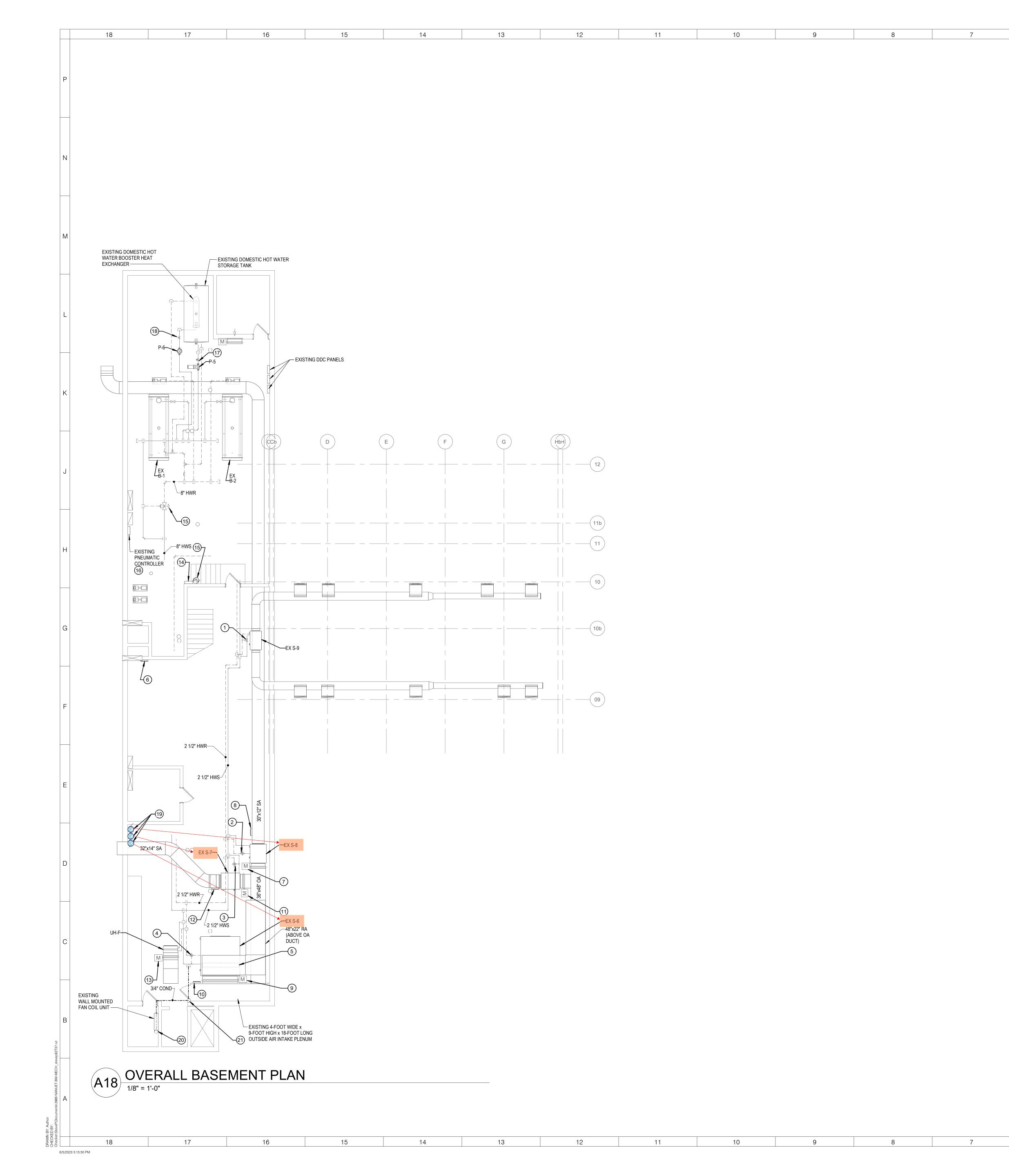
JOE LOMBARDO PLUMBING & HEATING, ROCKLAND CONTRACTOR

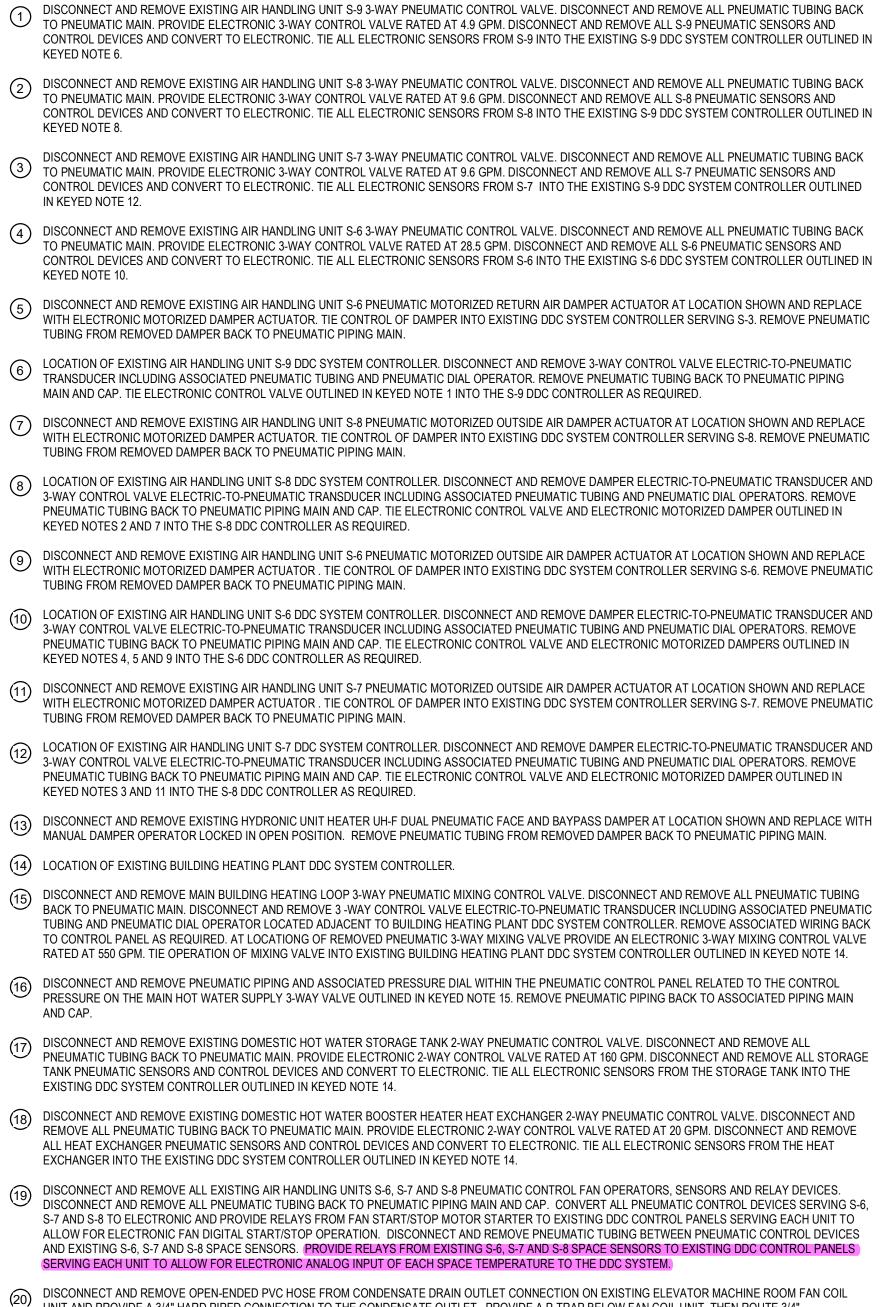


Job Name: Nanuet Bond Phase 3 High School JOB #: 44OP-366733 Siemens Industry Inc – Smart Infrastructure Thermostat location Submittal

#### Submittal Notes 12/7/2023

- 1. BACnet thermostats are proposed for controlling the existing & new FTR's, Heating Radiation & Convector Units.
- 2. At the time of submission, as per DWG BM-M112, note-4 thermostat is connected to EX S-2. pHowever, as per note-28 the same thermostat is mentioned as it will be controlling the 2-way valve for EX FTR. Thereby new BACnet thermostat will be provided for EX FTR and temperature reading will be shared with EX S-2.
- 3. At the time of submission, as per DWG BM-M111, UV-MS-3 and FT-MS-1 serving classroom 102A are sharing a single thermostat. Siemens proposes a new BACnet thermostat which will be controlling the FTR valve. Space temperature reading from this thermostat will be shared with UV-MS-3. New separate thermostat is not considered for UV units.
- 4. At the time of submission, as per DWG HS-M109, RTU-HS-5, R-2-3 and R-2-4 serving cafeteria are sharing a single thermostat. Siemens proposes a new BACnet thermostat (1 qty) for heating floor radiation units (R-2-3, R-2-4) which will be controlling radiation units' valves. RTU-HS-5 will be provided with manufacturer supplied thermostat.
- 5. At the time of submission, as per DWG HS-M109, RTU-HS-4, R-2-1 and R-2-2 serving dining room 2 are sharing a single thermostat. Siemens proposes a new BACnet thermostat (1 qty) for heating floor radiation units (R-2-1, R-2-2) which will be controlling radiation units' valves. RTU-HS-4 will be provided with manufacturer supplied thermostat.
- 6. At the time of submission, as per DWG HS-M109, thermostats are not shown for Convector units. Siemens is proposing new BACnet thermostat for these units to control the valves and to monitor space temperature. CV-HS-1 & CV-HS-2, CV-HS-4 & CV-HS-5 are serving same areas so single thermostat for each pair is considered.

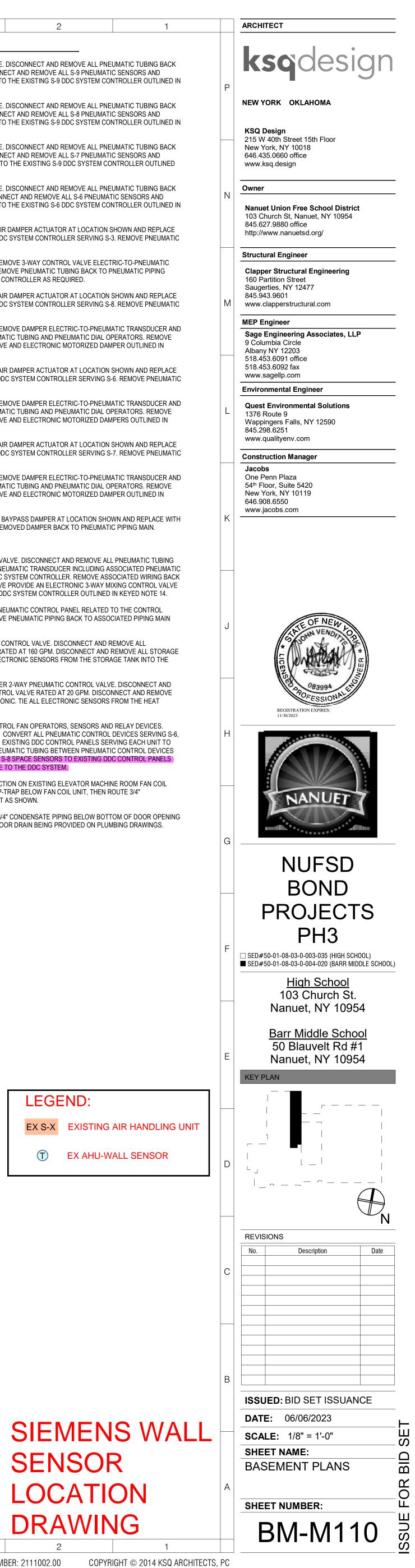


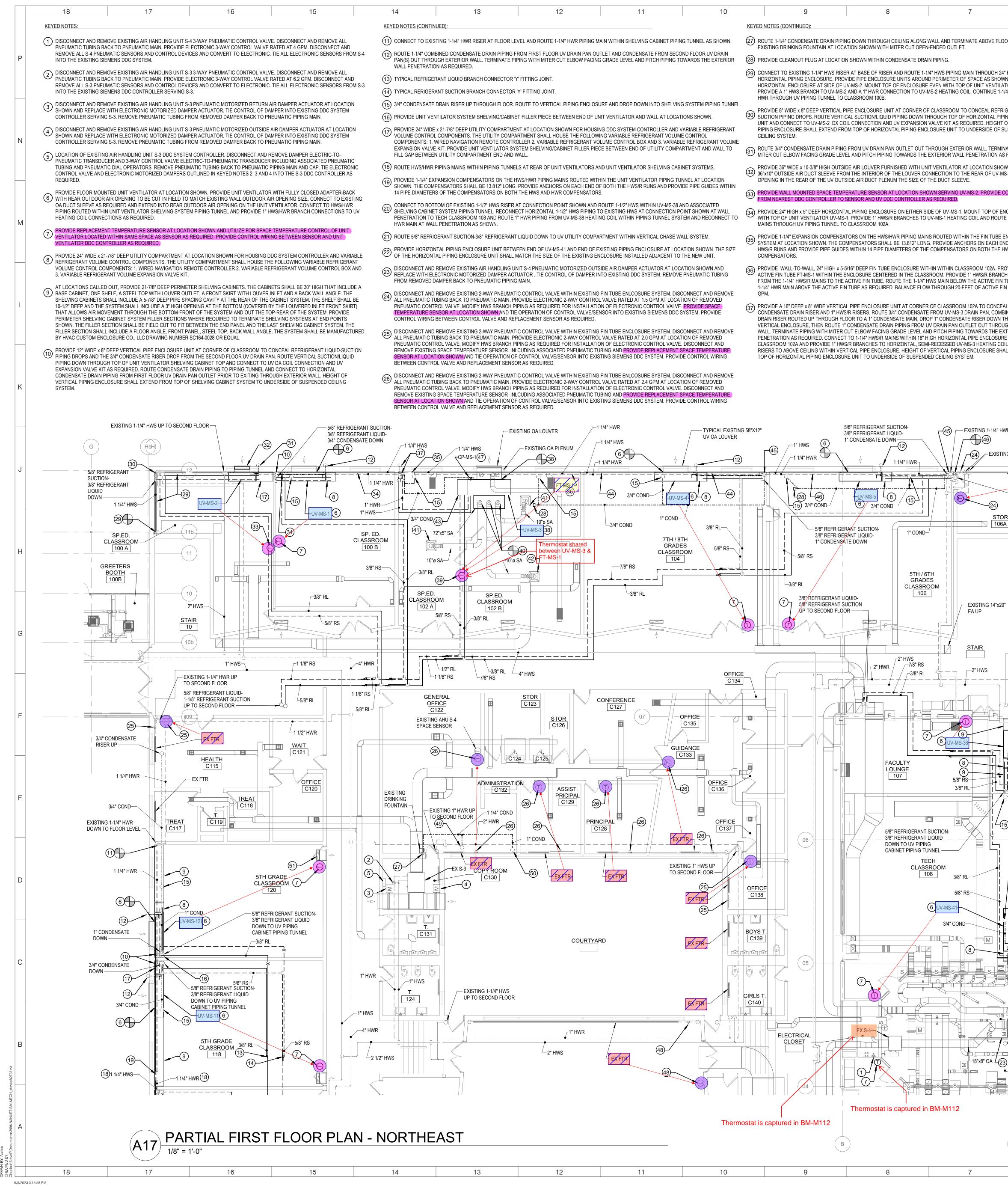


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KEYED NOTES:

- UNIT AND PROVIDE A 3/4" HARD PIPED CONNECTION TO THE CONDENSATE OUTLET. PROVIDE A P-TRAP BELOW FAN COIL UNIT, THEN ROUTE 3/4" CONDENSATE PIPING THROUGH ELEVATOR MACHINE ROOM TO MECHANICAL AREA OF BASEMENT AS SHOWN.
- (21) PROVIDE 3/4" CONDENSATE DROP DOWN AT LOCATION SHOWN TO FLOOR LEVEL, THEN ROUTE 3/4" CONDENSATE PIPING BELOW BOTTOM OF DOOR OPENING TO OA INTAKE PLENUM, THEN ROUTE 3/4" CONDENSATE PIPING ALONG FLOOR LEVEL TO NEW FLOOR DRAIN BEING PROVIDED ON PLUMBING DRAWINGS. TERMINATE CONDENSATE PIPING OPEN-ENDED ABOVE NEW FLOOR DRAIN.





13 12 11 10	9 8 7	6 5 4 3 2 1
	KEYED NOTES (CONTINUED):	GENERAL NOTES:
1-1/4" HWR RISER AT FLOOR LEVEL AND ROUTE 1-1/4" HWR PIPING MAIN WITHIN SHELVING CABINET PIPING TUNNEL AS SHOWN.	(27) ROUTE 1-1/4" CONDENSATE DRAIN PIPING DOWN THROUGH CEILING ALONG WALL AND TERMINATE ABOVE FLOOD RIM OF EXISTING DRINKING FOUNTAIN AT LOCATION SHOWN WITH MITER CUT OPEN-ENDED OUTLET.	1. REFRIGERANT PIPING NOTE: 90 DEGREE ELBOWS SHALL BE KEPT A MINIMUM OF 20" FROM CEILING UV DX COILS AND 20" FROM BRANCH CONNECTOR 'Y' JOINTS. IN ADDITION, BRANCH CONNECTOR 'Y' JOINTS SHALL BE A MINIMUM OF 40" FROM ANOTHER BRANCH 'Y' CONNECTOR JOINT.
XTERIOR WALL. TERMINATE PIPING WITH MITER CUT ELBOW FACING GRADE LEVEL AND PITCH PIPING TOWARDS THE EXTERIOR REQUIRED.	(28) PROVIDE CLEANOUT PLUG AT LOCATION SHOWN WITHIN CONDENSATE DRAIN PIPING.	2. REFRIGERANT PIPING NOTE: THE HEAT PUMP SYSTEM MANUFACTURER SHALL INSPECT ALL FIELD INSTALLED REFRIGERANT PIPING PRIOR TO INSULATION INSTALLATION.
LIQUID BRANCH CONNECTOR 'Y' FITTING JOINT.	(29) CONNECT TO EXISTING 1-1/4" HWS RISER AT BASE OF RISER AND ROUTE 1-1/4" HWS PIPING MAIN THROUGH 24" HIGH x 5" DEEP HORIZONTAL PIPING ENCLOSURE. PROVIDE PIPE ENCLOSURE UNITS AROUND PERIMETER OF SPACE AS SHOWN. TERMINATE HORIZONTAL ENCLOSURE AT SIDE OF UV-MS-2. MOUNT TOP OF ENCLOSURE EVEN WITH TOP OF UNIT VENTILATOR UV-MS-2.	3. THE EXISTING SUSPENDED CEILING SYSTEMS LOCATED WITHIN THE SCOPE OF WORK AREA OUTSIDE OF AREAS BEING RENOVATED BY THE GENERAL CONTRACTOR SHALL BE DISCONNECTED AND REMOVED TO ALLOW FOR THE INSTALLATION WORK AND REINSTALLED FOLLOWING COMPLETION OF THE WORK BY THE MECHANICAL CONTRACTOR. THE SUSPENDED CEILING GRID SYSTEMS SHALL BE REMOVED AND MODIFIED TO COMPLETE THE WORK AND REINSTALLED FOLLOWING THE COMPLETION OF WORK. THE CEILING TILES
UCTION BRANCH CONNECTOR 'Y' FITTING JOINT.	PROVIDE A 1" HWS BRANCH TO UV-MS-2 AND A 1" HWR CONNECTION TO UV-MS-2 HEATING COIL. CONTINUE 1-1/4" HWS AND 1" HWR THROUGH UV PIPING TUNNEL TO CLASSROOM 100B.	SHALL BE REMOVED AS REQUIRED TO COMPLETE THE WORK AND REINSTALLED FOLLOWING THE COMPLETION OF THE INSTALLATION WORK. ANY CEILING TILES DAMAGED DURING THE INSTALLATION WORK SHALL BE REPLACED BY THE MECHANICAL CONTRACTOR TO MATCH THE EXISTING CEILING TILES.
N RISER UP THROUGH FLOOR. ROUTE TO VERTICAL PIPING ENCLOSURE AND DROP DOWN INTO SHELVING SYSTEM PIPING TUNNEL		4. ALL CUTTING, PATCHING, AND FIREPROOFING ASSOCIATED WITH THE INSTALLATION WORK SHALL BE COMPLETED BY THE MECHANICAL CONTRACTOR. PATCHED AREAS SHALL
TOR SYSTEM SHELVING/CABINET FILLER PIECE BETWEEN END OF UNIT VENTILATOR AND WALL AT LOCATIONS SHOWN.	PROVIDE 8" WIDE x 8" DEEP VERTICAL PIPE ENCLOSURE UNIT AT CORNER OF CLASSROOM TO CONCEAL REFRIGERANT LIQUID- SUCTION PIPING DROPS. ROUTE VERTICAL SUCTION/LIQUID PIPING DOWN THROUGH TOP OF HORIZONTAL PIPING ENCLOSURE UNIT AND CONNECT TO UV-MS-2 DX COIL CONNECTION AND UV EXPANSION VALVE KIT AS REQUIRED. HEIGHT OF VERTICAL PIPING ENCLOSURE SHALL EXTEND FROM TOP OF HORIZONTAL PIPING ENCLOSURE UNIT TO UNDERSIDE OF SUSPENDED	MATCH EXISTING CONDITIONS. ALL REFRIGERANT PIPING AND CONDENSATE PIPING PENETRATIONS THROUGH CORRIDOR WALLS SHALL BE FIREPROOFED PER SPECIFICATION SECTION 078400.
IPONENTS. THE UTILITY COMPARTMENT SHALL HOUSE THE FOLLOWING VARIABLE REFRIGERANT VOLUME CONTROL ) NAVIGATION REMOTE CONTROLLER 2. VARIABLE REFRIGERANT VOLUME CONTROL BOX AND 3. VARIABLE REFRIGERANT VOLUME PROVIDE UNIT VENTILATOR SYSTEM SHELVING/CABINET FILLER PIECE BETWEEN END OF UTILITY COMPARTMENT AND WALL TO	CEILING SYSTEM.	5. ROUTE REFRIGERANT SUCTION AND LIQUID PIPING FROM THE UNIT VENTILATOR DX COIL CONNECTIONS TO THE HEAT PUMP UNITS. SIZE PIPING AND PROVIDE BRANCH CONNECTOR 'Y' JOINTS PER THE DRAWING. CONFIRM PIPING SIZES AND BRANCH CONNECTOR 'Y' JOINT LOCATIONS REQUIRED WITH HEAT PUMP SYSTEM MANUFACTURER.
ITY COMPARTMENT END AND WALL.	(31) ROUTE 3/4" CONDENSATE DRAIN PIPING FROM UV DRAIN PAN OUTLET OUT THROUGH EXTERIOR WALL. TERMINATE PIPING WITH MITER CUT ELBOW FACING GRADE LEVEL AND PITCH PIPING TOWARDS THE EXTERIOR WALL PENETRATION AS REQUIRED.	6. THE SMALLEST VOLUME ROOM THAT THE REFRIGERANT PIPING SYSTEMS ROUTE THROUGH FOR EACH OF THE HEAT PUMP SYSTEMS IS BELOW THE ASHRAE STANDARD 15 REFRIGERANT CONCENTRATION LIMIT OF 26 POUNDS PER 1,000 CUBIC FEET OF ROOM VOLUME FOR OCCUPIED SPACES.
G MAINS WITHIN PIPING TUNNELS AT REAR OF UNIT VENTILATORS AND UNIT VENTILATOR SHELVING CABINET SYSTEMS.	PROVIDE 36" WIDE x 10-3/8" HIGH OUTSIDE AIR LOUVER FURNISHED WITH UNIT VENTILATOR AT LOCATION SHOWN. PROVIDE A 36"x10" OUTSIDE AIR DUCT SLEEVE FROM THE INTERIOR OF THE LOUVER CONNECTION TO THE REAR OF UV-MS-2. PROVIDE AN OPENING IN THE REAR OF THE UV OUTSIDE AIR DUCT PLENUM THE SIZE OF THE DUCT SLEEVE.	7. PROVIDE FIRESTOPPING PER SPECIFICATION SECTION 078400 AT ALL PIPING PENETRATIONS THROUGH CORRIDOR WALLS AND STORAGE ROOM WALLS.
ATORS SHALL BE 13.812" LONG. PROVIDE ANCHORS ON EACH END OF BOTH THE HWS/R RUNS AND PROVIDE PIPE GUIDES WITHIN THE COMPENSATORS ON BOTH THE HWS AND HWR COMPENSATORS.	33 PROVIDE WALL MOUNTED SPACE TEMPERATURE SENSOR AT LOCATION SHOWN SERVING UV-MS-2. PROVIDE CONTROL WIRING	8. THE UV UTILITY COMPARTMENT SHALL INCLUDE A REMOVABLE FRONT PANEL, STANDARD #1/4-20 HEX FASTENER, STEEL TOP AND BACK WALL F-CHANNEL.
OF EXISTING 1-1/2" HWS RISER AT CONNECTION POINT SHOWN AND ROUTE 1-1/2" HWS WITHIN UV-MS-38 AND ASSOCIATED TEM PIPING TUNNEL. RECONNECT HORIZONTAL 1-1/2" HWS PIPING TO EXISTING HWS AT CONNECTION POINT SHOWN AT WALL	(34) PROVIDE 24" HIGH x 5" DEEP HORIZONTAL PIPING ENCLOSURE ON EITHER SIDE OF UV-MS-1. MOUNT TOP OF ENCLOSURE EVEN	10. ROUTE REFRIGERANT SUCTION-LIQUID PIPING WITHIN UNIT VENTILATOR PIPING TUNNELS AND UNIT VENTILATOR SHELVING SYSTEM TUNNELS TO DX COOLING COIL CONNECTIONS AND UV EXPANSION VALVE KITS PER THE MANUFACTURER'S RECOMMENDATIONS.
CLASSROOM 108 AND ROUTE 1" HWR PIPING FROM UV-MS-38 HEATING COIL WITHIN PIPING TUNNEL SYSTEM AND RECONNECT TO IETRATION AS SHOWN.		
NT SUCTION-3/8" REFRIGERANT LIQUID DOWN TO UV UTILITY COMPARTMENT WITHIN VERTICAL CHASE WALL SYSTEM.	3 PROVIDE 1-1/4" EXPANSION COMPENSATORS ON THE HWS/HWR PIPING MAINS ROUTED WITHIN THE FIN TUBE ENCLOSURE SYSTEM AT LOCATION SHOWN. THE COMPENSATORS SHALL BE 13.812" LONG. PROVIDE ANCHORS ON EACH END OF BOTH THE	<ul> <li>PROVIDE SEMI-RECESSED HORIZONTAL UNIT VENTILATOR UV-MS-3 AT LOCATION SHOWN. PROVIDE UV WITH BOTTOM RETURN AIR INLET STAMPED</li> <li>REGISTER, REAR DUCTED OUTSIDE AIR INLET AND FRONT DISCHARGE DUCTED SA OUTLET. EXTEND EXISTING OA PLENUM TO REAR OUTSIDE AIR INLET ON UV AS REQUIRED.</li> </ul>
PIPING ENCLOSURE UNIT BETWEEN END OF UV-MS-41 AND END OF EXISTING PIPING ENCLOSURE AT LOCATION SHOWN. THE SIZE PING ENCLOSURE UNIT SHALL MATCH THE SIZE OF THE EXISTING ENCLOSURE INSTALLED ADJACENT TO THE NEW UNIT.	HWS/R RUNS AND PROVIDE PIPE GUIDES WITHIN 14 PIPE DIAMETERS OF THE COMPENSATORS ON BOTH THE HWS AND HWR COMPENSATORS.	(39) PROVIDE WALL MOUNTED SPACE TEMPERATURE SENSOR AT LOCATION SHOWN SERVING UV-MS-3 AND FIN TUBE RADIATION FT-MS-1 CONTROL VALVE. PROVIDE CONTROL WIRING FROM NEAREST DDC CONTROLLER TO SENSOR AND UV DDC CONTROLLER AS REQUIRED.
DVE EXISTING AIR HANDLING UNIT S-4 PNEUMATIC MOTORIZED OUTSIDE AIR DAMPER ACTUATOR AT LOCATION SHOWN AND ONIC MOTORIZED DAMPER ACTUATOR . TIE CONTROL OF DAMPER INTO EXISTING DDC SYSTEM. REMOVE PNEUMATIC TUBING REACK TO PNEUMATIC PIPING MAIN.	PROVIDE WALL-TO-WALL, 24" HIGH x 5-5/16" DEEP FIN TUBE ENCLOSURE WITHIN WITHIN CLASSROOM 102A. PROVIDE 20-FEET OF ACTIVE FIN TUBE FT-MS-1 WITHIN THE ENCLOSURE CENTERED IN THE CLASSROOM. PROVIDE 1" HWS/R BRANCH CONNECTIONS FROM THE 1-1/4" HWS/R MAINS TO THE ACTIVE FIN TUBE. ROUTE THE 1-1/4" HWS MAIN BELOW THE ACTIVE FIN TUBE AND THE 1-1/4" HWR MAIN ABOVE THE ACTIVE FIN TUBE AS REQUIRED. BALANCE FLOW THROUGH 20-FEET OF ACTIVE FIN TUBE TO 2.3	PROVIDE 72"x5" SA PLENUM CONNECTED TO FRONT DISCHARGE OUTLET ON UV-MS-3. INSULATE THE SA PLENUM WITH 2" THICK FLEXIBLE GLASS FIBER DUCT WRAP INSULATION. CONNECT THE EXISTING, THREE 10" ROUND SA BRANCHES TO THE TOP OF THE 72"x5" SA PLENUM AS REQUIRED. INSTALL UV-MS-3 SO THAT THE THE BOTTOM OF THE SA PLENUM, WITH INSULATION, IS ABOVE THE TOP OF THE EXISTING SUSPENDED CEILING SYSTEM.
DVE EXISTING 2-WAY PNEUMATIC CONTROL VALVE WITHIN EXISTING FIN TUBE ENLCOSURE SYSTEM. DISCONNECT AND REMOVE BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 2-WAY CONTROL VALVE RATED AT 1.5 GPM AT LOCATION OF REMOVED ALVE. MODIFY HWS BRANCH PIPING AS REQUIRED FOR INSTALLATION OF ELECTRONIC CONTROL VALVE. PROVIDE SPACE	GPM.	(4) REBALANCE SUPPLY AIRFLOW THROUGH EXISTING LAY-IN SA DIFFUSERS UTILIZING EXISTING IN-DUCT VOLUME DAMPERS ON EACH SA BRANCH TO 430 CFM WITH UV-MS-3 OPERATING AT DESIGN SUPPLY AIRFLOW.
AT LOCATION SHOWN AND TIE OPERATION OF CONTROL VALVE/SENSOR INTO EXISTING SIEMENS DDC SYSTEM. PROVIDE EEN CONTROL VALVE AND REPLACEMENT SENSOR AS REQUIRED.	CONDENSATE DRAIN RISER AND 1" HWS/R RISERS. ROUTE 3/4" CONDENSATE FROM UV-MS-3 DRAIN PAN, COMBINE WITH 3/4" DRAIN RISER ROUTED UP THROUGH FLOOR TO A 1" CONDENSATE MAIN, DROP 1" CONDENSATE RISER DOWN THROUGH VERTICAL ENCLOSURE, THEN ROUTE 1" CONDENSATE DRAIN PIPING FROM UV DRAIN PAN OUTLET OUT THROUGH EXTERIOR VERTICAL ENCLOSURE, THEN ROUTE 1" CONDENSATE DRAIN PIPING FROM UV DRAIN PAN OUTLET OUT THROUGH EXTERIOR	(42) REBALANCE SUPPLY AIRFLOW THROUGH EXISTING LAY-IN SA DIFFUSER UTILIZING EXISTING IN-DUCT VOLUME DAMPERS ON EACH SA BRANCH TO 480 CFM WITH UV-MS-3 OPERATING AT DESIGN SUPPLY AIRFLOW.
DVE EXISTING 2-WAY PNEUMATIC CONTROL VALVE WITHIN EXISTING FIN TUBE ENCLOSURE SYSTEM. DISCONNECT AND REMOVE BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 2-WAY CONTROL VALVE RATED AT 2.0 GPM AT LOCATION OF REMOVED (ALVE. MODIFY HWS BRANCH PIPING AS REQUIRED FOR INSTALLATION OF ELECTRONIC CONTROL VALVE. DISCONNECT AND CE TEMPERATURE SENSOR INLCUDING ASSOCIATED PNEUMATIC TUBING AND PROVIDE REPLACEMENT SPACE TEMPERATURE SHOWN AND TIE OPERATION OF CONTROL VALVE/SENSOR INTO EXISTING SIEMENS DDC SYSTEM. PROVIDE CONTROL WIRING	WALL. TERMINATE PIPING WITH MITER CUT ELBOW FACING GRADE LEVEL AND PITCH PIPING TOWARDS THE EXTERIOR WALL PENETRATION AS REQUIRED. CONNECT TO 1-1/4" HWS/R MAINS WITHIN 18" HIGH HORIZONTAL PIPE ENCLOSURE WITHIN CLASSROOM 102A AND PROVIDE 1" HWS/R BRANCHES TO HORIZONTAL, SEMI-RECESSED UV-MS-3 HEATING COIL. ROUTE HWS/R RISERS TO ABOVE CEILING WITHIN VERTICAL PIPE ENCLOSURE. HEIGHT OF VERTICAL PIPING ENCLOSURE SHALL EXTEND FROM TOP OF HORIZONTAL PIPING ENCLOSURE UNIT TO UNDERSIDE OF SUSPENDED CEILING SYSTEM.	<ul> <li>PROVIDE EXTERNALLY MOUNTED WIRED NAVIGATION REMOTE CONTROLLER, VARIABLE REFRIGERANT VOLUME CONTROL BOX AND VARIABLE REFRIGERANT</li> <li>VOLUME EXPANSION VALVE KIT SERVING HORIZONTAL UNIT VENTILATOR UV-MS-3 AT LOCATION SHOWN ABOVE EXISTING SUSPENDED CEILING SYSTEM.</li> <li>ROUTE LIQUID/SUCTION REFRIGERANT PIPING TO EXPANSION VALVE KIT AND UV DX COIL AS REQUIRED.</li> </ul>
LVE AND REPLACEMENT SENSOR AS REQUIRED.	TOP OF HORIZONTAL FIFIING ENCLOSURE UNIT TO UNDERSIDE OF SUSPENDED CEILING STSTEM.	44 PROVIDE 24" HIGH x 5" DEEP HORIZONTAL PIPING ENCLOSURE ON EITHER SIDE OF UV-MS-4. MOUNT TOP OF ENCLOSURE EVEN WITH TOP OF UNIT VENTILATOR UV-MS-4. PROVIDE 1" HWS/R BRANCHES TO UV-MS-4 HEATING COIL AND ROUTE HWS/R MAINS THROUGH UV PIPING TUNNEL TO CLASSROOM 106.
DVE EXISTING 2-WAY PNEUMATIC CONTROL VALVE WITHIN EXISTING FIN TUBE ENLCOSURE SYSTEM. DISCONNECT AND REMOVE BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 2-WAY CONTROL VALVE RATED AT 2.4 GPM AT LOCATION OF REMOVED ALVE. MODIFY HWS BRANCH PIPING AS REQUIRED FOR INSTALLATION OF ELECTRONIC CONTROL VALVE. DISCONNECT AND CE TEMPERATURE SENSOR INLCUDING ASSOCIATED PNEUMATIC TUBING AND PROVIDE REPLACEMENT SPACE TEMPERATURE SHOWN AND TIE OPERATION OF CONTROL VALVE/SENSOR INTO EXISTING SIEMENS DDC SYSTEM. PROVIDE CONTROL WIRING LVE AND REPLACEMENT SENSOR AS REQUIRED.		PROVIDE 16" WIDE x 8" DEEP VERTICAL PIPE ENCLOSURE UNIT AT CORNER OF CLASSROOM TO CONCEAL REFRIGERANT LIQUID-SUCTION PIPING DROPS AND THE 3/4" CONDENSATE RISER DROP FROM THE TWO SECOND FLOOR CONDENSATE RISERS DROPS. ROUTE VERTICAL SUCTION/LIQUID PIPING DOWN THROUGH TOP OF HORIZONTAL PIPING ENCLOSURE AND CONNECT TO UV DX COIL CONNECTION AND UV EXPANSION VALVE KIT AS REQUIRED. ROUTE CONDENSATE DRAIN PIPING FROM VERTICAL DROP THROUGH HORIZONTAL PIPING ENCLOSURE AND CONNECT TO HORIZONTAL CONDENSATE DRAIN PIPING FROM VERTICAL DROP THROUGH HORIZONTAL PIPING ENCLOSURE AND CONNECT TO HORIZONTAL CONDENSATE DRAIN PIPING FROM VERTICAL DROP THROUGH HORIZONTAL PIPING ENCLOSURE AND CONNECT TO HORIZONTAL CONDENSATE DRAIN PIPING FROM FIRST FLOOR UV DRAIN PAN OUTLET PRIOR TO EXITING THROUGH EXTERIOR WALL. HEIGHT OF VERTICAL PIPING ENCLOSURE SHALL EXTEND FROM TOP OF HORIZONTAL PIPING ENCLOSURE UNIT TO UNDERSIDE OF EXISTING SUSPENDED CEILING SYSTEM.
EXISTING OA LOUVER	1" CONDENSATE DOWN	(46) PROVIDE 24" HIGH x 5" DEEP HORIZONTAL PIPING ENCLOSURE ON EITHER SIDE OF UV-MS-5. MOUNT TOP OF ENCLOSURE EVEN WITH TOP OF UNIT VENTILATOR UV-MS-5. PROVIDE 1" HWS/R BRANCHES TO UV-MS-5 HEATING COIL AND ROUTE 1-1/4" HWR MAIN THROUGH UV PIPING TUNNEL PAST UV-MS-5, THROUGH THE HORIZONTAL PIPING ENCLOSURE AND CONNECT TO THE EXISTING 1-1/4" HWR RISER AT THE CONNECTION POINT SHOWN AT BOTTOM RISER.
-1 1/4" HWS $-EXISTING OA PLENUM 6$		47) PROVIDE MINI-CONDENSATE REMOVAL PUMP AT LOCATION SHOWN ATTACHED TO UV-MS-3. ROUTE CONDENSATE FROM HORIZONTAL UV DRAIN PAN OUTLET TO INLET OF PUMP, THEN ROUTE CONDENSATE DRAIN PIPING FROM OUTLET OF PUMP TO 3/4" CONDENSATE DRAIN PIPING LINE AS SHOWN.
11/4" HWR 11/4" HWR 15 15 10 10 10 10 10 10 10 10 10 10	EXETR 28 46 UV-MS-5 8 15 15 24 COND C	SHOWN AND TIE OPERATION OF CONTROL VALVE/SENSOR INTO EXISTING SIEMENS DDC SYSTEM. PROVIDE CONTROL WIRING BETWEEN CONTROL VALVE AND REPLACEMENT SENSOR AS REQUIRED.
28 10"ø SA		EVEL 3/4" CONDENSATE DRAIN RISER UP THROUGH FLOOR. ROUTE CONDENSATE PIPING TO DRINKING FOUNTAIN TERMINATION OUTLET AS OUTLINED IN KEYED NOTE 27.
SA-1	5/8" REFRIGERANT SUCTION- 3/8" REFRIGERANT LIQUID- 1" COND- 1" COND-	50 PROVIDE 1" CONDENSATE DRAIN RISER UP THROUGH FLOOR AT LOCATION SHOWN.

- EXISTING 1-1/2" HWS DOWN TO FLOOR LEVEL

—3/4" COND

-1" HWR

-1 1/2" HWS

- 3/4" CONDENSATE

FABRICATION

-1 1/4" HWS

-1 1/4" HWR

CNC ROOM

( A )

DOWN

3/4" CONDENSATE

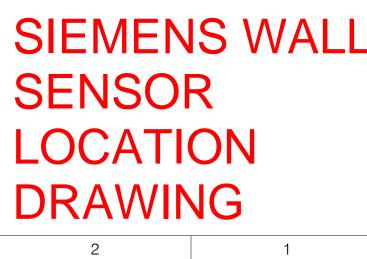
- EXISTING 1-1/4" HWS

UP TO SECOND FLOOR

51 LOCATION OF TYPICAL CEILING MOUNTED RELIEF AIR REGISTER DUCTED THROUGH CORRIDOR WALL TO CORRIDOR CEILING PLENUM, TERMINATED OPEN-

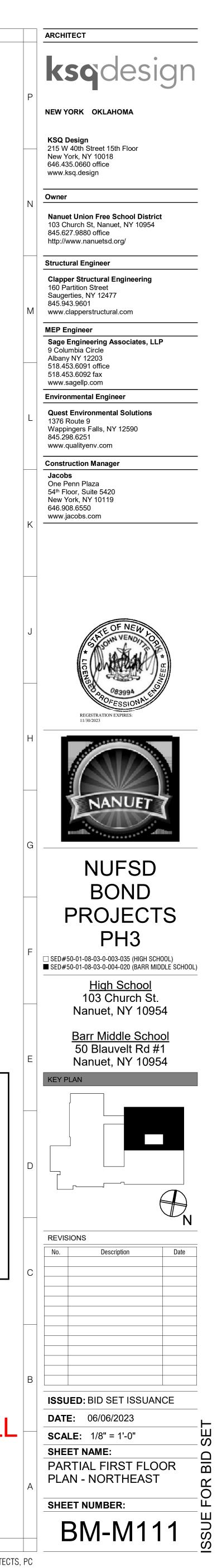
ENDED ABOVE CEILING PLENUM FOR RELIEF AIR OF CLASSROOMS.

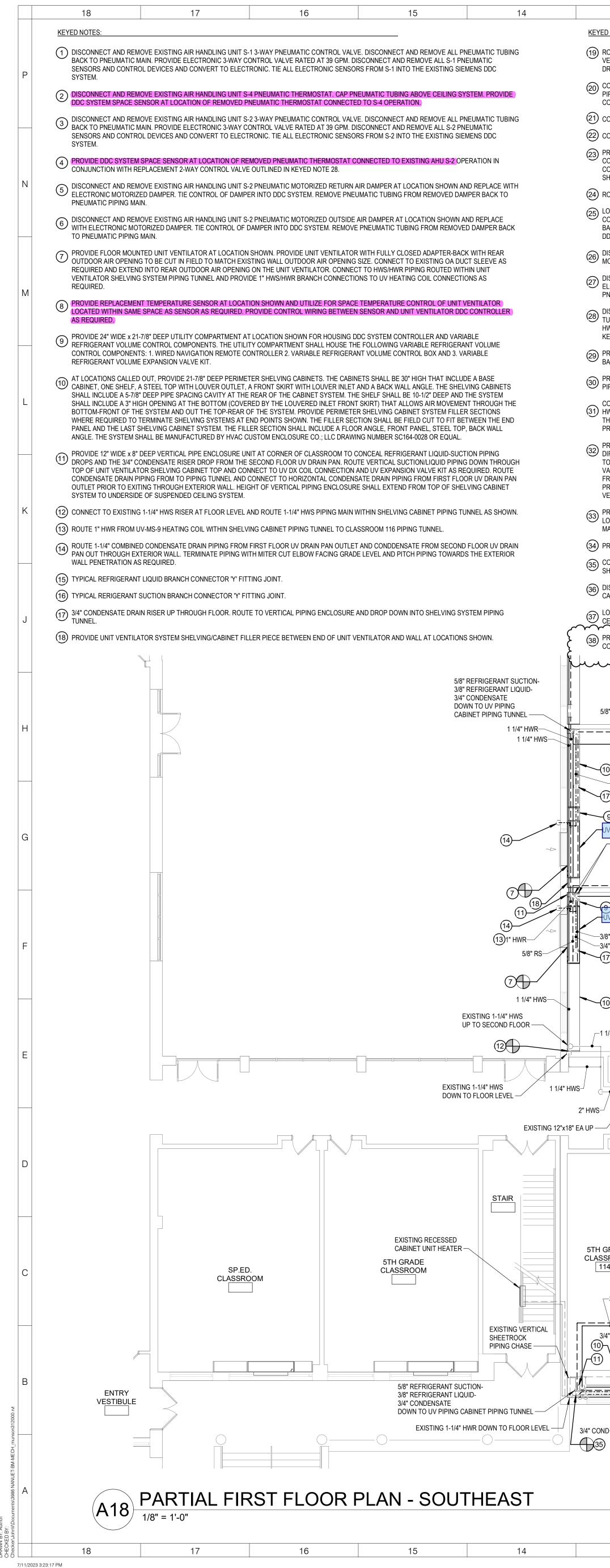
LEGEND:					
UV-MS-XX	UNIT VENTILATOR				
FT-MS-1	NEW FIN TUBE RADIATOR				
1	UV/NEW FTR-WALL SENSOR				
EX FTR	EXISTING FIN TUBE RADIATOR				
T	EX FTR-WALL SENSOR				
EX S-X	EXISTING AIR HANDLING UNIT				
T	EX AHU-WALL SENSOR				



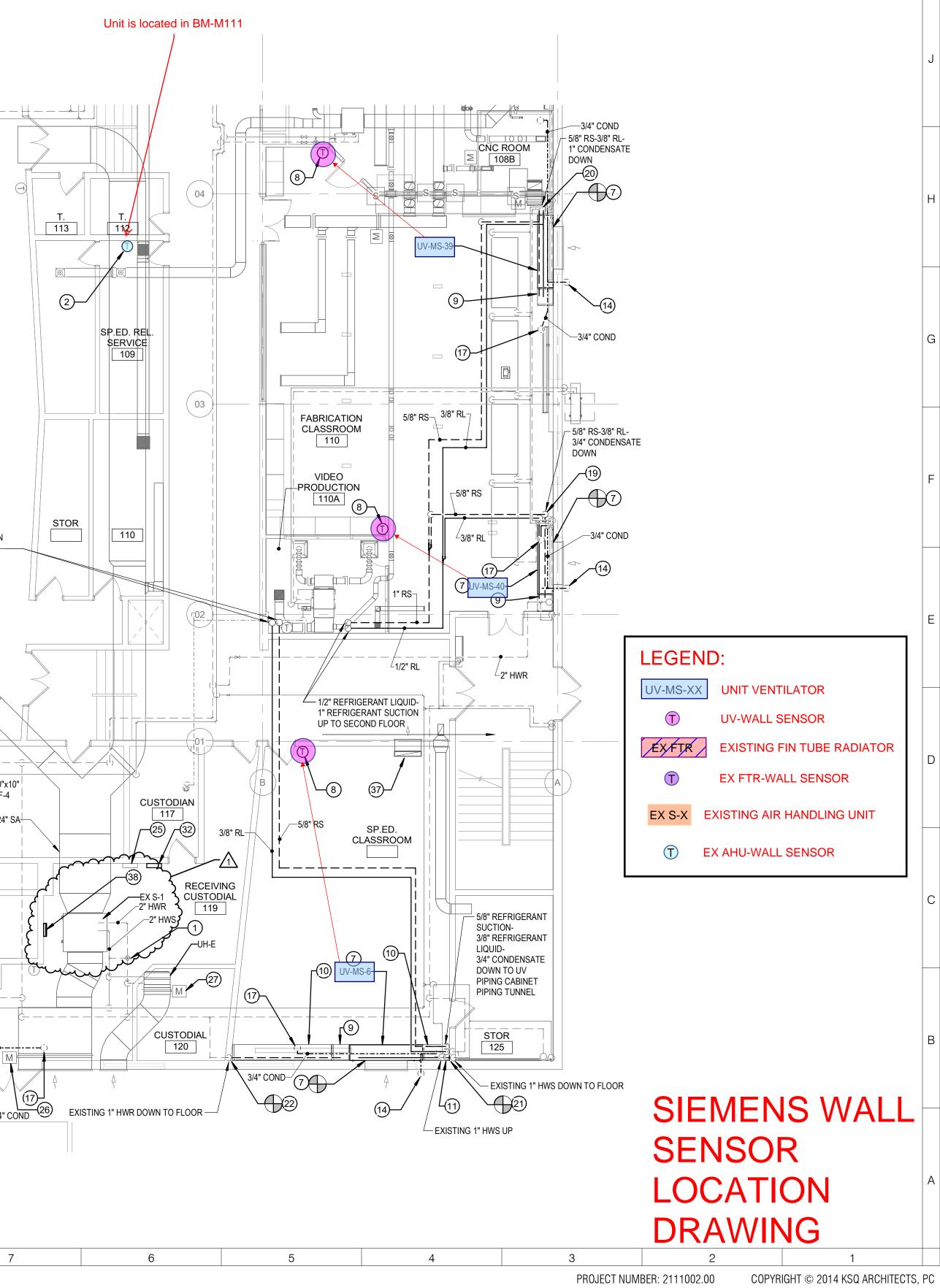
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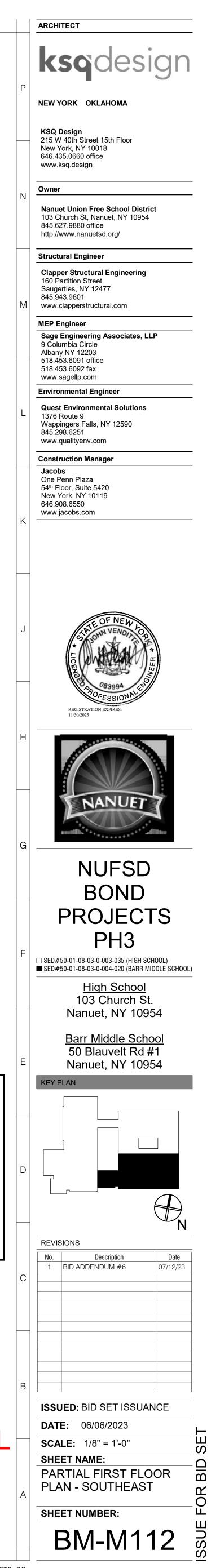
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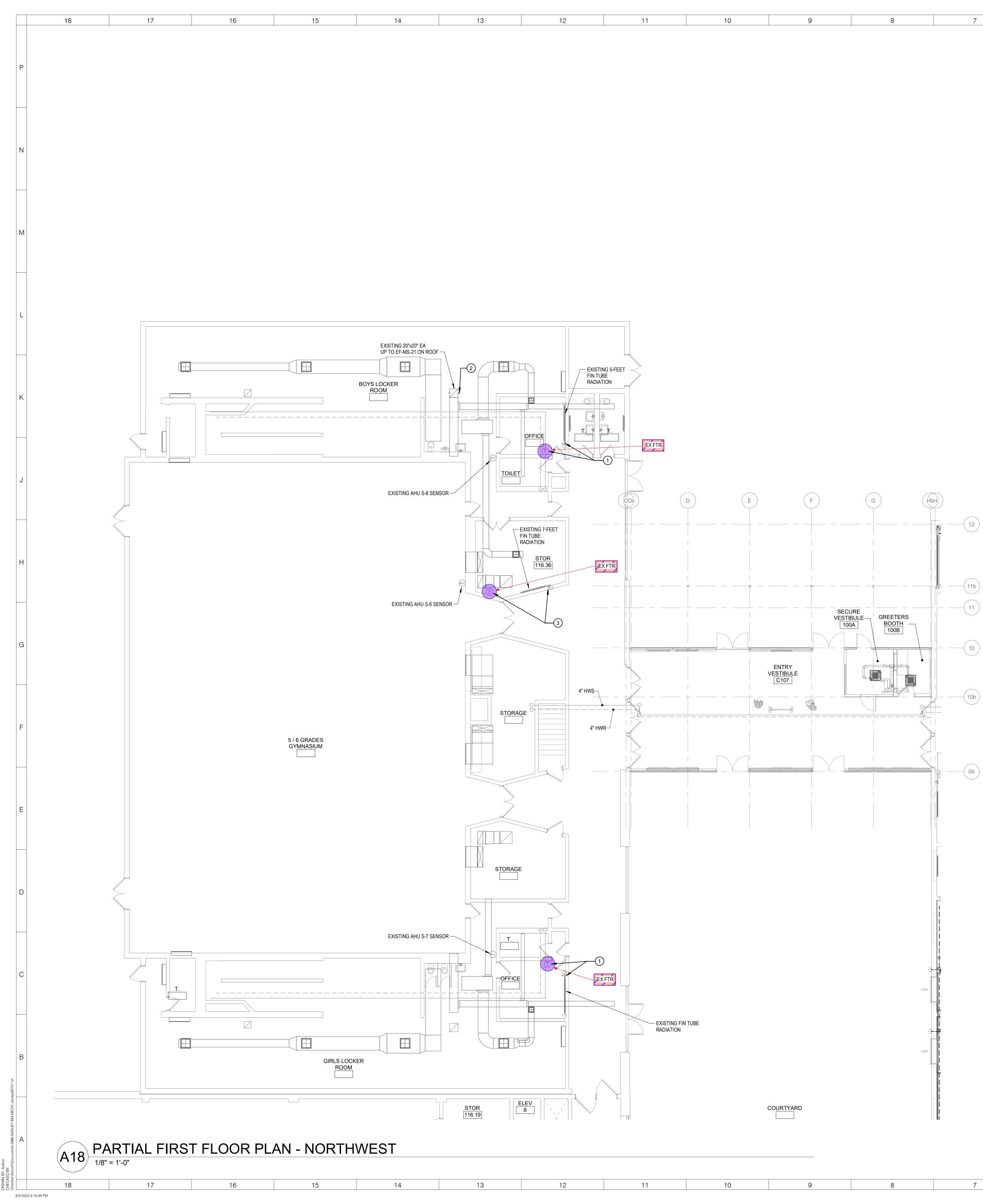




	POILE SH' CONDENSATE DRAIN FROM RISER UP THROUGH FLOOR AND THE 38" LOUID SP' SUCTION PIPING DROPS DOWN THROUGH VERTICAL CHASE TO WITHIN UNIT VERTICAR PIPING TUNNEL. BOUTE SUCTIONALIZING PIPING TO SYMBODIA VUL & KIT WITHIN UTILITY COMPARITMENT AND UV DX COLLAS REQUIRED. ROUTE CONDENSATE PIPING DROPS DOWN HROUGH VERTICAL CHASE TO WITHIN UNIT VERTICAR PIPING DROPS DOWN THROUGH PICKT TO EXPANSION VULLES TO WITHIN UTILITY COMPARITMENT OF UNIT AREA CONDENSATE DRAINS FROM TWO BESTL CACHONS UP THROUGH FLOOR TO DING F' COMPENSATE RESER DROP, ADD THE SY LUDD SS'S SUCTION PIPING DROPS DOWN HROUGH VERTICAL CHASE TO WITHIN UNIT VERTICATOR PIPING DROPS DOWN THROUGH PICKT TO EXPANSION VULLES IT UNITS COMPARITMENT AND UV DX COLLAS REQUIRED. ROUTE T' WIST DU VARS HEATING TO UNITS & CONDENSATE BRAIN LINE AS REQUIRED. CONNECT TO EXISTING T' HING DROP AT BASE OF RESER AND ROUTE T' HING TO UNITS & HEATING COLL CONNECT TO EXISTING T' HING DROP AT BASE OF RESER AND ROUTE T' HING TO UNITS & HEATING COLL CONNECT TO EXISTING T' HING DROP AT BASE OF RESER AND ROUTE T' HING TO UNITS & HEATING COLL POWIDE 24" VIDE 4 21-70" CERETURITY COLLAR DRIVEN FLOOR THRU THAN TO UNITS & HEATING COLL POWIDE 24" VIDE 4 21-70" CERETURITY COLLAR DRIVEN FLOOR THRU HAND AND COLL POWIDE 24" VIDE 4 21-70" CERETURITY COLLAR DRIVEN FLOOR THRU HAND AND COLL POWIDE 24" VIDE 4 21-70" CERETURITY COLLAR DRIVEN FLOOR THRU HAND AND ANALL POWIDE 24" VIDE 4 21-70" CERETURITY COLLAR DRIVEN FLOOR THRU HAND AND ANALL POWIDE 24" VIDE 4 21-70" CERETURITY COLLAR DRIVEN FLOOR THRU HAND AND ANALL POWIDE 24" VIDE 4 21-70" CERETURITY COLLAR DRIVEN FLOOR THRU HAND HAND AND ANALL POWIDE 24" VIDE 4 21-70" CERETURITY COLLAR DRIVEN FLOOR THRU HAND HAND AND ANALL POWIDE 24" VIDE 4 21-70" CERETURITY COLLAR DRIVEN FLOOR THRU HAND HAND AND ANALL POWIDE 24" VIDE 4 21-70" CERETURITY COLLARD THRU HAND HAND AND ANALL POWIDE 24" VIDE 4 21-70" CERETURITY COLARD THRU HAND HAND HAND AND AND ANALL<	<ol> <li>REFRIGERANT PIPING NOTE: 90 DEGREE ELBOWS SHALL BE KEPT A MINIMUM OF 20° FROM BRANCH CONNECTOR 'Y' JOINTS. IN ADDITION, BRANCH CONNECTOR 'Y' JOINTS SHALL BE A MINIMUM OF 40° FROM ANOTHER BRANCH 'Y' CONNECTOR JOINT.</li> <li>REFRIGERANT PIPING NOTE: THE HEAT PUMP SYSTEM MANUFACTURER SHALL INSPECT ALL FIELD INSTALLED REFRIGERANT PIPING PRIOR TO INSULATION INSTALLATION.</li> <li>THE EXISTING SUSPENDED CEILING SYSTEMS LOCATED WITHIN THE SCOPE OF WORK AREA OUTSIDE OF AREAS BEING RENOVATED BY THE GENERAL CONTRACTOR SHALL BE DISCONNECTED AND REMOVED TO ALLOW FOR THE INSTALLATION WORK AND REINSTALLED FOLLOWING COMPLETION OF THE WORK BY THE MECHANICAL CONTRACTOR. THE SUSPENDED CEILING GRID SYSTEMS SHALL BE REMOVED AND MODIFIED TO COMPLETE THE WORK AND REINSTALLED FOLLOWING THE COMPLETION OF WORK. ANY CEILING TILES SHALL BE REMOVED AS REQUIRED TO COMPLETE THE WORK AND REINSTALLED FOLLOWING THE COMPLETION OF WORK. ANY CEILING TILES DAMAGED DURING THE INSTALLATION WORK SHALL BE REPLACED BY THE MECHANICAL CONTRACTOR. THE CEILING SHALL BE FRIMEPROOFING ASSOCIATED WITH THE INSTALLATION WORK SHALL BE COMPLETE ON THE MISTALLED FOLLOWING THE COMPLETION OF THE STALLATION WORK. ANY CEILING TILES DAMAGED DURING THE INSTALLATION WORK SHALL BE REPLACED BY THE MECHANICAL CONTRACTOR TO MATCH THE EXISTING CEILING TILES.</li> <li>ALL CUTTING, PATCHING, AND FIREPROOFING ASSOCIATED WITH THE INSTALLATION WORK SHALL BE COMPLETED BY THE MECHANICAL CONTRACTOR. PATCHED AREAS SHALL BE FRIGERANT SUCTION AND LIQUID PIPING ADS CONDENSATE PIPING PRETRATIONS THROUGH CORRIDOR WALLS SHALL BE FIREPROOFED PER SPECIFICATION SECTION 078400.</li> <li>ROUTE REFRIGERANT SUCTION AND LIQUID PIPING SIZES AND BRANCH CONNECTOR 'Y' JOINT LOCATIONS REQUIRED WITH HEAT PUMP SYSTEM MANUFACTURER.</li> <li>THE SMALLEST VOLUME ROOM THAT THE REFRIGERANT PIPING SIZES AND BRANCH CONNECTOR 'Y' JOINT LOCATIONS REQUIRED WITH HEASHRAE STANDARD 15 REFRIGERANT SUCTION THAT THE REFRIGERANT PIPING SIZES AND BRANCH CONNECTOR 'Y' JOINT LOCATIONS REQUIR</li></ol>
	PROVIDED FROM EACH HEAT PUMP UNIT TO EACH CONTROLLER KIT LOCATED WITHIN THE UTILITY COMPARTMENT OF EACH NEW UNIT VENTLATOR.  PROVIDE UL-207 LISTED EXPANSION LOOP FOR THE 3/8' REFRIGERANT LIQUID AND 7/8' REFRIGERANT SUCTION LINES AT LOCATION SHOWN. THE 3/8' LOOP SHALL BE 28-1/2' LONG X 17.12' HIGH. THE 7/8' LOOP SHALL BE 28-1/2' LONG X 19-3/4' WIDE. PROVIDE PIPE GUIDES ON ETHER SIDE OF LOOP AND PIPE ANCHORS AT END OF PIPING RUNS PER MANUFACTURER'S RECOMMENDATIONS. INSTALL REFRIGERANT MAINS AT DIFFERENT ELEVATIONS TO ALLOW LOOPS TO AVOID CONFLICT WITHIN CEILING PLENUM.  PROVIDE CLEANOUT PLUG AT LOCATION SHOWN WITHIN CONDENSATE DRAIN PIPING. CONNECT TO EXISTING 3/4' HWS AND 1-1/4'' HWR PIPING LINES AT CONNECTION POINT SHOWN UPSTREAM OF PIPING PENETRATIONS THROUGH EXISTING VERTICAL SHEETROCK PIPING CHASE. DISCONNECT, REMOVE AND REINSTALL EXISTING PLYWOOD SERVING AS BOTTOM OF SOFFIT WITHIN CLASSROOM 116.5 AS REQUIRED TO PROVIDE REFRIGERANT RISERS CALLED OUT. UTILIZE EXISTING SCREWS WITHIN PLYWOOD SOFFIT AS REQUIRED TO REMOVE/REINSTALL. LOCATION OF TYPICAL CEILING MOUNTED RELIEF AIR REGISTER DUCTED THROUGH CORRIDOR WALL TO CORRIDOR CEILING PLENUM, TERMINATED OPEN-ENDED ABOVE CEILING PLENUM FOR RELIEF AIR OF CLASSROOMS. PROVIDE DC SYSTEM CONTROL PANEL/ENCLOSURE AT LOCATION SHOWN TO HOUSE DDC CONTROLLERS, TRANSFORMERS, RELAYS, AND REQUIRED DDC SYSTEM PROVIDED CS SYSTEM CONTROL PANEL/ENCLOSURE AT LOCATION SHOWN TO HOUSE DDC CONTROLLERS, TRANSFORMERS, RELAYS, AND REQUIRED DDC SYSTEM PROVIDED SCHERE OF OPERATIONS.	
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ASSROOM 114.5 38" RL 38" RL	Ad'X20'SA Ad'X20'SA	1/2" REFRIGERANT LIQUID- 11" REFRIGERANT SUCTION UP TO SECOND FLOOR       UV-MS-XX       UNIT VENTILATOR         0       1/2" REFRIGERANT SUCTION UP TO SECOND FLOOR       IV-MS-XX       UNIT VENTILATOR         0       0       0       IV-MS-XX       UV-MS-XX         0       0       0       IV-WALL SENSOR         IV-MS-XX       IV-WALL SENSOR       IV-WALL SENSOR
120 121 123 123 120 125 125 125 125 125 125 125 125	ASSROOM 114.5 3/8" RL 5/8" REFIGERANT LIQUID. 3/4" CONDENSATE DOWN TO UV PIPING CABINET PIPING TUNNEL 11/4" HWR 11/4" HWR 1	EXISTING 1" HWR DOWN TO FLOOR

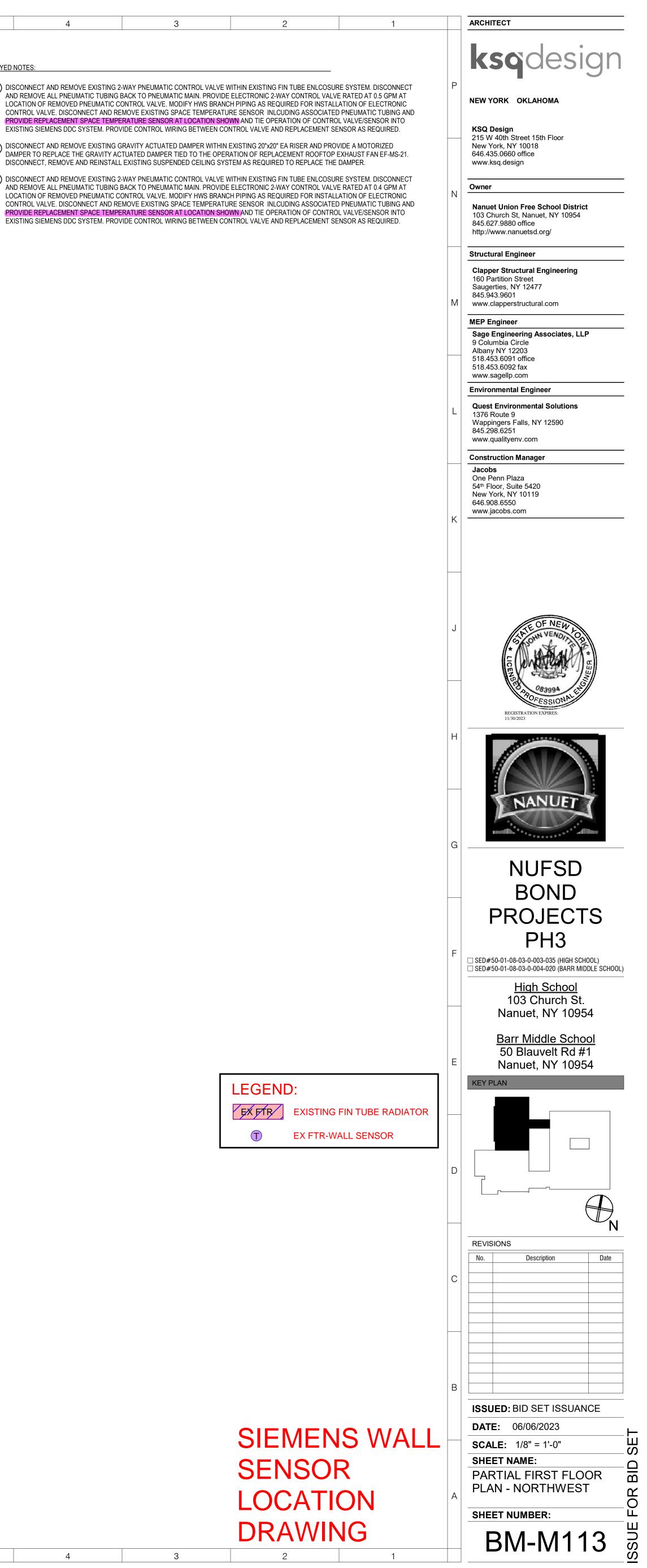




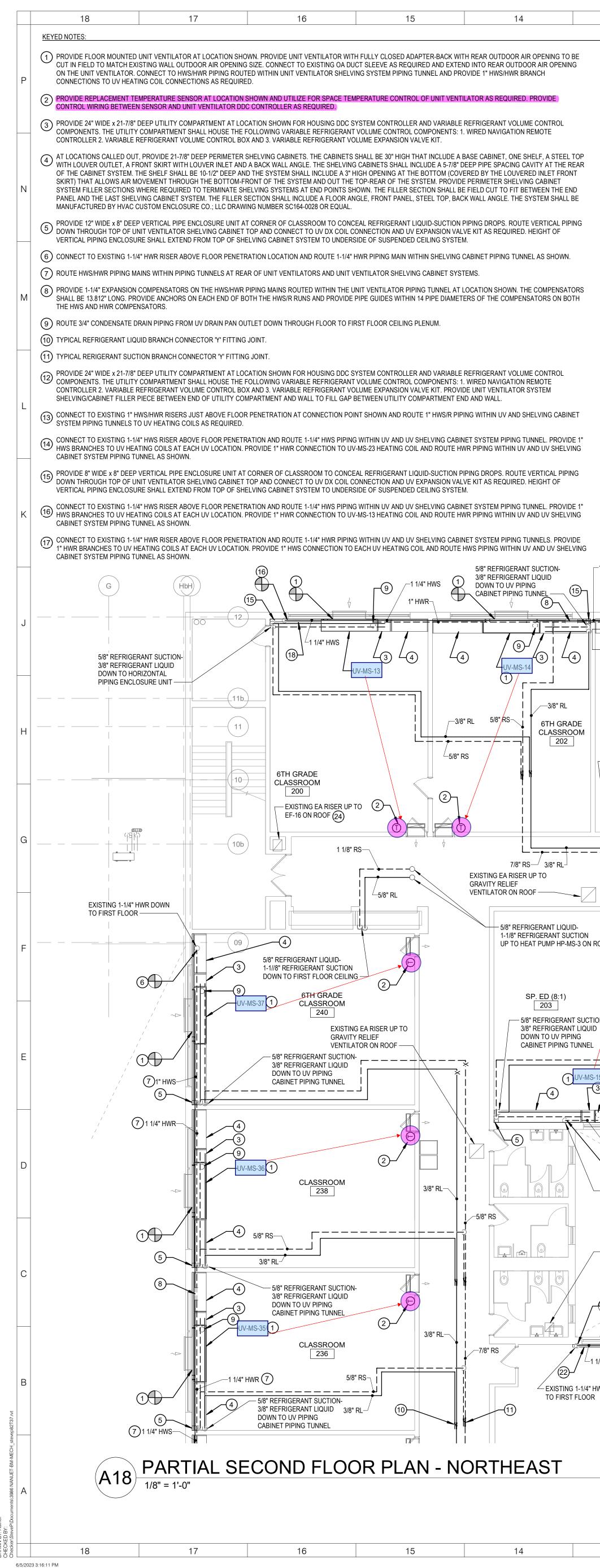


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		AN LO CC PR EX (2) DIS DA DIS AN LO CC	SCONNECT AND REMOVE EXISTING 2- ID REMOVE ALL PNEUMATIC TUBING E CATION OF REMOVED PNEUMATIC CO INTROL VALVE. DISCONNECT AND RE IOVIDE REPLACEMENT SPACE TEMPE ISTING SIEMENS DDC SYSTEM. PROV SCONNECT AND REMOVE EXISTING G MPER TO REPLACE THE GRAVITY AC SCONNECT, REMOVE AND REINSTALL SCONNECT, REMOVE AND REINSTALL SCONNECT AND REMOVE EXISTING 2- ID REMOVE ALL PNEUMATIC TUBING E CATION OF REMOVED PNEUMATIC CO INTROL VALVE. DISCONNECT AND RE	WAY PNEUMATIC CONTROL VALVE W BACK TO PNEUMATIC MAIN. PROVIDE DNTROL VALVE. MODIFY HWS BRANCI MOVE EXISTING SPACE TEMPERATUF RATURE SENSOR AT LOCATION SHOW IDE CONTROL WIRING BETWEEN CON RAVITY ACTUATED DAMPER WITHIN E TUATED DAMPER TIED TO THE OPER/ EXISTING SUSPENDED CEILING SYST WAY PNEUMATIC CONTROL VALVE W BACK TO PNEUMATIC CONTROL VALVE W BACK TO PNEUMATIC MAIN. PROVIDE DNTROL VALVE. MODIFY HWS BRANCI MOVE EXISTING SPACE TEMPERATUF	ELECTRONIC 2-WAY CONTROL VALVE H PIPING AS REQUIRED FOR INSTALL RE SENSOR INLCUDING ASSOCIATED WN AND TIE OPERATION OF CONTROL ITROL VALVE AND REPLACEMENT SE EXISTING 20"x20" EA RISER AND PROV ATION OF REPLACEMENT ROOFTOP E TEM AS REQUIRED TO REPLACE THE ITHIN EXISTING FIN TUBE ENLCOSUR ELECTRONIC 2-WAY CONTROL VALVE H PIPING AS REQUIRED FOR INSTALL RE SENSOR INLCUDING ASSOCIATED	E RATED AT 0.5 GPM AT ATION OF ELECTRONIC PNEUMATIC TUBING AND L VALVE/SENSOR INTO NSOR AS REQUIRED. //IDE A MOTORIZED EXHAUST FAN EF-MS-21. DAMPER. RE SYSTEM. DISCONNECT E RATED AT 0.4 GPM AT ATION OF ELECTRONIC PNEUMATIC TUBING AND

LEGEND: EX FTR-WALL SENSOR T



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<ul> <li>(31) TUNNEL SYSTEM OF UV-MS-17.</li> <li>(32) ROUTE 3/4" CONDENSATE DRAIN PIPING FRO FROM UV-MS-17. AT POINT OF COMBINING T SYSTEMS TO POINT OF DROP DOWN TO FIRS</li> </ul>	M DRAIN PAN OUTLET OF UV-MS-17 WITHIN UV P WO UV CONDENSATE DRAINS, INCREASE HORIZ ST FLOOR AS OUTLINED ON KEYED NOTE 33.	PING TUNNEL SYSTEM AND CONNECT TO ONTAL CONDENSATE DRAIN PIPING TO 1	O 3/4" HORIZONTAL DRAIN PIPING ROUT ", THEN ROUTE THROUGH UV PIPING TI	TED JNNEL	
0	OP DOWN TO FIRST FLOOR AT LOCATION SHOWN			EILING	
PLENUM FOR RELIEF AIR OF CLASSROOMS.	"HWS 5/8" REFRIGERANT SUCTION- 3/8" REFRIGERANT LIQUID DOWN TO UV PIPING CABINET PIPING TUNNEL (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	TIGERANT LIQUID-	5/8" REFRIGERANT S 3/8" REFRIGERANT L DOWN TO UV PIPING TUR CABINET PIPING TUR (4) (4) (4) (4) (4) (4) (4) (4)	SUCTION- IQUID I 1/4" HWR I 1/4" HWR I 1/4" HWR I 1/4" HWR I 1/4"	EXISTING 1- TO FIRST FI EXISTING EXISTING EXISTING EXISTING EXISTING EARIS EF-MS
ION-D     5/8" RL       5/8" RS     3/8" REFRIGERANT S       5/8" RS     3/8" REFRIGERANT S       3/8" REFRIGERANT L     DOWN TO UV PIPING       0     1 UV-MS-17       3     4	CLASSROOM 205 UP TO 1-3/8" R UP TO 1-3/8" R UP TO 1-3/8" R UP TO 1-3/8" R UP TO 1-3/8" R UP TO 1-3/8" R UP TO 1-3/8" R 1-3/8" R UP TO 1-3/8" R 1-3/8" R 1-3/	FRIGERANT LIQUID- EFRIGERANT SUCTION HEAT PUMP HP-MS-5 ON ROOF 5/8" RS 3/8" RL FRIGERANT SUCTION- EFRIGERANT SUCTION- EFRIGERANT LIQUID I TO UV PIPING IET PIPING TUNNEL	-3/8" RI -7/8" RL -7/8" RL -7/8" REFR 7/8" REFR DOWN TO -1 1/2" RS -7/8" CLAS		( 1) ( 3) ( 4) 1"
- EXISTING 1" HWR DOWN TO FIRST FLOOR - EXISTING EA RISER UP TO EE-5 ON ROOF	5 1" HWS- 1 (13) EXISTING 1" HWS DOWN TO FIRST FLOOR (24) EXISTING EA RISER U TO EF-6 ON ROOF		GRAV VENTI	ING EA RISER UP TO ITY RELIEF LATOR ON ROOF 7TH GRADE CLASSROOM 214	(4) UV-MS-2 (1) (7) (3) (4) (1)
	1 1/4" HWR		CLASS 2 -3/8" RL	GRADE SROOM 16 3/8" RL 5/8" RS	(
1/4" HWS HWS DOWN	(22) EXISTING 1-1/4" HWR DOWN TO FIRST FLOOR	SMALL INST. RM 241E	-5/8" RL 04 B	3/8" RL 5/8" RS	(3) (4) 11
13 12	11	10	9	8	7

TUNNEL SYSTEM OF UV-MS-17.

(31) ROUTE 3/4" CONDENSATE DRAIN PIPING FROM DRAIN PAN OUTLET OF UV-MS-20 WITHIN UV PIPING TUNNEL SYSTEM AND CONNECT TO HORIZONTAL DRAIN PIPING WITHIN PIPING

30 PROVIDE UL-207 LISTED EXPANSION LOOP FOR THE 5/8" REFRIGERANT LIQUID AND 1-1/4" REFRIGERANT SUCTION LINES AT LOCATION SHOWN. THE 5/8" LOOP SHALL BE 28-1/2" LONG x 193/4" HIGH. THE 1-1/4" LOOP SHALL BE 30" LONG x 23" WIDE. PROVIDE PIPE GUIDES ON EITHER SIDE OF LOOP AND PIPE ANCHORS AT END OF PIPING RUNS PER MANUFACTURER'S RECOMMENDATIONS.

(29) PROVIDE UL-207 LISTED EXPANSION LOOP FOR THE 7/8" REFRIGERANT LIQUID AND 1-1/2" REFRIGERANT SUCTION LINES AT LOCATION SHOWN. THE 7/8" LOOP SHALL BE 28-3/4" LONG x 21" HIGH. THE 1-1/2" LOOP SHALL BE 31" LONG x 25" WIDE. PROVIDE PIPE GUIDES ON EITHER SIDE OF LOOP AND PIPE ANCHORS AT END OF PIPING RUNS PER

13

KEYED NOTES (CONTINUED):

(21) REQUIRED.

P REQUIRED.

THE RADIATOR HEIGHT AND DEPTH.

MANUFACTURER'S RECOMMENDATIONS.

VALVE/SENSOR INTO EXISTING SIEMENS DDC SYSTEM.

12

SUCTION/LIQUID REFRIGERANT PIPING WITHIN HORIZONTAL ENCLOSURE TO UV PIPING TUNNEL.

(28) CONTROL WIRING BETWEEN SENSOR AND UNIT VENTILATOR UV-MS-17 DDC CONTROLLER AS REQUIRED.

11

(18) PROVIDE 18" HIGH x 5" DEEP HORIZONTAL PIPING ENCLOSURE UNIT BETWEEN WALL AND END OF UNIT VENTILATOR AT LOCATION SHOWN. ROUTE HWS PIPING AND

(20) CONNECT TO EXISTING 1-1/4" HWS/R RISERS ABOVE FLOOR PENETRATIONS AT CONNECTION POINTS SHOWN AND ROUTE HWS/R TO RADIATOR UNITS AS REQUIRED.

(22) PROVIDE HORIZONTAL AND VERTICAL TRIM COVERS AT LOCATIONS SHOWN TO CONCEAL THE HWS/HWR PIPNG SERVING R-MS-1/R-MS-2 FURNISHED BY THE RADIATOR MANUFACTURER, WITH HEIGHT AND DEPTH OF TRIM COVER TO MATCH THE RADIATOR HEIGHT AND DEPTH.

(19) PROVIDE 18" HIGH x 5" DEEP HORIZONTAL PIPING ENCLOSURE UNIT BETWEEN WALL AND END OF UV UTILITY COMPARTMENT AT LOCATION SHOWN. ROUTE HWR PIPING AND SUCTION/LIQUID REFRIGERANT PIPING WITHIN HORIZONTAL ENCLOSURE TO UV PIPING TUNNEL.

PROVIDE SPACE TEMPERATURE SENSOR AT LOCATION SHOWN. PROVIDE CONTROL WIRING FROM SENSOR TO CONTROL VALVE SERVING RADIATOR UNITS R-MS-1/R-MS-2 AS

23 PROVIDE 3/4" EXPANSION COMPENSATOR FLEXIBLE CONNECTOR AT LOCATION SHOWN BETWEEN TWO RADIATOR UNITS R-MS-1 AND R-MS-2. INSTALL THE FLEXIBLE CONNECTOR IN A U-BEND FORMAT WITH THE U FACING DOWN. CONNECT THE OUTLET PIPING FROM R-MS-1 TO THE INLET OF R-MS-2. PROVIDE A HORIZONTAL WALL TRIM COVER OVER THE

PROVIDE MOTORIZED DAMPER WITHIN EXISTING EA DUCT RISER. MODIFY EA RISER AS REQUIRED FOR DAMPER INSTALLATION. TIE CONTROL OF DAMPER TO OPERATION OF

DISCONNECT AND REMOVE EXISTING 2-WAY PNEUMATIC CONTROL VALVE WITHIN EXISTING FIN TUBE ENLCOSURE SYSTEM. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 2-WAY CONTROL VALVE RATED AT 1.5 GPM AT LOCATION OF REMOVED PNEUMATIC CONTROL VALVE. MODIFY HWS BRANCH

PIPING AS REQUIRED FOR INSTALLATION OF ELECTRONIC CONTROL VALVE. PROVIDE SPACE TEMPERATURE SENSOR AT LOCATION SHOWN AND TIE OPERATION OF CONTROL

(26) DISCONNECT AND REMOVE DAMAGED SPACE TEMPERATURE SENSOR AT LOCATION SHOWN AND PROVIDE REPLACEMENT SPACE TEMPERATURE SENSOR TIED TO UV-MS-21 DDC CONTROLLER. PROVIDE CONTROL WIRING FROM REPLACEMENT SENSOR TO UV CONTROLLER AS REQUIRED.

PROVIDE REPLACEMENT SPACE TEMPERATURE SENSOR TIED TO UV-MS-22 DDC CONTROLLER. PROVIDE CONTROL WIRING FROM REPLACEMENT SENSOR TO UV CONTROLLER AS

PROVIDE REPLACEMENT TEMPERATURE SENSOR AT LOCATION SHOWN AND UTILIZE FOR SPACE TEMPERATURE CONTROL OF UNIT VENTILATOR AS REQUIRED. PROVIDE

ROOFTOP EXHAUST FAN CONNECTED TO EA RISER. PROVIDE CONTROL RELAY TO EXISTING EXHAUST FAN AND TIE OPERATION OF EXHAUST FAN TO DDC SYSTEM.

PIPING AND FLEXIBLE CONNECTOR BETWEEN THE TWO RADIATOR UNITS FURNISHED BY THE RADIATOR MANUFACTURER, WITH HEIGHT AND DEPTH OF TRIM COVER TO MATCH

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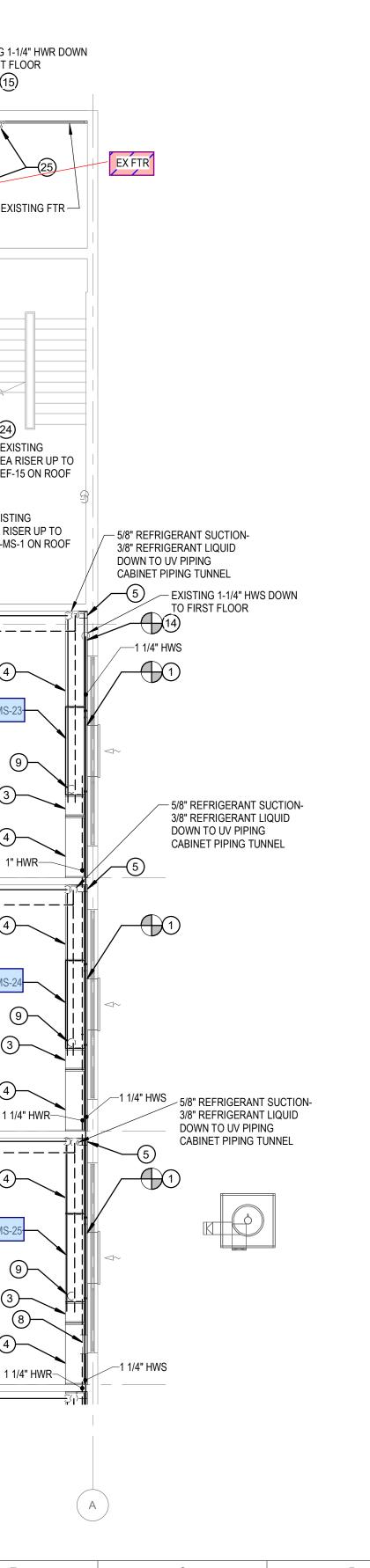
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GENERAL NOT	ES:				
	ERANT PIPING NOTE: 90 DEGREE ELB UM OF 40" FROM ANOTHER BRANCH '		0" FROM BRANCH CONNECTOR 'Y' JOI	NTS. IN ADDITION, BRANCH CONNECT	FOR 'Y' JOINTS SHALL BE
2. REFRIG	ERANT PIPING NOTE: THE HEAT PUM	P SYSTEM MANUFACTURER SHALL INS	PECT ALL FIELD INSTALLED REFRIGE	RANT PIPING PRIOR TO INSULATION I	NSTALLATION.
DISCON SUSPEN SHALL E	NECTED AND REMOVED TO ALLOW FO IDED CEILING GRID SYSTEMS SHALL I BE REMOVED AS REQUIRED TO COMP	OR THE INSTALLATION WORK AND RE BE REMOVED AND MODIFIED TO COM LETE THE WORK AND REINSTALLED F	DRK AREA OUTSIDE OF AREAS BEING NSTALLED FOLLOWING COMPLETION PLETE THE WORK AND REINSTALLED F OLLOWING THE COMPLETION OF THE TRACTOR TO MATCH THE EXISTING C	OF THE WORK BY THE MECHANICAL FOLLOWING THE COMPLETION OF WO INSTALLATION WORK. ANY CEILING 1	CONTRACTOR. THE DRK. THE CEILING TILES
MATCH			ON WORK SHALL BE COMPLETED BY T IG PENETRATIONS THROUGH CORRID		
			DX COIL CONNECTIONS TO THE HEAT I		
	REFRIGERANT PIPING THROUGH THE OF PENETRATION OF EACH HEAT PUI		PUMP SYSTEMS. PROVIDE A PIPE CU	RB AND SIDE REFRIGERANT PIPIPNG	OUTLET PORTAL AT

7. THE SMALLEST VOLUME ROOM THAT THE REFRIGERANT PIPING SYSTEMS ROUTE THROUGH FOR EACH OF THE HEAT PUMP SYSTEMS IS BELOW THE ASHRAE STANDARD 15

REFRIGERANT CONCENTRATION LIMIT OF 26 POUNDS PER 1,000 CUBIC FEET OF ROOM VOLUME FOR OCCUPIED SPACES. 8. PROVIDE FIRESTOPPING PER SPECIFICATION SECTION 078400 AT ALL PIPING PENETRATIONS THROUGH CORRIDOR WALLS AND STORAGE ROOM WALLS.

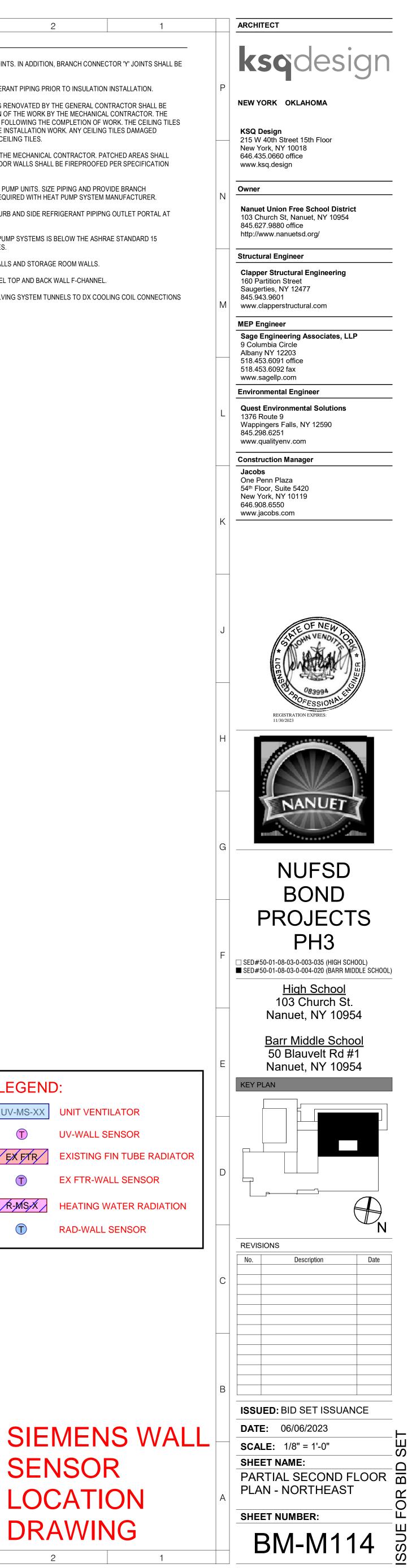
9. THE UV UTILITY COMPARTMENT SHALL INCLUDE A REMOVABLE FRONT PANEL, STANDARD #1/4-20 HEX FASTENER, STEEL TOP AND BACK WALL F-CHANNEL.

10. ROUTE REFRIGERANT SUCTION-LIQUID PIPING WITHIN UNIT VENTILATOR PIPING TUNNELS AND UNIT VENTILATOR SHELVING SYSTEM TUNNELS TO DX COOLING COIL CONNECTIONS AND UV EXPANSION VALVE KITS PER THE MANUFACTURER'S RECOMMENDATIONS.



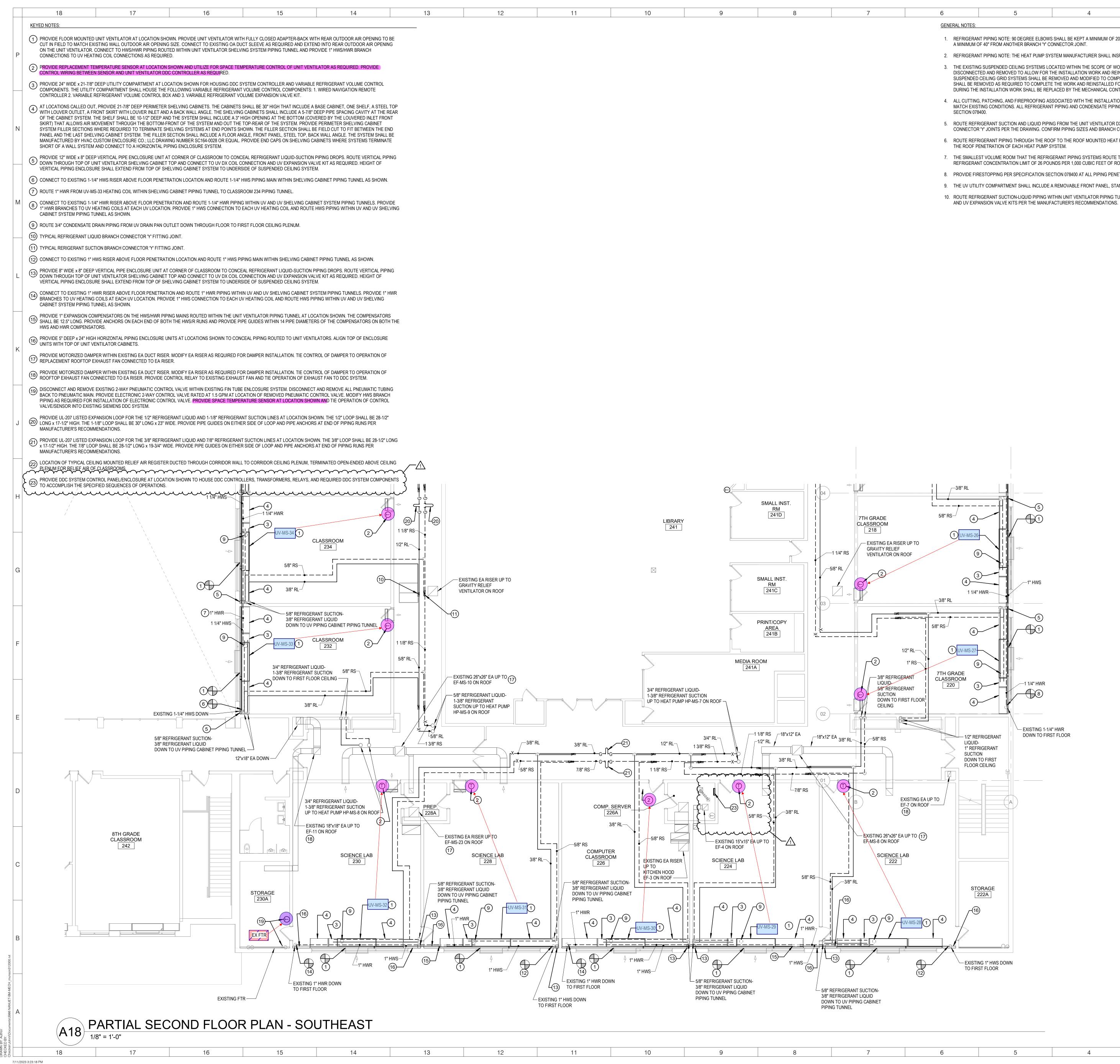
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LEGEND:				
UV-MS-XX	UNIT VENTILATOR			
T	UV-WALL SENSOR			
EX FTR	EXISTING FIN TUBE RADIATOR			
T	EX FTR-WALL SENSOR			
R-MS-X	HEATING WATER RADIATION			
T	RAD-WALL SENSOR			



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GENERAL 1	NOTES:				
	RIGERANT PIPING NOTE: 90 DEGREE ELBOWS NIMUM OF 40" FROM ANOTHER BRANCH 'Y' CO		ROM BRANCH CONNECTOR 'Y' JOINTS	S. IN ADDITION, BRANCH CONNECTOR	'Y' JOINTS SHALL BE
2. REF	RIGERANT PIPING NOTE: THE HEAT PUMP SYS	STEM MANUFACTURER SHALL INSPEC	T ALL FIELD INSTALLED REFRIGERAN	NT PIPING PRIOR TO INSULATION INS	TALLATION.
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MAT	CUTTING, PATCHING, AND FIREPROOFING AS CH EXISTING CONDITIONS. ALL REFRIGERAN TION 078400.				
5. ROU	TE REFRIGERANT SUCTION AND LIQUID PIPIN	IG FROM THE UNIT VENTILATOR DX C	OIL CONNECTIONS TO THE HEAT PUN	MP UNITS. SIZE PIPING AND PROVIDE	BRANCH

CONNECTOR 'Y' JOINTS PER THE DRAWING. CONFIRM PIPING SIZES AND BRANCH CONNECTOR 'Y' JOINT LOCATIONS REQUIRED WITH HEAT PUMP SYSTEM MANUFACTURER.

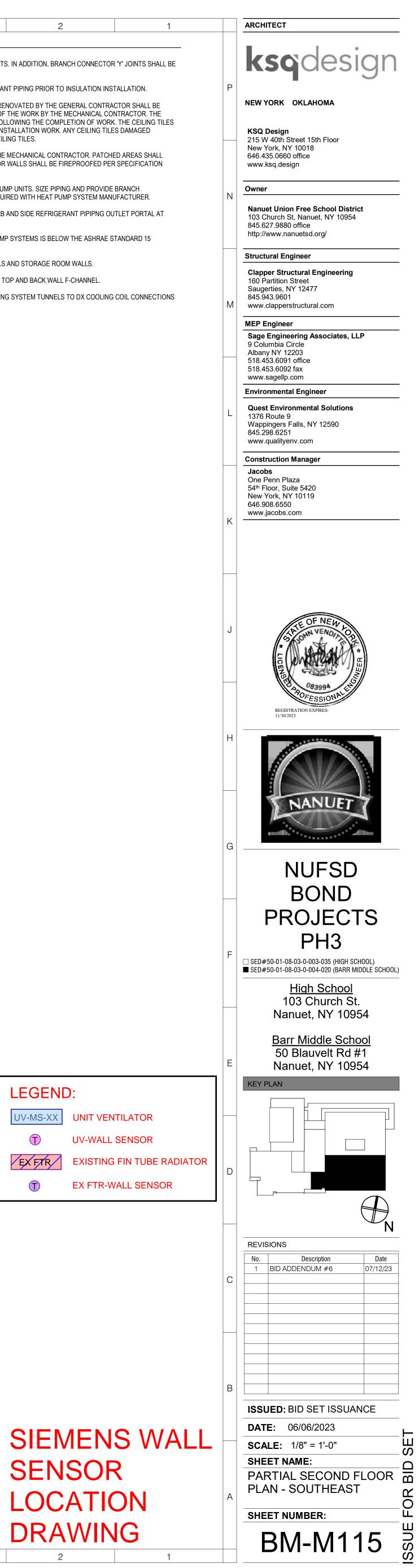
6. ROUTE REFRIGERANT PIPING THROUGH THE ROOF TO THE ROOF MOUNTED HEAT PUMP SYSTEMS. PROVIDE A PIPE CURB AND SIDE REFRIGERANT PIPIPNG OUTLET PORTAL AT 7. THE SMALLEST VOLUME ROOM THAT THE REFRIGERANT PIPING SYSTEMS ROUTE THROUGH FOR EACH OF THE HEAT PUMP SYSTEMS IS BELOW THE ASHRAE STANDARD 15

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8. PROVIDE FIRESTOPPING PER SPECIFICATION SECTION 078400 AT ALL PIPING PENETRATIONS THROUGH CORRIDOR WALLS AND STORAGE ROOM WALLS.

9. THE UV UTILITY COMPARTMENT SHALL INCLUDE A REMOVABLE FRONT PANEL, STANDARD #1/4-20 HEX FASTENER, STEEL TOP AND BACK WALL F-CHANNEL. 10. ROUTE REFRIGERANT SUCTION-LIQUID PIPING WITHIN UNIT VENTILATOR PIPING TUNNELS AND UNIT VENTILATOR SHELVING SYSTEM TUNNELS TO DX COOLING COIL CONNECTIONS

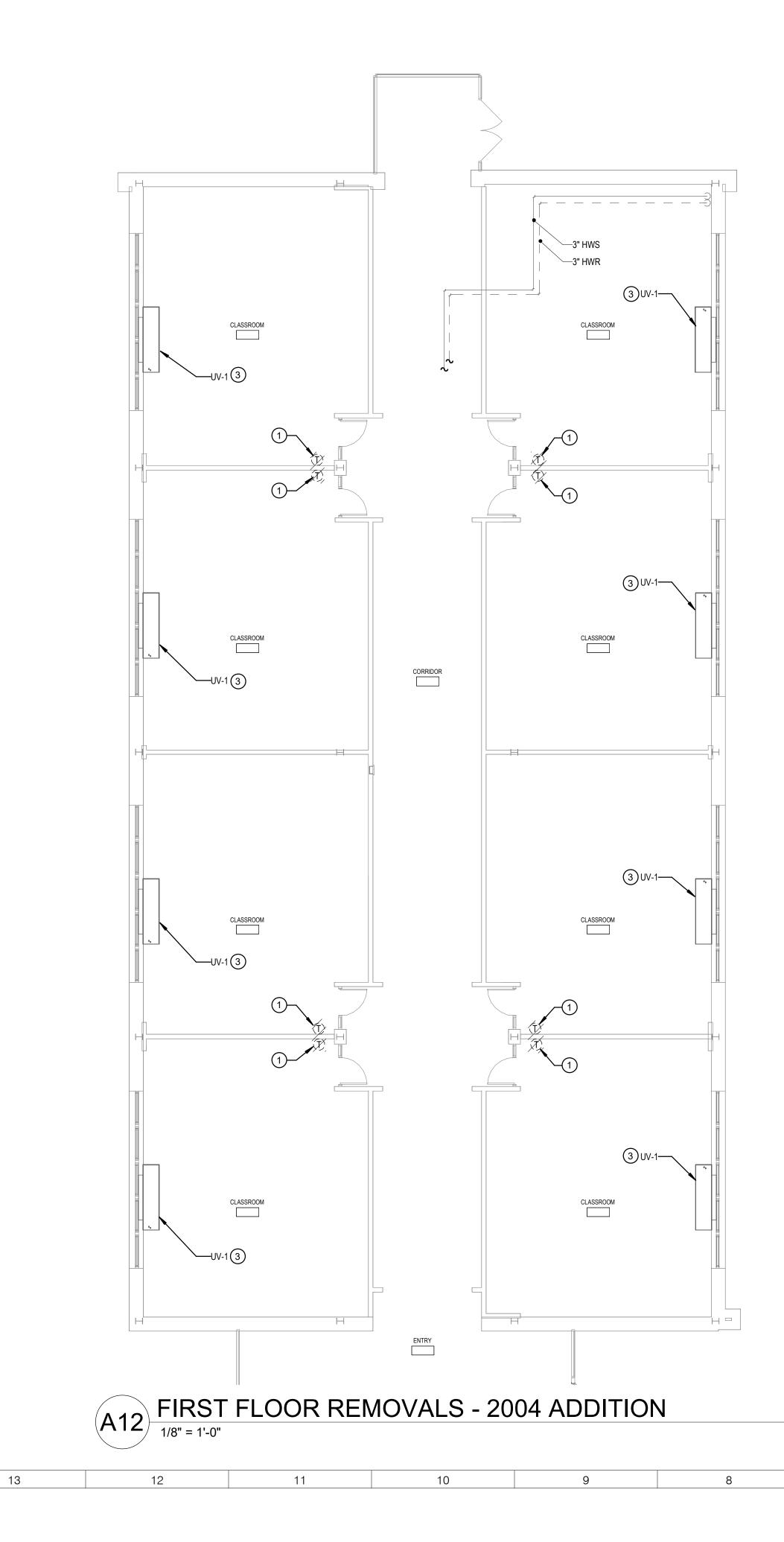
LEGEND:						
UV-MS-XX	UNIT VENTILATOR					
T	UV-WALL SENSOR					
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T	EX FTR-WALL SENSOR					



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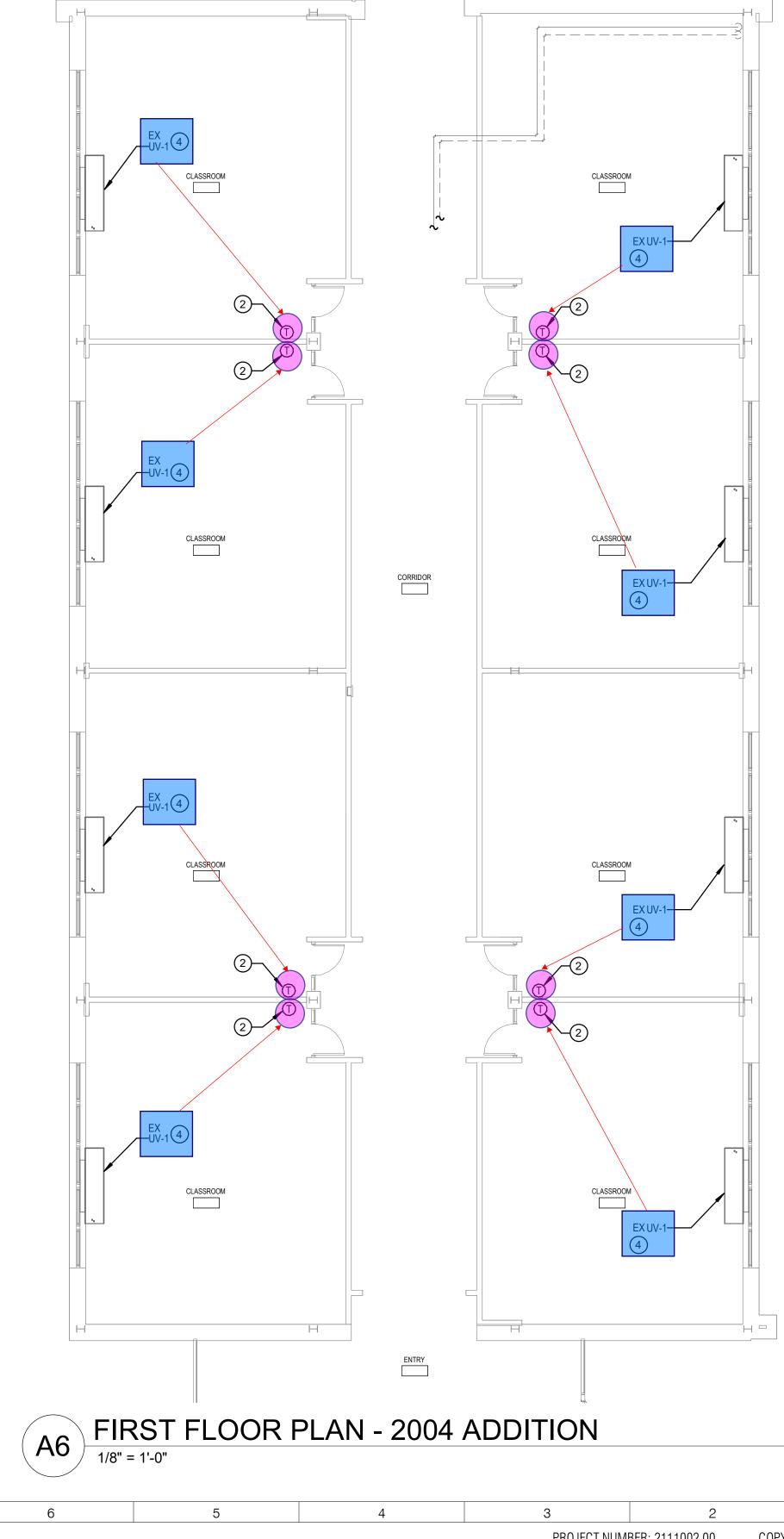
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# SIEMENS WALL SENSOR LOCATION DRAWING

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AND ACTUATOR. PROVIDE DDC SYSTEM EQUIPMENT CONTROLLER WITHIN THE EXISTING ACCESS ENCLOSURE AREA OF EXISTING FLOOR MOUNTED UNIT VENTILATOR AT LOCATION SHOWN. PROVIDE DDC CONTROL POINTS PER CONTROL DRAWING LOCATED ON A10/HS-M602. PROVIDE CONTROL WIRING FROM DDC CONTROLLER TO WALL MOUNTED SPACE TEMPERATURE SENSOR. PROVIDE CONTROL WIRING BETWEEN DDC CONTROLLER AND EXISTING UNIT VENTILATOR HEATING WATER CONTROL VALVE AS REQUIRED. PROVIDE CONTROL WIRING BETWEEN DDC CONTROLLER AND EXISTING UNIT VENTILATOR OA/RA DAMPER ACTUATOR AND FACE&BYPASS DAMPER ACTUATOR.

PROVIDE SENSORS AS OUTLINED AND PROVIDE CONTROL WIRING TO ALLOW START/STOP OPERATION OF EXISTING UNIT VENTILATOR

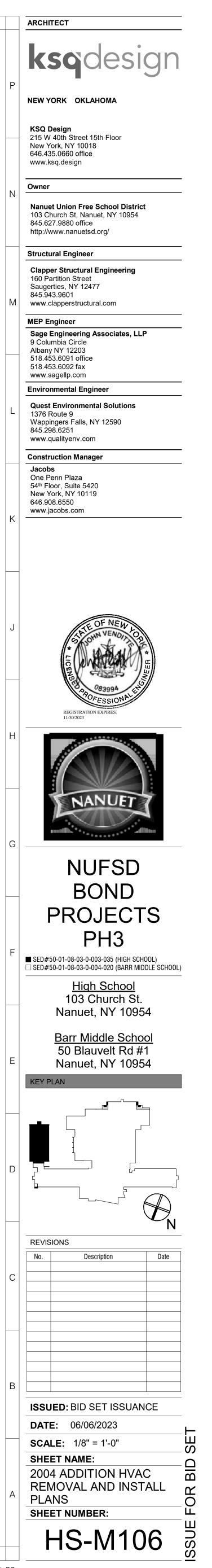
OBJECTION DISCONNECT AND REMOVE FLOOR MOUNTED UNIT VENTILATOR INTREGRAL MICROTECH II CONTROLLER LOCATED WITHIN THE UNIT VENTILATOR ACCESS ENCLOSURE. DISCONNECT AND REMOVE ALL ASSOCIATED CONTROL WIRING BETWEEN CONTROLLER AND REMOVED SPACE THERMOSTAT AND BETWEEN CONTROLLER AND UNIT VENTILATOR SENSORS, RELAYS, DAMPER ACTUATORS, AND CONTROL VALVE AS REQUIRED. MAINTAIN UNIT VENTILATOR CONTROL VALVE, OA/RA DAMPER AND ACTUATOR, FACE&BYPASS DAMPER

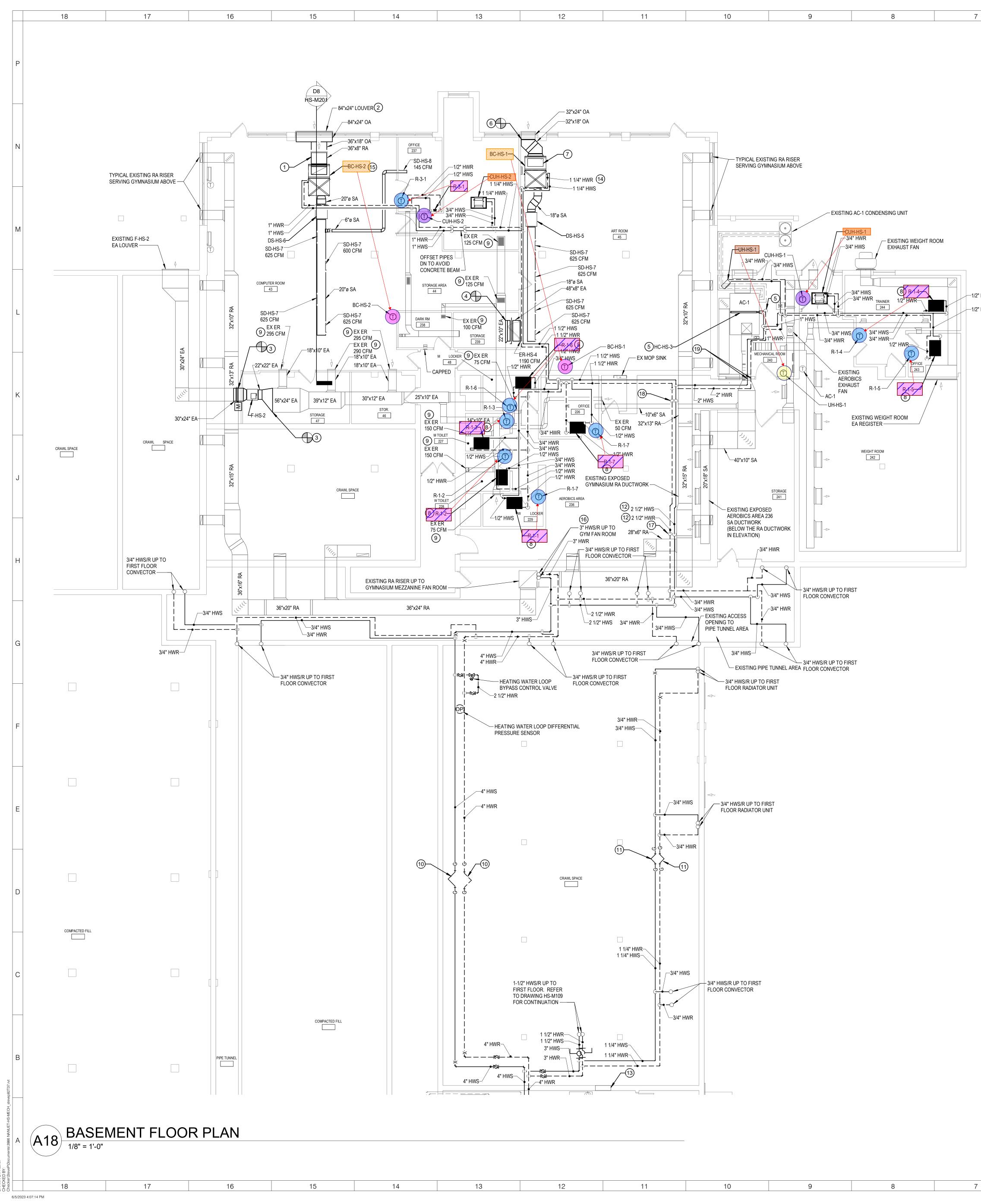
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- 2 PROVIDE REPLACEMENT SPACE TEMPERATURE SENSOR AT LOCATION SHOWN AND UTILIZE FOR SPACE TEMPERATURE CONTROL OF THE UNIT VENTILATOR AS REQUIRED. PROVIDE CONTROL WIRING BETWEEN SENSOR AND UNIT VENTILATOR DDC CONTROLLER AS REQUIRED.
- (1) DISCONNECT AND REMOVE REMOTE SPACE TEMPERATURE SENSOR FOR THE EXISTING UNIT VENTILATOR.
- KEYED NOTES:

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MECHANICAL COOLING SYSTEM.

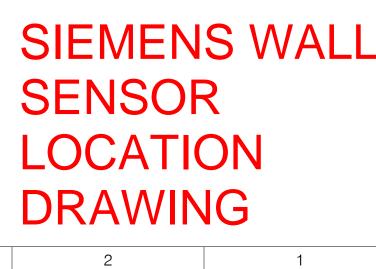




6	5	4	3	2	1
	(1) P Tr S (2) P O	NOTES: ROVIDE 36"x18" OUTSIDE AIR DUCTWO OP RA INLET ON BC-HS-2 MIXING BOX, TACKED ABOVE 36"x18" OUTSIDE AIR E ROVIDE 84"x24" OUTSIDE AIR PLENUM UTLINED ON THE ARCHITECTURAL DR. EQUIRED.	THEN PROVIDE A TRANSITION ELBON DUCT AND TERMINATE OPEN-ENDED CONNECTED TO 84"x24" LOUVER MOD	N TO 36"x8" RA DUCTWORK. ROUTE 36 NITH 1/4" GALVANIZED WIRE MESH SC JNTED IN TOP OF EXISTING GLAZING \$	"x8" RETURN AIR DUCT REEN. SYSTEM PANEL AS
	G Fi D 56 D	ROVIDE INLINE FAN F-HS-2 AT LOCATIC ROM EXISTING EXHAUST AIR DUCTWO UCT TO EXISTING 30"x24" EXHAUST AII 6"x24" EXHAUST AIR DUCT AT INLET OF ISCONNECT/REMOVE/REINSTALL SUSF UTLET EA DUCTWORK.	RK TO INLET AND OUTLET CONNECT R DUCT AT OUTLET OF FAN. CONNEC F FAN AS REQUIRED. PROVIDE A MO	ONS ON F-HS-2 AS REQUIRED. CONNE T 22"x22" TO 56"x24" TRANSITION DUC TORIZED DAMPER AT OUTLET OF FAN	CT 30"x24" EXHAUST AIR FFITTING TO EXISTING IN EA DUCTWORK.
	(4) CONNECT 48"x8" EXHAUST AIR DUCT TO EXISTING 22"x10" EXHAUST AIR DUCT MAIN AT CONNECTION POINT SHOWN AND PROVIDE A WALL MOUNTED EA REGISTER WITHIN ART ROOM 45, MOUNTED ABOVE THE DOORWAY TO STORAGE ROOM 239.				
	5 PROVIDE A 59" WIDE x 33" HIGH HOT WATER HEATING COIL HC-HS-3 WITHIN EXISTING AIR HANDLER AC-1 HEATING COIL SECTION. AC-1 IS A TRANE MODEL LPCAC14D HORIZONTAL AIR HANDLING UNIT. COORDINATE INSTALLATION OF THE HEATING COIL WITHIN THE EXISTING AIR HANDLING UNIT HEATING COIL SECTION WITH THE LOCAL TRANE REPRESENTATIVE. PROVIDE 2" HWS/R DROPS DOWN TO THE HEATING COIL INLET AND OUTLET CONNECTION POINTS.				
		ONNECT 32"x18" OUTSIDE AIR INTAKE UTSIDE AIR DUCT TO REAR INLET ON I	DUCT TO EXISTING 32"x24" OUTSIDE A BLOWER COIL BC-HS-1 MIXING BOX.	AIR INTAKE DUCT AT CONNECTION PO	INT SHOWN. ROUTE 32"x18"
	(7) P	ROVIDE TOP INLET RA OPENING ON BO	C-HS-1 MIXING BOX.		
	8 P	ROVIDE EXPOSED CEILING MOUNTED	RADIATOR UNITS AT LOCATIONS SHO	WN SUPPORTED FROM FLOOR DECK	ABOVE.
BALANCE EXISTING EA REGISTER TO AIRLFOW AMOUNTS SHOWN WITH INLINE EXHAUST FAN F-HS-2 CAPACITY.				NE EXHAUST FAN F-HS-2 OPERATING A	AT FULL AIRFLOW
	( <u>10</u> ) M	ROVIDE 43.75" LONG x 18.875" WIDE V- IOVEMENT. PROVIDE PIPE GUIDES AND ETURN BEND OF THE LOOP PER THE N	D ANCHORS AS SHOWN INSTALLED PI		
		ROVIDE 26.25" LONG x 12" WIDE V-TYPI APABLE OF 3" +/- MOVEMENT. PROVID UPPORT THE RETURN BEND OF THE L	E PIPE GUIDES AND ANCHORS AS SH	OWN INSTALLED PER THE MANUFACT	1-1/4" HWS/R MAINS. JRER'S INSTRUCTIONS.
		OUTE 2-1/2" HWS/R PIPING MAINS EXP UCTWORK ROUTED NORTH-SOUTH TH EROBICS AREA. PROVIDE PVC JACKET	ROUGH THE AERBOICS AREA, AND A	BOVE THE EXPOSED SUPPLY AIR DUC	
	P	OCATION OF EXISTING 3-FOOT WIDE x IPING BETWEEN BOILER ROOM AND AB ISULATED HWS/R PIPING LINESS WITH	EROBICS AREA 236 WITHIN CRAWLSP		
	B W A	OUTE HWS/R PIPING MAINS EXPOSED LOWER COIL BC-HS-1 HEATING COIL A /EST SIDE OF ART ROOM 45. PROVIDE RT ROOM 45 BELOW EXISTING NORTH /UTLET LOCATION ON BLOWER COIL.	S REQUIRED. PROVIDE HEATING COII PVC JACKETING OVER ALL EXPOSED	ON LEFT HAND SIDE OF BLOWER CO INSULATED HWS/R PIPING. MOUNT B	IL TO ALLOW COIL PULL TO LOWER COIL EXPOSED IN
	(10)	IOUNT BLOWER COIL BC-HS-2 EXPOSE UTLET LOCATION ON BLOWER COIL.	D WITHIN WOODSHOP 43. PROVIDE E	XPOSED SPIRAL SA DUCTWORK OUT	OF FRONT DISCHARGE
		OUTE 3" HWS/R PIPING APPROXIMATE		G TUNNEL UP TO GYMNASIUM MEZZAN	IINE FAN ROOM. ROUTE

- (17) ROUTE HWS/R PIPING MAINS BELOW EXISTING 28"x6" RA BRANCH AT LOCATION SHOWN, THEN PROVIDE A RISE UP AND ROUTE THE HWS/R PIPING MAINS WITH TOP OF PIPING EVEN WITH TOP OF EXISTING 32"X15" RA MAIN.
- (18) PROVIDE DROP IN ELEVATION ON THE HWS/R PIPING MAINS AT LOCATION SHOWN ONCE PAST THE EXISTING 10"X6" SA BRANCH.
- 19 ROUTE 2" HWS/R PIPING BRANCHES BELOW EXISTING SA DUCTWORK CONNECTED TO EXISTING AC-1 AND PENETRATE MECHANICAL ROOM 240 WALL BELOW AC-1 SA DUCTWORK AS SHOWN.

#### LEGEND: BC-HS-X BLOWER COIL **BC-WALL SENSOR** T CABINET UNIT HEATER CUH-HS-X CUH-WALL SENSOR T R-1-X HEATING WATER RADIATION RAD-WALL SENSOR (T)UNIT HEATER T UH-WALL SENSOR



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