South High Community School

170 Apricot Street, Worcester, MA 01603

FINAL BID PACKAGE

ARCHITECTS ILLUSTRATION - NOT FOR CONSTUCTION

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DRAWING LIST COVER 3

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Worcester Public Schools

South High Community School

170 Apricot Street, Worcester, MA 01603

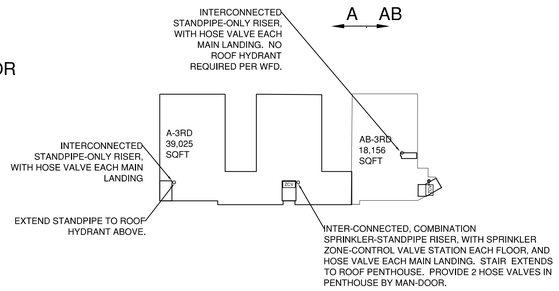
Date:

January 31, 2019

Set No:

VOLUME III OF IV

3RD FLOOR



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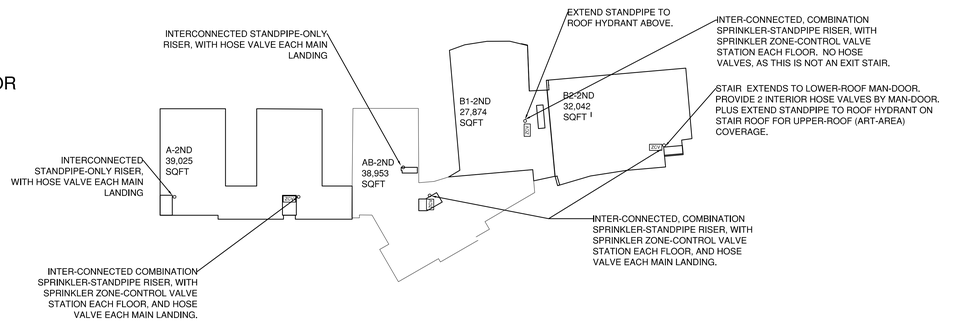

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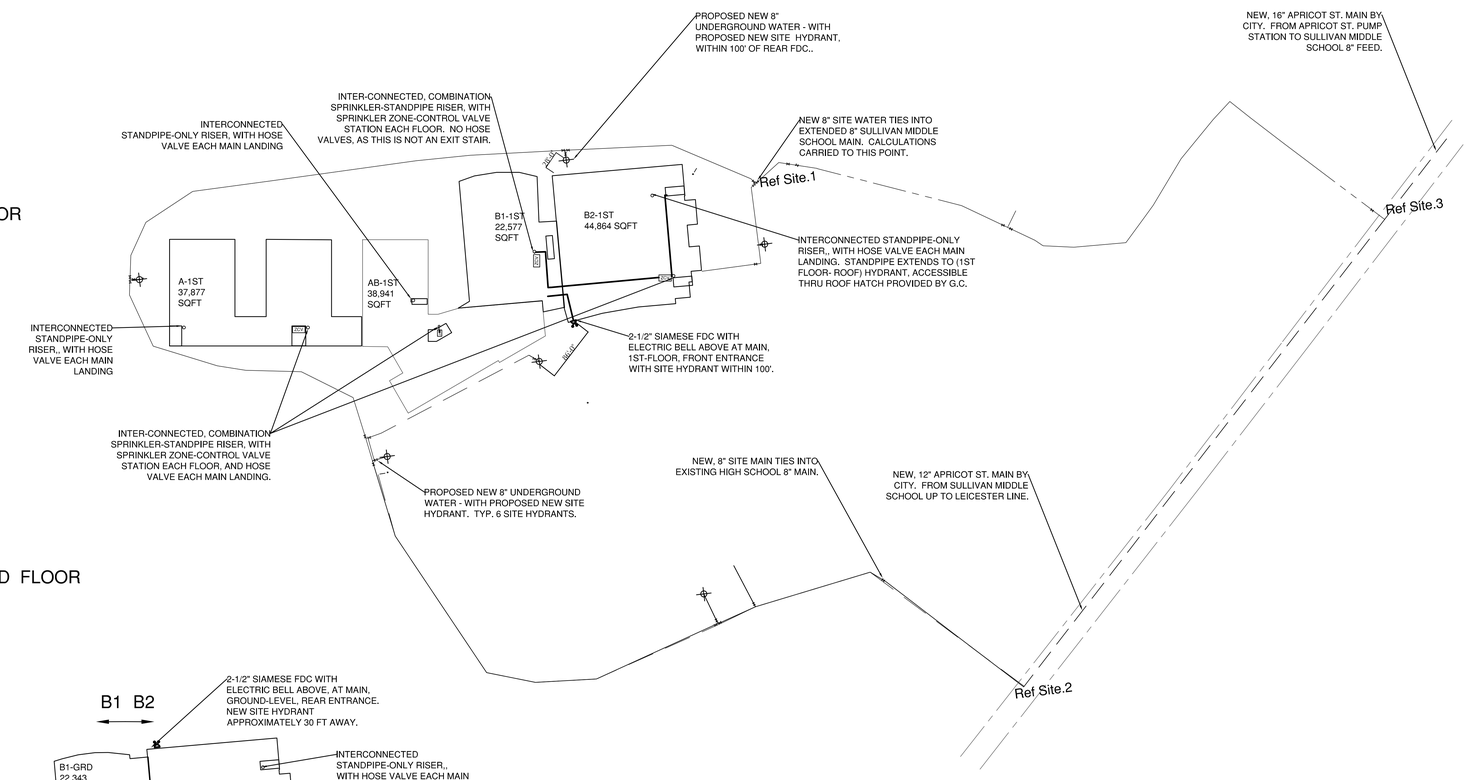
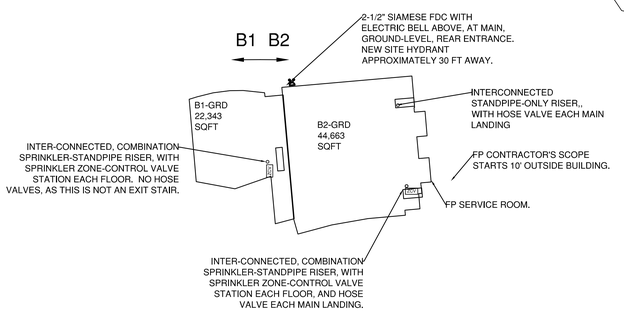


GROUND FLOOR



STANDPIPES REQUIRED:

1. ACADEMIC BUILDING (A AND LEFT PART OF AB) AND SUPPORT WINGS (RIGHT PART OF AB, AND B1 AND B2)) TOP FLOOR LEVELS ARE MORE THAN 30' ABOVE THE LOWEST FIRE DEPARTMENT ACCESS.
2. THERE IS FIRE DEPT VEHICLE ACCESS TO 100% OF THE BUILDING.
3. NO AREAS ARE MORE THAN 400 FT FROM THE NEAREST DOOR.

RISER AREA LIMITATIONS:

1. ALL AREAS ARE LIGHT OR ORDINARY HAZARD - 52,000 SQFT PER FLOOR PERMITTED PER RISER.
2. RISER AREA SUMMARY BY FLOOR:
   2.1. SEE KEY PLAN

1 / FP1.1 Key Plan
NO SCALE

MASTER FP LEGEND

SYMBOL	DESCRIPTION
	FLAT-PLATE, CONCEALED PENDANT, STANDARD SPRAY, QR, K5.6, 200 F. VK462 OR EQUAL.
K8.0	FLAT-PLATE, CONCEALED PENDANT, EXTENDED COVERAGE UP TO 18'x18', QR K8.0 200F VK634 OR EQUAL.
K11.2	FLAT-PLATE, CONCEALED PENDANT, EXTENDED COVERAGE UP TO 14'x14'-QR, OR 20'x20'-SR, K11.2, 200F OH LISTED, VK538 OR EQUAL.
	FUSIBLE LINK UPRIGHT - STANDARD SPRAY, QR, K5.6, 200 F VK316 OR EQUAL.
K11.2	FUSIBLE LINK UPRIGHT - EXTENDED COVERAGE UP TO 14'x14'-QR OR 20'x20'-SR, K11.2 200 F OH LISTED, VK535 OR EQUAL.
	INTERMEDIATE LEVEL IN-RACK UPRIGHT - QR, K5.6, 200 F. LINK STYLE, VK551 OR EQUAL
	AUXILIARY DRAIN
	SINGLE OR DOUBLE BRANCH RISER NIPPLE.
	DRY SIDEWALL - ADJUSTABLE, RECESSED, QR, K 5.6, 155 F BULB-STYLE, VK182 OR EQUAL.
	CONCEALED, HORIZONTAL SIDEWALL - QR, K5.6, 220 F LINK-STYLE, VK481 OR EQUAL.
	FLAT - PLATE CONCEALED, DRY PENDANT - QR, 200 F. VICTAULIC V3302 OR EQUAL
K11.2	DRY SIDEWALL - SR, K 11.2, 155 F. LISTED FOR ORDINARY HAZARDS. TYCO DS-3 (TY5339) OR EQUAL.
	BACK-TO-BACK ATTIC SPRINKLER LISTED FOR UP TO 12:12 SLOPE. 200 F. K5.6 TYCO TYBB-3 - TY3182 OR EQUAL.
K8.	WINDOW SPRINKLER - UL LISTED AS ALTERNATIVE TO 2-HOUR RATED CLASS. TYCO TY3488 (PROPRIETARY SPEC) - -
	NEW WET SYSTEM PIPING - LABELED WITH SERVICE AND SIZE. INCLUDES: FIRE SERVICE (FS-SIZE"), OR RISER NUMBER (R-B-SIZE").
	NEW STANDPIPE PIPING - LABELED STP - 6"
	NEW DRAIN PIPING - LABELED DRN - 2"
	NEW UNDERGROUND PIPING BY SITE CONTRACTOR. LABELED UNDERGROUND FIRE SERVICE (UGFS-SIZE"),
3	SHEET-KEYNOTE REPLACES FREQUENTLY REPEATED TEXT. SEE KEYNOTE LEGEND THIS SHEET.
REF 1,2	HYDRAULIC CALCULATION REFERENCE NUMBER
N1	HYDRAULIC CALCULATION SPRINKLER "NOZZLE" NUMBER
C	RISER ALARM CHECK VALVE
	SUPERVISED, INDICATING CONTROL VALVE
	FLOW SWITCH
	VALVED PRESSURE GAGE
	DOUBLE-CHECK VALVE, WITH BYPASS-FLOW -DETECTOR
	FD CONNECTION CHECK VALVE WITH BALL DRIP
	TEST AND DRAIN
	FIRE DEPT. CONNECTION -2-1/2" SIAMESE REQUIRED
B	WATER-FLOW BELL - WIRED BY DIV. 26
	FLEXIBLE COUPLING
ZCV	ZONE CONTROL VALVE STATION

FIRE PROTECTION KEYNOTES

1	ALL EXTERIOR CANOPIES WILL BE NON OR LIMITED COMBUSTIBLE INCLUDING (CLASS A) ROOFING MEMBRANE, NO SPRINKLERS REQUIRED EXCEPT AT LOADING DOOK, AND UNDER OCCUPIED SPACES
2	200F CONCEALED DRY PENDANT IN WALK-IN COOLER / FREEZER.
3	HEAD CAGES REQUIRED FOR ALL SPRINKLERS IN THIS AREA
4	ORDINARY HAZARD AREA (SPACES WITHOUT A KEYNOTE 4 OR 5 ARE LIGHT HAZARD)
5	EXTRA HAZARD AREA (SPACES WITHOUT A KEYNOTE 4 OR 5 ARE LIGHT HAZARD)
6	PROVIDE APPROVED SEISMIC SEPARATION ASSEMBLY CAPABLE OF 1" MOVEMENT.
7	NFPA "SMALL ROOM" - SPRINKLER COVERAGE AREA = ROOM AREA / # OF SPRINKLERS
8	FIRE-STOP RATED ASSEMBLY WITH LISTED, SUBMITTED, AND APPPROVED FIRE-STOP MATERIALS
9	NEW DROP NIPPLE AND UPRIGHT UNDER OBJECTS OVER 4' WIDE
10	DO NOT RUN FP PIPING OVER ANY TELECOM. OR ELECTRICAL PANELS OR EQUIPMENT. PROVIDE NFPA CLEARANCE FROM ALL SURFACE-MOUNTED LIGHTS. MAINTAIN CLEARANCES PER NFPA 70 AND APPLICABLE CODE.
11	EXTENDED COVERAGE SIDEWALL SPRINKLERS PROTECTING UNDER-BLEACHER AREA.
12	PROVIDE FLEXIBLE COUPLING ON BOTH SIDES OF STEEL BEAM PENETRATION. HOLE BY METAL FABRICATIONS.

GENERAL NOTES

1. ALL WORK MUST BE INSPECTED AND FOUND ACCEPTABLE BY THE ENGINEER OF RECORD OR THE AUTHORITIES HAVING JURISDICTION. ANY WORK NOT CONFORMING WITH THE CONTRACT DOCUMENTS, APPROVED SHOP DRAWINGS OR APPROVED CALCULATIONS SHALL BE CORRECTED OR REPLACED AT NO EXTRA COST TO THE OWNER, BEFORE FINAL PAYMENT WILL BE RELEASED.
2. DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE NOT INTENDED TO SHOW EVERY DETAIL, OFFSET, ETC. REQUIRED FOR A COMPLETE INSTALLATION. THE CONTRACTOR SHALL INCLUDE IN HIS PRICE, ALL MATERIALS, LABOR, EQUIPMENT, RIGGING, SUB-CONTRACTED WORK, PERMITS, FEES, AND ALL OTHER EXPENSES REQUIRED TO PROVIDE COMPLETE AND OPERATING SYSTEMS.
3. LOCATIONS AND ROUTING OF EQUIPMENT AND DISTRIBUTION SYSTEMS ARE APPROXIMATE. EXACT LOCATIONS TO SECURE THE BEST RESULTS SHALL BE DETERMINED IN THE FIELD. COORDINATE WORK WITH OTHER TRADES AND BUILDING STRUCTURE TO AVOID CONFLICTS.
4. ALL WORK TO BE DONE IN ACCORDANCE WITH THE MOST RECENT PRINTING OF APPLICABLE NATIONAL, STATE, AND LOCAL CODES, AND RECOMMENDED PRACTICES.
5. ALL EQUIPMENT, PIPE, AND FITTINGS TO BE INSTALLED PER MANUFACTURERS INSTALLATION INSTRUCTIONS.
6. "PROVIDE" MEANS TO FURNISH AND NEATLY INSTALL IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, APPROVED SUBMITTALS, AND MANUFACTURERS REQUIREMENTS, ALL MATERIALS AND LABOR REQUIRED FOR A COMPLETE, OPERATING SYSTEM.
7. SOME CONTRACT REQUIREMENTS EXCEED MINIMUM CODE REQUIREMENTS. PRICE AND INSTALL WHAT IS SHOWN.

FIRE PROTECTION SCOPE SUMMARY

WORK INCLUDED: PROVIDE LABOR, MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THE WORK OF THIS SECTION, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. COMMISSIONING: THE FP SYSTEM WILL BE COMMISSIONED BY AN INDEPENDENT COMMISSIONING AGENT (CXA). THIS SUB-CONTRACTOR SHALL REVIEW ALL COMMISSIONING REQUIREMENTS OUTLINED IN THE COMMISSIONING SPECIFICATION, AND SHALL PROVIDE ALL COMMISSIONING TASK LABOR AND DOCUMENTATION, ATTEND ALL REQUIRED MEETINGS, AND PROVIDE ALL ON-SITE ASSISTANCE REQUIRED BY THE CXA TO PROPERLY COMPLETE THEIR WORK.
2. NEW FLOW TEST. FLOW TEST SHALL OCCUR BETWEEN 9 AM AND 5 PM OF A WEEK-DAY (M-F), AND SHALL BE WITNESSED BY THE FP ENGINEER-OF-RECORD AND LOCAL WATER DEPT. FLOW TEST SHALL OCCUR WHEN LEICESTER'S CHERRY VALLEY REGION IS PUMPING WATER FROM THE APRICOT ST. MAIN, TO ENSURE FLOW TO THE HIGH SCHOOL IS STILL ADEQUATE.
3. PREPARATION OF COMPLETE "FIRE PROTECTION SHOP DRAWINGS" AND HYDRAULIC CALCULATIONS, STAMPED BY A MASS. PROFESSIONAL REGISTERED ENGINEER OR NICET-CERTIFIED LEVEL III OR IV ENGINEERING TECHNICIAN.
4. COMPLETE AND OPERATING WET SYSTEM PER NFPA 13, THE 9TH EDITION STATE BUILDING CODE, AND LOCAL ORDINANCES9
   4.1. SPRINKLER SYSTEMS SHALL COVER ALL AREAS OF THE SCHOOL EXCEPT NON-OR-LIMITED-COMBUSTIBLE EXTERIOR CANOPIES, ELEVATOR HOISTWAYS, PITS, AND MACHINES ROOM
   4.2. INTER-CONNECTED, STAIRWELL STANDPIPES REQUIRED, WITH 4 COMBINATION SPRINKLER-RISER / STANDPIPES, AND 2 DEDICATED STANDPIPE RISERS...
   4.3. SUPERVISE THE INSTALLATION AND PRESSURE TESTING OF ALL UNDERGROUND PIPING AND VALVES DEDICATED TO FIRE PROTECTION SERVICE - WITH COMPLETED NFPA UNDERGROUND TEST CERTIFICATE.
5. THE FIRE PROTECTION SUBCONTRACTOR'S SCOPE RESPONSIBILITY SHALL START 10 FT. OUTSIDE THE BUILDING, AT THE TERMINATION OF THE SITE CONTRACTOR'S 8" FP SERVICE LINE.
6. PROVIDE CONSTRUCTION PHASE FIRE SAFETY MEASURES PER NFPA 241.
7. NEW 8" BACKFLOW PREVENTOR. BACKFLOW TO INCLUDE FULL-PORT, LINE-SIZE, INDICATING CONTROL VALVES ON EITHER SIDE AND A VALVED PRESSURE GAUGE ON BOTH SIDES.
8. 4 NEW WET SYSTEM RISERS WITH SUPERVISED INDICATING CONTROL VALVE, RISER CHECK VALVE, VALVED PRESSURE GAGES, PRESSURE RELIEF VALVE, AND SUPERVISED FLOW SWITCH ALARM WITH RETARD FEATURE.
9. 12 NEW ZONE-CONTROL VALVE STATIONS SUPERVISED INDICATING CONTROL VALVE, CHECK VALVE, VALVED PRESSURE GAGES, PRESSURE RELIEF VALVE, AND SUPERVISED FLOW SWITCH ALARM WITH RETARD FEATURE.
10. APPROVED SEISMIC SEPARATION ASSEMBLY AND FIRE-STOPPING WHEREVER FP PIPING CROSSES A BUILDING SEISMIC SEPARATION JOINT / FIRE WALL.
11. MAIN AND AUXILIARY DRAINS (SIZE PER NFPA) AS REQUIRED FOR COMPLETE DRAINING OF ALL PIPING. PIPE MAIN DRAIN TO THE EXTERIOR OF THE BUILDING. AUXILIARY DRAINS SHALL BE CLEARLY LABELED IN THE FIELD, AND HIGH-LIGHTED IN YELLOW OR CLOUDED IN RED ON THE AS-BUILT DRAWINGS.
12. SPRINKLER HEADS PER THE SPRINKLER LEGEND. INCLUDE SPRINKLER GUARDS AS SPECIFIED.
13. PIPING MAINS, CROSS MAINS, AND BRANCHES, FITTINGS AND VALVES, VIBRATION ISOLATORS, FLEXIBLE CONNECTORS, AND EXPANSION FITTINGS. INCLUDE SWING ARMS TO CENTER SPRINKLERS IN TILED CEILINGS.
14. NEW INSPECTORS TEST-TEES - ONE AT EACH RISER AND ZONE CONTROL VALVE STATION.
15. NEW FIRE DEPT. CONNECTION APPROVED BY AUTHORITIES HAVING JURISDICTION, FOR THE NEW FP SERVICE. PIPE FDC BALL DRIP TO THE EXTERIOR OF THE BUILDING, TERMINATING WITH A 45 DOWN. PROVIDE A WEATHER-PROOF ELECTRIC BELL ABOVE THE FDC (WIRED BY DIV. 26)
16. NEW IDENTIFICATION SIGNS AT ALL CONTROL VALVES, FIRE DEPT CONNECTION, DRAINS, AND SPRINKLER VALVE ROOM. ALSO NFPA 13 GENERAL INFORMATION SIGN, HYDRAULIC CALCULATIONS SIGNS (FOR EACH AREA CALCULATED), AND LIST OF SPARE SPRINKLERS IN THE SPARE SPRINKLER CABINET.
   16.1. VALVE AND DRAIN SIGNS SHALL INDICATE THE PORTION OF THE BUILDING SERVED, THEIR FUNCTION AND NORMAL POSITION.
   16.2. ALL SIGNS SHALL MEET THE 9TH EDITION STATE BUILDING CODE REQUIREMENTS, AS WELL AS NFPA 13, 2013 REQUIREMENTS.
17. SLEEVES, ESCUTCHEONS, HANGERS AND SUPPORTS, INCLUDING MISCELLANEOUS STEEL SUPPORTS.. HANGER SPACING PER THE DRAWING SCHEDULE AND NFPA 13.
18. ACCESS PANELS FOR ANY DEVICES OR EQUIPMENT INSTALLED IN OTHER-WISE INACCESSIBLE LOCATIONS (NONE REQUIRED FOR BID-SET LAYOUT)
19. SEISMIC BRACING AND END-OF-BRANCH LINE RESTRAINTS. PROVIDE BRACING ON ON ALL MAINS, CROSS MAINS, AND ALL BRANCHES 2-1/2" AND OVER, PER THE DRAWING DETAILS AND NFPA 13. (LATERAL BRACING MAY BE OMITTED WHERE HANGER RODS ARE LESS THAN 6" FROM TOP OF PIPE TO BUILDING ATTACHMENT)
20. DRILLING FOR INSTALLATION OF HANGER AND SWAY-BRACING INSERTS AS REQUIRED
21. CORE DRILLING AND CUTTING FOR THE WORK OF THIS SECTION AS SPECIFIED IN SECTION 01 73 00.
22. 6 SPARE SPRINKLERS OF EACH TYPE, ALONG WITH SPRINKLER WRENCHES IN 1 OR MORE LABELED SPARE SPRINKLER CABINET(S) LOCATED IN THE BOILER ROOM.
   22.1. ALSO INCLUDE IN BID PRICE, 5 SPRINKLERS ON 1" x 6' SWING ARMS, AND 5, 1" HANGERS NOT SHOWN ON THE FLOOR PLANS - TO BE USED AS REQUIRED IN UNSPECIFIED LOCATIONS .
23. ALL TAMPER AND ALARM SWITCHES TO BE MONITORED BY THE FIRE ALARM CONTROL PANEL PROVIDED BY DIVISION 26 00 00.
24. SHOP DRAWINGS AND SUBMITTALS, COORDINATION AND RECORD DRAWINGS . SEE DIVISION 1 FOR COORDINATION DRAWING REQUIREMENTS.
25. HOISTING EQUIPMENT: THE FIRE PROTECTION FILED-SUB-CONTRACTOR SHALL FURNISH, INSTALL AND MAINTAIN IN SAFE AND ADEQUATE CONDITION ALL MECHANICAL HOISTING EQUIPMENT, OPERATING PERSONNEL AND RIGGING THAT IS NECESSARY FOR THE PROPER EXECUTION OF THE WORK OF THIS SECTION - PER SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS.
26. STAGING, PLANKING AND SCAFFOLDING: THE FIRE PROTECTION FILED-SUBCONTRACTOR SHALL OBTAIN REQUIRED PERMITS FOR, AND FURNISH, INSTALL, MAINTAIN IN SAFE AND ADEQUATE CONDITION, AND DISMANTLE WHEN NO LONGER REQUIRED, ALL STAGING, PLANKING, SCAFFOLDING, PORTABLE LADDERS AND MOBILE PLATFORMS, AND TARPAULINS FOR COVERING SAME THAT ARE NECESSARY FOR THE PROPER EXECUTION OF THE WORK IN THIS SECTION.
27. FIRE-STOPPING OF ALL RATED WALL, FLOOR, AND CEILING PENETRATIONS USED BY THE FIRE PROTECTION SUB-CONTRACTOR FOR ANY WORK COMPLETED UNDER THIS SECTION. SEE SECTION 07 84 00 FOR REQUIRED METHODS AND PROCEDURES.
28. SEALING WITH NON-COMBUSTIBLE MATERIAL, ALL FP PIPE PENETRATIONS INTO:
   28.1. CLASSROOMS, OFFICES, CAFETERIA, GYMNASIUM, AND MUSIC ROOMS (FOR SOUND CONTROL), AND
   28.2. THRU EXTERIOR WALLS (FOR WATER AND AIR SEAL).
29. 2 HOUR HYDROSTATIC AND 24 HOUR AIR PRESSURE TESTS ON ALL NEW PIPING, PER NFPA 13. TESTS SHALL BE WITNESSED BY THE ENGINEER OF RECORD, THE OPM, OR WORCESTER FIRE DEPT.. REPAIR ALL DEFECTS.
30. SYSTEM AND EQUIPMENT START-UPS, AND COMPLETED NFPA 13 TEST AND ACCEPTANCE REPORTS FOR BOTH ABOVE AND UNDER-GROUND PIPING. . REPAIR ALL DEFECTS, WITH 1 YEAR WRITTEN WARRANTY.
31. PULL ALL PERMITS, PAY ALL FEES AND OBTAIN REQUIRED INSPECTIONS.
32. PROVIDE OPERATION AND MAINTENANCE MANUALS AND INSTRUCTIONS TO OWNERS PERSONNEL.
33. INSPECTIONS: THE CONTRACTOR SHALL NOTIFY THE ENGINEER WHEN ALL PUNCH ITEMS ARE BELIEVED TO BE COMPLETE AND READY FOR RE-INSPECTION. IF THE ENGINEER'S RE-INSPECTION SHOWS ANY PUNCH ITEMS STILL NOT COMPLETED, THE FP SUB-CONTRACTOR SHALL HAVE A QUALIFIED INSTALLER ON SITE DURING ALL SUBSEQUENT INSPECTIONS BY THE ENGINEER, TO ENSURE ANY UN-RESOLVED ISSUES ARE FULLY UNDERSTOOD AS TO LOCATION AND REMEDIAL WORK REQUIRED.

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OWNER

Worcester Public Schools

Worcester, Ma.

Project North

PROJECT

Final Bid Package

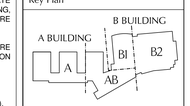
South High Community School

170 Apricot St, Worcester, MA 01603

TITLE

Fire Protection Scope Summary, Legends and Key Plan

Key Plan



REVISIONS

No.	Description	Date

FILE: SoHS FP 100% CD Submission 1-24-19

DWN. BY: LKB	JOB NO: 1611
CKD. BY: LKB	SCALE: 1/8" = 1'

DATE: January 31, 2019

FP1.1

PROVIDE ADDITIONAL SPRINKLERS AS NECESSARY IN ORDER TO COORDINATE WITH ANY AND ALL OBSTRUCTIONS. SEE TABLE BELOW FOR SOME COMMON CLEARANCES REQUIRED FOR STANDARD SPRAY SPRINKLERS.

REQUIRED OBSTRUCTOIN CLEARANCES			
STANDARD SPRAY SPRINKLERS MAXIMUM HEIGHT OF SPRINKLER DEFLECTOR ABOVE BOTTOM OF OBSTRUCTION	HORIZONTAL DISTANCE FROM SIDE OF SOLID, CONTINUOUS, OBSTRUCTION LOCATED TO THE SIDE OF THE SPRINKLER. SEE LAST COLUMN FOR SOFFITT EXCEPTIONS	EXTENDED COVERAGE PENDANT AND UPRIGHT SPRINKLERS MAXIMUM HEIGHT OF SPRINKLER DEFLECTOR ABOVE BOTTOM OF OBSTRUCTION	STANDARD SPRAY AND EXTENDED COVERAGE PENDANT AND UPRIGHT SPRINKLERS HORIZONTAL DISTANCE FROM SIDE OF CEILING-SOFFITT.
0'-0"	UP TO 1'	0"	SOFFITTS LESS THAN 24" DEEP (FROM WALL TO FRONT OF SOFFITT),REQUIRE NO ADDITIONAL SPRINKLERS IF CEILING SPRINKLER IS 18" MIN. ABOVE BOTTOM OF SOFFIT.
2-1/2"	1' TO 1'6"	0"	
3-1/2"	1'6" TO 2'	1"	
5-1/2"	2' TO 2'6"	1"	SOFFITS LESS THAN 30" DEEP (FROM WALL TO FRONT OF SOFFIT) MUST HAVE CLEARANCE "A" FROM SPRINKLER TO FRONT OF SOFFIT. IF D = SOFFIT DEPTH, AND B = HEIGHT OF SPRINKLER ABOVE BOTTOM OF SOFFIT: ALL MEASUREMENTS IN INCHES: A => (D - B) + B
7-1/2"	2'-6" TO 3'	1"	
9-1/2"	3' TO 3'6"	3"	
12"	3'-6" TO 4'	3"	
14"	4' TO 4'6"	5"	WHERE THE VERTICAL DROP FROM CEILING TO BOTTOM OF SOFFIT EXCEEDS 2', THE CEILING AND SOFFIT SHALL BE COVERED AS IF THERE IS A WALL AT THE EDGE OF THE SOFFIT.
16-1/2"	4'-6" TO 5'	7"	
18"	5' TO 5'6"	7"	
20"	5'6" TO 6'	7"	
24"	6' TO 6'6"	9"	
30"	6'6" TO 7'	11"	
35"	7' TO 7'6"	14"	
OVER 18"	PROVIDE ADDITIONAL SPRINKLER UNDER OBSTRUCTIONS OVER 4' WIDE	14"	
CLEARANCE FROM NON-CONTINUOUS OBSTRUCTIONS (OBSTRUCTING A SINGLE SPRINKLER ONLY - SUCH AS BAR JOIST WEB, LIGHT FIXTURE, HVAC UNIT, ETC)	DISTANCE FROM SPRINKLER DEFLECTOR TO CLOSEST POINT OF NON-SOLID OBSTRUCTIONS - 3 TIMES THE MAXIMUM DIMENSION OF THE OBSTRUCTION, WITH A MAXIMUM SEPARATION OF 24" REQUIRED.	DISTANCE FROM SPRINKLER DEFLECTOR TO CLOSEST POINT OF NON-SOLID OBSTRUCTIONS - 4 TIMES THE MAXIMUM DIMENSION OF THE OBSTRUCTION, WITH A MAXIMUM SEPARATION OF 36" REQUIRED.	

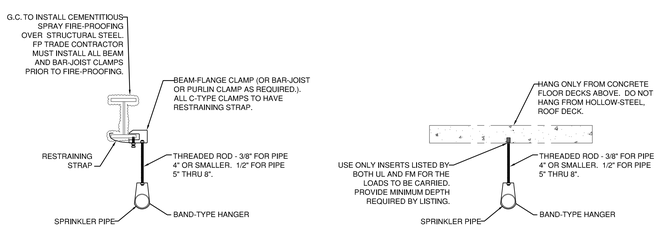
NOTE: REFER TO NFPA 13 FOR OBSTRUCTION CLEARANCES FOR SIDEWALLS AND EXTENDED COVERAGE SPRINKLERS.

1 FP1.2 Fire Protection Obstruction Clearances Required
NO SCALE

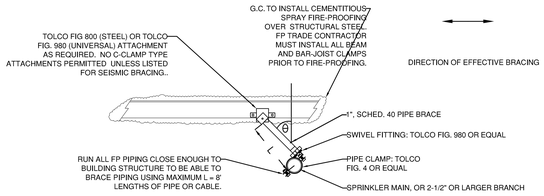
SPRINKLER PIPE HANGER MAXIMUM SPACING								
PIPE TYPE	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4" TO 6"	END-OF-LINE HANGER TO END SPRINKLER
GROOVED SCHEDULE 10 AND THREADED SCHEDULE 30 AND 40.	12'	12'	15'	15'	15'	15'	15'	3' FOR 1" PIPE UNDER 100 PSI, 12" OVER 100 PSI

NOTE 1. COORDINATE EXACT HANGER LOCATION WITH BUILDING STRUCTURE

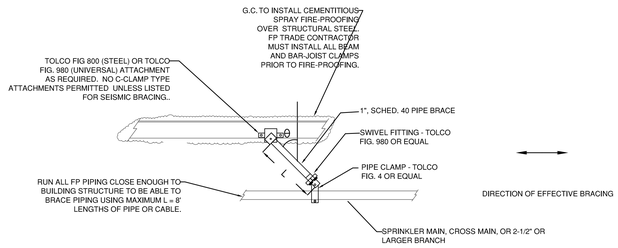
2 FP1.2 Fire Protection Hanger Spacing Table
NO SCALE



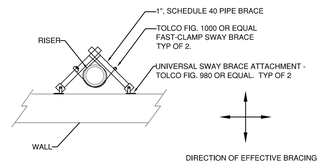
3 FP1.2 Fire Protection Typical Hanger - From Steel and Structural Deck
NO SCALE



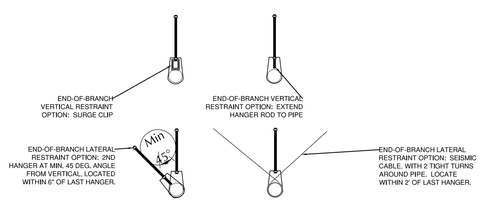
4 FP1.2 Fire Protection Typical Lateral Brace Detail
NO SCALE



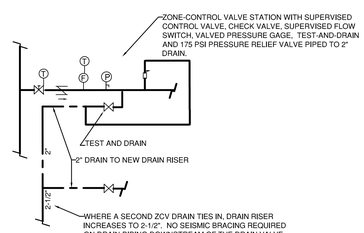
5 FP1.2 Fire Protection Typical Longitudinal Brace Detail
NO SCALE



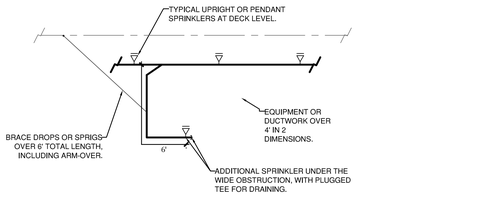
6 FP1.2 Fire Protection Typical 4-Way Brace Detail
NO SCALE



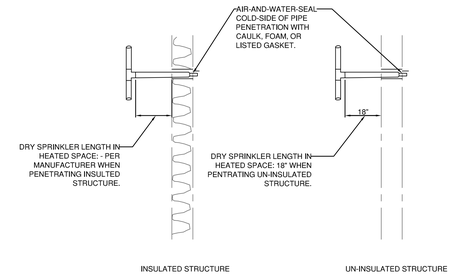
7 FP1.2 Fire Protection Typical End of Line Restraint Detail
NO SCALE



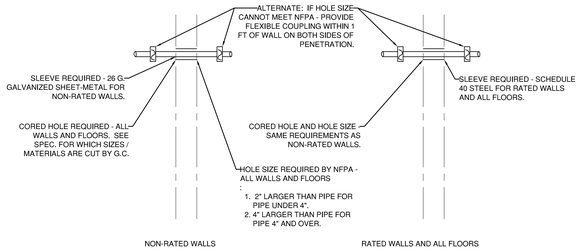
8 FP1.2 Fire Protection Typical Zone-Control Valve Station Detail
NO SCALE



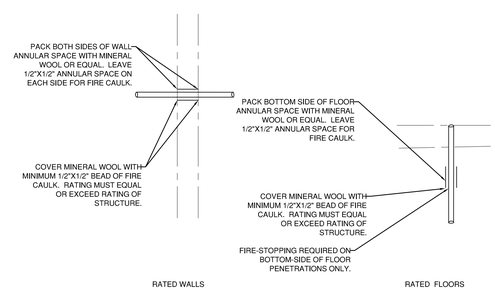
9 FP1.2 Fire Protection Typical Sprinkler Under Wide Obstruction
NO SCALE



10 FP1.2 Fire Protection Typical Dry Sprinkler Installation
NO SCALE



11 FP1.2 Fire Protection Typical Masonry or Steel Penetration Detail
NO SCALE



12 FP1.2 Fire Protection Typical Fire Stopping Detail
NO SCALE

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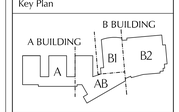
OWNER
Worcester Public Schools
Worcester, Ma.

Project North

PROJECT
Final Bid Package
South High Community School
170 Apricot St, Worcester, MA 01603

TITLE
Fire Protection Details

Key Plan



REVISIONS

No.	Description	Date

FILE: SoHS FP 100% CD Submission 1-24-19

DWN. BY: LKB	JOB NO: 1611
CKD. BY: LKB	SCALE: 1/8" = 1'

DATE: January 31, 2019

FP1.2

HYDRAULIC CALCULATIONS SUMMARY

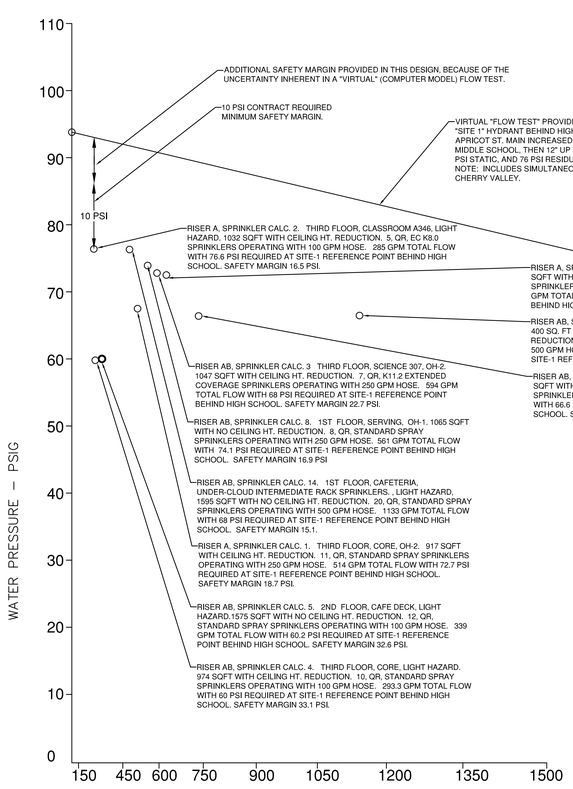
RISER #	CALCULATION #	AREA	SPECIAL CONDITIONS / SPRINKLER TYPE	HAZARD CLASS	DESIGN AREA SQFT	# NOZZLES CALCULATED	REQ.. DENSITY GPM / SQFT	ACTUAL DENSITY	SPRINKLER GPM	INSIDE HOSE GPM	OUTSIDE HOSE GPM	TOTAL FLOW GPM	REQUIRED PRESSURE PSI	AVAILABLE PRESSURE AT REQUIRED FLOW	PRESSURE MARGIN OF SAFETY - PSI
ALL	0	STANDPIPE	WET-MANUAL	N/A	N/A	N/A	N/A	N/A	N/A	1,000	0	1000	147 AT FDC	150 PSI AT 1500 GPM PER WFD	N/A
A	1	3RD FLOOR OH CORE	NONE -STANDARD SPRAY	OH2	910	11	.2	0.29	262	0	250	512	73.1	91.5	18.4
A	1A	3RD FLOOR SCIENCE A366	NONE - QR, EC-OH2 K11.2 SPRINKLERS	OH-2	1004	6	.2	.4	406	0	250	656	79.4	90	10.6
A	2	3RD FLOOR CLASSROOM A346	NONE - QR, EC-K8.0 SPRINKLERS	Light	1029	5	.1	.19	194	0	100	294	82.8	93.1	10.3
AB	3	3RD FLOOR SCIENCE A307	NONE -QR, EC-OH2 K11.2 SPRINKLRES	OH2	1047	7	.2	.4	361	0	250	611	79.1	90.5	11.4
AB	4	3RD FLOOR LIGHT CORE	NONE - STANDARD SPRAY	Light	971	10	.1	.21	202	0	100	302	65.6	93.1	27.4000
AB	5	CAFE DECK	CEILING "CLOUDS" - STANDARD SPRAY WITH INTERMEDIATE RACK UNDER CLOUDS	LIGHT	1608	12	.1	.15	242	0	100	342	81	92.8	11.8
AB	6	RECEIVING	LOADING DOCK - OH2 DRY SIDEWALLS,	OH2	1602	12	.2	.28	443	0	250	693	73.2	89.6	16.4000
AB	7	RECYCLING	GROUP A PLASTICS UP TO 10'. K11.2	EH-2 OVER 400 SQFT, WITHIN OH-2 AND LIGHT HAZARD AREA.	1595	20	.4 AND .2 AND .1	.43	644	0	500	1144	71.6000	82.9	11.3000
AB	8	SERVING	NONE- SS AND QR-EC-OH1, K11.2	OH1	1065	8	0.1500	.3	304	0	250	554	74.6000	91.1	16.5000
B1	9	STAGE	NONE - STANDARD SPRAY	OH2	1522	23	.2	.37	555	0	250	805	70	88.2	18.2000
B1	10	AUDITORIUM	CEILING "CLOUDS".- INTERMEDIATE RACK SPRINKLERS AND DECK INCLUDED IN CALC	LIGHT	1625	8	.1	.34	552	0	100	652	68.6	90.1	21.5000
B1	11	AUDITORIUM STORAGE	NONE- STANDARD SPRAY	OH2	1512	15	.2	.21	320	0	250	570	74.4	90.9000	16.5
B1	12	MAIN LOBBY	ATTIC SPRINKLERS, WINDOW SPRINKLERS. AND SS	LIGHT	1600	21	.1	.32	505	0	100	505	68.6	91.6000	23.0000
B1	13	MAIN LOBBY	K8.0 EC SPR.	LIGHT	1634	16	.1	.34	528	0	100	628	73.4	93.9000	16.9000
AB	14	CAFETERIA	UNDER CLOUD RACK SPRINKLERS	LIGHT	1522	28	.1	.32	480	0	100	580	76.5	90.8	14.3000
B2	15	GYM	NONE - STANDARD SPRAY	LIGHT	1640	9	.1	.14	232	0	100	332	80	92.9	12.9000
B2	16	ART STORAGE	NONE - OR - EC-OH K11.2, AND SS.	OH2 UNDER 400 SQFT WITHIN LIGHT	1518	15	.2 AND .1	0.3600	537	0	100	637	72.4	90.2	17.8000
B2	20	GROUND LEVEL AUTO-DIESEL	ACETYLENE STORAGE IN FENCED AREAS	UNENCLOSED EH1 WITHIN OH2	2558	38	.3 AND .2	.37	944	0	500	1444	59	76.9	17.9

1. ALL HAZARD CLASSES ARE PER NFPA 13. CITY IS SELF-INSURED - WITH NO SPECIAL INSURANCE HAZARD CLASS REQUIREMENTS.
2. ALL DESIGN-PHASE CALCULATIONS ARE CARRIED TO THE NEW, "SITE 1" HYDRANT NEAR THE JUNCTION OF THE SOUTH HS 8" FEED AND SULLIVAN MIDDLE SCHOOL 8" EXTENSION - SEE KEY PLAN FOR LOCATION.
3. ONCE THE NEW WATER MAIN TO THE NEW HS IS INSTALLED, THE CONTRACTOR SHALL PROVIDE A NEW FLOW TEST. CONTRACTOR'S CALCULATIONS SHALL BE CARRIED TO THE "SITE 1" HYDRANT.

1 / FP1.3 SPRINKLER SYSTEM AND CALCULATION SUMMARY

NO SCALE

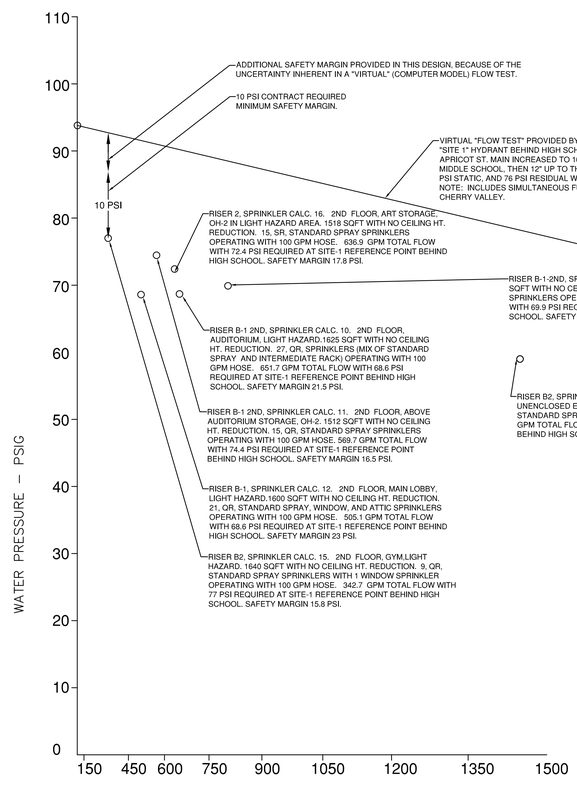
SOUTH COMMUNITY HIGH SCHOOL
A AND AB AREAS - SPRINKLER HYDRAULICS SUMMARY



3 / FP1.3 RISERS A & AB HYDRAULICS GRAPHS

NO SCALE

SOUTH COMMUNITY HIGH SCHOOL
B1 AND B2 AREAS - SPRINKLER HYDRAULICS SUMMARY



4 / FP1.3 RISERS B1 & B2 HYDRAULICS GRAPHS

NO SCALE

FIRE PROTECTION BASIS OF DESIGN

A NEW "WET-TYPE" SYSTEM WILL BE INSTALLED THROUGH-OUT PER NFPA 13 (2013), WITH STAIRWELL STANDPIPE SYSTEM PER NFPA 14 (2013)

SPRINKLERS WILL BE INTERMEDIATE TEMPERATURE THROUGHOUT THE BUILDING, EXCEPT WHERE A HIGHER TEMPERATURE RATING IS REQUIRED BY NFPA 13.

ALL SPACES WITH CEILINGS WILL UTILIZE CONCEALED PENDANTS AT THE REQUEST OF WORCESTER FACILITIES. K-FACTOR WILL BE 5.6 IN MOST AREAS, WITH K8.0 LIGHT-LISTED EXTENDED COVERAGE SPRINKLERS USED IN ***SOME*** LIGHT HAZARD AREAS, AND K11.2 OH-LISTED EXTENDED COVERAGE SPRINKLERS USED IN ***SOME*** ORDINARY HAZARD AREAS.

AREAS WITH NO CEILINGS WILL UTILIZE EXPOSED PIPING, WITH FUSIBLE LINK, UPRIGHT SPRINKLERS.

MECHANICAL SPACES, WALK-IN COOLERS WITH AUTO-DEFROST, AND COOKING AREAS WILL BE COVERED BY HIGH TEMPERATURE UPRIGHTS, TO PREVENT FALSE ACTIVATION IN THE EVENT OF A PRESSURE RELIEF VALVE BLOWING, ELECTRICAL OVER-HEATING CONDITION, OR DEFROSTER / COOKING HEAT,.

ALL EXPOSED SPRINKLERS IN THE GYMNASIUM, MECHANICAL SPACES, STORAGE AREAS, OR INSTALLED UNDER 12' AFF WILL HAVE PROTECTIVE HEAD-CAGES.

ALL ABOVE-CEILING SPACES ARE NON-OR-LIMITED-COMBUSTIBLE, SO ***NONE*** OF THESE ARE "COMBUSTIBLE CONCEALED SPACES" REQUIRING SPRINKLERS. SOME CEILINGS ARE NOT SOLID-AND-CONTINUOUS, HOWEVER, SO DO REQUIRE 2 LEVELS OF SPRINKLERS - ONE AT THE DECK, AND ONE AT THE CEILING LEVEL. THESE INCLUDE THE CAFETERIA, AUDITORIUM, AND LARGE MUSIC ROOMS THERE IS ***NO*** ACCESSIBLE SPACE UNDER THE STAGE, SO NO SPRINKLERS THERE.

WALK-IN COOLERS / FREEZERS AND THE LOADING DOCK AREA ARE PROTECTED BY DRY SPRINKLERS PIPED FROM WET-PIPING IN HEATED SPACE. THE LOADING DOCK AREA WILL USE ORDINARY-HAZARD-LISTED DRY SIDEWALLS - TYCO DS-3. OTHER DRY SPRINKLERS WILL BE PENDANT OR SIDEWALL, STANDARD OR EXTENDED COVERAGE, AS REQUIRED BY THE AREA COVERED.

A NEW KITCHEN EXHAUST-HOOD WILL BE PROVIDED, AND A NEW, DRY-AGENT, PACKAGED FIRE SUPPRESSION SYSTEM PROVIDED AS PART OF THE HVAC / HOOD PACKAGE.

INTERIOR PIPING SYSTEMS WILL BE SCHEDULE 40 THREADED OR GROOVED, BLACK STEEL FOR PIPE 2" AND UNDER, AND SCHEDULE 10, GROOVED STEEL FOR PIPE 2-1/2" AND OVER. ALL PIPE WILL BE SIZED FOR A MAXIMUM WATER VELOCITY OF 25 FPS.

STANDPIPES WILL BE LOCATED IN OR NEAR ALL STAIRWELLS, AND WILL HAVE A HOSE VALVE STATION AT EACH MAIN LANDING. AT THE 3 STAIRWELLS THAT EXTEND TO A ROOF MAN-DOOR, THE STANDPIPE WILL TERMINATE AT 2 HOSE VALVES AT THE ROOF LEVEL. ALL OTHER STANDPIPES WILL EXTEND UP TO A ROOF HYDRANT, EXCEPT FOR 1 (AB-AREA) STAIRWELL THAT WFD EXEMPTED FROM HAVING A ROOF HYDRANT DUE TO ITS PROXIMITY TO THE MAIN-AB-STAIR ROOF HOSE VALVES.

4 OF THE STANDPIPES WILL BE COMBINATION SPRINKLER - STANDPIPE RISERS, WITH A SPRINKLER ZONE CONTROL VALVE STATION ON EACH FLOOR THAT THEY SERVE. 3 STANDPIPES WILL BE "STANDPIPE-ONLY" RISERS.

SEISMIC BRACING TO BE PROVIDED WILL INCLUDE RISER-4-WAY BRACING AND MAIN-LONGITUDINAL SWAY BRACING THRU-OUT. WHERE POSSIBLE, SPRINKLER MAIN HANGER RODS WILL BE LESS THAN 6" LONG FROM POINT OF ATTACHMENT TO TOP OF PIPE, ELIMINATING THE NEED FOR LATERAL BRACING. WHERE THIS IS NOT POSSIBLE, ALL MAINS, CROSS MAINS, AND BRANCHES OVER 2-1/2" WILL HAVE BOTH LATERAL AND LONGITUDINAL SEISMIC BRACING. BRANCH LINES CARRYING 2 OR MORE SPRINKLERS WILL ALSO HAVE END-OF-LINE RESTRAINTS.

FIRE PROTECTION EQUIPMENT AND CONTROLS LOCATIONS:

THE FIRE PROTECTION SERVICE ENTRANCE, AND BACKFLOW PREVENTOR, WILL BE LOCATED IN THE FP SERVICE ENTRANCE ROOM, LOCATED AT THE SOUTH END OF THE B2-GROUND LEVEL. EACH OF THE 4 COMBINATION SPRINKLER STANDPIPE WET-RISERS WILL BE LOCATED IN A STAIRWELL - 1 RISER FOR EACH OF THE A, AB, B1, AND B2 BUILDING AREAS. AS APPROVED BY WFD, THESE RISERS WILL HAVE A HOSE VALVE AT EACH STAIRWELL MAIN LANDING. THEY WILL ***NOT*** HAVE A RISER CONTROL VALVE, BUT WILL HAVE ZONE-CONTROL VALVE STATIONS FOR THE SPRINKLERS ON EACH FLOOR. ZONE CONTROL VALVE STATIONS WILL TYPICALLY BE LOCATED ABOVE THE STAIR-LANDING CEILING, AND WILL ALL HAVE A SUPERVISED CONTROL VALVE, CHECK VALVE, PRESSURE RELIEF VALVE, PRESSURE GAGES, FLOW-SWITCH ALARM, AND TEST AND DRAIN PER NFPA 13.

IN ADDITION, THERE WILL BE 3, STANDPIPE-ONLY RISERS - IN 2NDARY STAIRWELLS IN THE A, AB AND B2 BUILDING-AREAS. THESE WILL ALSO HAVE A HOSE VALVE AT EACH STAIRWELL MAIN LANDING, BUT NO SPRINKLER ZONE CONTROL VALVE STATIONS.

PER THE WORCESTER FIRE DEPT.
(WFD) STANDARDS, 2, NEW, 2-1/2" SIAMESE FDCS WILL BE PROVIDED TO SERVE BOTH THE SPRINKLER AND STANDPIPE SYSTEM. AT THE REQUEST OF THE LOCAL FIRE CHIEF, AWATER-FLOW BELL WILL BE LOCATED ABOVE EACH FDC, WITH A RED BEACON (PROVIDED BY FIRE ALARM CONTRACTOR) OVER THE DOOR TO THE MAIN ANNUNCIATOR.

CROSS-CONTAMINATION WILL BE PREVENTED BY A NEW, DOUBLE CHECK VALVE BACKFLOW PREVENTER INSTALLED ON THE NEW FP SERVICE ENTRANCE.

THERE IS NO SMOKE CONTROL SYSTEM OR EXHAUST REQUIRED FOR THIS BUILDING, AND NONE IS PROVIDED. THE ONLY ALTERNATIVE FIRE SUPPRESSION SYSTEM IN THE BUILDING IS THE KITCHEN HOOD DRY-AGENT SYSTEM, LOCATED IN THE MAIN KITCHEN.

IDENTIFICATION SIGNS PER NFPA 13 AND THE 9TH EDITION BUILDING CODE WILL BE PROVIDED ON:

1. ALL CONTROL VALVES
2. ALL TEST AND DRAIN VALVES AND ALL AUXILIARY DRAINS
3. FIRE DEPT. CONNECTIONS
4. HOSE VALVES
5. FIRE SUPPRESSION CONTROL ROOM DOOR
6. SPARE SPRINKLER CABINET (TYPED LIST OF SPRINKLERS AND THEIR CHARACTERISTICS AND USE)
7. HYDRAULICS CALCULATIONS SIGNS AT THE SERVICE ENTRANCE

SEQUENCE OF OPERATIONS: ALL CONTROL VALVES WILL HAVE CONTINUOUSLY MONITORED TAMPER SWITCHES, AND THE MAIN SERVICE ENTRANCE AND ALL ZONE-CONTROL VALVE STATIONS WILL HAVE FLOW SWITCHES. FLOW SWITCH ALARMS WILL TRIGGER ALL BUILDING NOTIFICATION DEVICES AND EVACUATION. FLOW SWITCHES WILL ALSO HAVE TAMPER SWITCHES ON THEIR COVER, TO PREVENT DISABLING OF ANY FLOW-SWITCH DEVICE. BOTH TAMPER SWITCH AND FLOW SWITCH ACTIVATION WILL BE COMMUNICATED TO THE WORCESTER FIRE DEPT. SEE FIRE ALARM NARRATIVE FOR DETAILS.

FIRE PROTECTION NOTES

1. SPRINKLER LOCATIONS SHOWN ON THESE DRAWINGS HAVE BEEN COORDINATED BY THE ARCHITECT FOR AESTHETICS, AND TO AVOID CONFLICTS WITH OTHER TRADES. LOCATIONS SHALL NOT BE CHANGED WITHOUT WRITTEN APPROVAL OF BOTH THE FP ENGINEER OF RECORD, AND THE ARCHITECT. IF LAYOUT SHOWN MUST BE MODIFIED TO PROVIDE PROPER SPRINKLER COVERAGE PER CODE, NOTIFY THE ENGINEER IMMEDIATELY IN WRITING.
2. ALL EQUIPMENT AND MATERIALS USED SHALL BE LISTED FOR THE USE REQUIRED AND FOR A MINIMUM OF 175 PSI.
3. ALL SPRINKLERS IN SQUARE-TILED CEILINGS SHALL BE CENTERED IN THE TILE. SPRINKLERS IN RECTANGULAR-TILED CEILINGS SHALL BE CENTERED IN 1 HALF OF THE TILE.
4. COORDINATE EXACT PIPING LOCATIONS AND HEIGHTS WITH BUILDING STRUCTURE, ARCHITECTURE AND ALL OTHER TRADES. VERIFY ALL DIMENSIONS IN THE FIELD.
5. RUN ALL BRANCH PIPING AS HIGH AS POSSIBLE - WITHIN BAR-JOISTS WHERE-EVER FEASIBLE. RUN FP PIPING MAINS AND CROSS MAINS A MINIMUM OF 16" ABOVE THE CEILING.
6. ALL PIPING SHALL BE A53 BLACK STEEL. 2" AND UNDER SHALL BE SCHEDULE 40, WITH THREADED OR GROOVED JOINTS. PIPING 2-1/2" AND OVER SHALL BE SCHEDULE 10 WITH ROLL-GROOVED JOINTS. NO CUT-GROOVE PIPE PERMITTED.
7. ALL RUN-OUTS AND DROPS TO INDIVIDUAL SPRINKLERS ARE 1" UNLESS NOTED OTHERWISE. ALL BRANCHES AND RUN-OUTS SHALL BE TAKEN FROM THE SIDE OR TOP OF THE ORIGINATING MAIN OR BRANCH.
8. SLEEVE ALL PIPE PENETRATIONS THRU MASONRY WALLS. WHERE PIPE PASSES THROUGH BUILDING MASONRY OR STEEL STRUCTURE, ADJUST PIPE POSITION SO IT IS NOT IN CONTACT WITH THE SLEEVE OR STRUCTURE.

8.1. THE HOLE DRILLED SHALL BE MINIMUM 2" GREATER THAN THE PIPE O.D. FOR PIPE UNDER 4", AND 4" GREATER THAN PIPE SIZE FOR PIPE 4" OR LARGER. OR

8.2. FLEXIBLE COUPLINGS SHALL BE PROVIDED WITHIN 1' OF BOTH SIDES OF THE STRUCTURE

9. GROOVED PIPE COUPLINGS LISTED AS "FLEXIBLE" COUPLINGS SHALL BE PROVIDED:

9.1. AT THE TOP AND BOTTOM OF EACH RISER
9.2. ABOVE AND BELOW ALL FLOOR PENETRATIONS,
9.3. AND WITHIN 24" OF BUILDING EXPANSION JOINTS (ONE SIDE ONLY).
9.4. ALL OTHER LOCATIONS REQUIRED BY NFPA 13.

10. PROVIDE 4-WAY RESTRAINTS ON ALL SPRIGS AND DROPS OVER 6' (TOTAL DEVELOPED LENGTH).
11. GROOVED-PIPE COUPLINGS NOT SPECIFIED AS "FLEXIBLE" SHALL BE "RIGID" TYPE.
12. SPRINKLER TEMPERATURE RATINGS SHALL BE PER NFPA 13: INCLUDING (BUT NOT LIMITED TO):

12.1. INTERMEDIATE TEMPERATURE IN MECHANICAL AND ELECTRICAL ROOMS; UNDER SKYLIGHTS; IN WALK-IN COOLERS / FREEZERS WITH AUTO-DEFROST; WITHIN 2-1/2 FT OF HVAC SUPPLY REGISTERS;

12.2. HIGH TEMPERATURE: WITHIN 7 FT OF HEATING EQUIPMENT PRESSURE RELIEF VALVES; WITHIN 7 FT OF UNIT HEATER DISCHARGE; AROUND COMMERCIAL KITCHEN COOKING EQUIPMENT, AND OVER EXTRA HAZARD SPACES

13. PROVIDE SPRINKLER GUARDS FOR ALL SPRINKLERS IN THE GYM, MECHANICAL SPACES, UNDER STAIR LANDINGS, AND IN STORAGE ROOMS.
14. ALL C-CLAMP TYPE FASTENERS FOR PIPE HANGERS SHALL HAVE A RESTRAINING STRAP. C-CLAMP TYPE FASTENERS NOT PERMITTED FOR SEISMIC RESTRAINT, UNLESS PART OF A LISTED SYSTEM.
15. ALL MAINS AND CROSS MAINS (REGARDLESS OF SIZE) SHALL BE SEISMICALLY BRACED LONGITUDINALLY 40' FROM THE END-OF-LINE, AND MAX. 80' O.C. THERE-AFTER. ALL MAINS AND CROSS MAINS AND AND ALL BRANCH PIPING 2-1/2" OR LARGER SHALL BE SEISMICALLY BRACED LATERALLY 6' FROM THE EOL, AND MAX. 40' OC. THERE-AFTER. PROVIDE ADDITIONAL BRACING IN LOCATIONS REQUIRED BY NFPA 13, INCLUDING BUT NOT LIMITED TO:

15.1. OFFSETS IN BRACED LINES OVER 12' LONG SHALL HAVE AN ADDITIONAL 4-WAY BRACE AT THE MID-POINT OF THE OFF-SET

15.2. WHERE BRACE LOADS WOULD OTHERWISE EXCEED THE MAX. PERMITTED LOAD PER TABLE 9.3.5.3.2 a THRU e.

16. BRANCHES WITH 2 OR MORE SPRINKLERS SHALL BE RESTRAINED VERTICALLY AND LATERALLY WITHIN 2' OF THE END HANGER.
17. DRAINS AND TEST CONNECTIONS SHALL BE INSTALLED TO PERMIT FULL FLOW WITHOUT CAUSING WATER DAMAGE.

17.1. DRAINS 2" AND OVER SHALL BE HARD-PIPED TO THE BUILDING EXTERIOR.

17.1. AUXILIARY DRAINS FOR LINES UNDER 5 GALLONS WATER CONTENT MAY BE A PLUGGED TEE, OR SINGLE-PENDANT PIPED OFF THE SIDE OR BOTTOM OF THE LINE TO BE DRAINED.

17.2. AUXILIARY DRAINS FOR LINES OVER 5 GALLONS WATER CONTENT SHALL BE HOSE END DRAINS, WITH CAP AND CHAIN, SIZE PER NFPA 13.

18. COORDINATE WORK WITH BUILDING STRUCTURE AND OTHER TRADES - ADJUSTING SPRINKLER AND BRANCH LOCATIONS AS REQUIRED TO MEET THE CLEARANCE REQUIREMENTS LISTED IN THE OBSTRUCTION TABLE, 1 / FP 1.2, AND MAINTAIN NFPA MINIMUM AND MAXIMUM SPRINKLER SPACINGS:
19. ELECTRICAL PANELS AND DEVICES ARE NOT SHOWN ON THESE DRAWINGS. COORDINATE PIPE ROUTING TO AVOID RUNNING DIRECTLY OVER ANY ELECTRICAL POWER, TELECOM, OR CONTROL PANELS.
20. ALL DETAILS (VALVING, SUPERVISION, ETC) ARE SUBJECT TO THE APPROVAL OF THE AUTHORITY HAVING JURISDICTION (AHJ).
21. ALL PIPE SHALL BE HYDROSTATICALLY TESTED AT 200 PSI. ALL HYDROSTATIC TEST SHALL BE WITNESSED BY THE ENGINEER-OF-RECORD OR AUTHORITY HAVING JURISDICTION.
22. PROVIDE ALL CODE-REQUIRED, DURABLE, PERMANENTLY INSTALLED, AHJ APPROVED SIGNS INCLUDING (NOT LIMITED TO):

22.1. "BUILDING SPRINKLER CONTROL VALVES" IN 2-1/2" HIGH LETTERS ON ALL VALVE-ROOM DOORS.

22.2. "AUTOMATIC SPRINKLERS" IN 1" HIGH LETTERS ON THE FIRE DEPT. CONNECTION(S).

22.3. "TEST AND DRAIN" AND "FOR (AREA SERVED)" IN 2" HIGH LETTERS ON ALL TEST AND DRAINS

22.4. "SPRINKLER CONTROL VALVE" AND "FOR (AREA SERVED)" IN 2" HIGH LETTERS ON ALL CONTROL VALVES.

22.5. "DESIGN HYDRAULICS SUMMARY: WITH FLOW TEST GPM AND PRESSURES, RISER NUMBER, AND DESIGN GPM AND PRESSURES FOR EACH CALCULATED AREA.

22.6. NFPA 13 "GENERAL INFORMATION" SIGN

22.7. LIST OF SPARE SPRINKLERS AND AREA USED IN THE SPARE SPRINKLER CABINET

22.8. PROVIDE AN 8-1/2x11, LAMINATED, COLOR-CODED, CLEARLY LABELED FLOOR PLAN AT EACH CONTROL VALVE AND DRAIN, SHOWING THE SERVICE AERA OF THAT VALVE.

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Worcester Public Schools

Worcester, Ma.

Project North

PROJECT

Final Bid Package

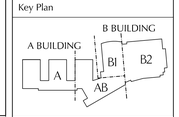
South High Community School

170 Apricot St, Worcester, MA 01603

TITLE

Fire Protection Hydraulics, Notes and Basis of Design

Key Plan



REVISIONS

No.	Description	Date

FILE: SoHS FP 100% CD Submission 1-24-19

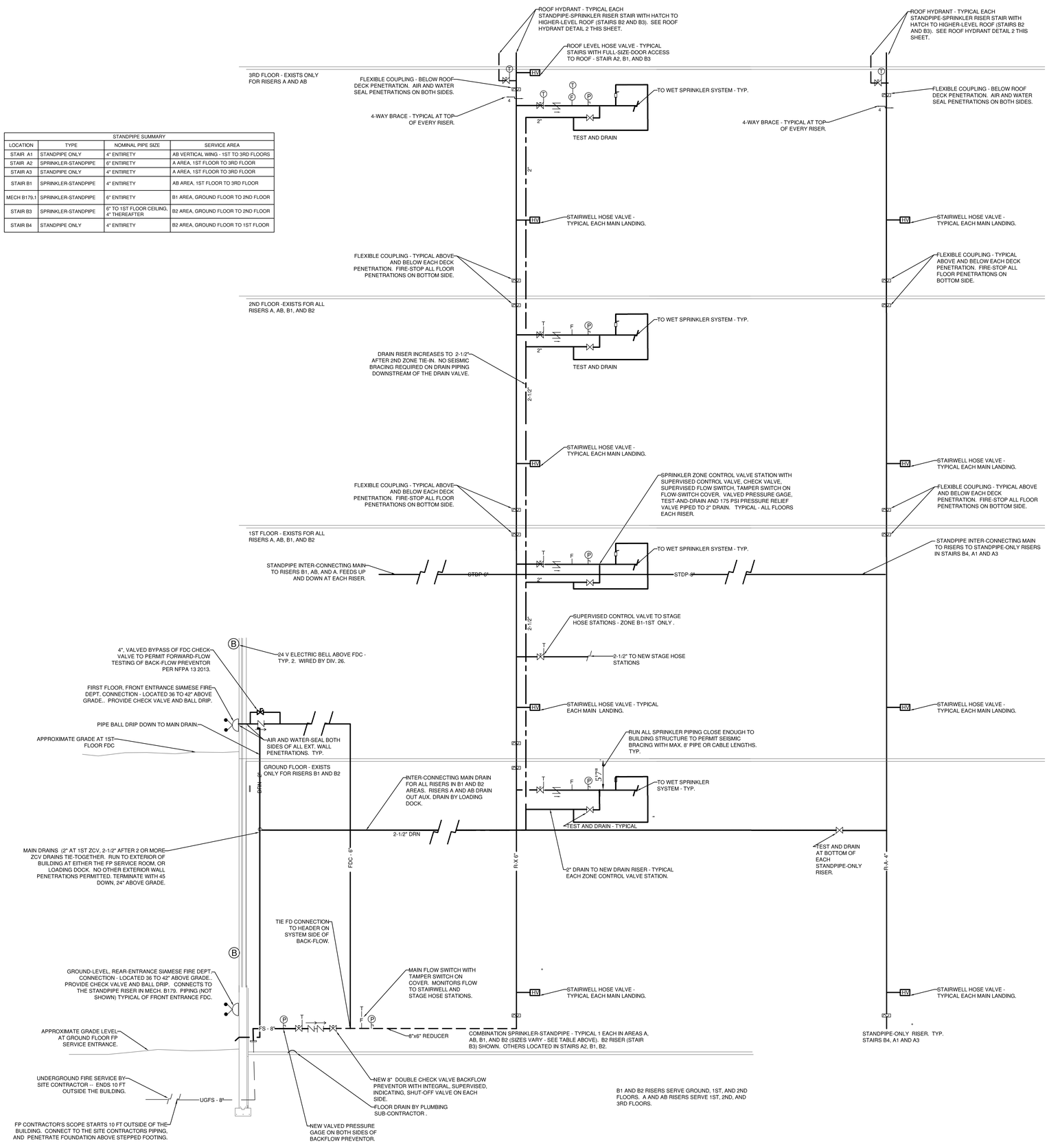
DWN. BY: LKB | JOB NO: 1611

CKD. BY: LKB | SCALE: 1/8" = 1'

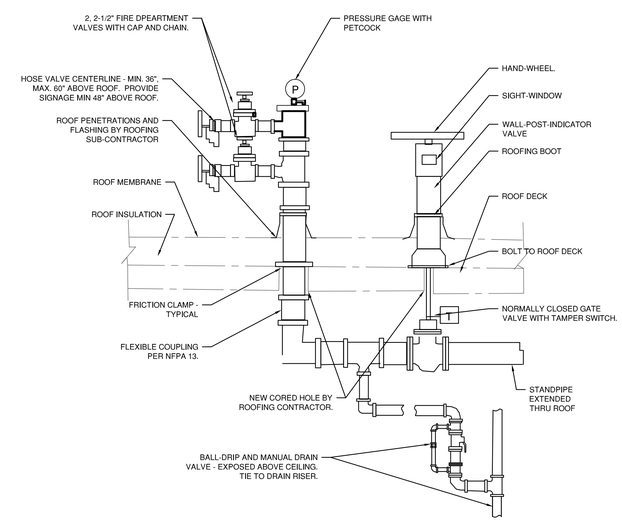
DATE: January 31, 2019

FP1.3

STANDPIPE SUMMARY			
LOCATION	TYPE	NOMINAL PIPE SIZE	SERVICE AREA
STAIR A1	STANDPIPE ONLY	4" ENTIRETY	AB VERTICAL WING - 1ST TO 3RD FLOORS
STAIR A2	SPRINKLER-STANDPIPE	6" ENTIRETY	A AREA, 1ST FLOOR TO 3RD FLOOR
STAIR A3	STANDPIPE ONLY	4" ENTIRETY	A AREA, 1ST FLOOR TO 3RD FLOOR
STAIR B1	SPRINKLER-STANDPIPE	4" ENTIRETY	AB AREA, 1ST FLOOR TO 3RD FLOOR
MECH B179.1	SPRINKLER-STANDPIPE	6" ENTIRETY	B1 AREA, GROUND FLOOR TO 2ND FLOOR
STAIR B3	SPRINKLER-STANDPIPE	6" TO 1ST FLOOR CEILING, 4" THEREAFTER	B2 AREA, GROUND FLOOR TO 2ND FLOOR
STAIR B4	STANDPIPE ONLY	4" ENTIRETY	B2 AREA, GROUND FLOOR TO 1ST FLOOR



1 FP1.4 Fire Protection Riser Diagram
NO SCALE



2 FP1.4 FP Roof Hydrant Detail
NO SCALE

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PROJECT

Final Bid Package

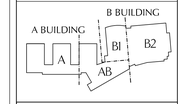
South High Community School

170 Apricot St, Worcester, MA 01603

TITLE

Fire Protection Riser Diagram and Roof Hydrant Detail

Key Plan



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FILE: SoHS FP 100% CD Submission 1-24-19

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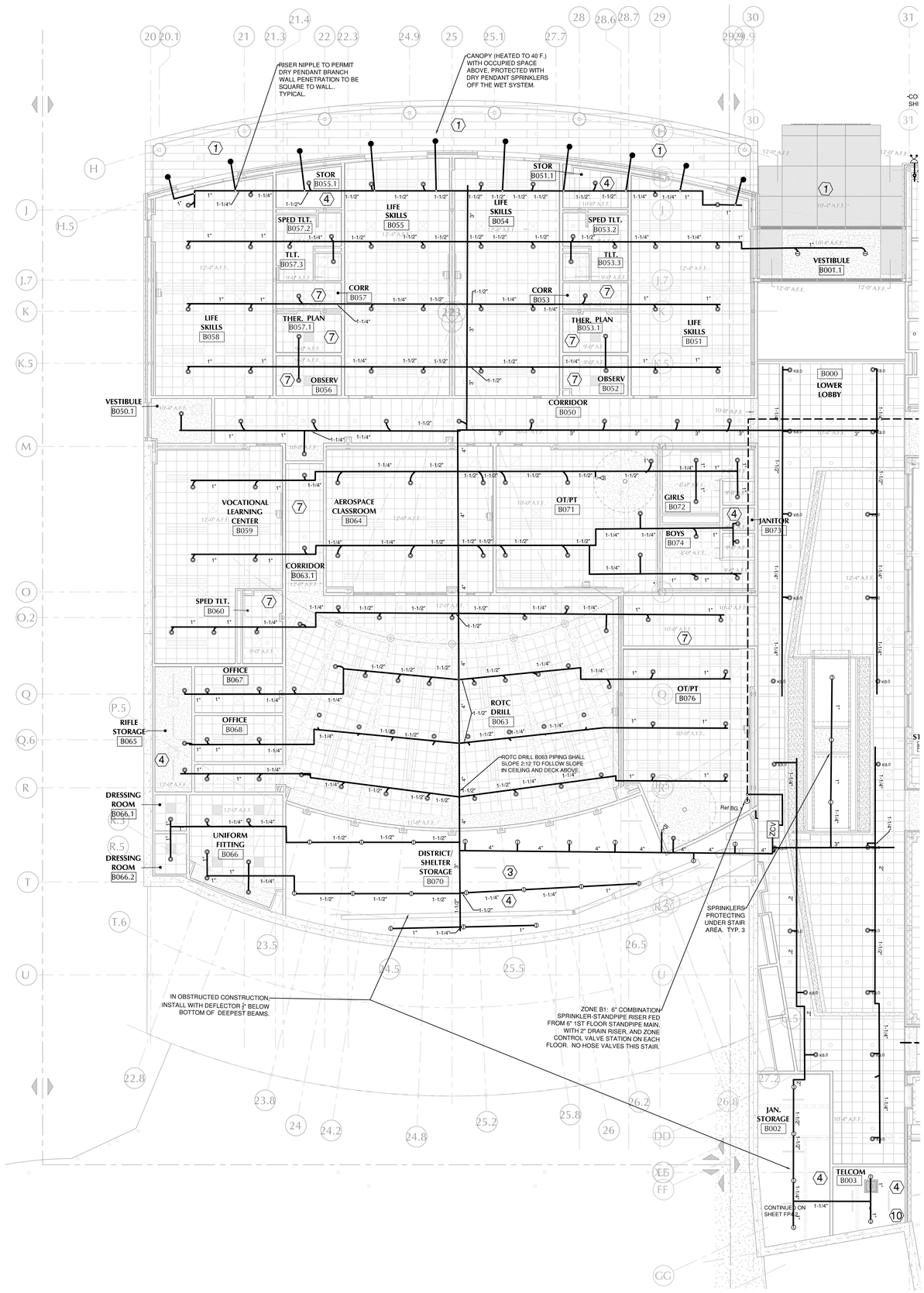
FP1.4



1 Fire Protection Ground Level Reflected Ceiling Floor Plan - Riser B-1
FP4.1 Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot St, Worcester, MA 01603

TITLE

Fire Protection Ground Floor Reflected Ceiling Plan Riser B1

Key Plan

A BUILDING
B BUILDING
A
AB
B1
B2

REVISIONS

No.	Description	Date

FILE: SoHS FP 100% CD Submission 1-24-19

DWN. BY: LKB | JOB NO: 1611

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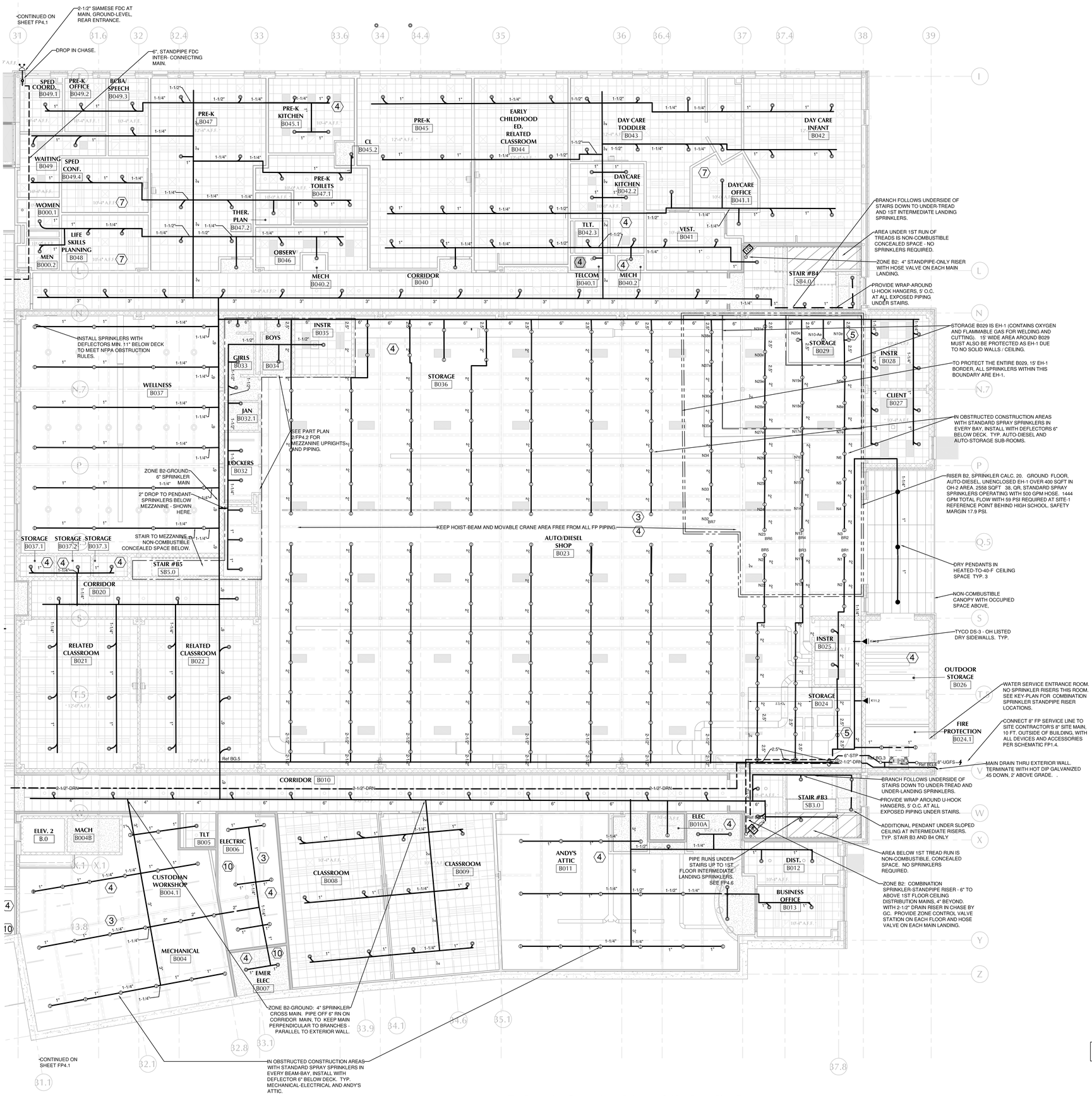
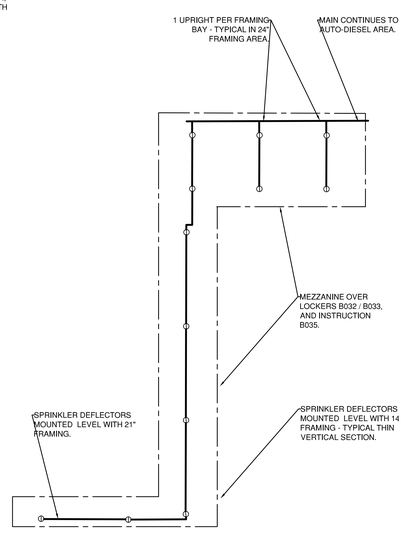
DATE: January 31, 2019

FP4.1



1 FP4.2 Fire Protection Ground Level Reflected Ceiling Plan - Riser B-2
Scale: 1/8" = 1'-0"



2 FP4.2 Fire Protection Part Plan - Auto-Diesel Mezzanine
Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot St, Worcester, MA 01603

TITLE

Fire Protection Ground Floor Reflected Ceiling Plan Riser B2

Key Plan

A BUILDING, B BUILDING, AB, B1, B2

REVISIONS

No.	Description	Date

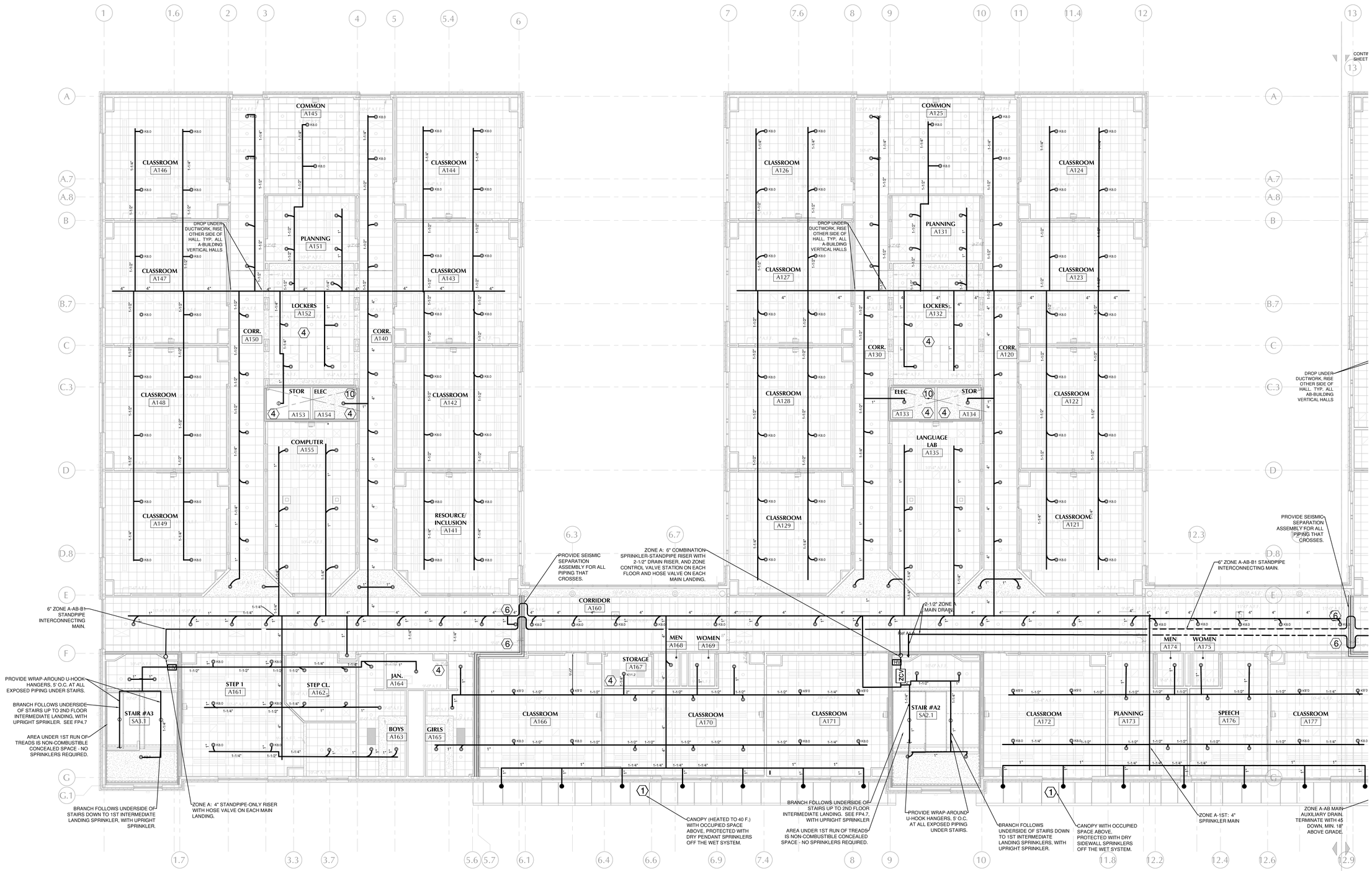
FILE: SoHS FP 100% CD Submission 1-24-19

DWN. BY: LKB | JOB NO: 1611

CKD. BY: LKB | SCALE: 1/8" = 1'

DATE: January 31, 2019

FP4.2



1 FP4.3 Fire Protection First Floor Reflected Ceiling Plan Riser A
Scale: 1/8" = 1'-0"

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TITLE

Fire Protection First Floor Reflected Ceiling Plan Riser A

Key Plan

A BUILDING
B BUILDING
A
AB
B1
B2

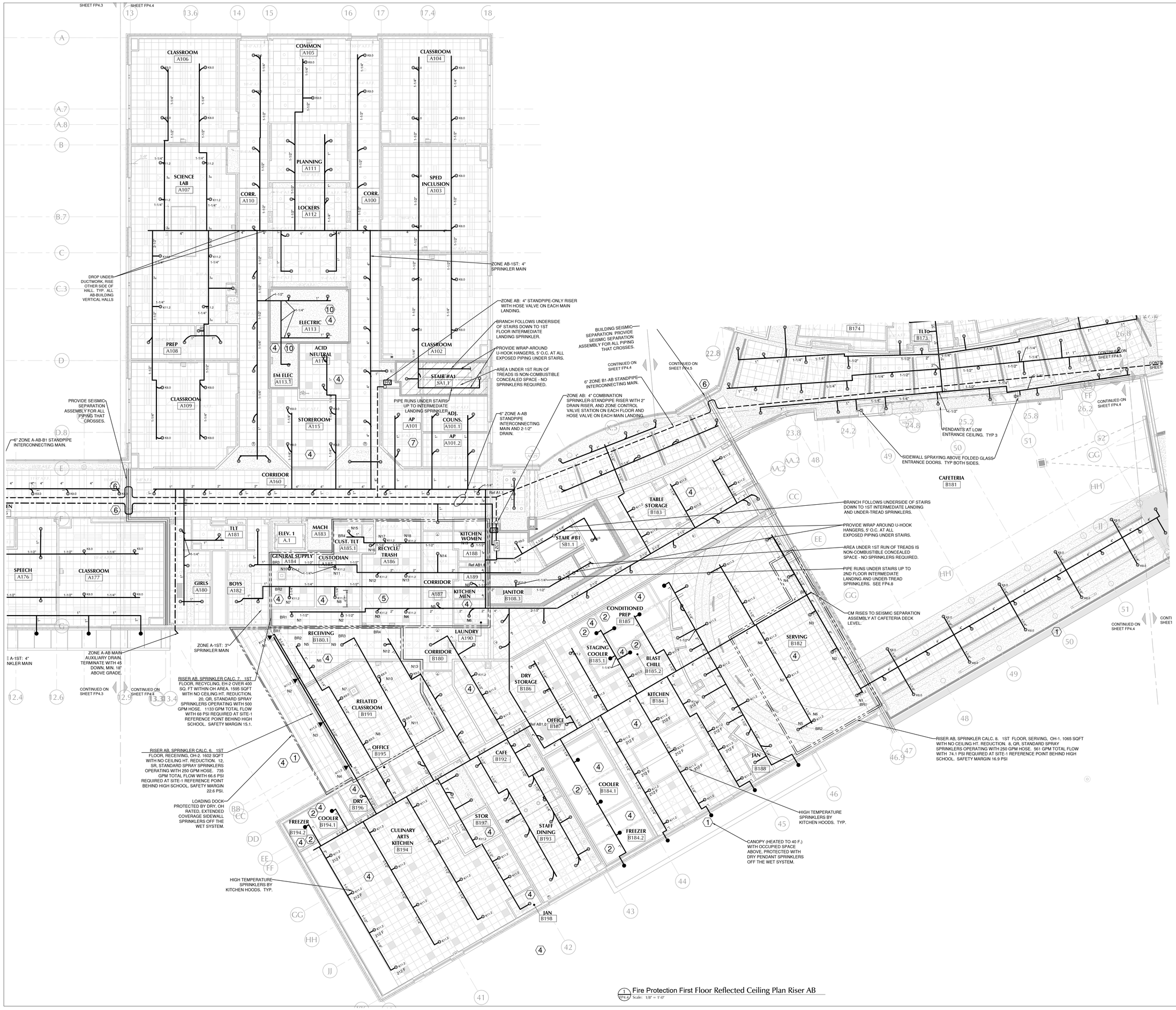
REVISIONS

No.	Description	Date

FILE: SoHS FP 100% CD Submission 1-24-19

DWN. BY: LKB
JOB NO: 1611
CKD. BY: LKB
SCALE: 1/8" = 1'
DATE: January 31, 2019

FP4.3



1 Fire Protection First Floor Reflected Ceiling Plan Riser AB
FP4.4 Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot St, Worcester, MA 01603

TITLE

Fire Protection First Floor Reflected Ceiling Plan Riser AB

Key Plan

A BUILDING | B BUILDING | A | AB | B1 | B2

REVISIONS

No.	Description	Date

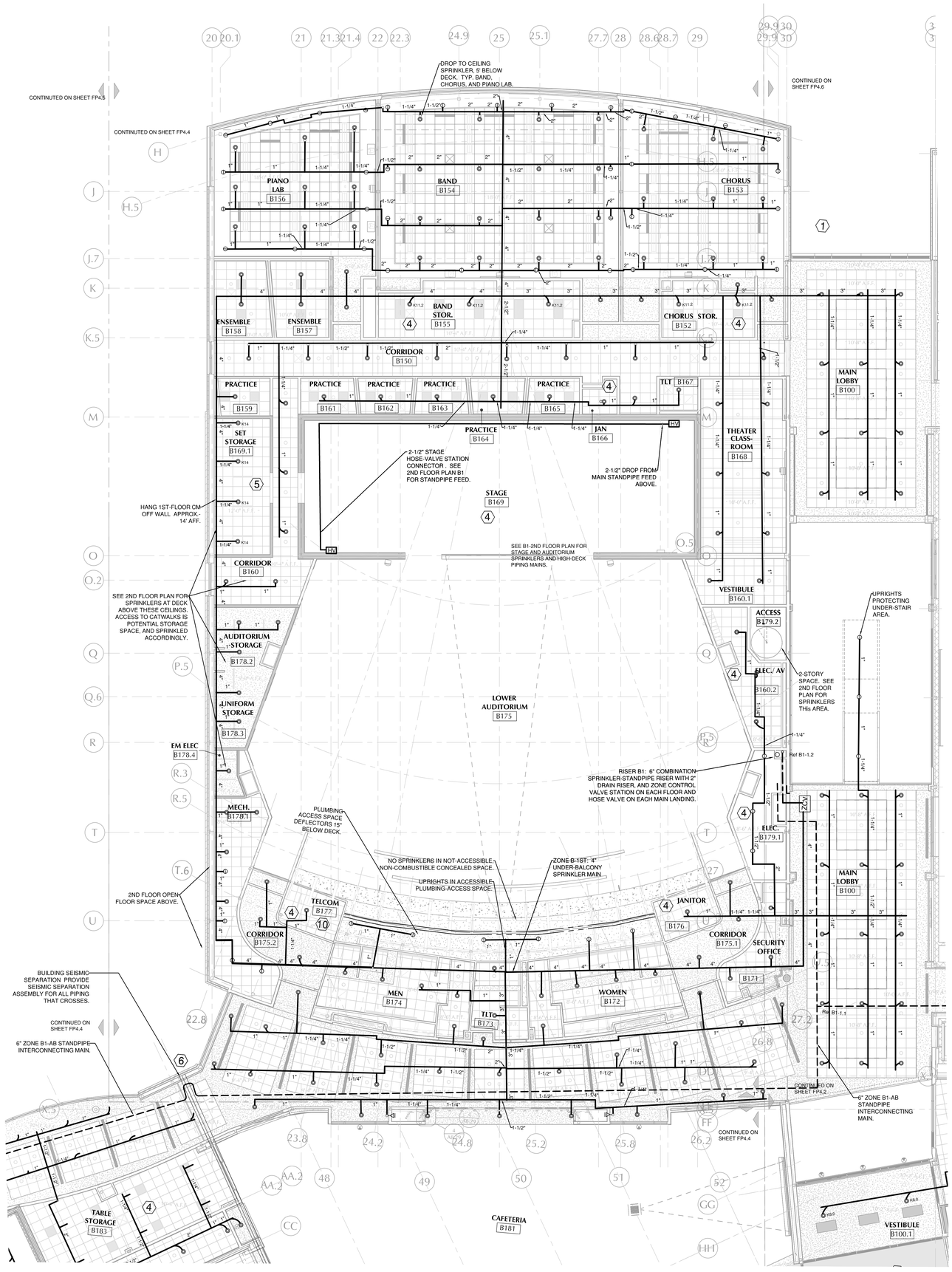
FILE: SoHS FP 100% CD Submission 1-24-19

DWN. BY: LKB | JOB NO: 1611

CKD. BY: LKB | SCALE: 1/8" = 1'

DATE: January 31, 2019

FP4.4



1 FP4.5 Fire Protection First Floor Reflected Ceiling Plan - Riser B-1
Scale: 1/8" = 1'-0"

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170 Apricot St, Worcester, MA 01603

TITLE

Fire Protection First Floor Reflected Ceiling Plan Riser B1

Key Plan

A BUILDING B BUILDING B1 B2 A AB

REVISIONS

No.	Description	Date

FILE: SoHS FP 100% CD Submission 1-24-19

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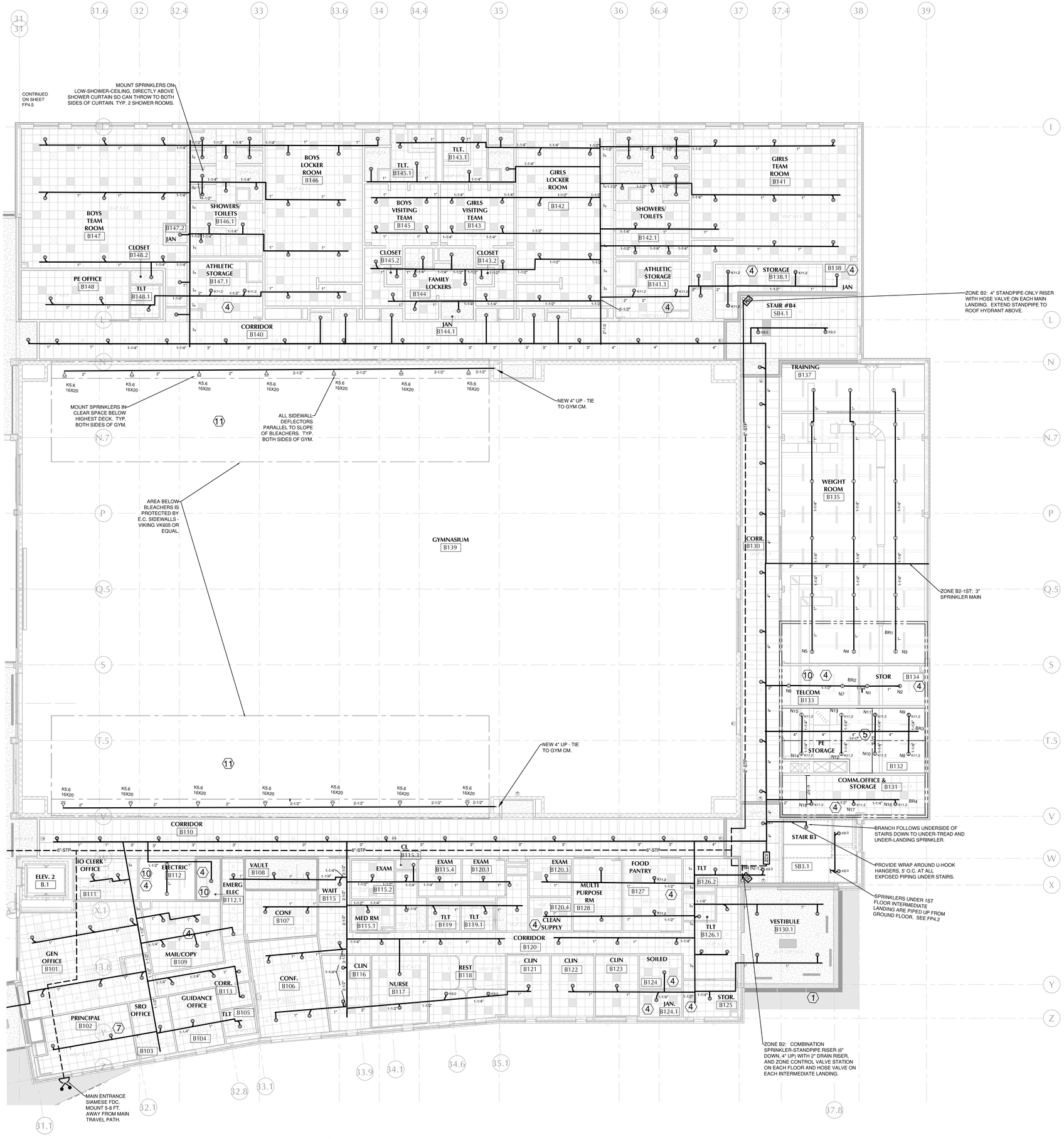
CKD. BY: LKB | SCALE: 1/8" = 1'

DATE: January 31, 2019

FP4.5



1 FP4.6 Fire Protection First Floor Reflected Ceiling Plan - Riser B-2
Scale: 1/8" = 1'-0"

FP UNDER BLEACHERS NOTES:

1. FP LAYOUT SHALL NOT INTERFERE WITH THE BLEACHERS FULLY OPENING OR CLOSING.
2. THE DESIGN SHOWN IS CONTINGENT UPON LOCAL AUTHORITY HAVING JURISDICTION (AHJ) APPROVAL.
3. SPRINKLER SHOWN IN UNDER BLEACHER LAYOUT HAS LISTING LIMITATIONS THAT REQUIRE AHJ APPROVAL:
   - 3.1. SIDEWALLS ARE LISTED FOR USE UNDER (HORIZONTAL OR SLOPED) SMOOTH FLAT CEILINGS.
   - 3.2. THE VIKING VK605 IS LISTED FOR USE UNDER SLOPED CEILINGS UP TO 4:12 SLOPE. BLEACHER SLOPE IS 5:12.
   - 3.3. THE VIKING VK605 MAXIMUM LISTED THROW IS 20 FT. THROW REQUIRED FOR 100% COVERAGE IS 22± FT.

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PROJECT
Final Bid Package
South High Community School
170 Apricot St, Worcester, MA 01603

TITLE
Fire Protection First Floor Reflected Ceiling Plan Riser B2

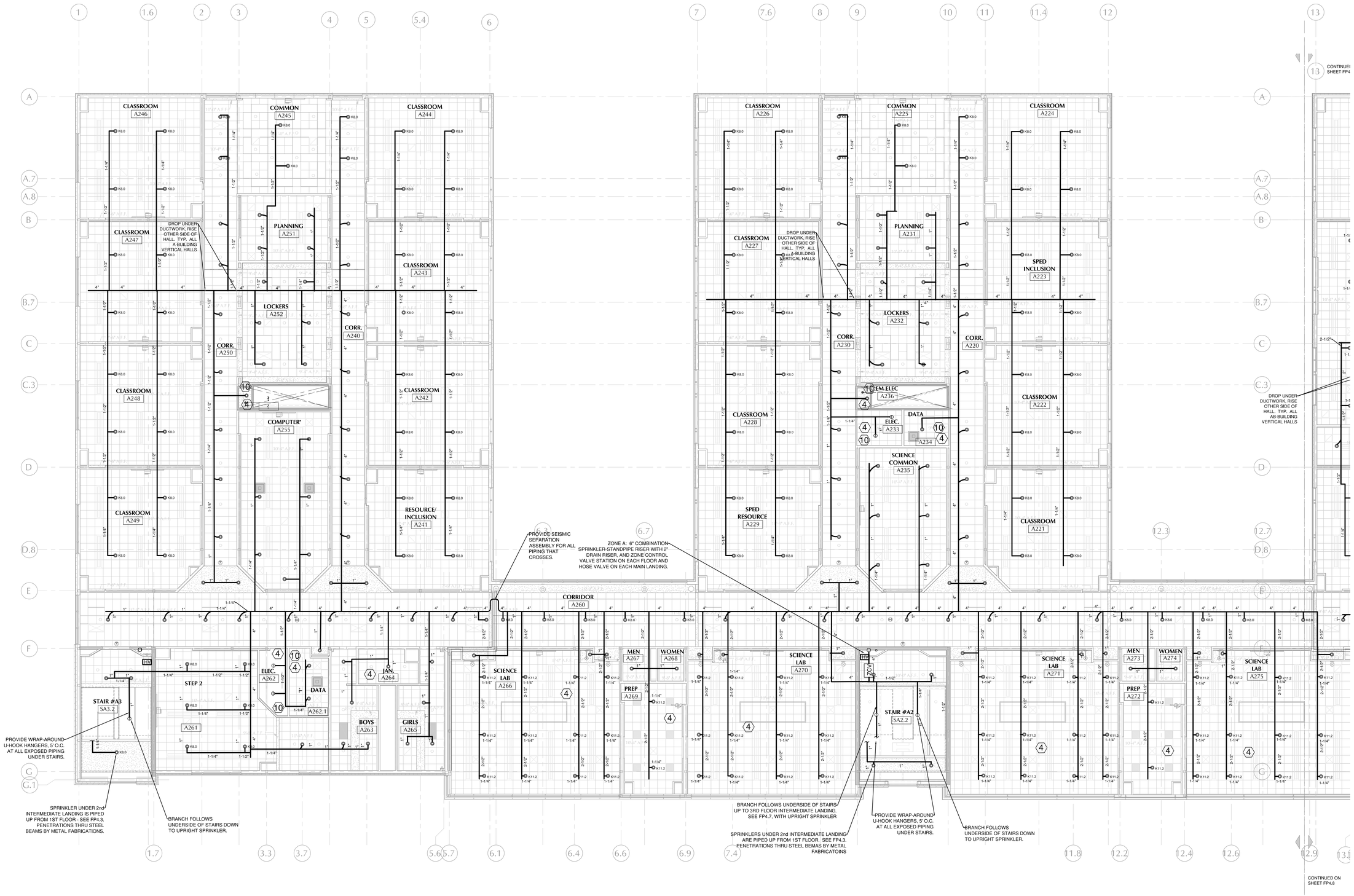
Key Plan
A BUILDING
B BUILDING
A, AB, B1, B2

REVISIONS

No.	Description	Date

FILE: SoHS FP 100% CD Submission 1-24-19
DWN. BY: LKB
JOB NO: 1611
CKD. BY: LKB
SCALE: 1/8" = 1'
DATE: January 31, 2019

FP4.6



1 Fire Protection Second Floor Reflected Ceiling Plan Riser A
FP4.7 Scale: 1/8" = 1'-0"

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PROJECT

Final Bid Package

South High Community School

170 Apricot St, Worcester, MA 01603

TITLE

Fire Protection Second Floor Reflected Ceiling Plan Riser A

Key Plan

A BUILDING B BUILDING A B1 B2 AB

REVISIONS

No.	Description	Date

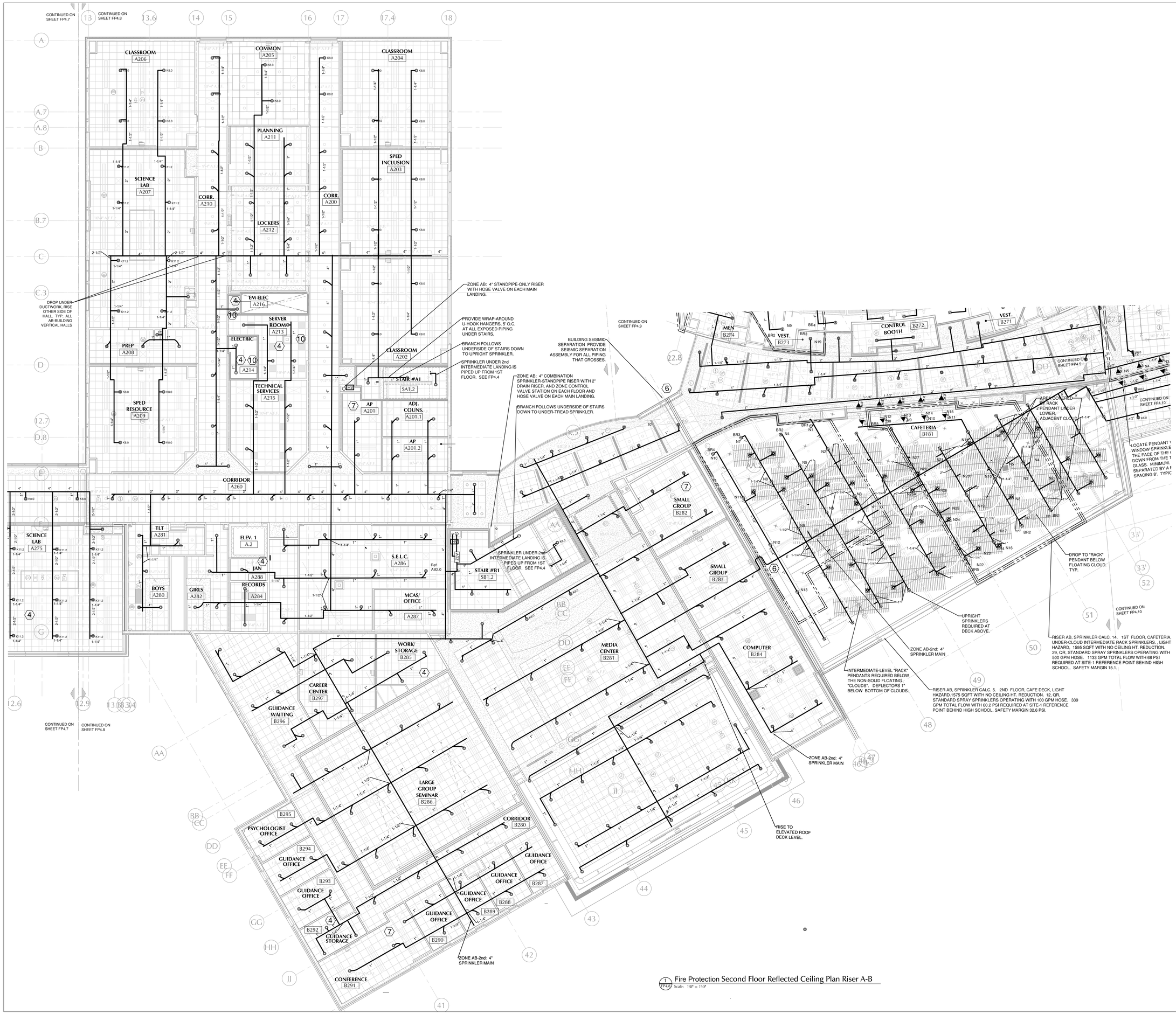
FILE: SoHS FP 100% CD Submission 1-24-19

DWN. BY: LKB | JOB NO: 1611

CKD. BY: LKB | SCALE: 1/8" = 1'

DATE: January 31, 2019

FP4.7



1 FP4.8 Fire Protection Second Floor Reflected Ceiling Plan Riser A-B
Scale: 1/8" = 1'-0"

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Final Bid Package

South High Community School

170 Apricot St, Worcester, MA 01603

TITLE

Fire Protection Second Floor Reflected Ceiling Plan Riser AB

Key Plan

A BUILDING | B BUILDING

REVISIONS

No.	Description	Date

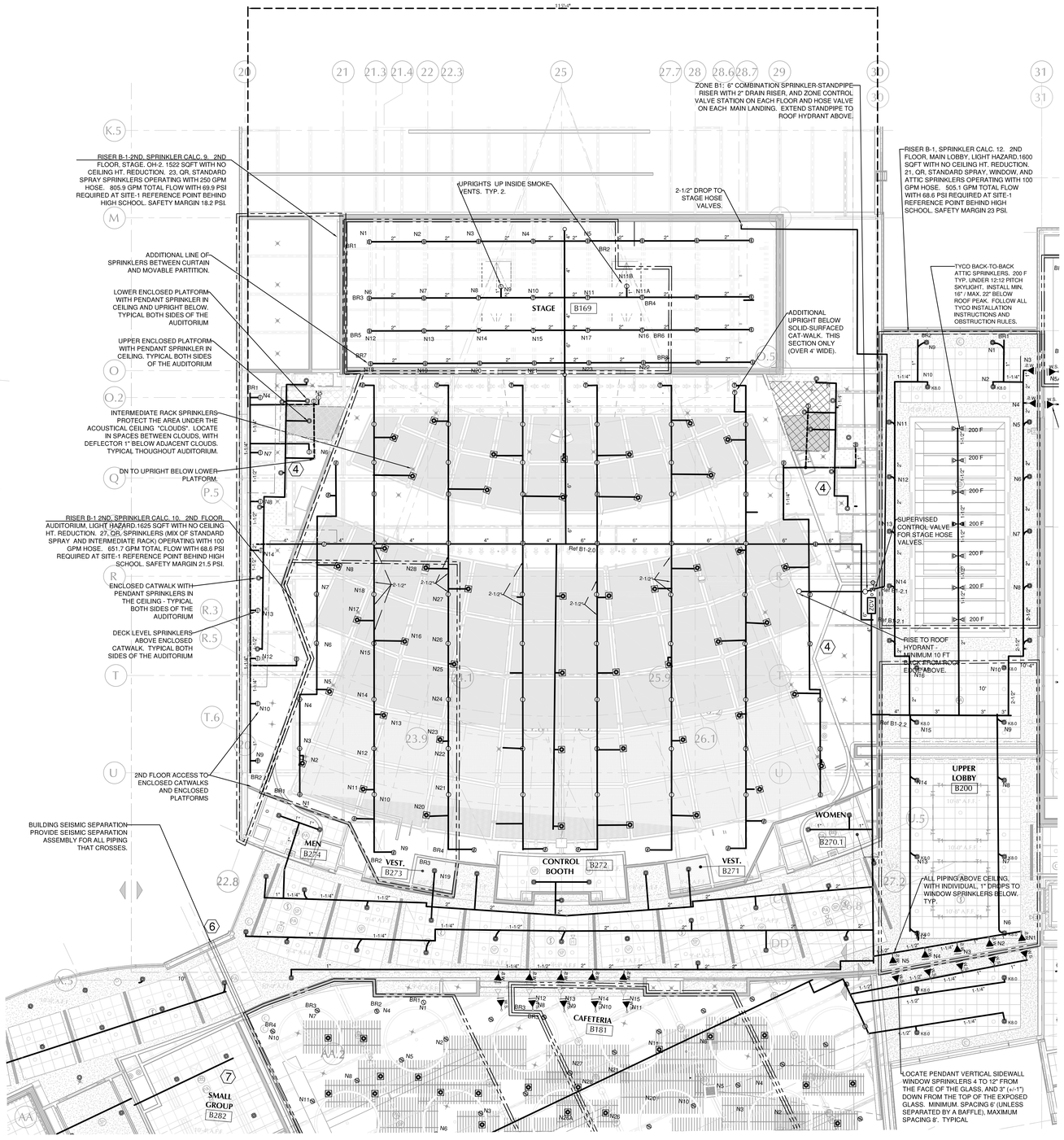
FILE: SoHS FP 100% CD Submission 1-24-19

DWN. BY: LKB | JOB NO: 1611

CKD. BY: LKB | SCALE: 1/8" = 1'

DATE: January 31, 2019

FP4.8



1 Fire Protection Second Floor Reflected Ceiling Plan Riser B-1
FP4.9 Scale: 1/8" = 1'-0"

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Project North

PROJECT

Final Bid Package

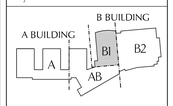
South High Community School

170 Apricot St, Worcester, MA 01603

TITLE

Fire Protection Second Floor Reflected Ceiling Plan Riser B-1

Key Plan



REVISIONS

No.	Description	Date

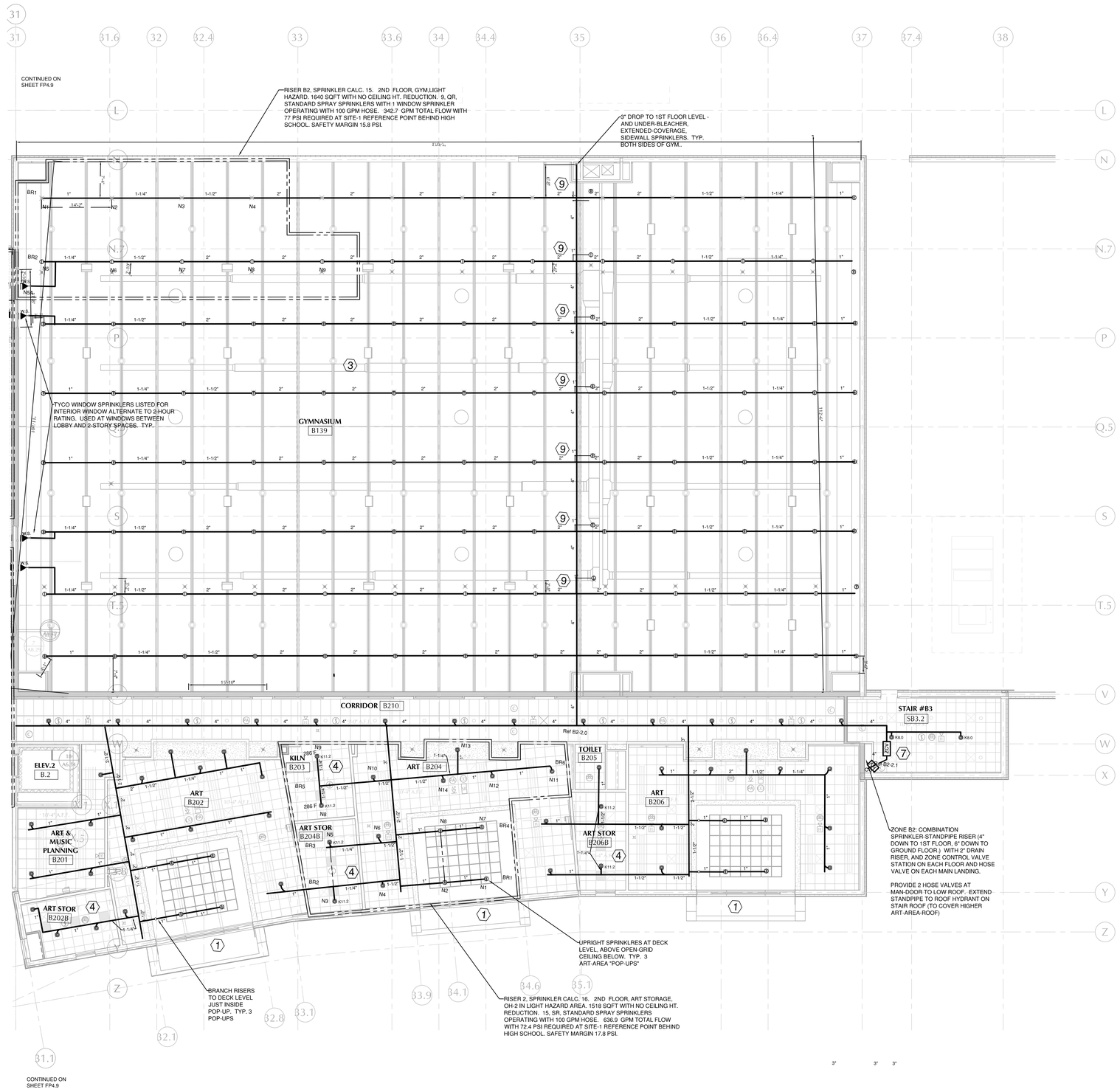
FILE: SoHS FP 100% CD Submission 1-24-19

DWN. BY: LKB | JOB NO: 1611

CKD. BY: LKB | SCALE: 1/8" = 1'

DATE: January 31, 2019

FP4.9



1 Fire Protection Second Floor Reflected Ceiling Plan Riser B-2
FP4.10 Scale: 1/8" = 1'-0"

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Final Bid Package

South High Community School

170 Apricot St, Worcester, MA 01603

TITLE

Fire Protection Second Floor Reflected Ceiling Plan Riser B2

Key Plan

A BUILDING
B BUILDING
A
AB
BI
B2

REVISIONS

No.	Description	Date

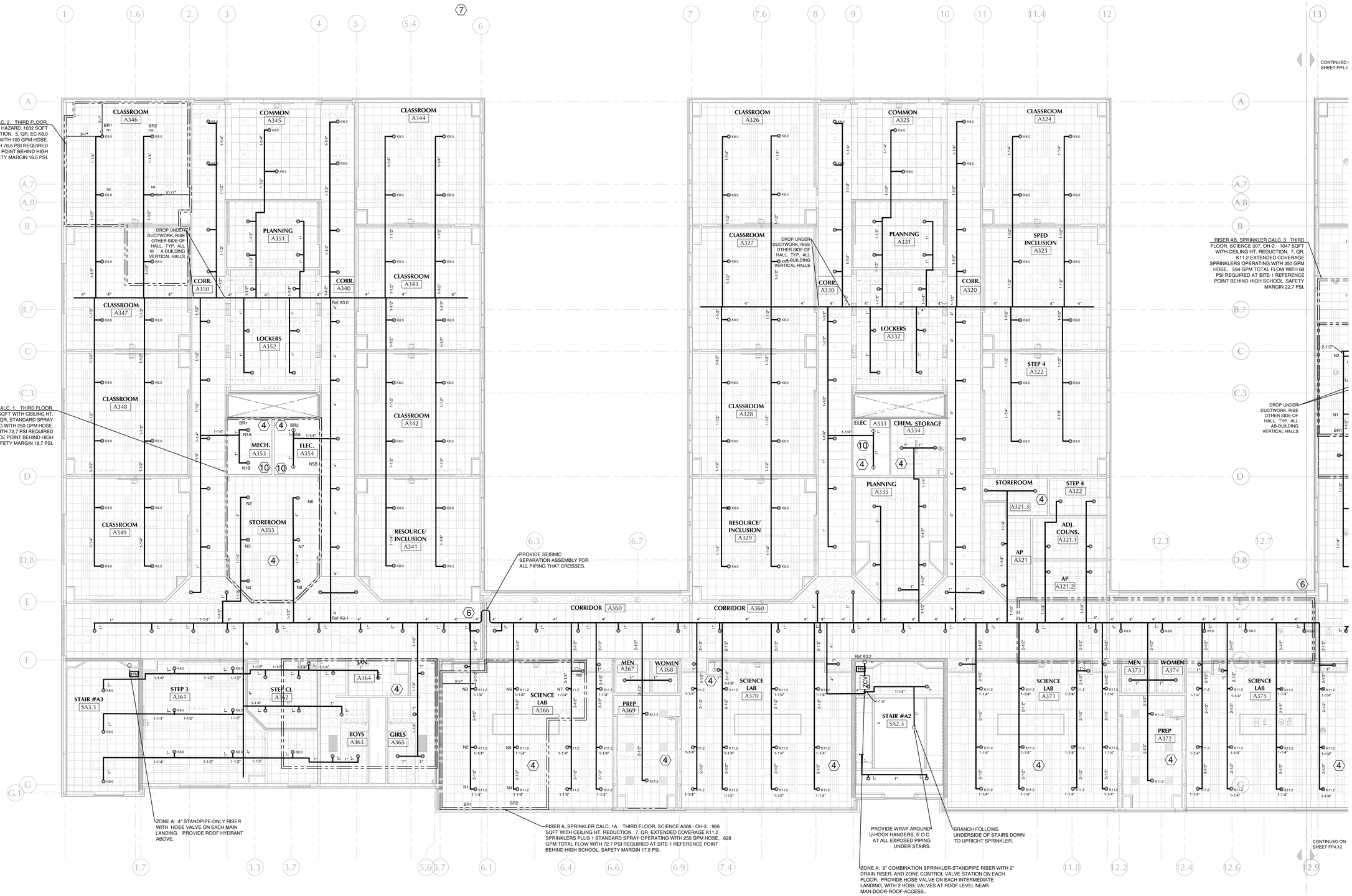
FILE: SoHS FP 100% CD Submission 1-24-19

DWN. BY: LKB | JOB NO: 1611

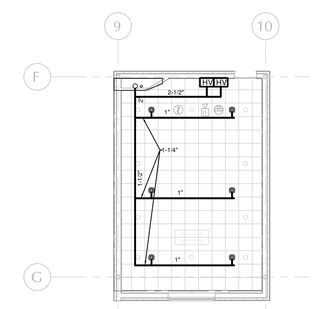
CKD. BY: LKB | SCALE: 1/8" = 1'

DATE: January 31, 2019

FP4.10



1 Fire Protection Third Floor Plan Riser A
FP4.11 Scale: 1/8" = 1'-0"



2 Fire Protection Part Plan Stair #A2 Roof-Penthouse
FP4.11 Scale: 1/8" = 1'-0"

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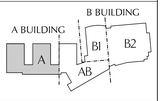
South High Community School

170 Apricot St, Worcester, MA 01603

TITLE

Fire Protection Third Floor Reflected Ceiling Plan Riser A

Key Plan



REVISIONS

No.	Description	Date

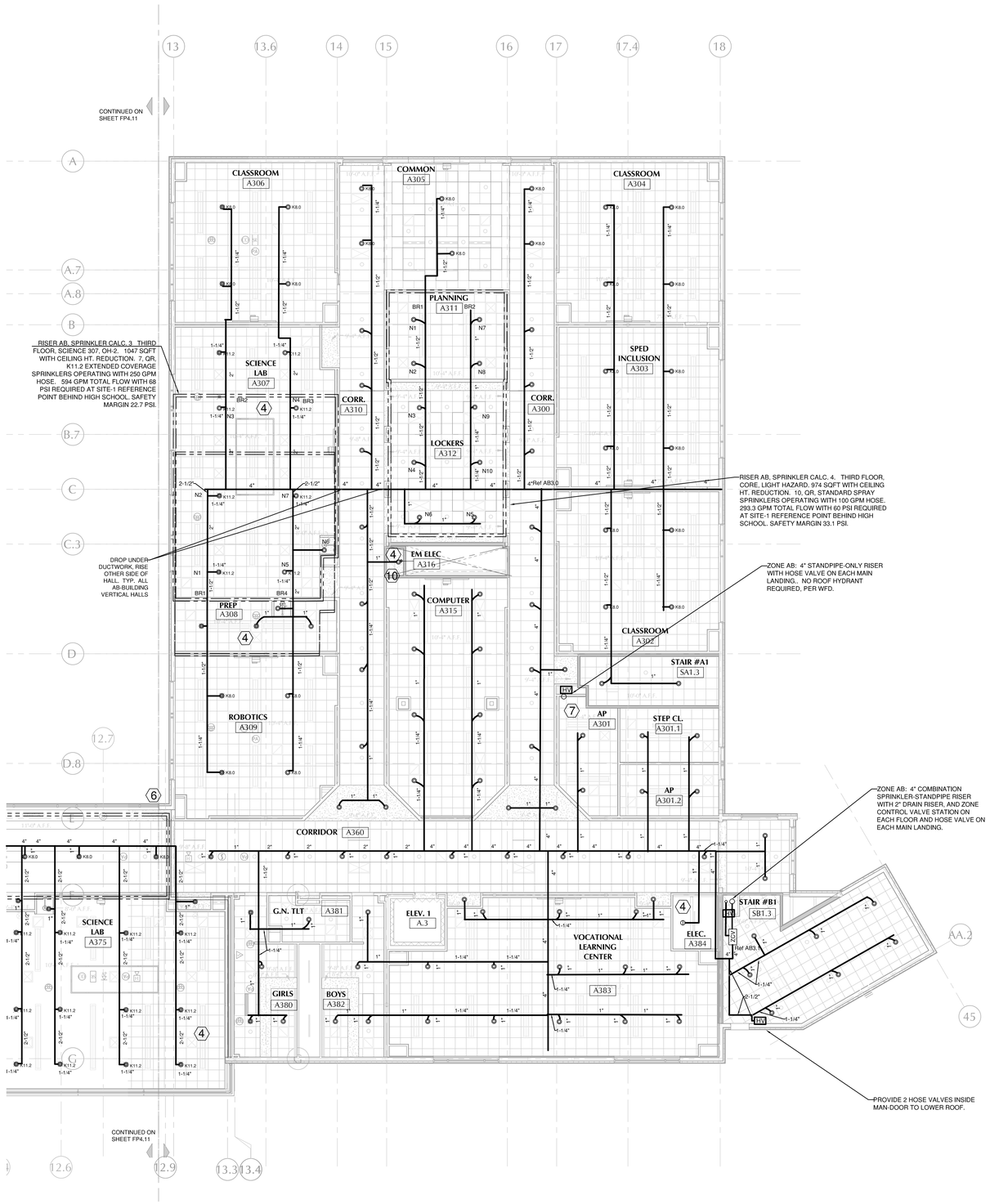
FILE: SoHS FP 100% CD Submission 1-24-19

DWN. BY: LKB | JOB NO: 1611

CKD. BY: LKB | SCALE: 1/8" = 1'

DATE: January 31, 2019

FP4.11



FP4.12 Fire Protection Third Floor Reflected Ceiling Plan Riser AB
Scale: 1/8" = 1'-0"

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170 Apricot St, Worcester, MA 01603

TITLE

Fire Protection Third Floor Reflected Ceiling Plan Riser AB

Key Plan

A BUILDING
B BUILDING
A
B1
B2
AB

REVISIONS

No.	Description	Date

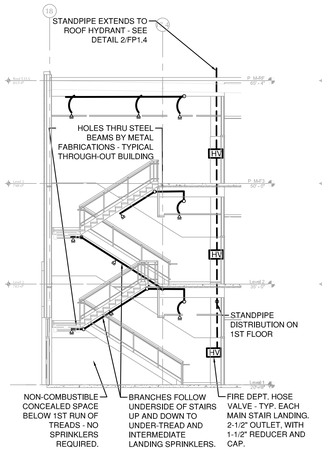
FILE: SoHS FP 100% CD Submission 1-24-19

DWN. BY: LKB | JOB NO: 1611

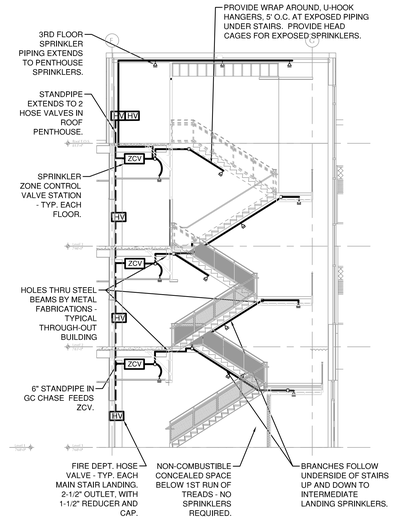
CKD. BY: LKB | SCALE: 1/8" = 1'

DATE: January 31, 2019

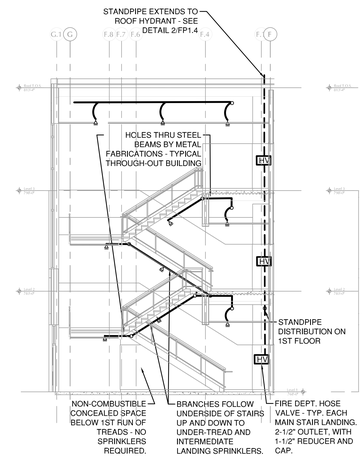
FP4.12



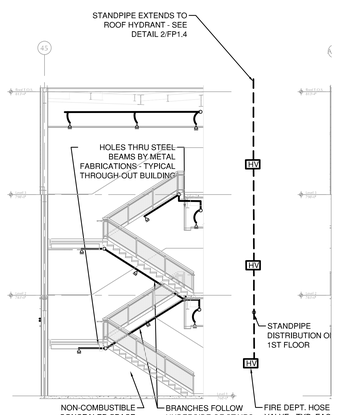
1 FP7.1 Fire Protection Stair A1 Section N-S
Scale: 1/8" = 1'-0"



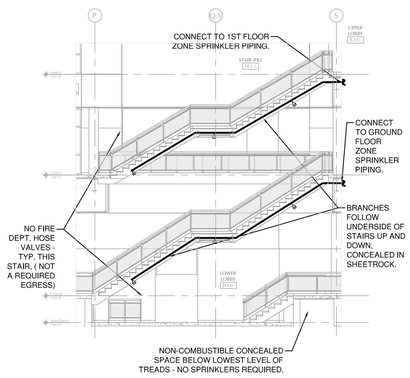
1 FP7.2 Fire Protection Stair A2 Section E-W
Scale: 1/8" = 1'-0"



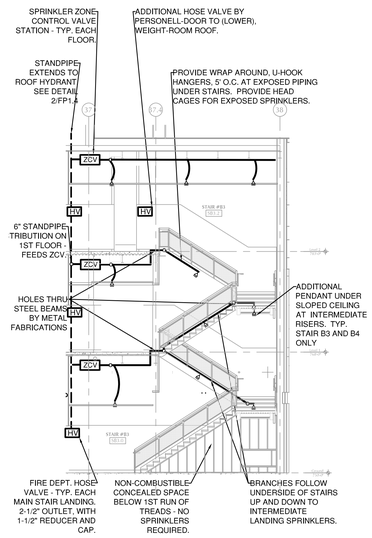
1 FP7.3 Fire Protection Stair A3 Section E-W
Scale: 1/8" = 1'-0"



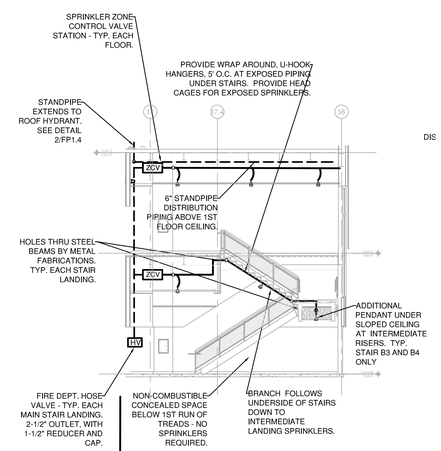
1 FP7.4 Fire Protection Stair B1 Section E-W
Scale: 1/8" = 1'-0"



1 FP7.5 Fire Protection Stair B2 Section E-W
Scale: 1/8" = 1'-0"



1 FP7.6 Fire Protection Stair B3 Section N-S
Scale: 1/8" = 1'-0"



1 FP7.7 Fire Protection Stair B4 Section N-S
Scale: 1/8" = 1'-0"

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Worcester, Ma.

Project North

PROJECT

Final Bid Package

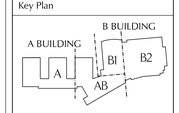
South High Community School

170 Apricot St, Worcester, MA 01603

TITLE

Fire Protection Stair Sections

Key Plan



REVISIONS

No.	Description	Date

FILE: SoHS FP 100% CD Submission 1-24-19

DWN. BY: LKB | JOB NO: 1611

CKD. BY: LKB | SCALE: 1/8" = 1'

DATE: January 31, 2019

FP7.1

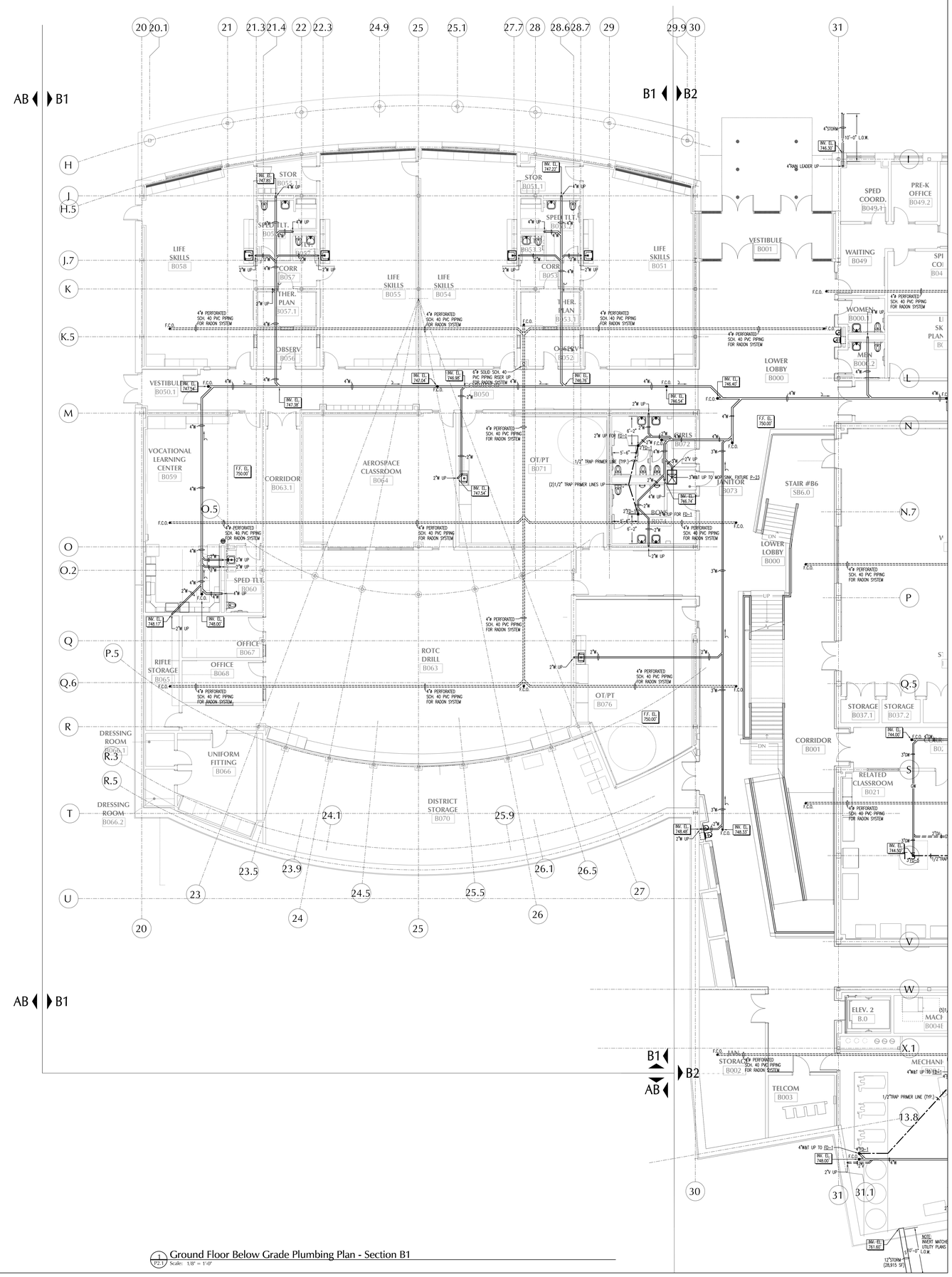
L E G E N D

	SANITARY OR WASTE PIPING
	VENT PIPING
	COLD WATER PIPING – (CW)
	HOT WATER PIPING (112°F TO 115°F) – (HW)
	HOT WATER RETURN PIPING – (HWR)
	TEMPERED HOT WATER PIPING – (TW)
S	STORM DRAIN PIPING (S)
G	NATURAL GAS SUPPLY PIPING (G)
AW	ACID WASTE PIPING (AW)
AV	ACID VENT PIPING (AV)
LCW	LAB COLD WATER PIPING (LCW)
LHW	LAB HOT WATER PIPING (112°F TO 115°F) (LHW)
LHW	LAB HOT WATER RETURN PIPING (LHWR)
THW	TEMPERED WATER PIPING (60°F TO 70°F)
THWR	TEMPERED WATER RETURN PIPING (60°F TO 70°F)
A	COMPRESSED AIR PIPING
	RADON VENT PIPING
	SANITARY OR WASTE PIPING – BELOW SLAB
KW	KITCHEN GREASE WASTE PIPING – BELOW SLAB (KW)
GW	OIL (GASOLINE) WASTE PIPING – BELOW SLAB (GW)
	VENT PIPING – BELOW SLAB
GV	OIL (GASOLINE) VENT PIPING – BELOW SLAB (GV)
	COLD WATER PIPING – BELOW SLAB
	HOT WATER PIPING – BELOW SLAB
S	STORM DRAIN PIPING – BELOW SLAB
AW	ACID WASTE PIPING – BELOW GRADE
AV	ACID VENT PIPING – BELOW GRADE
LCW	LAB COLD WATER PIPING – BELOW GRADE
LHW	LAB HOT WATER PIPING – BELOW GRADE
G	NATURAL GAS SUPPLY PIPING – BELOW GRADE
	FLUE AND/OR COMBUSTION AIR VENTING
	RADON VENT PIPING – BELOW GRADE
	CLEANOUT – (CO)
	FLOOR LEVEL CLEANOUT – (FCO)
	PIPE UP
	PIPE DOWN
	P-TRAP
BWV	BWV & STANDPIPE FOR HVAC CONDENSATE
OR	FULL PORT BALL VALVE
	GATE VALVE (G.V.)
	CHECK VALVE
	STRAINER
	GLOBE VALVE
	PRESSURE REDUCING VALVE
	GAS COCK
	BALANCING VALVE
	PIPE UNION
	BACKFLOW PREVENTER ASSEMBLY
	EMERGENCY GAS SHUT-OFF IN RECESSED CABINET
	GAS SOLENOID VALVE
	PIPING TRANSITION
	PIPE ANCHOR
	PIPE GUIDE
OR OR	DRAIN VALVE
	THERMOMETERS (STRAIGHT)-(DIAL)
	PRESSURE GAUGE
	FIXTURE STOP, H.B. OR FPSC
	OVERFLOW DRAIN OUTLET/DOWNSPOUT NOZZLE
	EMERGENCY GAS SHUT-OFF
	DIRECTION OF SLOPED PIPING
F.D.	FLOOR DRAIN, FLOOR SINK OR TRENCH DRAIN
A.F.C.O.	ACID RESISTANT FLOOR CLEANOUT
A.P.	ACCESS PANEL
BWV	BACKWATER VALVE
W.H.A.	WATER HAMMER ARRESTOR/SHOCK ABSORBER
H.B.	HOSE BIBB
FPSC	FREEZE PROOF SILLCOCK/WALL HYDRANT
V.B.	VACUUM BREAKER
VTR	VENT PIPING THRU ROOF
AVTR	ACID VENT PIPING THRU ROOF
RD	ROOF DRAIN
D/W	DISHWASHER
INV.	INVERT
F.F. EL.	FINISHED FLOOR ELEVATION
W&T	WASTE AND TRAP
W	CLOTHES WASHER
D	CLOTHES DRYER
PRV	PRESSURE REDUCING VALVE
L.O.W.	LIMIT OF WORK
W.C.O.	WALL CLEANOUT
A.F.L.R.	ABOVE FLOOD LEVEL RIM
OFD	OVERFLOW DRAIN
CFH	CUBIC FEET PER HOUR (OF NATURAL GAS)
POU	POINT OF USE
MV	MIXING/TEMPERING VALVE
HT	HEIGHT
GI	GREASE INTERCEPTOR
RP	RECIRCULATING PUMP
CLG.	CEILING
W.F.	WATER FILTER
RPZ BFP	2"REDUCED PRESSURE ZONE BACKFLOW PREVENTER
S.S.	STAINLESS STEEL
GWH-1	PLUMBING EQUIPMENT CALLOUT
V.I.F.	VERIFY IN FIELD
B.F.P.	BACKFLOW PREVENTER
TP	AUTOMATIC TRAP PRIMER VALVE
B.O.D.	BASIS OF DESIGN
E.C.	ELECTRICAL CONTRACTOR
G.C.	GENERAL CONTRACTOR
P.C.	PLUMBING SUBCONTRACTOR
K.E.C.	KITCHEN EQUIPMENT CONTRACTOR

P-1 INDICATES PLUMBING FIXTURE NUMBER

L-1 INDICATES SCIENCE LABORATORY FIXTURE NUMBER

DETAIL NUMBER
DRAWING NUMBER



1 P2.1 Ground Floor Below Grade Plumbing Plan - Section B1
Scale: 1/8" = 1'-0"

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OWNER

Worcester Public Schools

Worcester, MA

Project North

PROJECT

FINAL BID PACKAGE

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Ground Floor Below Grade Plumbing Plan Section B1

Key Plan

A BUILDING B BUILDING

REVISIONS

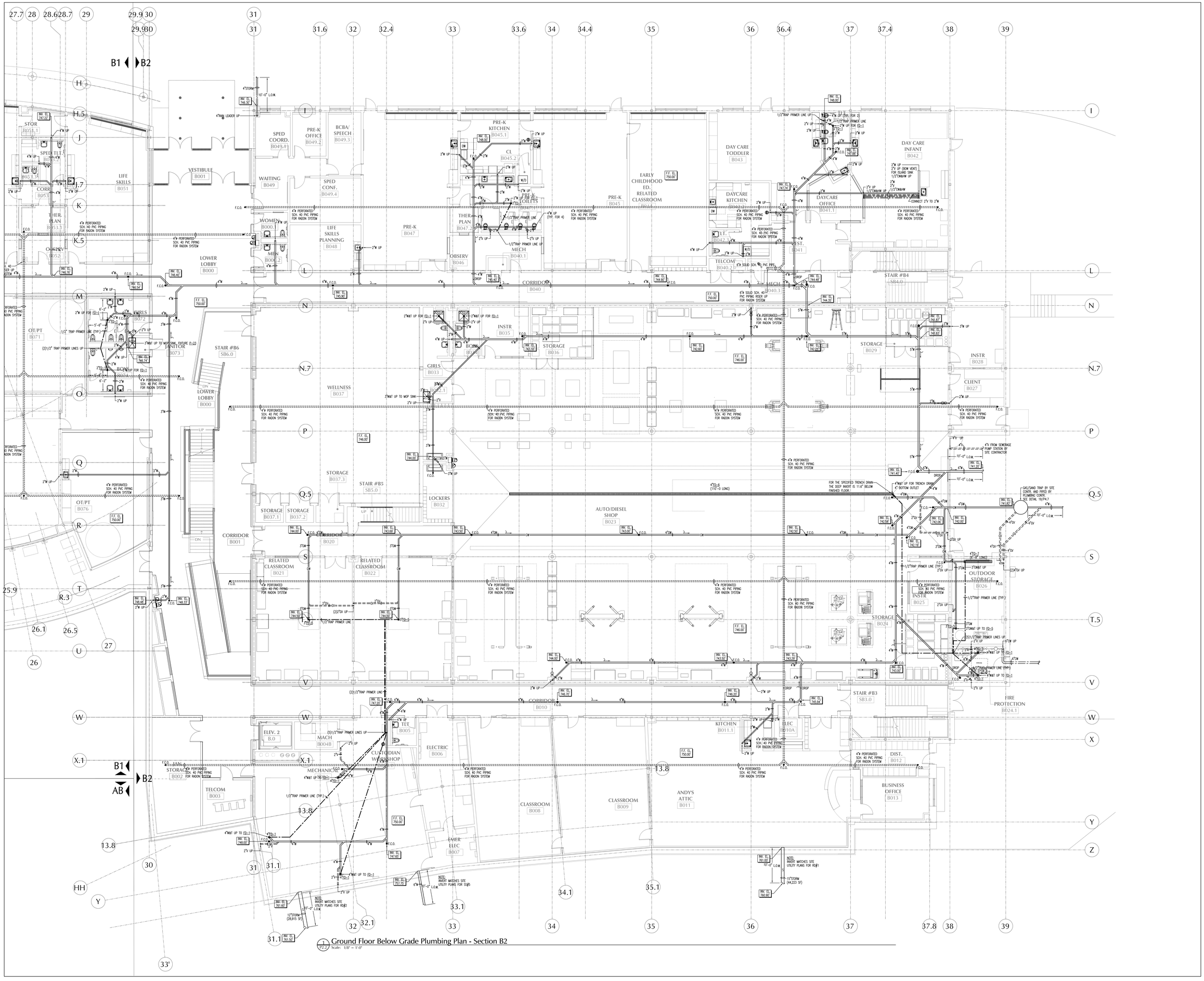
No.	Description	Date

FILE:

DWN. BY: CDR	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

P2.1



1 Ground Floor Below Grade Plumbing Plan - Section B2
P2.2 Scale: 1/8" = 1'-0"

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PROJECT

FINAL BID PACKAGE

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Ground Floor Below Grade Plumbing Plan Section B2

Key Plan

A BUILDING
B BUILDING
A
AB
B1
B2

REVISIONS

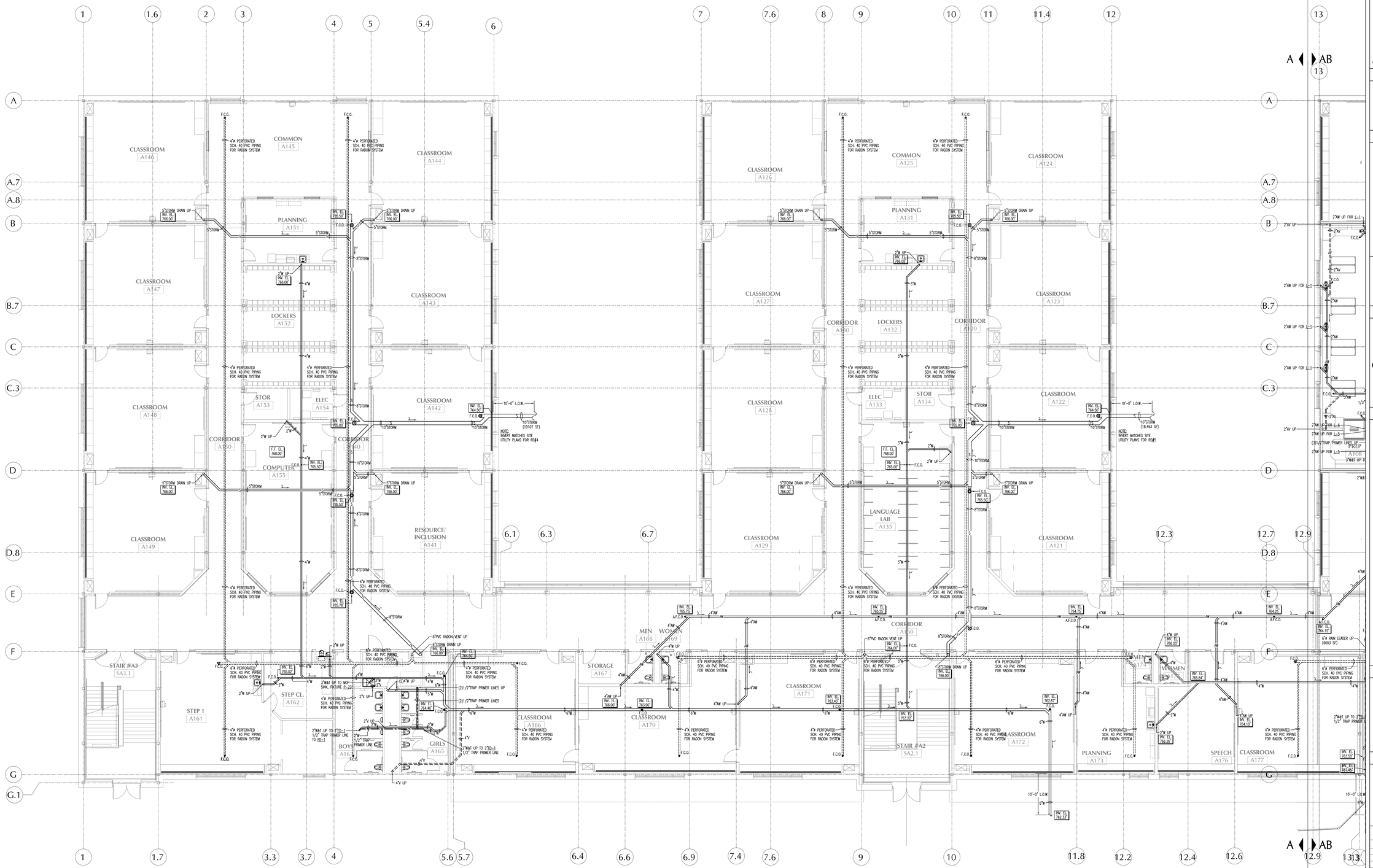
No.	Description	Date

FILE:

DWN. BY: CDR	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

P2.2



1 First Floor Below Grade Plumbing Plan Section A
P2.3 Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

First Floor Below Grade Plumbing Plan Section A

Key Plan

A BUILDING
B BUILDING
A
AB
B1
B2

REVISIONS

No.	Description	Date

FILE:

DWN. BY: CDR | JOB NO: #1611

CKD. BY: KRS | SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

P2.3

1 First Floor Below Grade Plumbing Plan Section AB
P2.4 Scale: 1/8" = 1'-0"

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Worcester, MA

Project North

PROJECT

FINAL BID PACKAGE

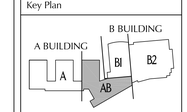
South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

First Floor Below Grade Plumbing Plan Section AB

Key Plan



REVISIONS

No.	Description	Date

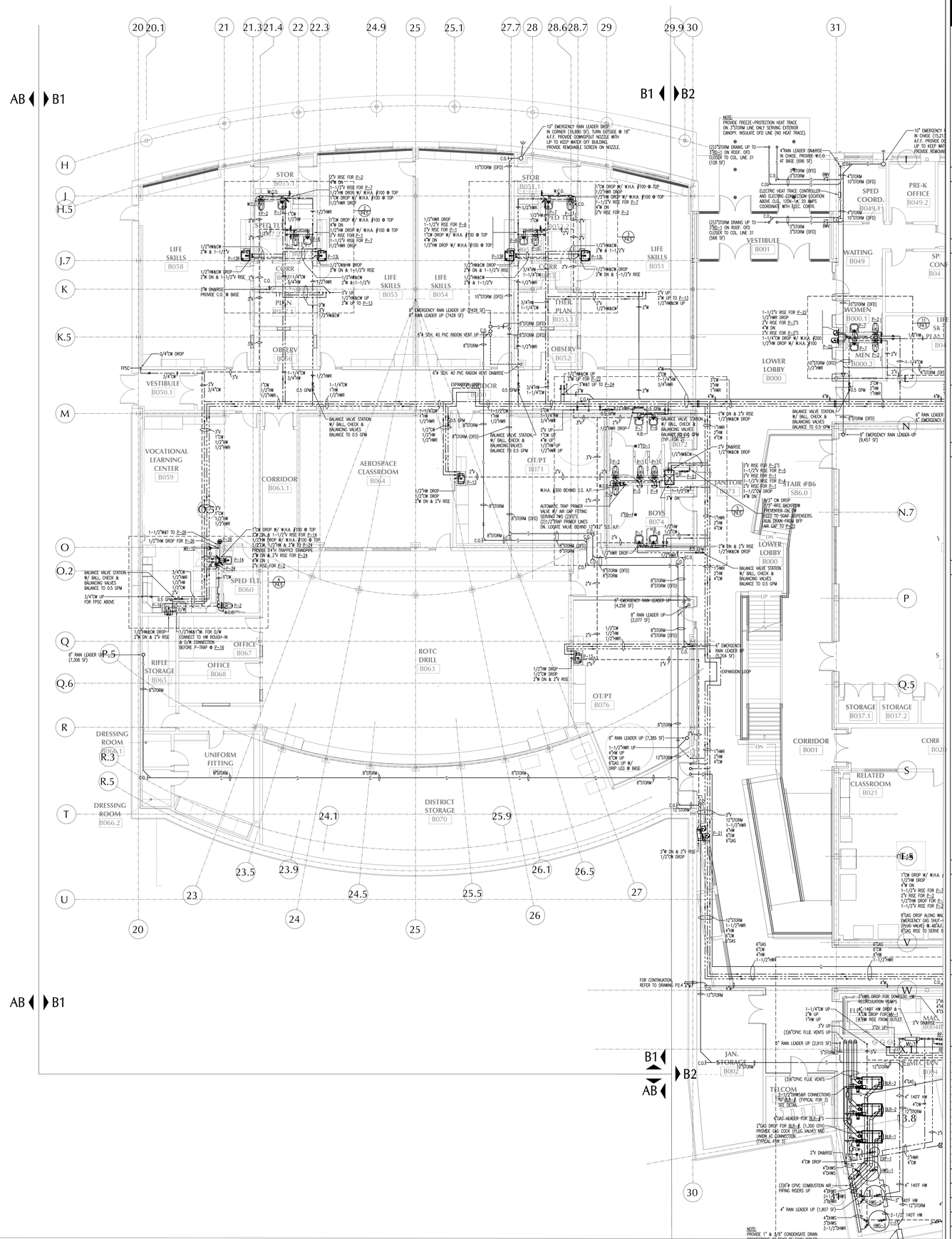
FILE:

DWN. BY: CDR | JOB NO: #1611

CKD. BY: KRS | SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

P2.4



1 Ground Level Above Grade Plumbing Floor Plan - Section B1
P3.1 Scale: 1/8" = 1'-0"

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PROJECT
FINAL BID PACKAGE
South High Community School
170 Apricot Street, Worcester, MA 01603

TITLE
Ground Floor Above Grade Plumbing Plan Section B1

Key Plan
A BUILDING: A, AB
B BUILDING: B1, B2

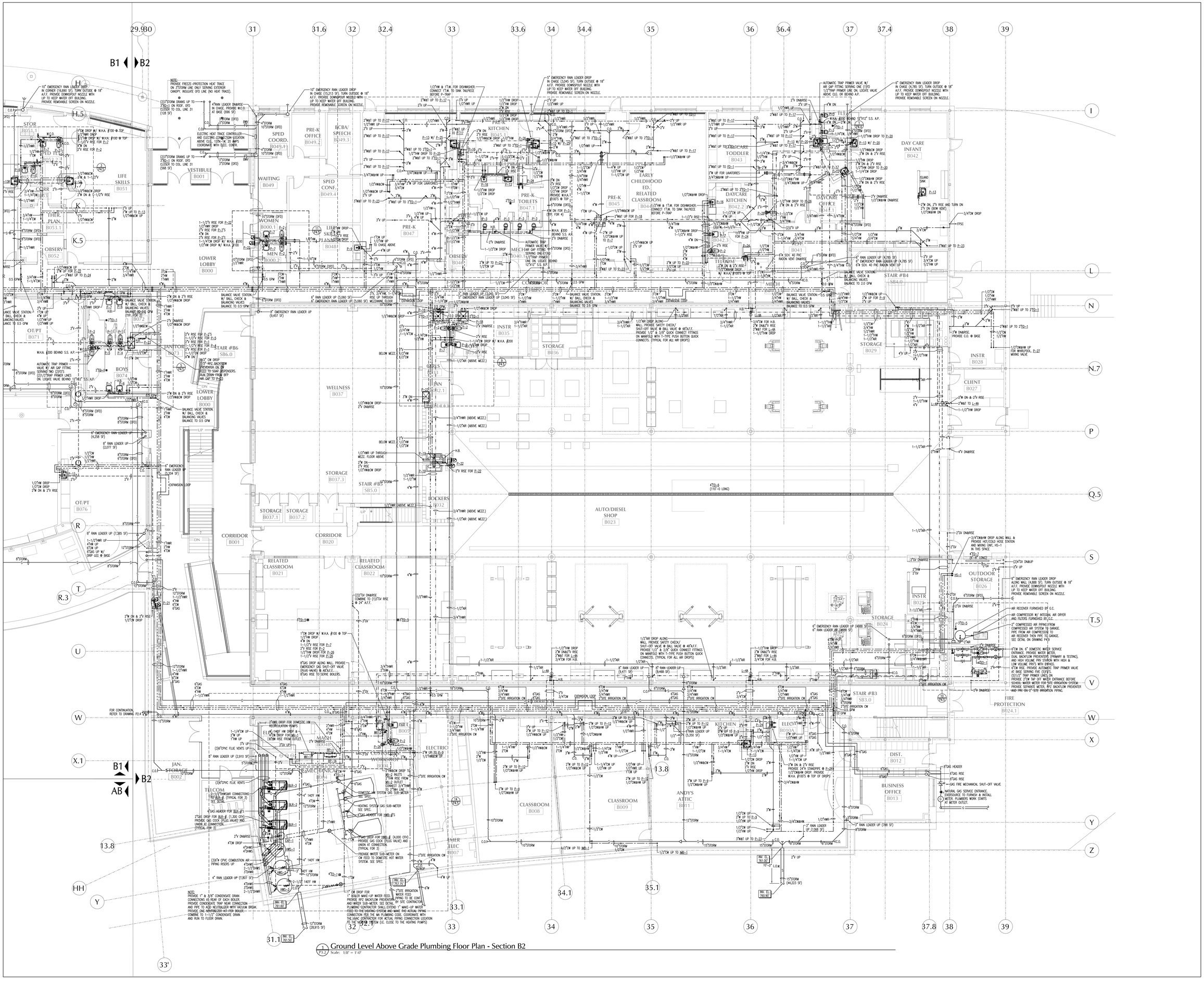
REVISIONS

No.	Description	Date

FILE:

DWN. BY: CDR	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

P3.1



1 Ground Level Above Grade Plumbing Floor Plan - Section B2
P3.2 Scale: 1/8" = 1'-0"

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FINAL BID PACKAGE

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Ground Floor Above Grade Plumbing Plan Section B2

Key Plan

A BUILDING
B BUILDING
A
AB
BI
B2

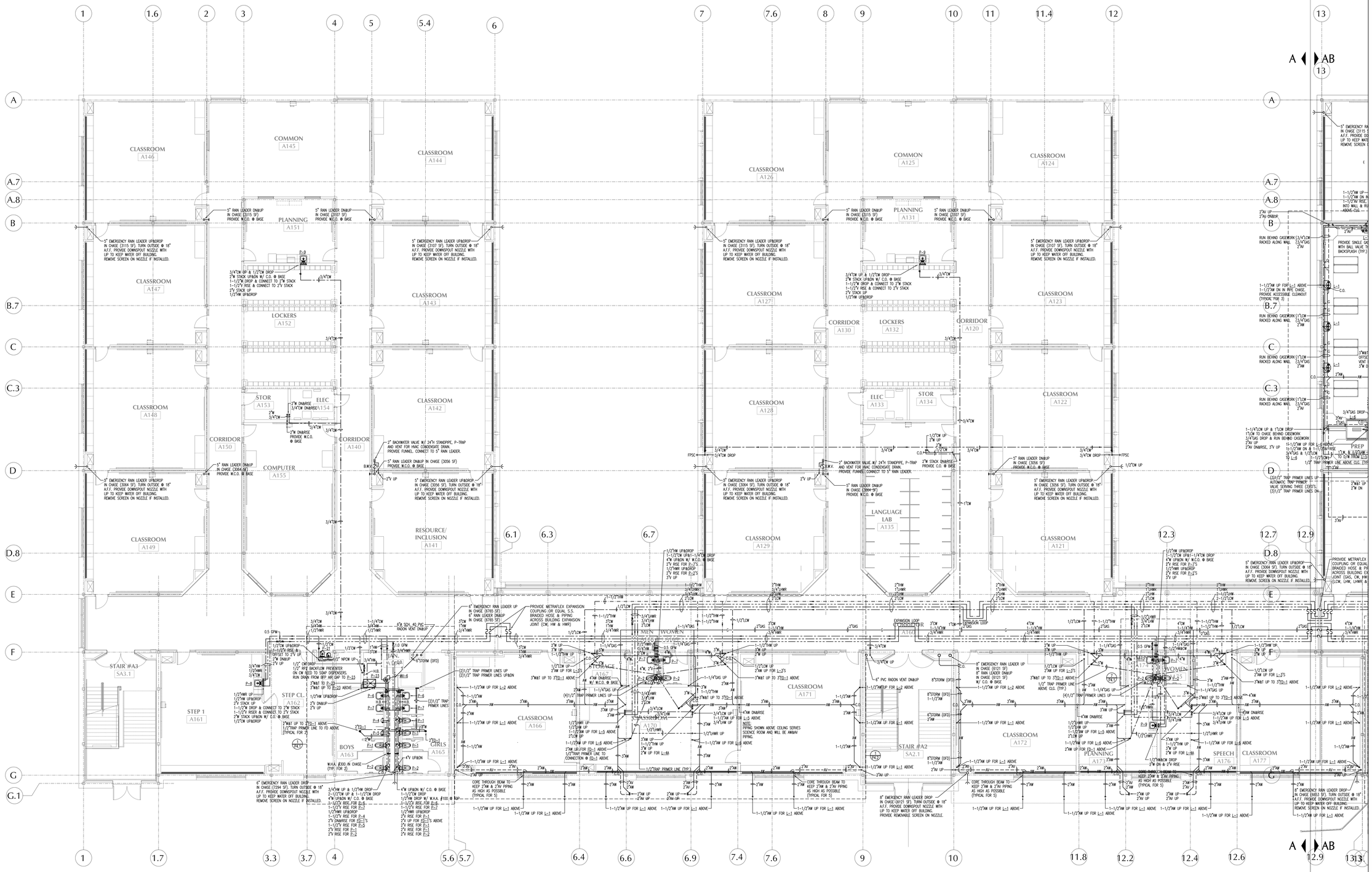
REVISIONS

No.	Description	Date

FILE:

DWN. BY: CDR	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

P3.2



1 First Floor Above Grade Plumbing Plan Section A
P3.3 Scale: 1/8" = 1'-0"

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Worcester Public Schools

Worcester, MA

Project North

PROJECT

FINAL BID PACKAGE

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

First Floor Above Grade Plumbing Plan Section A

Key Plan

A BUILDING
B BUILDING
A
AB
BI
B2

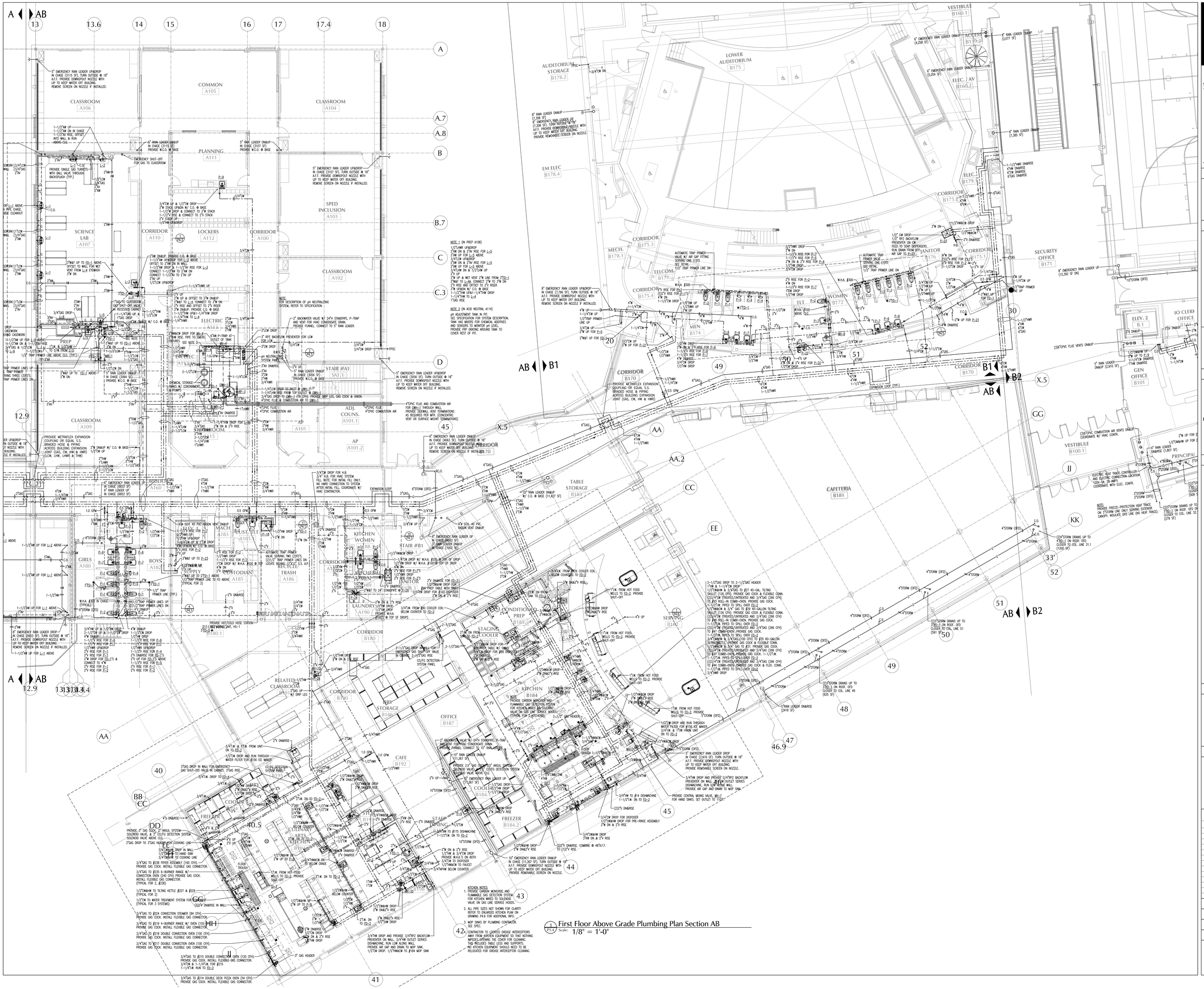
REVISIONS

No.	Description	Date

FILE:

DWN. BY: CDR	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

P3.3



1 First Floor Above Grade Plumbing Plan Section AB
P3.4 Scale: 1/8" = 1'-0"

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PROJECT

FINAL BID PACKAGE

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

First Floor Above Grade Plumbing Plan Section AB

Key Plan

A BUILDING: A, AB
B BUILDING: B1, B2

REVISIONS

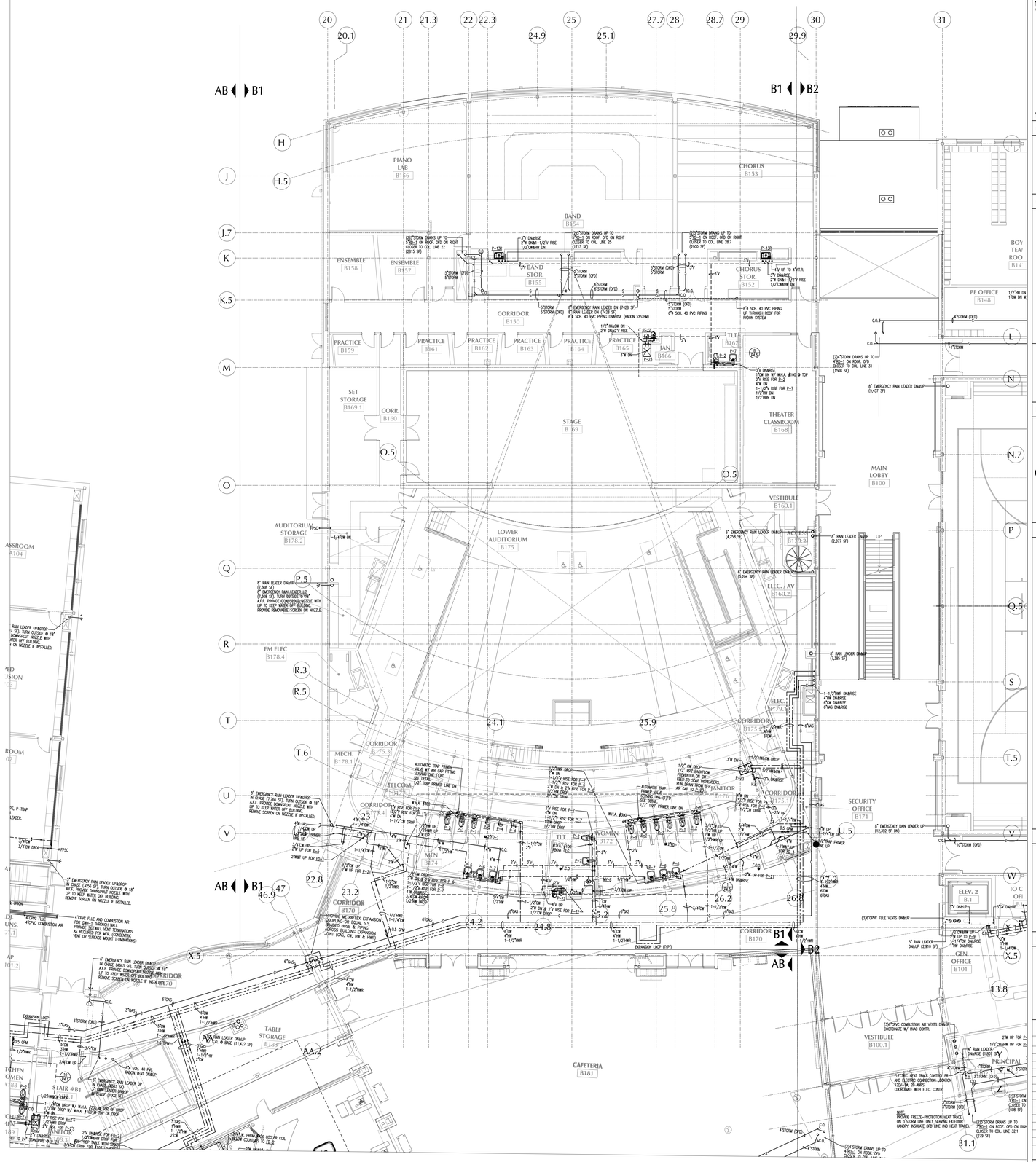
No.	Description	Date

FILE:

DWN. BY: CDR	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

P3.4



1 First Floor Plumbing Plan - Section B1
P3.5 Scale: 1/8" = 1'-0"

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PROJECT

FINAL BID PACKAGE

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

First Floor Plumbing Plan Section B1

Key Plan

A BUILDING
B BUILDING
A
AB
BI
B2

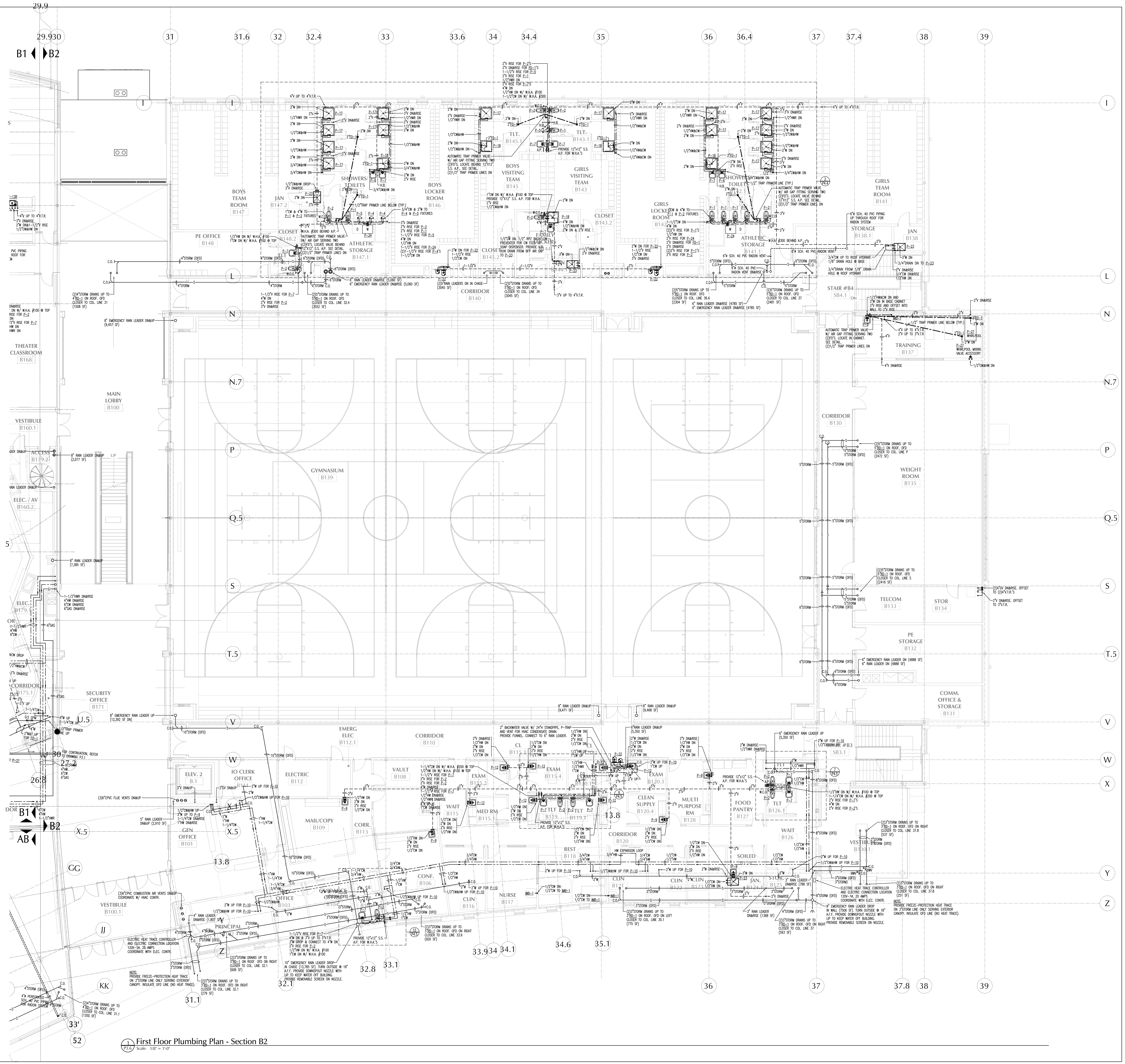
REVISIONS

No.	Description	Date

FILE:

DWN. BY: CDR	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

P3.5



1 / P3.6 First Floor Plumbing Plan - Section B2
Scale: 1/8" = 1'-0"

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PROJECT

FINAL BID PACKAGE

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

First Floor Plumbing Plan Section B2

Key Plan

B BUILDING
A BUILDING
A
BI
B2
AB

REVISIONS

No.	Description	Date

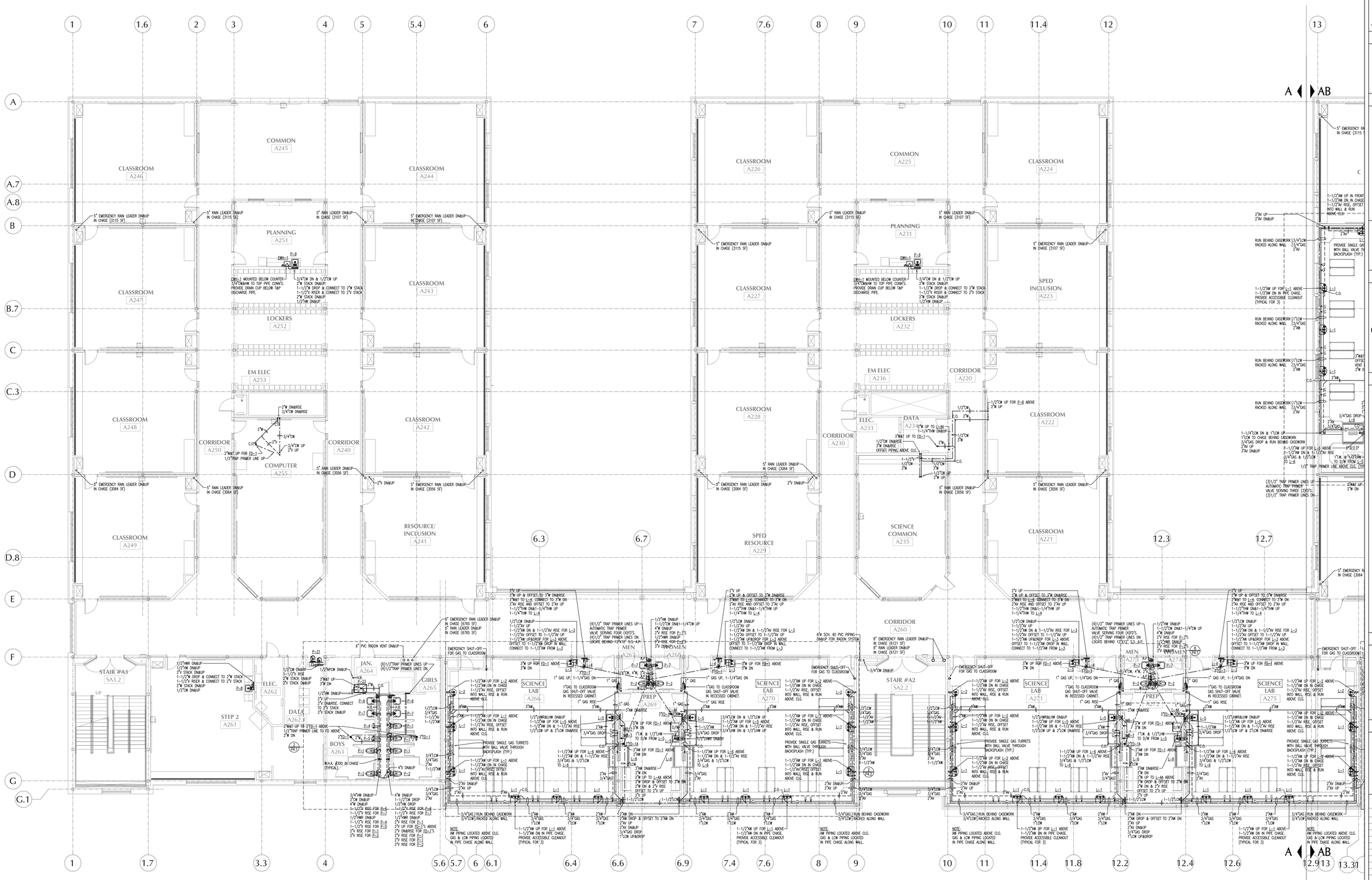
FILE:

DWN. BY: CDR — JOB NO: #1611

CKD. BY: KRS — SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

P3.6



1 Second Floor Plumbing Plan Section A
P3.7 Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Second Floor Plumbing Plan Section A

Key Plan

A BUILDING
B BUILDING
A
AB
BI
B2

REVISIONS

No.	Description	Date

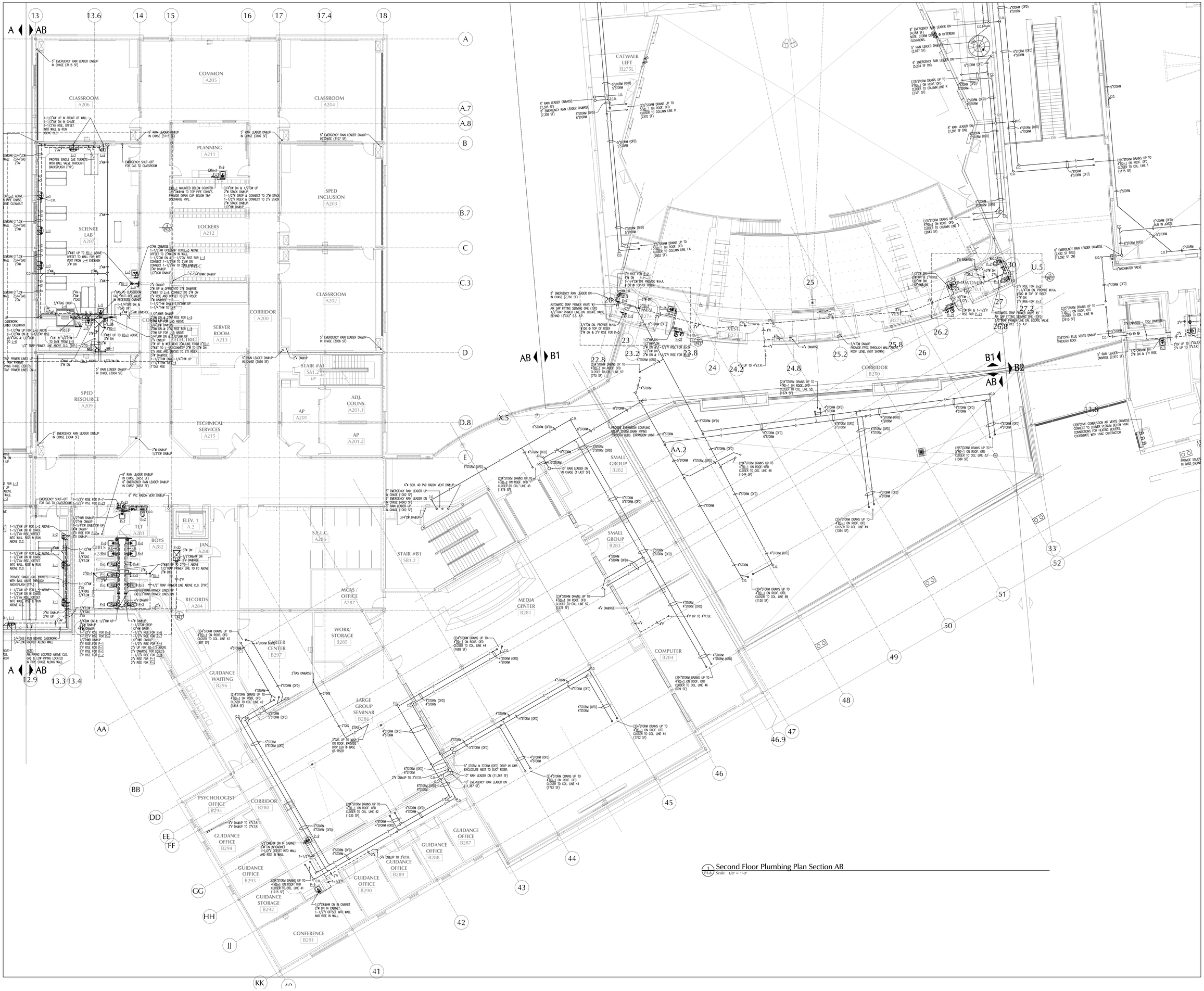
FILE:

DWN. BY: CDR | JOB NO: #1611

CKD. BY: KRS | SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

P3.7



1 Second Floor Plumbing Plan Section AB
P3.8 Scale: 1/8" = 1'-0"

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FINAL BID PACKAGE

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Second Floor Plumbing Plan Section AB

Key Plan

A BUILDING

B BUILDING

REVISIONS

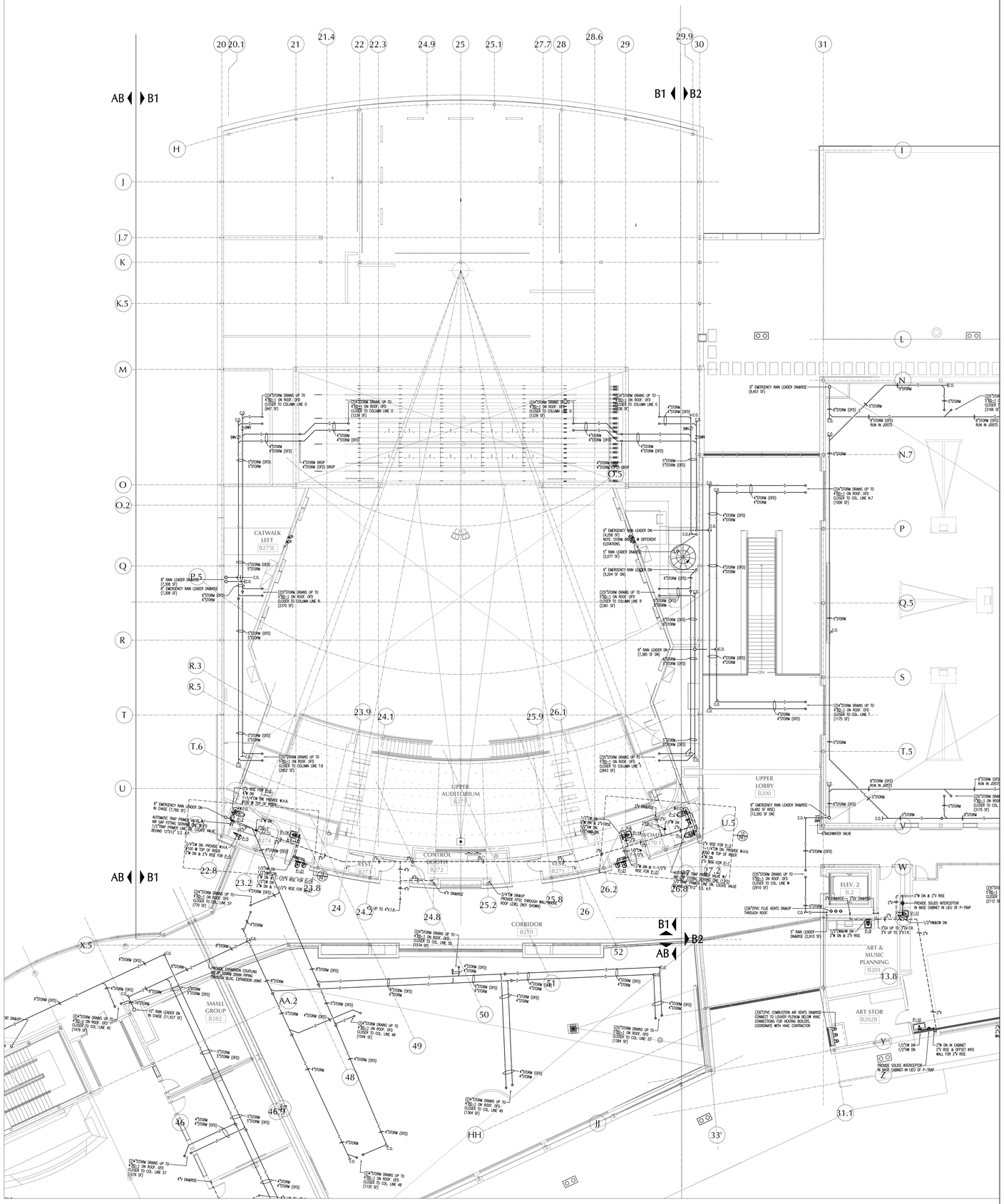
No.	Description	Date

FILE:

DWN. BY: CDR	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

P3.8



1 P3.9 Second Floor Plumbing Plan Section B1
Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Second Floor Plumbing Plan Section B1

Key Plan

A BUILDING
B BUILDING
A
AB
BI
B2

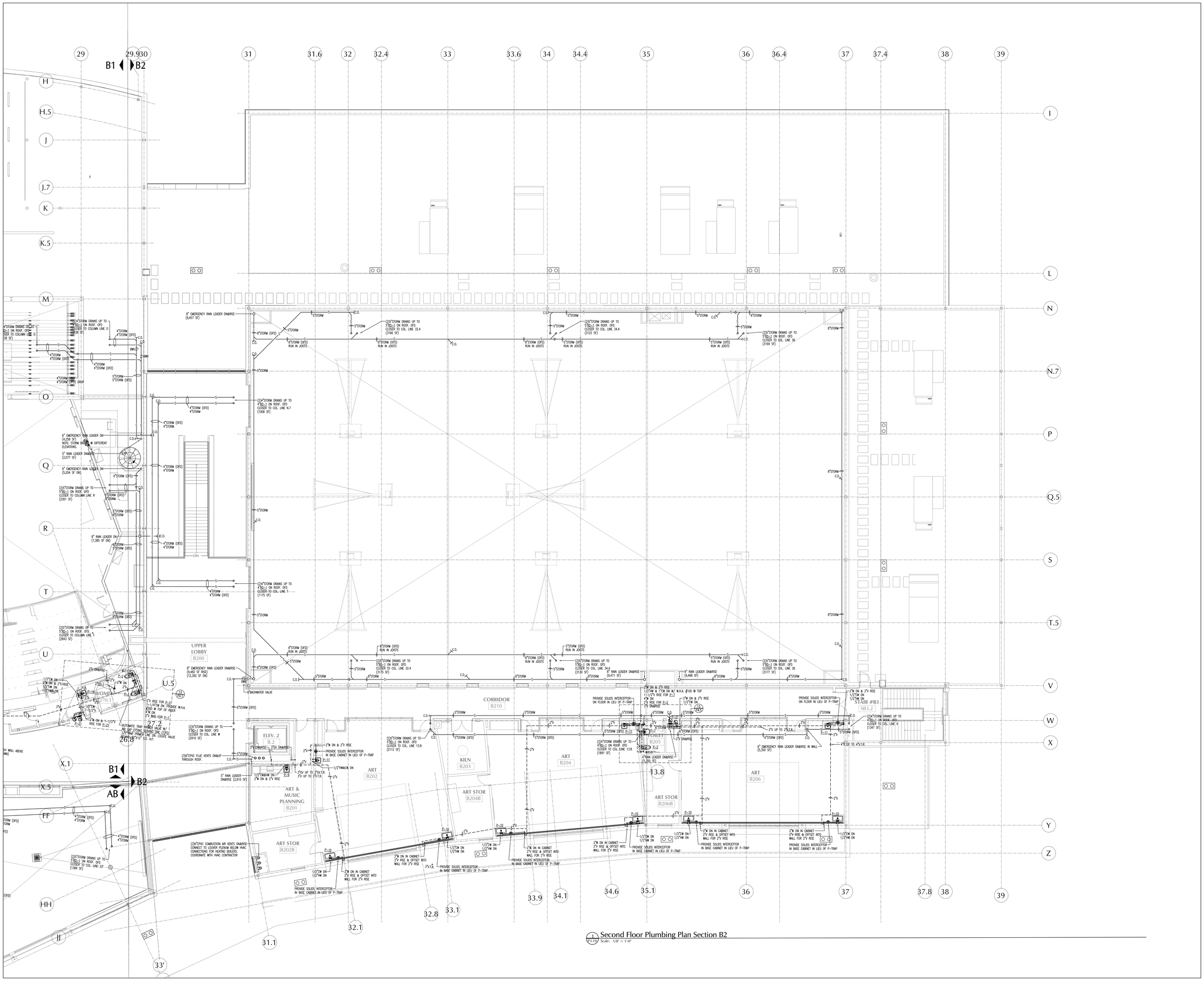
REVISIONS

No.	Description	Date

FILE:

DWN. BY: CDR	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

P3.9



1 Second Floor Plumbing Plan Section B2
P3.10 Scale: 1/8" = 1'-0"

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PROJECT

FINAL BID PACKAGE

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Second Floor Plumbing Plan Section B2

Key Plan

A BUILDING: A, AB
B BUILDING: BI, B2

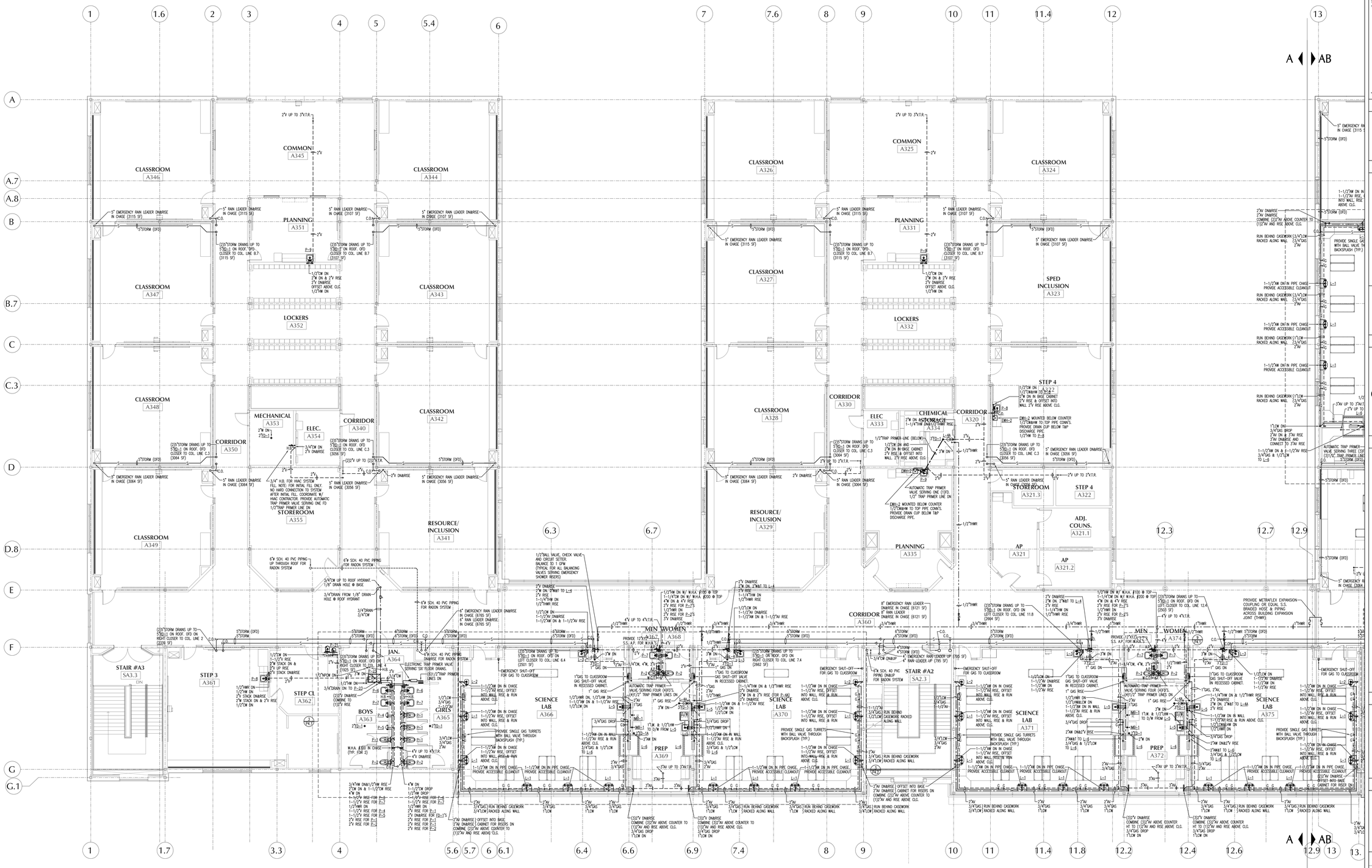
REVISIONS

No.	Description	Date

FILE:

DWN. BY: CDR	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

P3.10



1 Third Floor Plumbing Plan Section A
P3.11 Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Third Floor Plumbing Plan Section A

Key Plan

A BUILDING
B BUILDING
A
AB
BI
B2

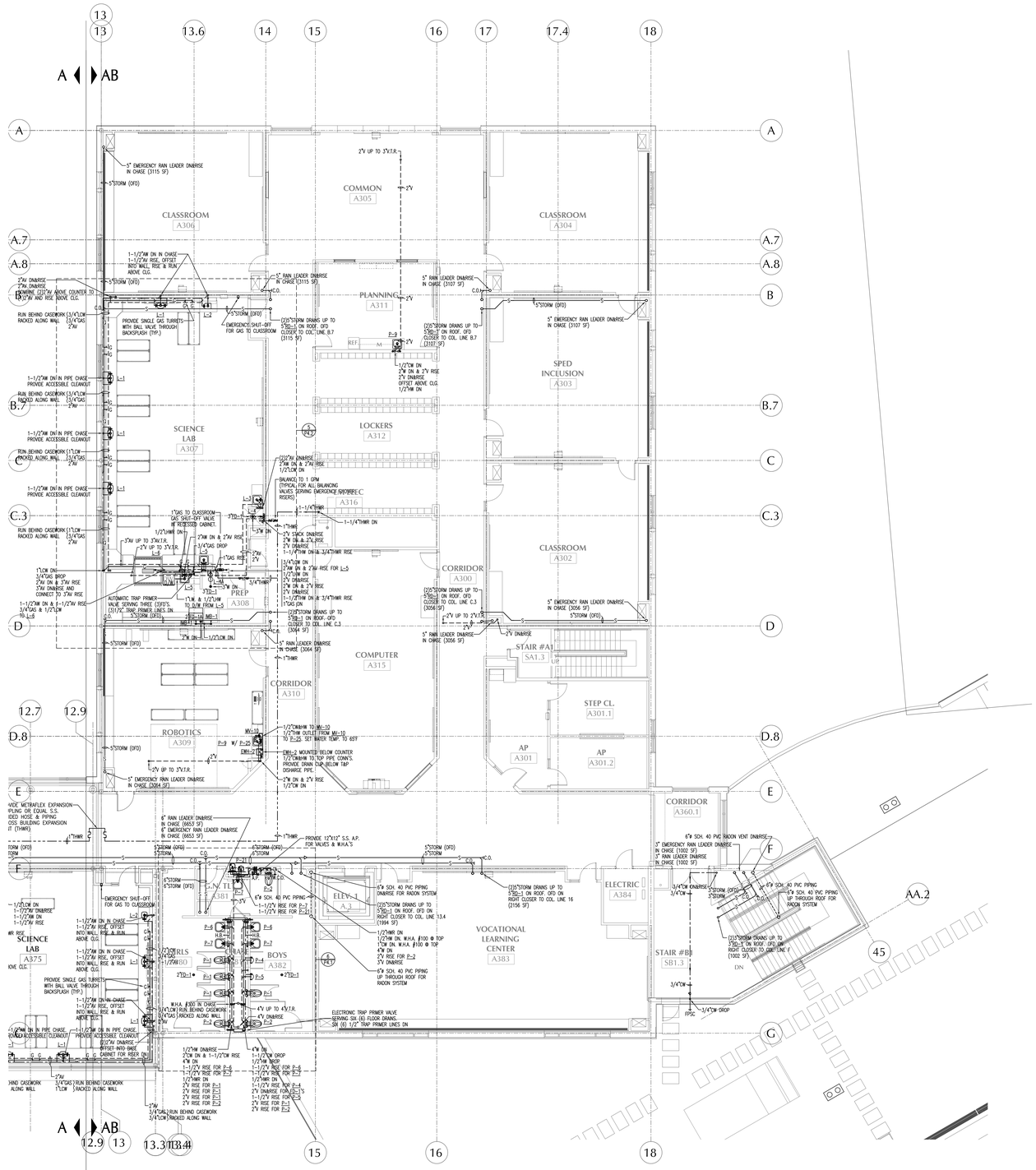
REVISIONS

No.	Description	Date

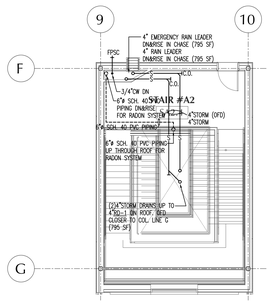
FILE:

DWN. BY: CDR	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

P3.11



1 Third Floor Plumbing Plan Section AB
P3.12 Scale: 1/8" = 1'-0"



2 Roof Stain Plumbing Plan Section A
P3.12 Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Third Floor Plumbing Plan Section AB

Key Plan

A BUILDING
B BUILDING
A
AB
B1
B2

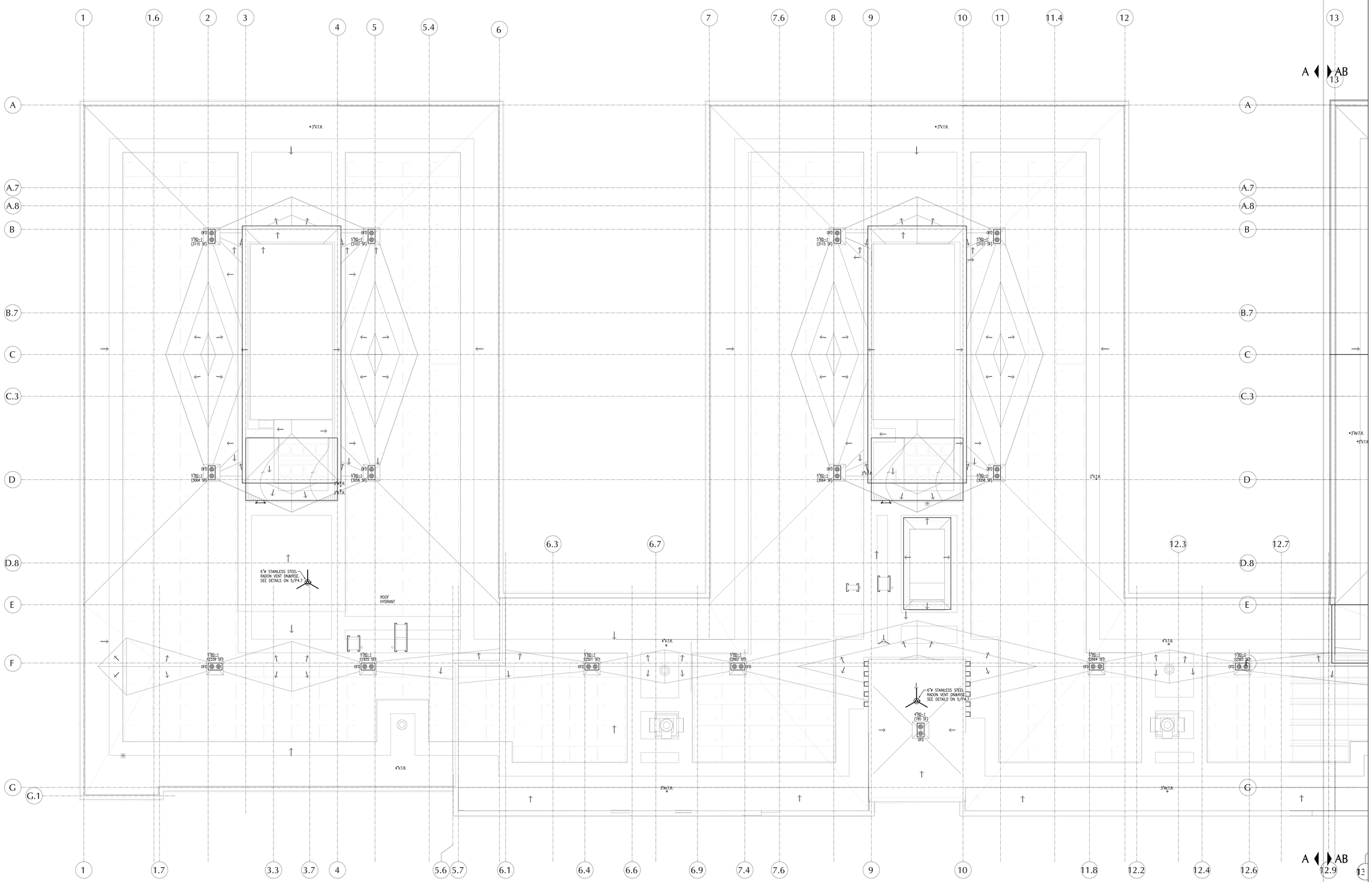
REVISIONS

No.	Description	Date

FILE:

DWN. BY: CDR
JOB NO: #1611
CKD. BY: KRS
SCALE: 1/8" = 1'-0"
DATE: January 31, 2019

P3.12



1 Roof Plumbing Plan Section A
P3.13 Scale: 1/8" = 1'-0"

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PROJECT

FINAL BID PACKAGE

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Roof Plumbing Plan Section A

Key Plan

A BUILDING
B BUILDING
B1
B2
AB

REVISIONS

No.	Description	Date

FILE:

DWN. BY: CDR	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

P3.13

1 Roof Plumbing Plan Section AB
P3.14 Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Roof Plumbing Plan Section AB

Key Plan

A BUILDING
B BUILDING
A
B1
B2

REVISIONS

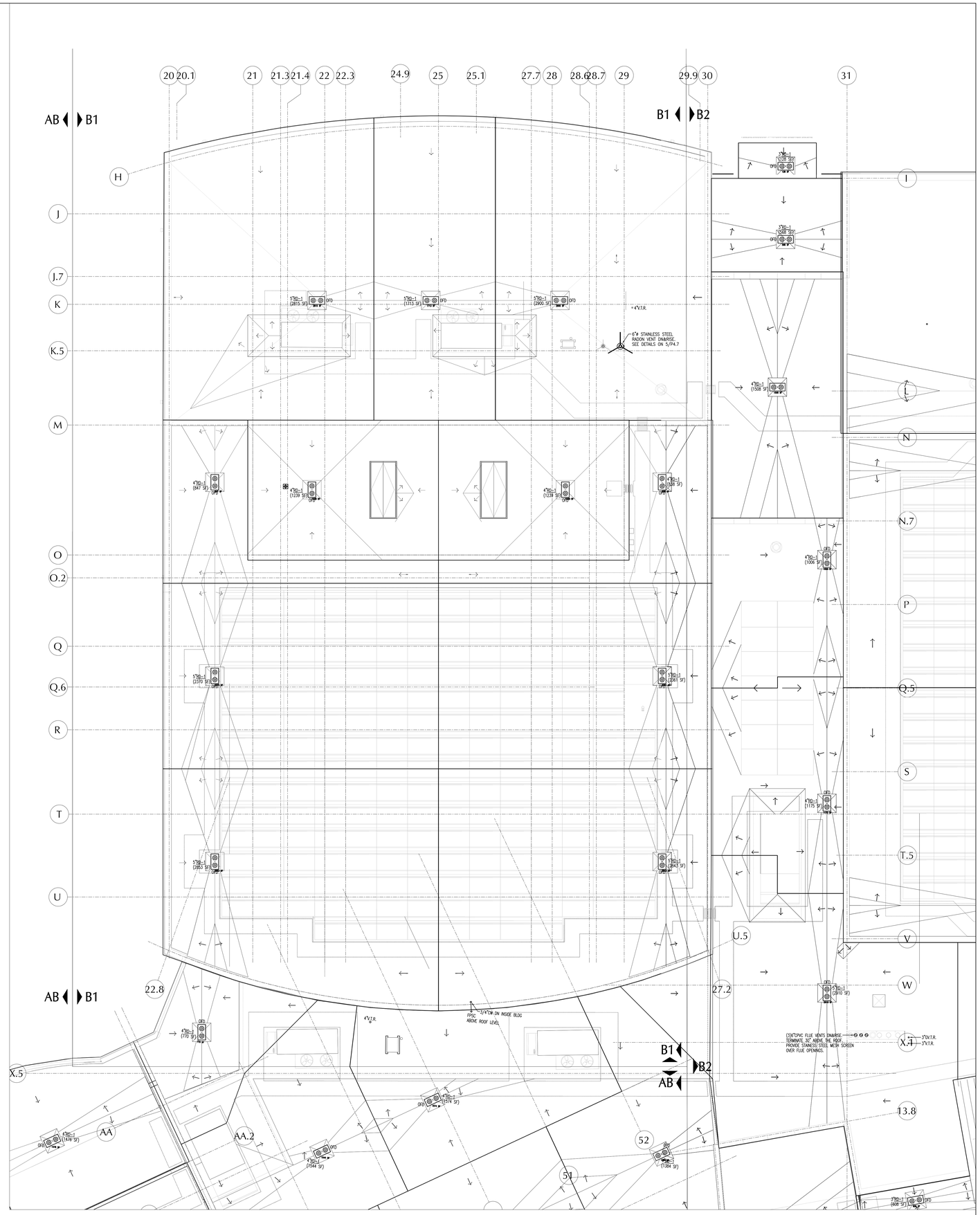
No.	Description	Date

FILE:

DWN. BY: CDR	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

P3.14



1 P3.15 Roof Plumbing Plan Section B1
Scale: 1/8" = 1'-0"

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PROJECT

FINAL BID PACKAGE

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Roof Plumbing Plan Section B1

Key Plan

A BUILDING B BUILDING

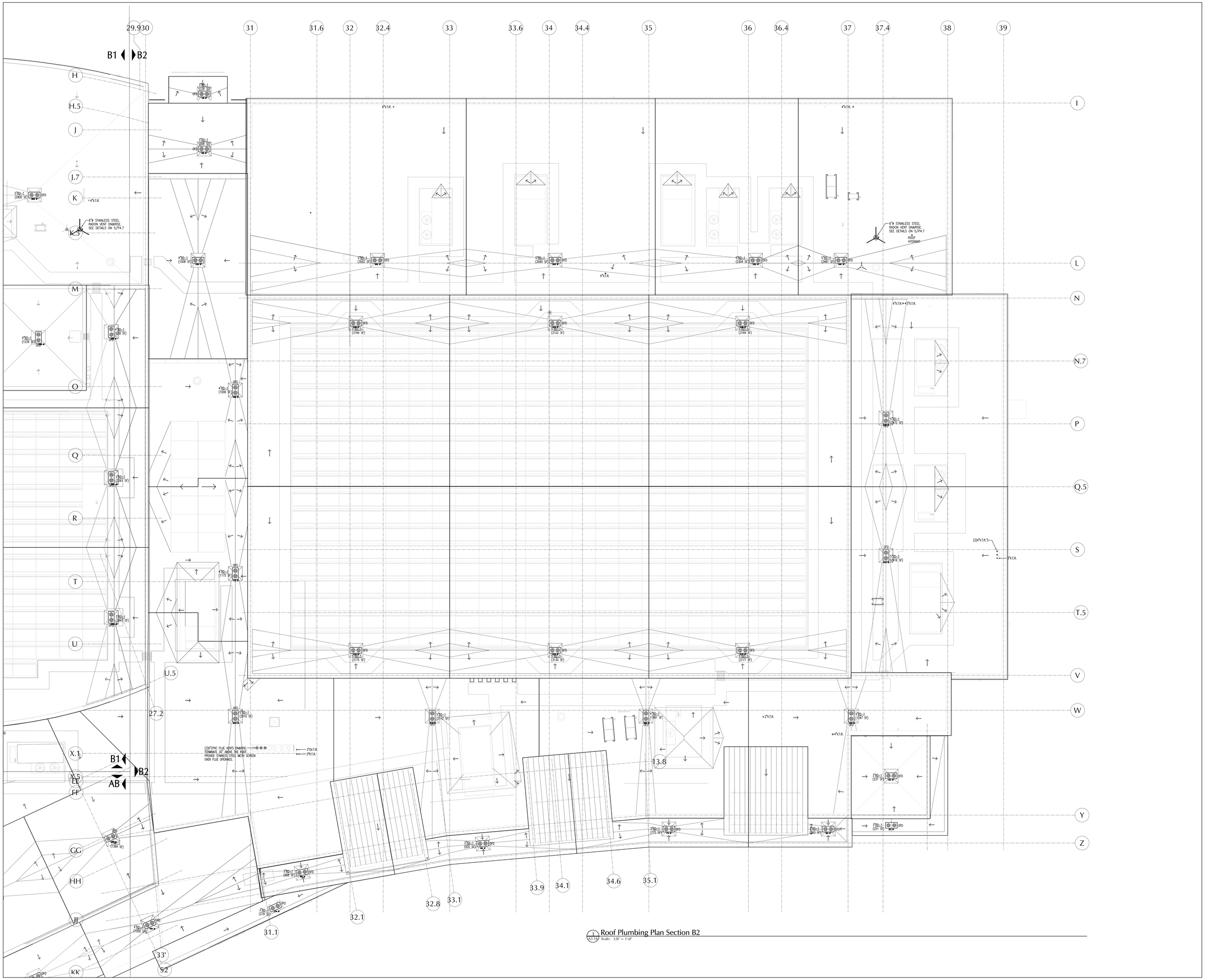
REVISIONS

No.	Description	Date

FILE:

DWN. BY: CDR	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

P3.15



1 Roof Plumbing Plan Section B2
A3.16 Scale: 1/8" = 1'-0"

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Project North

PROJECT

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Roof Plumbing Plan Section B2

Key Plan

A BUILDING
B BUILDING
A
AB
BI
B2

REVISIONS

No.	Description	Date

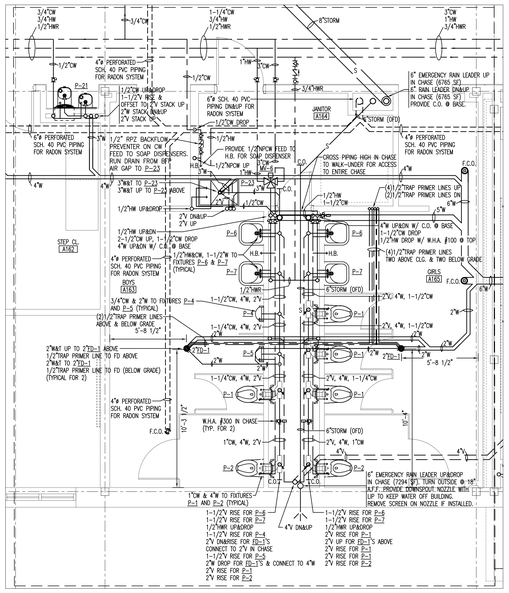
FILE:

DWN. BY: CDR | JOB NO: #1611

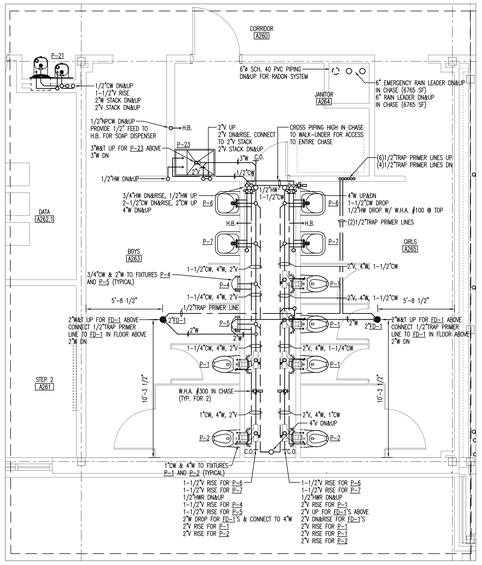
CKD. BY: KRS | SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

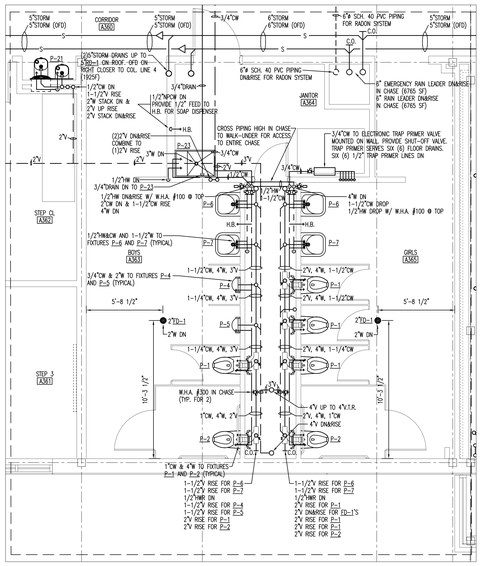
P3.16



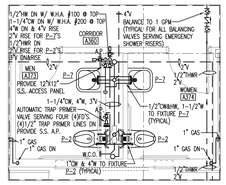
1 Partial First Floor Plumbing Plan Section A
P4.1 Scale: 1/4" = 1'-0"



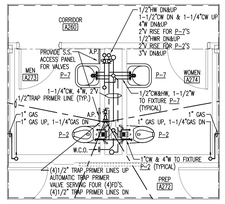
2 Partial Second Floor Plumbing Plan Section A
P4.1 Scale: 1/4" = 1'-0"



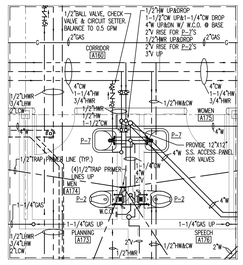
3 Partial Third Floor Plumbing Plan Section A
P4.1 Scale: 1/4" = 1'-0"



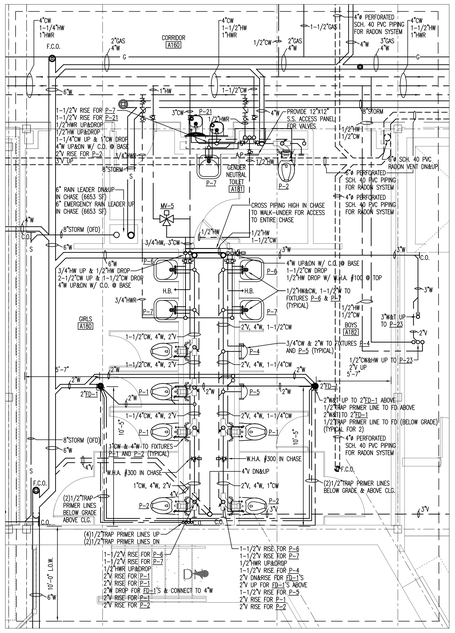
9 Partial Third Floor Plumbing Plan Section A
P4.1 Scale:



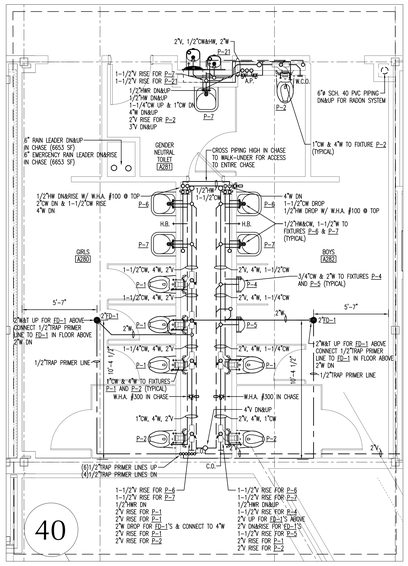
8 Partial Second Floor Plumbing Plan Section A
P4.1 Scale:



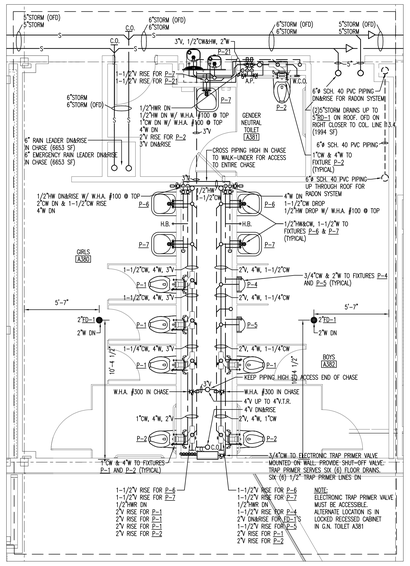
7 Partial First Floor Plumbing Plan Section A
P4.1 Scale: 1/4" = 1'-0"



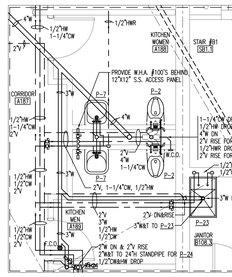
5 Partial First Floor Plumbing Plan Section AB
P4.1 Scale: 1/4" = 1'-0"



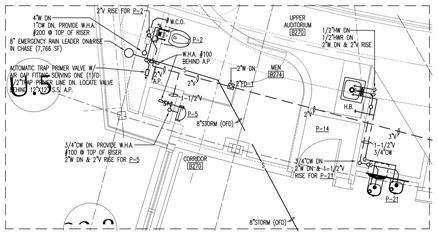
5 Partial Second Floor Plumbing Plan Section AB
P4.1 Scale: 1/4" = 1'-0"



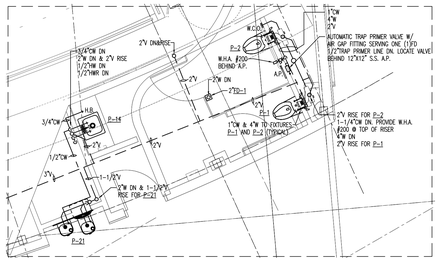
6 Partial Third Floor Plumbing Plan Section AB
P4.1 Scale: 1/4 = 1'-0"



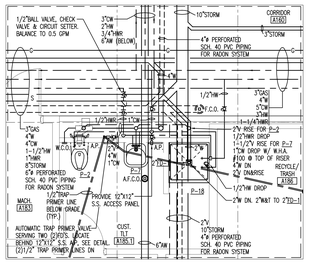
10 Partial First Floor Plumbing Plan Section AB
P4.1 Scale: 1/4" = 1'-0"



12 Partial Second Floor Plumbing Plan Section AB
P4.1 Scale:



13 Partial Second Floor Plumbing Plan Section AB
P4.1 Scale:



11 Partial First Floor Plumbing Plan Section AB
P4.1 Scale: 1/4" = 1'-0"

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OWNER

Worcester Public Schools

Worcester, MA

Project North

PROJECT

FINAL BID PACKAGE

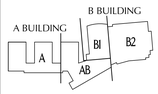
South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Partial Plumbing Plans Sections A & AB

Key Plan



REVISIONS

No.	Description	Date

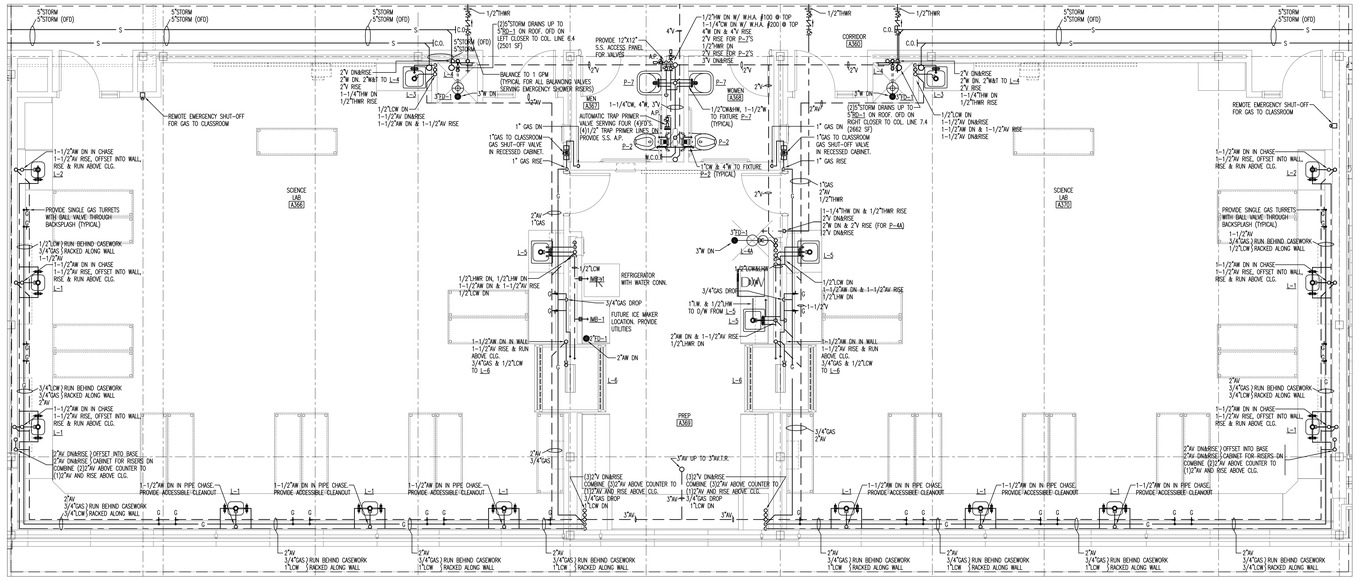
FILE:

DWN. BY: CDR | JOB NO: #1611

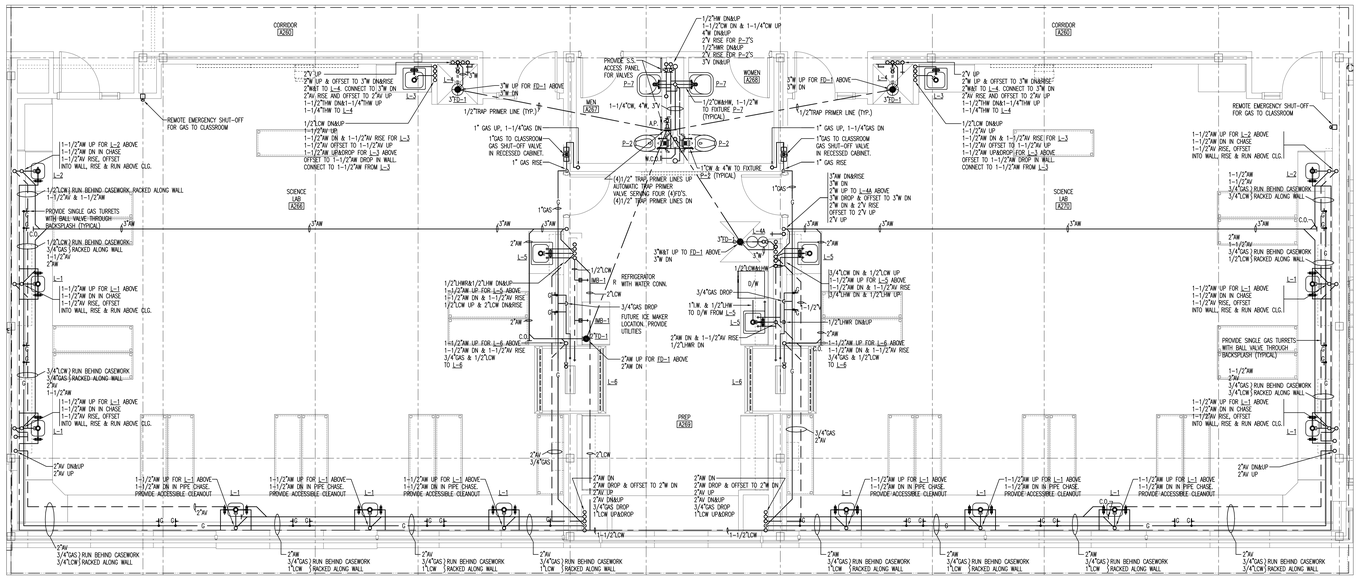
CKD. BY: KRS | SCALE: 1/4" = 1'-0"

DATE: January 31, 2019

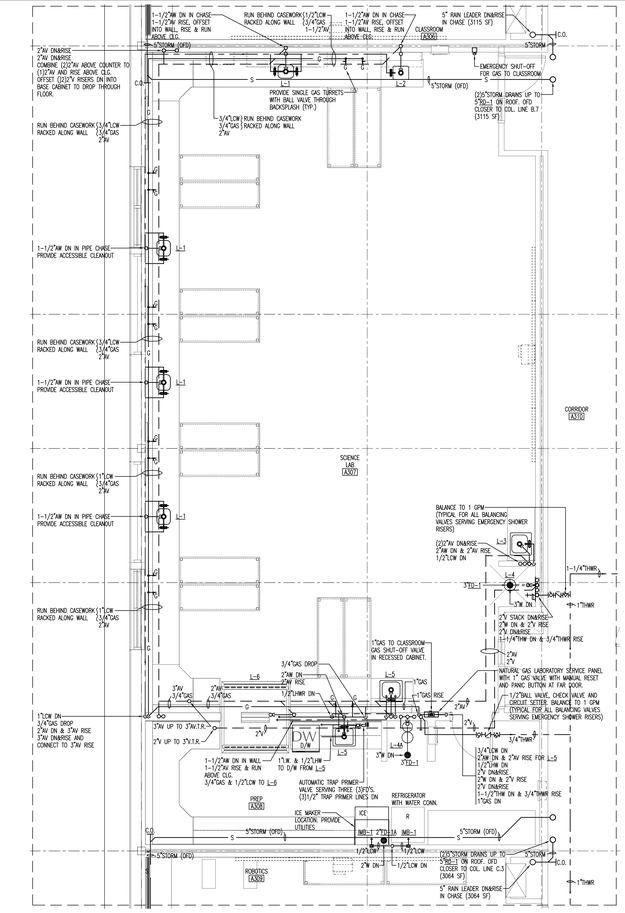
P4.1



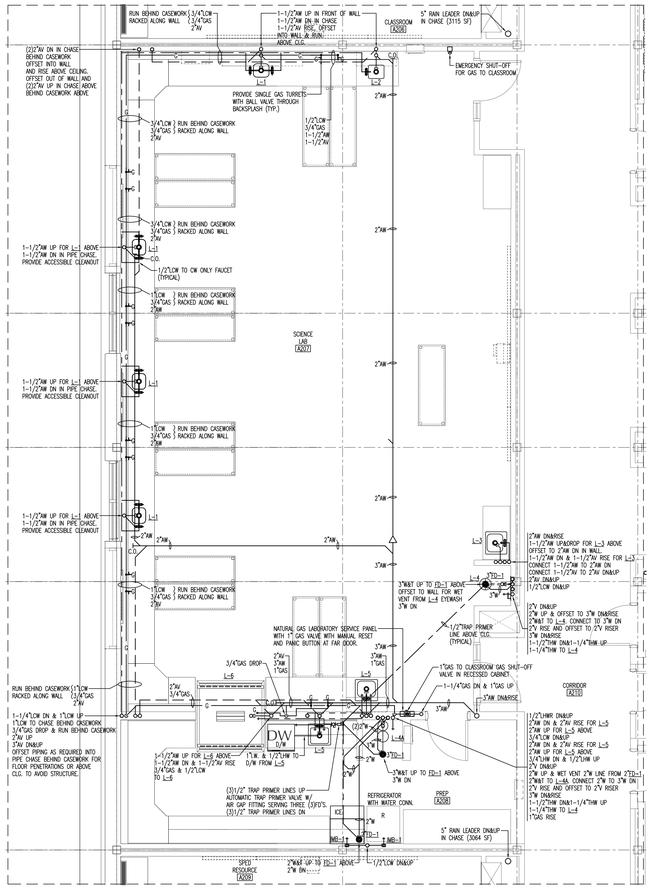
1 Partial Third Floor Plumbing Plan Section A
P4.2 Scale: 1/4" = 1'-0"



2 Partial Second Floor Plumbing Plan Section A
P4.2 Scale: 1/4" = 1'-0"



5 Partial Third Floor Plumbing Plan Section AB
P4.2 Scale: 1/4" = 1'-0"



4 Partial Second Floor Plumbing Plan Section AB
P4.2 Scale: 1/4" = 1'-0"

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Partial Plumbing Plans Sections A & AB

Key Plan

A BUILDING: A, AB
B BUILDING: B1, B2

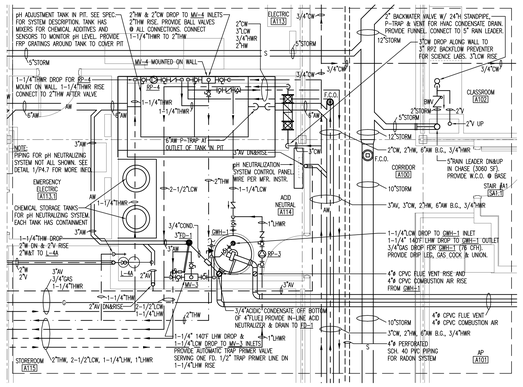
REVISIONS

No.	Description	Date

FILE:

DWN. BY: CDR	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/4" = 1'-0"
DATE: January 31, 2019	

P4.2



2 P4.3 Partial First Floor Plumbing Plan Section AB
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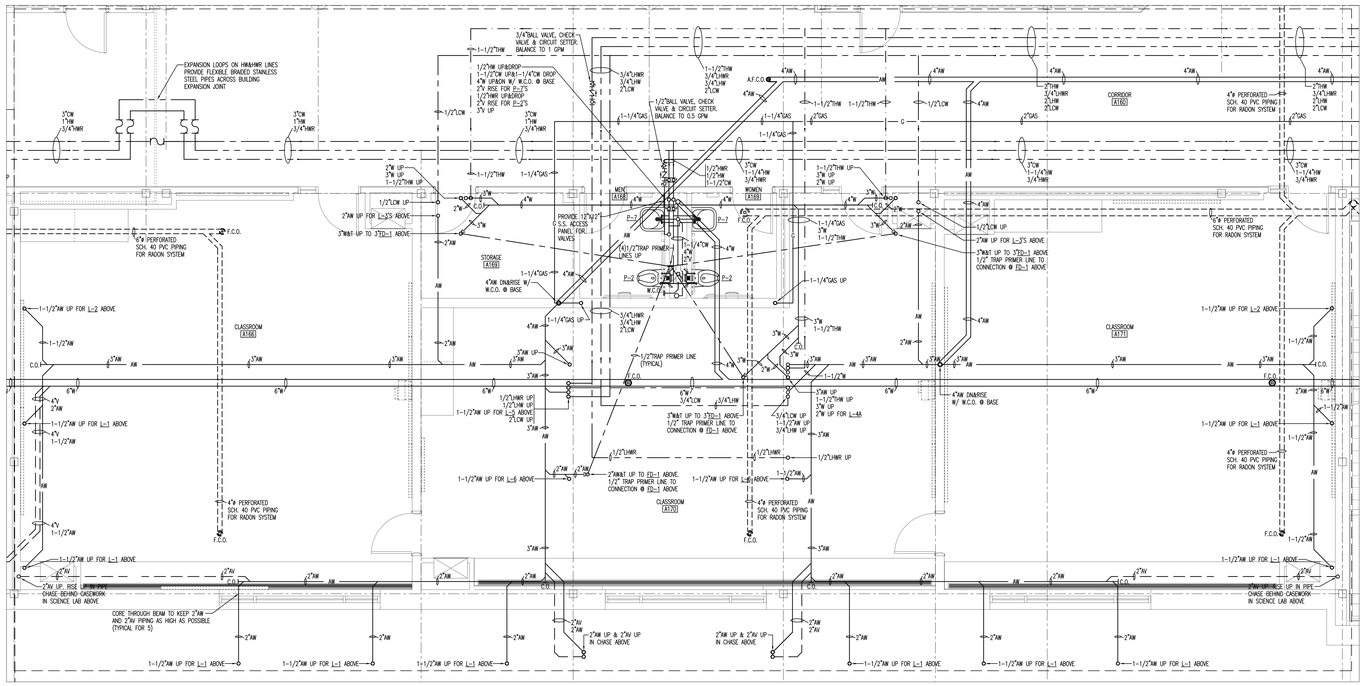

3 P4.3 Partial First Floor Plumbing Plan Section A
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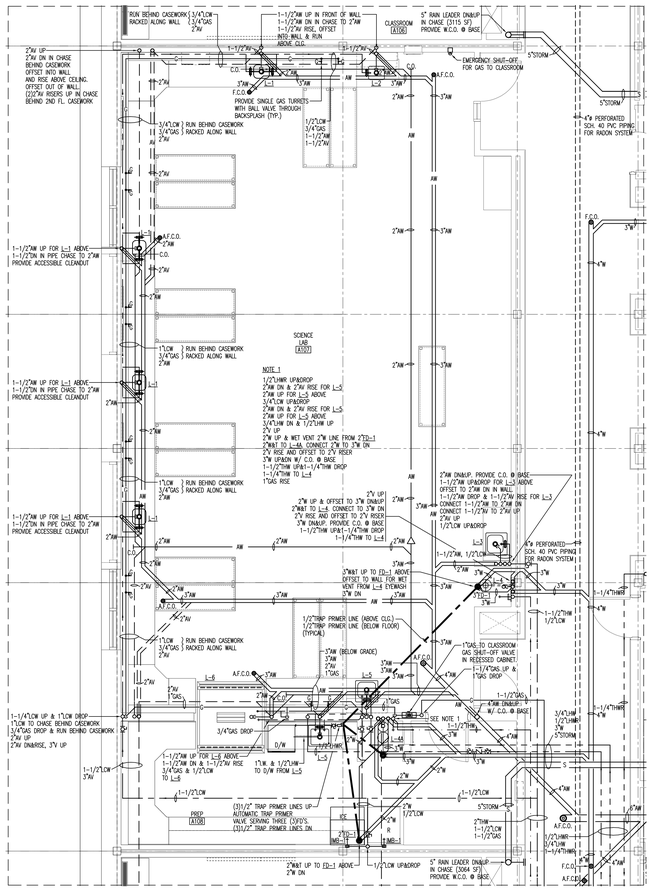

1 P4.3 Partial First Floor Plumbing Plan Section AB
Scale: 1/4" = 1'-0"

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170 Apricot Street, Worcester, MA 01603

TITLE

Partial Plumbing Plans Sections A & AB

Key Plan

A BUILDING
A
AB
B BUILDING
B1
B2

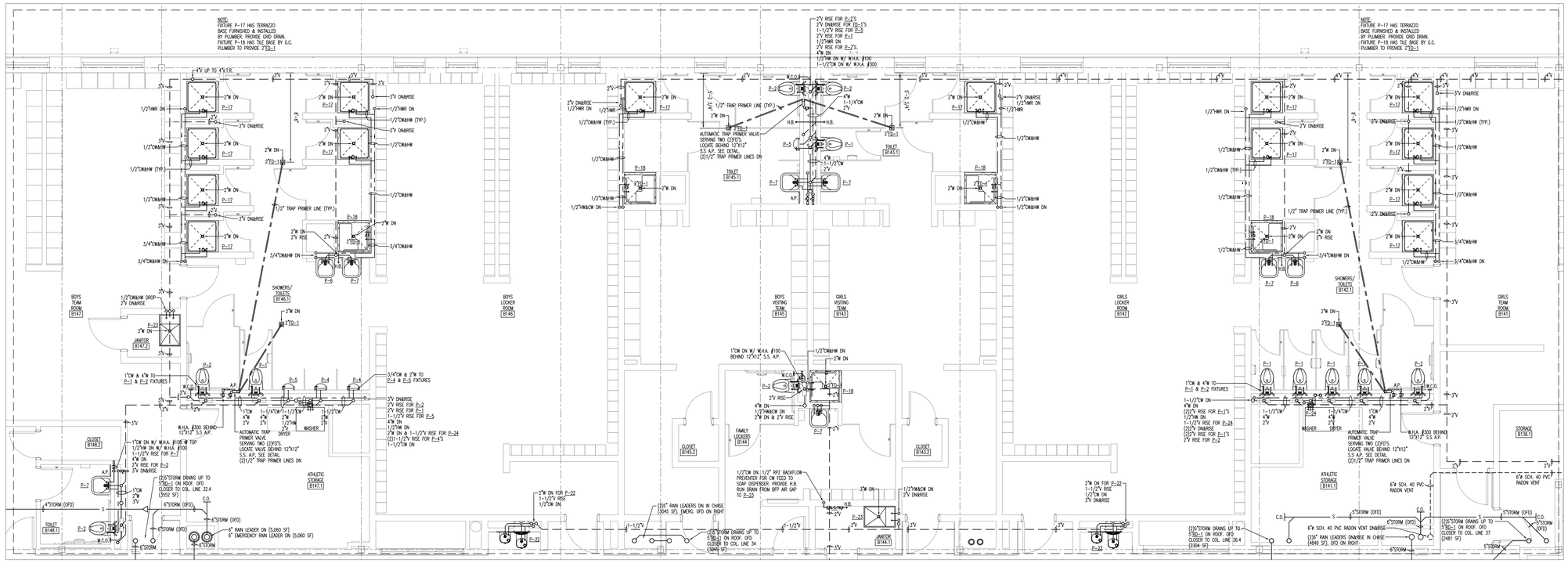
REVISIONS

No.	Description	Date

FILE:

DWN. BY: CDR	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/4" = 1'-0"
DATE: January 31, 2019	

P4.3



2 P4.4 Partial First Floor Plumbing Plan Section B2
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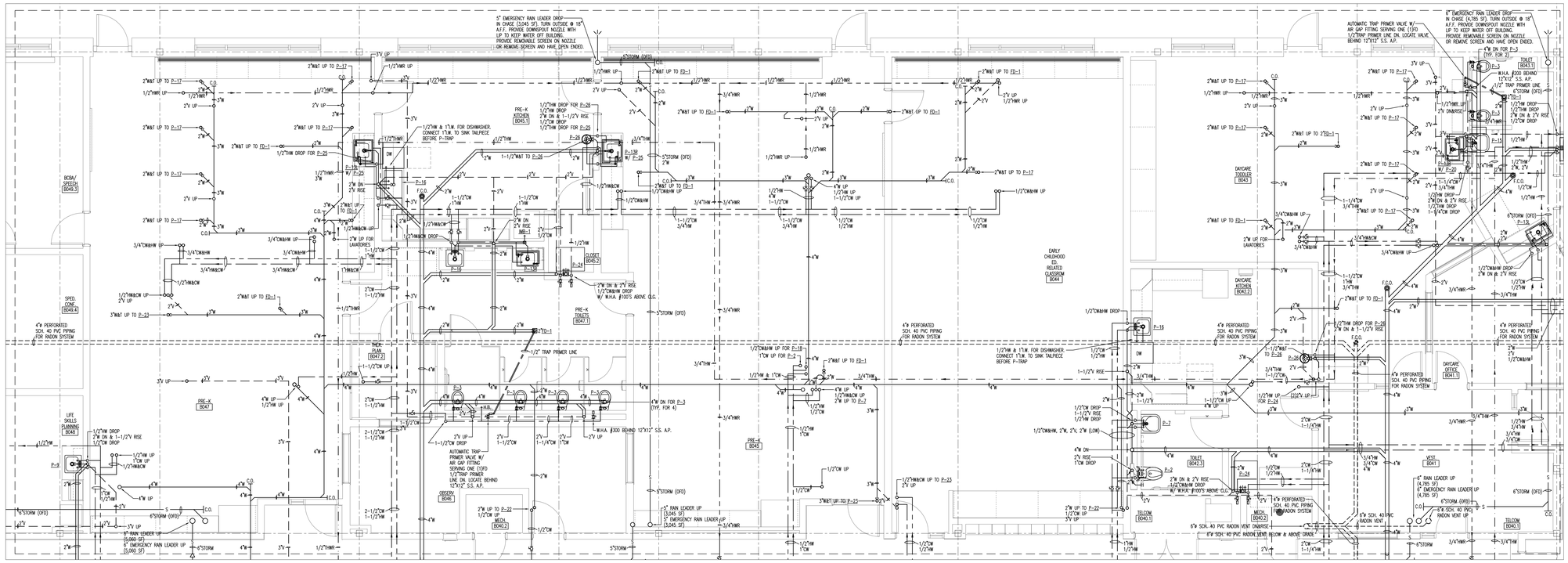

1 P4.4 Partial Ground Floor Plumbing Plan Section B2
Scale: 1/4" = 1'-0"

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TITLE

Partial Plumbing Plans Section B2

Key Plan

A BUILDING: A, AB
B BUILDING: BI, B2

REVISIONS

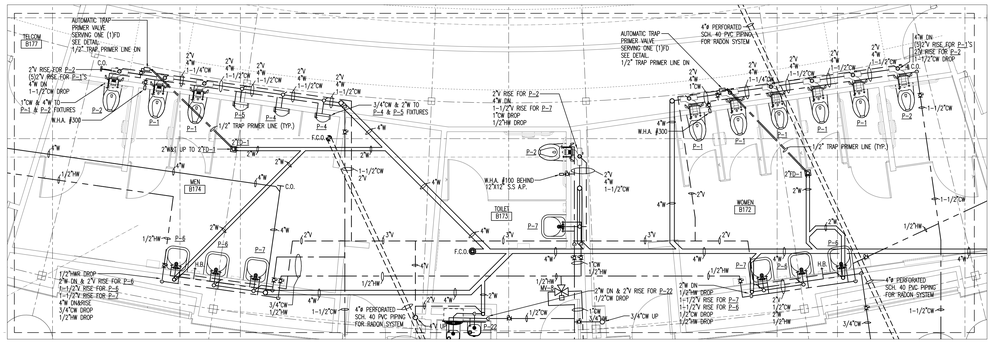
No.	Description	Date

FILE:

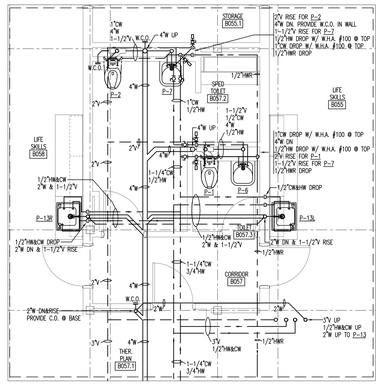
DWN. BY: CDR	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/4" = 1'-0"

DATE: January 31, 2019

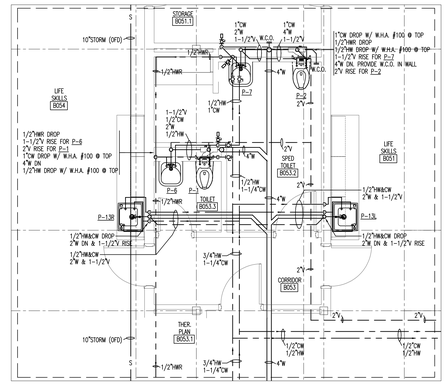
P4.4



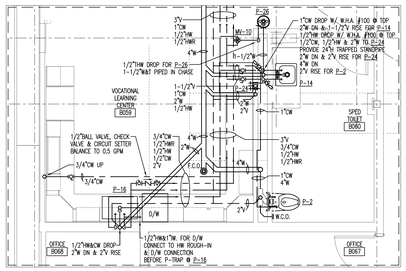
1 P4.5 Partial First Floor Plumbing Plan Section B1
Scale: 1/4" = 1'-0"



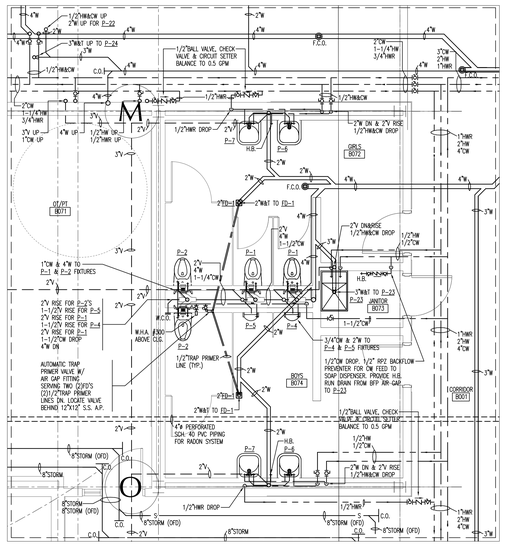
2 P4.5 Partial Ground Floor Plumbing Plan Section B1
Scale: 1/4" = 1'-0"



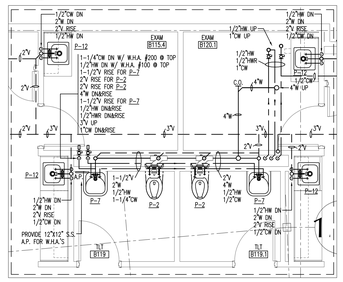
3 P4.5 Partial Ground Floor Plumbing Plan Section B1
Scale: 1/4" = 1'-0"



4 P4.5 Partial Ground Floor Plumbing Plan Section B1
Scale: 1/4" = 1'-0"



5 P4.5 Partial Ground Floor Plumbing Plan Section B1
Scale: 1/4" = 1'-0"



6 P4.5 Partial First Floor Plumbing Plan Section B2
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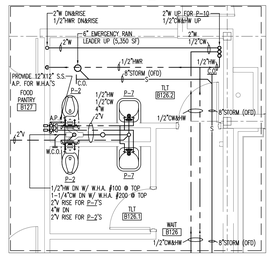

7 P4.5 Partial First Floor Plumbing Plan Section B2
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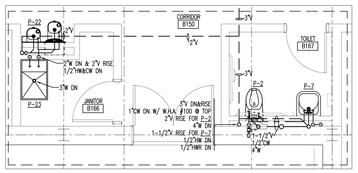
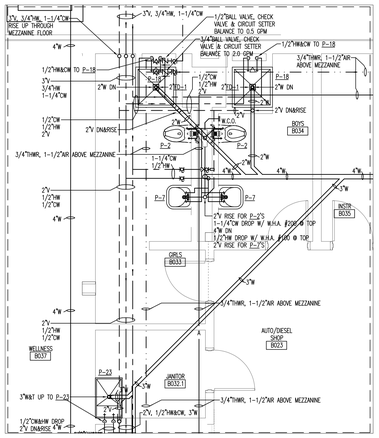


8 P4.5 Partial First Floor Plumbing Plan Section B1
Scale: 1/4" = 1'-0"



9 P4.5 Partial Ground Floor Plumbing Plan Section B2
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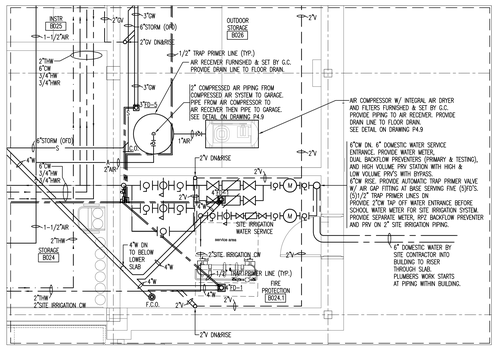
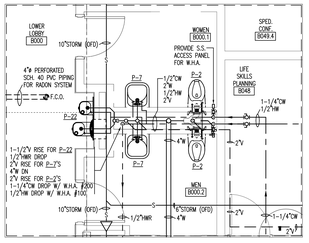


10 P4.5 Partial First Floor Plumbing Plan Section B2
Scale: 1/4" = 1'-0"



11 P4.5 Partial Ground Floor Plumbing Plan Section B2
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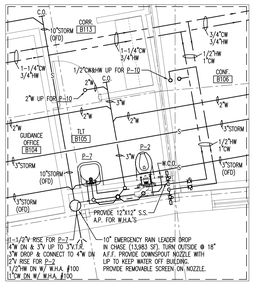
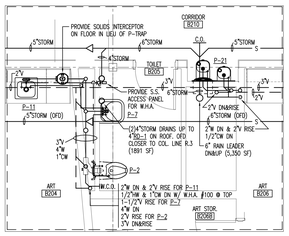


12 P4.5 Partial First Floor Plumbing Plan Section B2
Scale: 1/4" = 1'-0"



13 P4.5 Partial Second Floor Plumbing Plan Section B2
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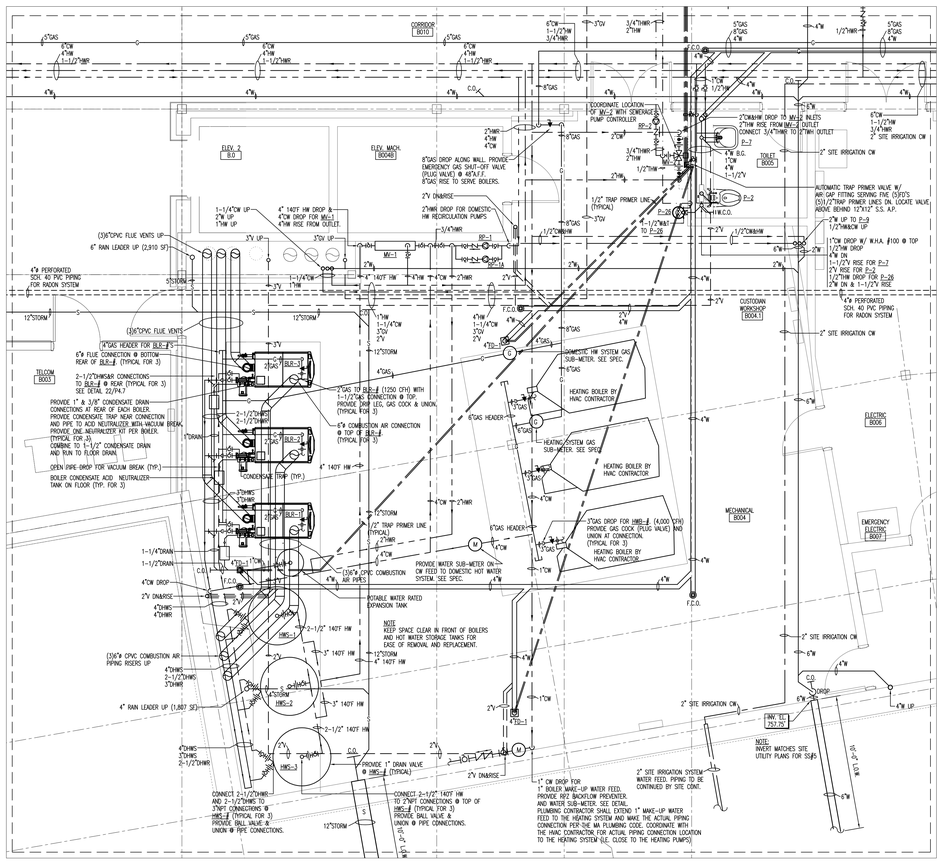

14 P4.5 Partial Ground Floor Plumbing Plan Section B2
Scale: 1/4" = 1'-0"

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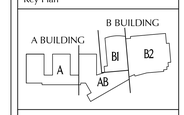
170 Apricot Street, Worcester, MA 01603

TITLE

Partial Plumbing Plans Sections B1 & B2

Key Plan



REVISIONS

No.	Description	Date

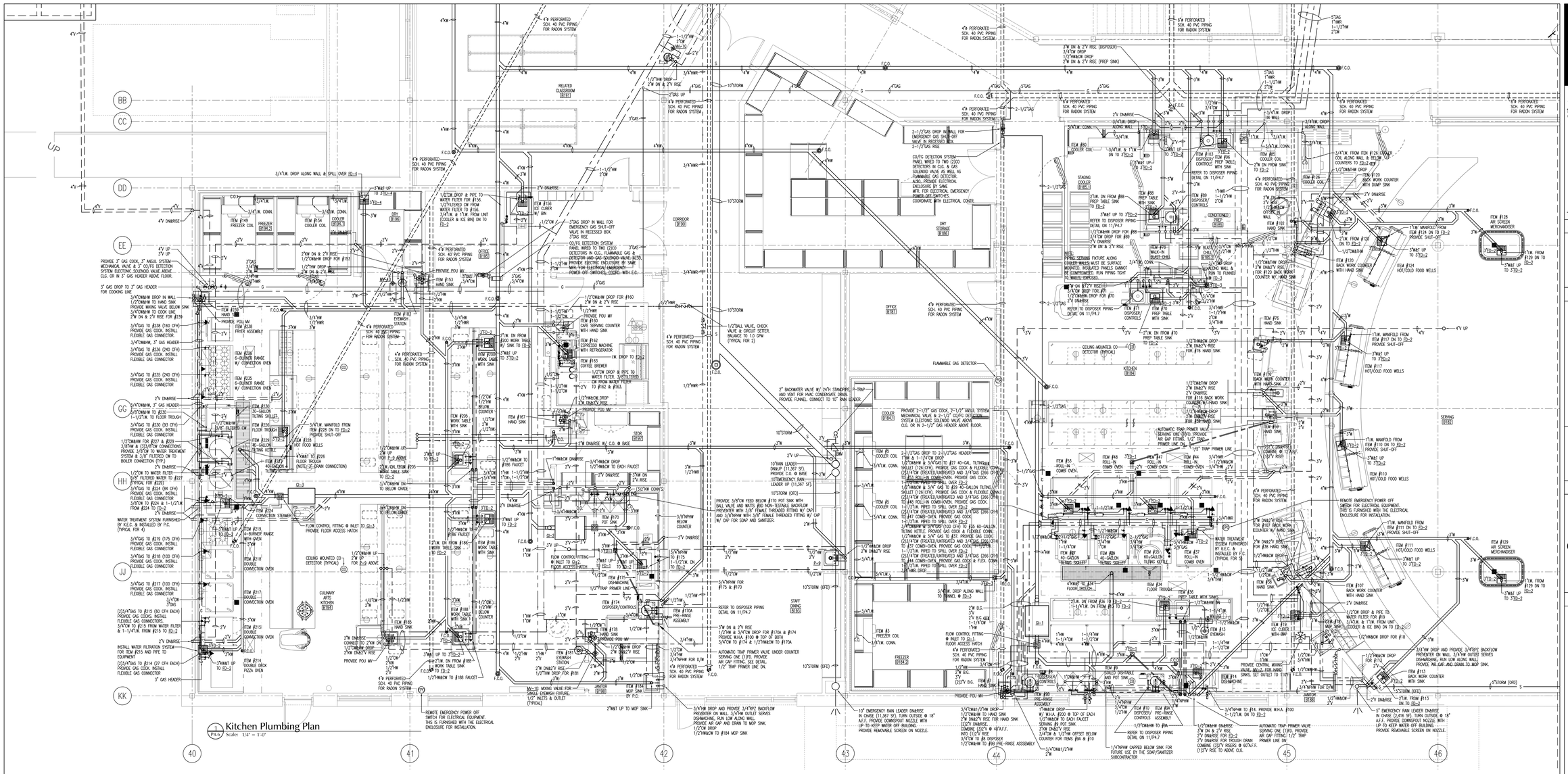
FILE:

DWN. BY: CDR | JOB NO: #1611

CKD. BY: KRS | SCALE: 1/4" = 1'-0"

DATE: January 31, 2019

P4.5



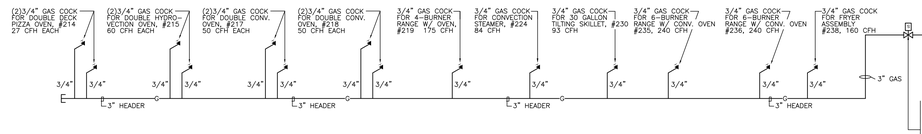
Kitchen Plumbing Plan
P4.6 Scale: 1/4" = 1'-0"

KITCHEN EQUIPMENT SCHEDULE – PLUMBING CONNECTIONS

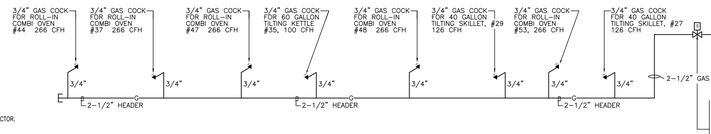
No.	Qty.	Description	Plumbing Utilities HW	CW	DW	IW	MBTUS	Gas Size	Plumbing Height	Comment
3	1	Freezer Coil				3/4"				
5	1	Cooler Coil				3/4"				
7	1	Handsink	1/2"	1/2"	1-1/2"					PC - Provide 110 degree hot water to faucet.
8	1	Disposer/Controls		1/2"	2"					
9	1	Soiled Dishtable & Pot sink	(2) 1/2"	(2) 1/2"	(3) 2"					PC to cap and tap 1/4" line of of the 1/2" HW line for future use by the soap/sanitizer subcontractor.
9A	1	Pre-Rinse Assembly	1/2"	1/2"						
9B	1	Pre-Rinse Assembly	1/2"	1/2"						
10	1	Disposer/Controls		1/2"	2"					
13	1	Emergency Eyewash	1/2" TW		1 1/4"					PC - Provide warm water as required by ANSI Z358.1-2004.
14	1	Dishmachine	3/4"	3/4"		1 1/2"				
18	1	Mop Sink	1/2"	1/2"	2"					PC - Furnish and install mop sink. See spec.
19	1	Ice Cuber w/ Bin		3/8"		3/4" & 1"				
27	1	40 Gallon Tilting Skillet	3/8"	3/8"			126	3/4"	33.5"	
29	1	40 Gallon Tilting Skillet	3/8"	3/8"			126	3/4"	33.5"	
34	1	Floor Trough			4"					
35	1	60 Gallon Tilting Kettle	1/2"	1/2"			100	1/2"	26.1"	
36	1	Prep Table w/ Sinks	1/2"	1/2"		2"				
37	1	Roll-In Combi-Oven		(2) 3/4"		1 1/2"	266	3/4"	7"	PC - Water filtration system installed and piped for this equipment.
38	1	Handsink	1/2"	1/2"	1-1/2"					PC - Provide 110 degree hot water to faucet.
39	1	Utility Distribution System	3/4"	1-1/2"			2350	2"		
44	1	Roll-In Combi-Oven		(2) 3/4"		1 1/2"	266	3/4"	7"	PC - Water filtration system installed and piped for this equipment.
47	1	Roll-In Combi-Oven		(2) 3/4"		1 1/2"	266	3/4"	7"	PC - Water filtration system installed and piped for this equipment.
48	1	Roll-In Combi-Oven		(2) 3/4"		1 1/2"	266	3/4"	7"	PC - Water filtration system installed and piped for this equipment.
53	1	Roll-In Combi-Oven		(2) 3/4"		1 1/2"	266	3/4"	7"	PC - Water filtration system installed and piped for this equipment.
59	1	Handsink	1/2"	1/2"	1-1/2"					PC - Provide 110 degree hot water to faucet.
70	1	Prep Table w/ Sinks	1/2"	1/2"		2"				
71	1	Disposer/Controls		1/2"	2"					
76	1	Handsink	1/2"	1/2"	1-1/2"					PC - Provide 110 degree hot water to faucet.
78	1	Walk-In Blast Chiller			3/4"					
80	1	Cooler Coil				3/4"				
85	1	Cooler Coil				3/4"				
88	1	Prep Table w/ Sinks	1/2"	1/2"		2"				
89	1	Disposer/Controls		1/2"	2"					
96	1	Prep Table w/ Sinks	1/2"	1/2"		2"				
102	1	Handsink	1/2"	1/2"	1-1/2"					PC - Provide 110 degree hot water to faucet.
103	1	Disposer/Controls		1/2"	2"					
107	1	Back Work Counter w/ Hand Sink	1/2"	1/2"	1-1/2"					
110	1	Hot Food Wells				1"				
111	1	Hot/Cold Food Wells				1"				
113	1	Back Work Counter w/ Sink	1/2"	1/2"		2"				
116	1	Back Work Counter w/ Hand Sink	1/2"	1/2"	1-1/2"					
117	1	Hot/Cold Food Wells				1"				
120	1	Back Work Counter w/ Hand & Dump Sinks	(2)1/2"	(2)1/2"	1-1/2"	2"				
124	1	Hot/Cold Food Wells				1"				
126	1	Cooler Coil				3/4"				
128	1	Air Screen Merchandiser				1"				
129	1	Air Screen Merchandiser				1"				
149	1	Freezer Coil				3/4"				
153	1	Handsink	1/2"	1/2"	1-1/2"					PC - Provide 110 degree hot water to faucet.
154	1	Cooler Coil				3/4"				
156	1	Ice Cuber w/ Bin		3/8"		3/4" & 1"				
160	1	Cafe Serving Counter w/ Handsink	1/2"	1/2"	1-1/2"					PC - Provide 110 degree hot water to faucet.
162	1	Espresso Machine with Refrigerator			5/8"	1/4"				
163	1	Coffee Brewer		1/4"						
167	1	Handsink	1/2"	1/2"	1-1/2"					PC - Provide 110 degree hot water to faucet.
170	1	Pot Sink & Clean Dishtable	(2) 1/2"	(2) 1/2"	(3) 2"					PC - PC to provide 3/8" female threaded fitting with shut off valve and approved backflow prevention on the incoming cold and hot water line for soap and sanitizer.
170A	1	Pre-Rinse Assembly	1/2"	1/2"						
174	1	Disposer/Controls		1/2"	2"					
175	1	Dishmachine	3/4"			1 1/2"				
178	1	Handsink	1/2"	1/2"	1-1/2"					PC - Provide 110 degree hot water to faucet.
181	1	Eye Wash Station	1/2" TW		1-1/4"					PC - Provide warm water as required by ANSI Z358.1-2004.
183	1	Eye Wash Station	1/2" TW		1-1/4"					PC - Provide warm water as required by ANSI Z358.1-2004.
184	1	Mop Sink	1/2"	1/2"	2"					PC - Furnish and install mop sink. See spec.
185	1	Handsink	1/2"	1/2"	1-1/2"					PC - Provide 110 degree hot water to faucet.
186	1	Work Table with Sink	1/2"	1/2"		2"				
188	1	Work Table with Sink	1/2"	1/2"		2"				
200	1	Work Table with Sink	1/2"	1/2"		2"				
205	1	Work Table with Sink	1/2"	1/2"		2"				
214	1	Double Deck Pizza Oven					54	3/4"	45"	PC - There are two (2) gas connections, 27 CFH each
215	1	Double Convection Oven		3/4"		1-1/4"	120	3/4"	18"	PC - Water filtration system installed and piped for this equipment.
217	1	Double Convection Oven					100	3/4"	10"	
218	1	Double Convection Oven					100	3/4"	10"	
219	1	4-Burner Range w/ Oven					175	3/4"	34"	
224	1	Convection Steamer		3/8"		1-1/2"	84	3/4"	10"	
226	1	Floor Trough			3"					
227	1	40 Gal. Tilting Kettle	3/8"	(3)3/8"		2"				PC - Water filtration system installed for (1)3/8" CW and piped for this equipment.

KITCHEN EQUIPMENT PLUMBING NOTES

1. ALL FLOOR SINK AND FLOOR DRAINS PROVIDED AND INSTALLED BY P.C. K.E.C. TO VERIFY & COORDINATE FLOOR SINK LOCATIONS IN THE FIELD WITH THE CONTRACTOR.
2. K.E.C. SHALL PROVIDE REFRIGERATION LINE RUNS BETWEEN COOLER/FREEZER CONDENSERS AND COILS. COORDINATE IN THE FIELD WITH CONTRACTOR.
3. ALL HORIZONTAL PIPING EXTENDED AND CONNECTED TO EQUIPMENT SHOULD BE RUN AT THE HIGHEST POSSIBLE ELEVATION ABOVE THE FLOOR. NO LINES SHOULD LAY DIRECTLY ON THE FLOOR AT ANY TIME.
4. RECOMMENDED FLOOR SINKS SHALL BE SQUARE TYPE INDIRECT WASTE RECEPTORS WITH REMOVABLE GRATE. PERCENTAGE OF GRATE AS INDICATED ON PLAN.
5. ALL PLUMBING FIXTURES FURNISHED FOR FOODSERVICE EQUIPMENT TO BE PROVIDED BY K.E.C. UNLESS INSTALLED BY THE P.C.
6. ALL WASTES, DIRECT OR INDIRECT, TO BE FURNISHED AND INSTALLED BY THE P.C.
7. AUTOMATIC FIRE SYSTEM GAS LINE SHUT-OFF VALVES SUPPLIED BY K.E.C. AND INSTALLED BY P.C.
8. INTERIOR GREASE TRAP FURNISHED AND INSTALLED BY P.C. EXTERIOR GREASE TRAP PIPED BY P.C. & INSTALLED BY SITE CONTR.
9. FURNISH & INSTALL CO & FG DETECTION SYSTEMS WIRED TO HOOD SOLENOID VALVE IN GAS LINE. WIRING FOR CO DETECTION SYSTEM BY P.C. SEE SPEC.
10. K.E.C. SHALL PROVIDE ELECTRIC HEAT TRACE ON CONDENSATE DRAIN PIPING IN FREEZER. ELECTRIC HEAT TRACE NOT REQUIRED IN COOLER.



KITCHEN GAS HEADER FOR PIPING UNDER HOOD DETAIL – CULINARY ARTS KITCHEN B194
NOT TO SCALE

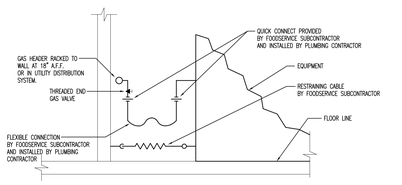


NOTE:
PER FOODSERVICE UTILITY SCHEDULE, THIS COOKING LINE HAS A UTILITY DISTRIBUTION SYSTEM BETWEEN THE TWO HOODS (I.E. BEHIND THE EQUIPMENT). THE PLUMBER IS RESPONSIBLE FOR ALL PIPING WITHIN THE UTILITY DISTRIBUTION SYSTEM. THE GAS PIPING MAY FACE STRAIGHT DOWN FROM THE HEADER. COORDINATE WITH KITCHEN EQUIPMENT CONTRACTOR.

KITCHEN GAS HEADER FOR PIPING UNDER HOOD DETAIL – KITCHEN B184
NOT TO SCALE

KITCHEN EQUIPMENT SCHEDULE – PLUMBING CONNECTIONS (CONT.)

No.	Qty.	Description	Plumbing Utilities HW	CW	DW	IW	MBTUS	Gas Size	Plumbing Height	Comment
228	1	Hot Food Wells				1"				
229	1	40 Gal. Tilting Kettle	3/8"	(3)3/8"		2"				PC - Water filtration system installed for (1)3/8" CW and piped for this equipment.
230	1	30 Gallon Tilting Skillet	3/8"	3/8"		1-1/2"	93	3/4"	33.5"	
235	1	6 Burner Range with Convection Oven					240	3/4"	30"	
236	1	6 Burner Range with Convection Oven					240	3/4"	30"	
238	1	Fryer Assembly					160	3/4"	10.5"	
239	1	Handsink	1/2"	1/2"	1-1/2"					PC - Provide 110 degree hot water to faucet.



KITCHEN EQUIPMENT GAS CONNECTION DETAIL
NOT TO SCALE

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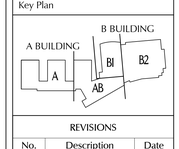
OWNER
Worcester Public Schools
Worcester, MA

Project North

PROJECT
FINAL BID PACKAGE
South High Community School
170 Apricot Street, Worcester, MA 01603

TITLE
Kitchen Plumbing Plan & Schedule

Key Plan



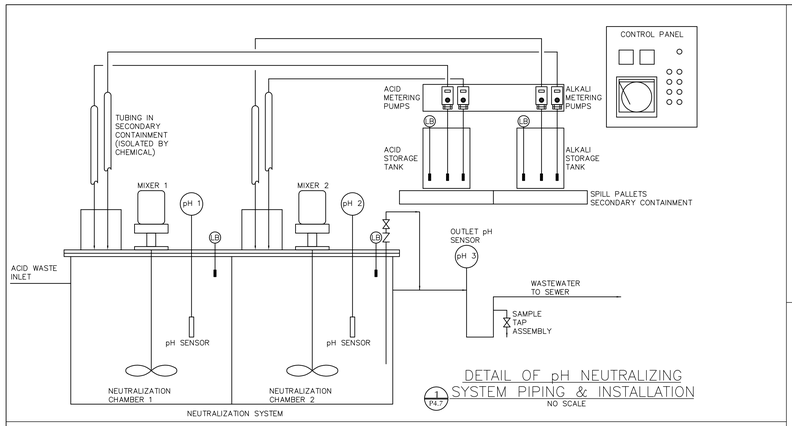
REVISIONS

No.	Description	Date

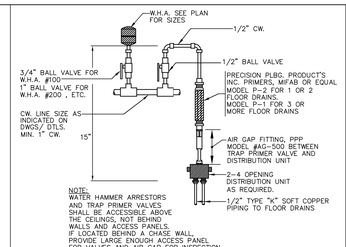
FILE:

DWN. BY: CDR	JOB NO: #1611
CKD. BY: KRS	SCALE: AS NOTED
DATE: January 31, 2019	

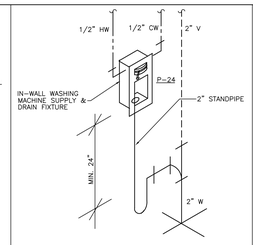
P4.6



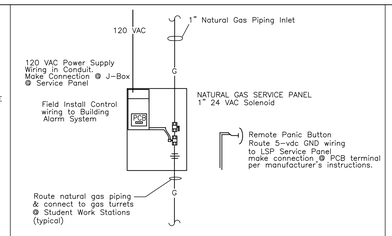
1 P4.7 DETAIL OF pH NEUTRALIZING SYSTEM PIPING & INSTALLATION
NO SCALE



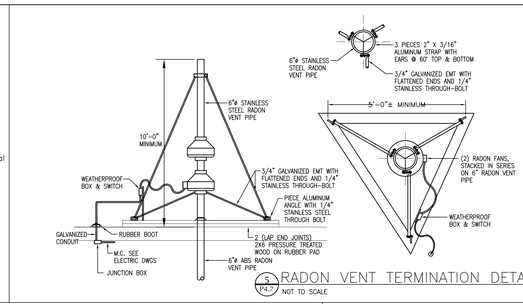
2 P4.7 DETAIL OF TRAP PRIMERS & WATER HAMMER ARRESTORS
NOT TO SCALE



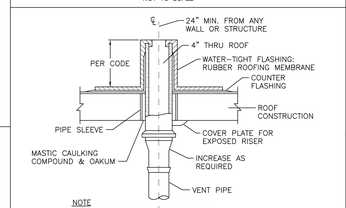
3 P4.7 WASHING MACHINE SUPPLY & DRAIN PIPING DETAIL
NO SCALE



4 P4.7 TYPICAL SCIENCE CLASSROOM EMERGENCY GAS SHUT-OFF PIPING DIAGRAM
NOT TO SCALE

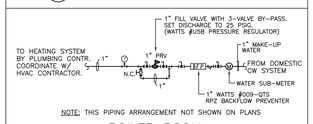


5 P4.7 RADON VENT TERMINATION DETAILS
NOT TO SCALE



6 P4.7 VENT THRU ROOF DETAIL
NO SCALE

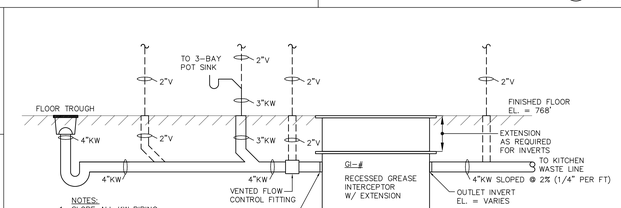
7 P4.7 DETAIL OF P-13 FIXTURE
NOT TO SCALE



NOTE: THIS PIPING ARRANGEMENT NOT SHOWN ON PLANS

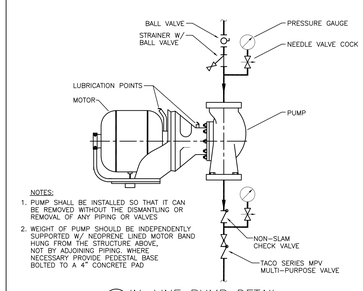
BOILER ROOM

8 P4.7 COLD WATER MAKE-UP DETAIL
NO SCALE FOR HEATING BOILERS



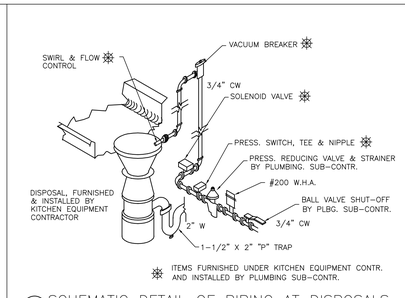
NOTES:
1. SLOPE ALL KW PIPING @ 2% (1/4" PER FT)
2. PROVIDE FLOOR ACCESS PANEL FOR FLOW CONTROL FITTING
3. INVERTS & EXTENSION HEIGHT MUST BE DETERMINED BEFORE ORDERING. SEE DRAWING P2.4 FOR INVERTS

9 P4.7 DETAIL OF KITCHEN INTERIOR GREASE INTERCEPTOR GI-# PIPING & INSTALLATION
NOT TO SCALE

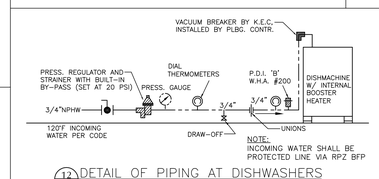


NOTES:
1. PUMP SHALL BE INSTALLED SO THAT IT CAN BE REMOVED WITHOUT THE DISMANTLING OR REMOVAL OF ANY PIPING OR VALVES
2. WEIGHT OF PUMP SHOULD BE INDEPENDENTLY SUPPORTED W/ NEOPRENE LINED MOTOR BAND HUNG FROM THE STRUCTURE ABOVE. NOT BY ADJOINING PIPING. WHERE NECESSARY PROVIDE PEDESTAL BASE BOLTED TO A 4" CONCRETE PAD

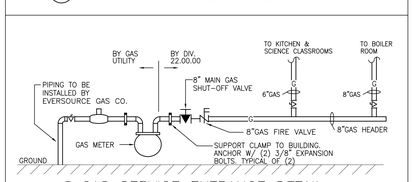
10 P4.7 IN-LINE PUMP DETAIL
NO SCALE



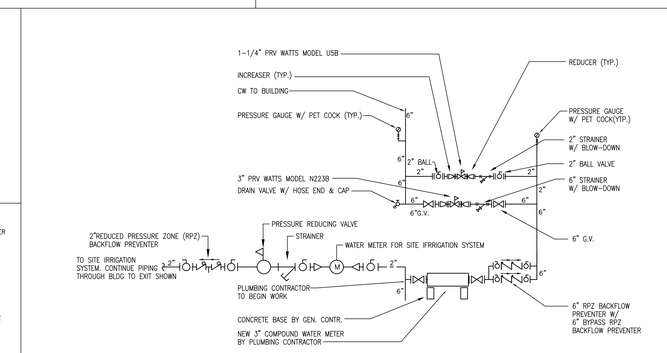
11 P4.7 SCHEMATIC DETAIL OF PIPING AT DISPOSALS
NOT TO SCALE



12 P4.7 DETAIL OF PIPING AT DISHWASHERS
NOT TO SCALE ITEMS #14 & #175

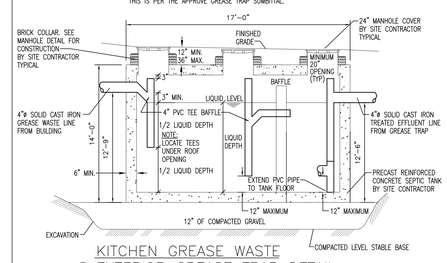


13 P4.7 GAS SERVICE ENTRANCE DETAIL
NO SCALE



14 P4.7 DOMESTIC WATER ENTRANCE DETAIL
NO SCALE

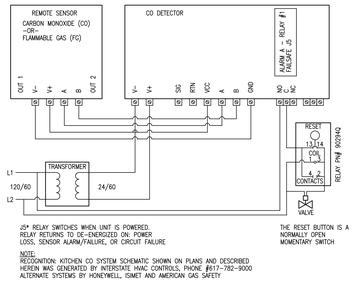
NOTES
1. THIS DETAIL PROVIDED FOR REFERENCE. EXTERIOR GREASE TRAP & CASTINGS ARE FURNISHED AND INSTALLED BY THE SITE CONTRACTOR. ALL PIPING IS BY THE PLUMBING CONTRACTOR. PERIMETER DIMENSIONS ARE FROM THE APPROVED EXTERIOR GREASE TRAP SUBMITTAL FOR THIS PROJECT
2. THE LIQUID DEPTH IS 11'-10" THEREFORE, 1/2 THE LIQUID DEPTH IS 5'-11" THIS IS PER THE APPROVE GREASE TRAP SUBMITTAL.



KITCHEN GREASE WASTE EXTERIOR GREASE TRAP DETAIL
15 P4.7 NOT TO SCALE

SEQUENCE OF OPERATION

DUAL CO DETECTORS WITH MANUAL RESET WITH NON MANUAL RESET GAS VALVE, AS LONG AS MANUAL RESET DOES NOT RESET WHEN THE CO CLEARS THE DETECTORS. FOR INSTANCE, IF THE CO DETECTOR SENSES CO IT SHUTS OFF THE ELECTRICAL POWER TO THE REST OF THE SYSTEM, TRIPPING THE MANUAL RESET. IF THE CO CLEARS AND THE CONTROL PANEL IS REACTIVATED, THE POWER REMAINS OFF UNTIL SOMEONE MANUALLY RESETS THE SYSTEM.

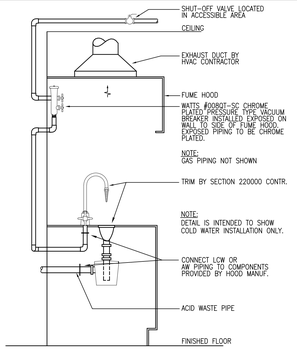


J5* RELAY SWITCHES WHEN UNIT IS POWERED. RELAY RETURNS TO DE-ENERGIZED ON: POWER LOSS, SENSOR ALARM/FAILURE, OR CIRCUIT FAILURE

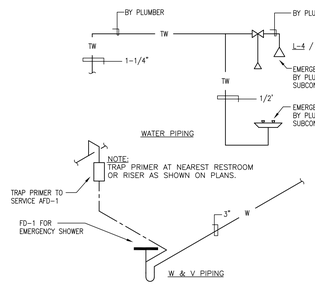
THE RESET BUTTON IS A NORMALLY OPEN MOMENTARY SWITCH

NOTE:
RECOGNITION: KITCHEN CO SYSTEM SCHEMATIC SHOWN ON PLANS AND DESCRIBED HEREIN WAS GENERATED BY INTERSTATE HVAC CONTROLS, PHONE #617-782-9000
ALTERNATE SYSTEMS BY HONEYWELL, ISMET AND AMERICAN GAS SAFETY

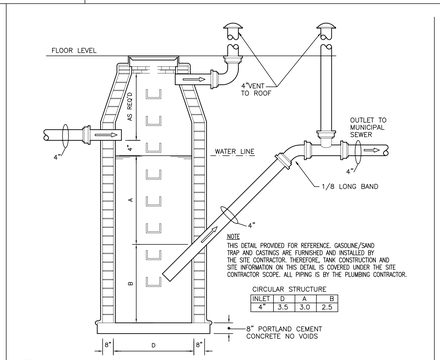
16 P4.7 WIRING DIAGRAM FOR COMMERCIAL KITCHENS
NOT TO SCALE



17 P4.7 TYPICAL FUME HOOD DETAIL
NOT TO SCALE

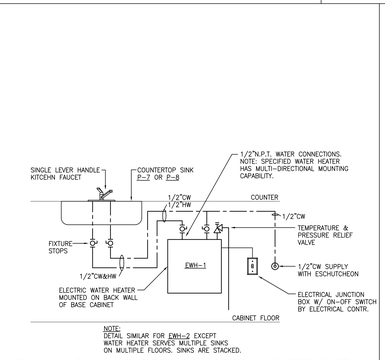


EMERGENCY SHOWER & EYE WASH PIPING DETAIL – SCIENCE LABS & PREP RMS
18 P4.7 NOT TO SCALE



INLET	D	A	B
4"	3.5	3.0	2.5

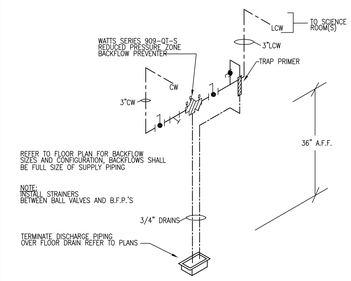
19 P4.7 CATCH BASIN AND GASOLINE TRAP DETAIL
NOT TO SCALE



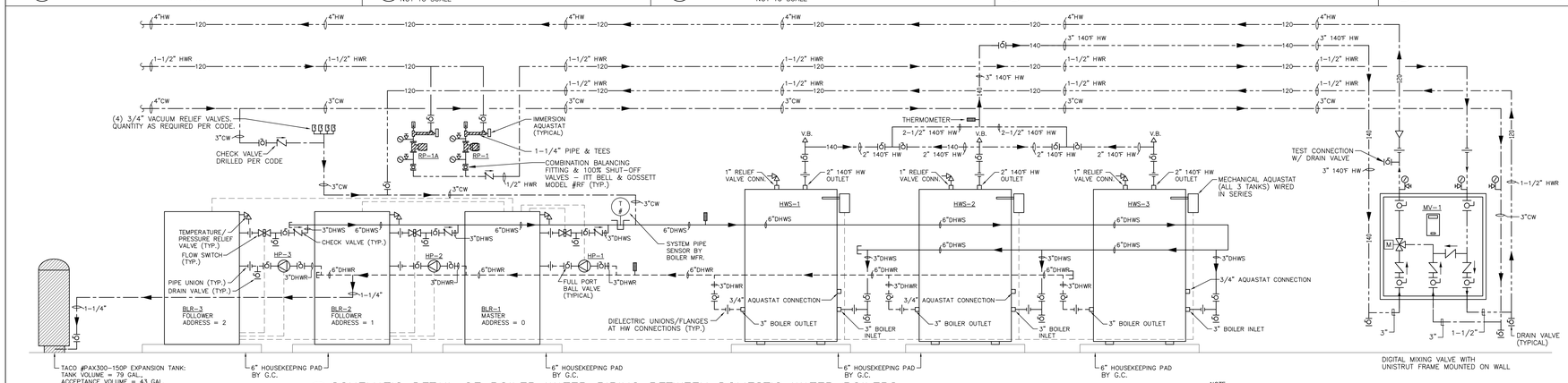
1/2"N.P.T. WATER CONNECTIONS. NOTE: SPECIFIED WATER HEATER HAS MULTI-DIRECTIONAL MOUNTING CAPABILITY.

NOTE:
DETAIL SIMILAR FOR EWH-2 EXCEPT WATER HEATER SERVES MULTIPLE SINKS ON MULTIPLE FLOORS. SINKS ARE STACKED.

20 P4.7 MINI-TANK ELECTRIC WATER HEATER DETAIL
NO SCALE



PIPING FOR REDUCED PRESSURE BACKFLOW PREVENTER DETAIL
21 P4.7 NOT TO SCALE



NOTE:
PIPING TO BOILERS AND TANKS SHALL BE INSTALLED SUCH THAT THE TANKS CAN BE EASILY REMOVED WITHOUT REMOVING TOO MUCH PIPING. ONCE THE BOILERS AND TANKS ARE DISCONNECTED, THEY SHOULD BE ABLE TO BE REMOVED FORE REPLACEMENT.

SCHEMATIC DETAIL OF BOILER WATER PIPING BETWEEN DOMESTIC WATER BOILERS, HOT WATER STORAGE TANKS AND THERMOSTATIC MIXING VALVE
22 P4.7 NOT TO SCALE

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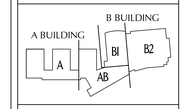
OWNER
Worcester Public Schools
Worcester, MA

Project North

PROJECT
FINAL BID PACKAGE
South High Community School
170 Apricot Street, Worcester, MA 01603

TITLE
Plumbing Details

Key Plan

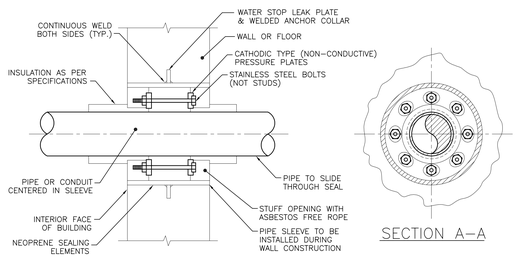


REVISIONS

No.	Description	Date

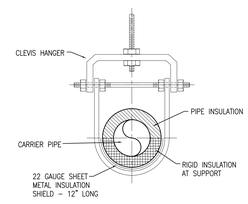
FILE:
DWN. BY: CDR
JOB NO: #1611
CKD. BY: KRS
SCALE: AS NOTED
DATE: January 31, 2019

P4.7

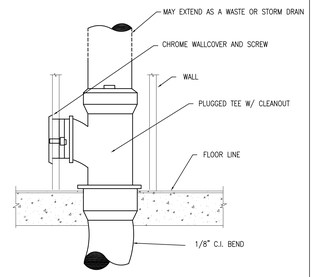


NOTES:
WHEN SEALING FLOOR PENETRATIONS, EXTEND SLEEVE 3" ABOVE FINISHED FLOOR.
WHEN CORE DRILL IS USED THE PIPE SLEEVE & WATER STOP/LEAK PLATE ARE NOT REQUIRED.

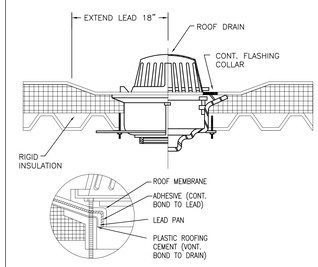
1 P4.8 MOLDED RUBBER BOLTED SEAL ASSEMBLY
NOT TO SCALE



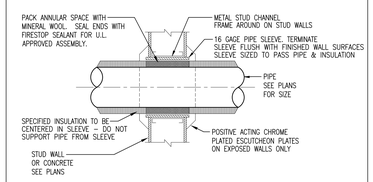
2 P4.8 PIPE HANGER DETAIL FOR ALL INSULATED PIPING
NO SCALE



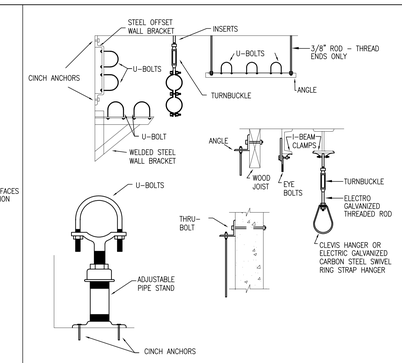
3 P4.8 WALL CLEANOUT DETAIL
NO SCALE



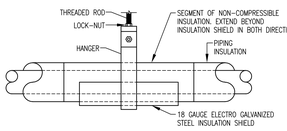
4 P4.8 ROOF DRAIN DETAIL
NO SCALE



5 P4.8 PIPE THROUGH WALL DETAIL
NO SCALE

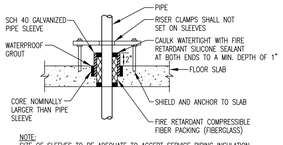


6 P4.8 TYPICAL PIPE SUPPORT DETAIL
NO SCALE



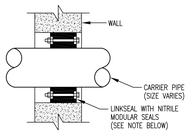
NOTES:
1. HANGER SHIELD IS TYPICAL FOR INSULATED PIPING
2. ALL HANGERS HARDWARE AND RODS SHALL BE ELECTRIC GALVANIZED

7 P4.8 PIPE HANGERS AND SHIELD
NOT TO SCALE



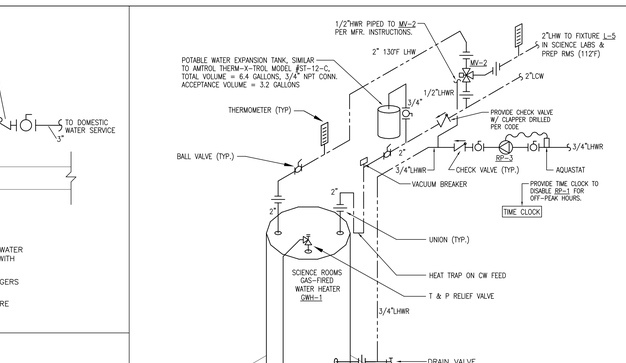
NOTE:
SIZE OF SLEEVES TO BE ADEQUATE TO ACCEPT SERVICE PIPING INSULATION WHERE REQUIRED. ALL PENETRATIONS SHALL BE UL LISTED ASSEMBLIES

8 P4.8 TYPICAL FLOOR PENETRATION
NOT TO SCALE



NOTE:
SEAL ASSEMBLY SHALL BE MODULAR MECHANICAL TYPE CONSISTING OF INTERLOCKING RUBBER LINKS SHAPED TO CONTINUOUSLY FILL IN THE ANNULAR SPACE BETWEEN PIPE AND WALL OPENING. PRESSURE PLATES SHALL BE DELRIN PLASTIC. BOLTS AND NUTS SHALL BE 18/8 STAILESS STEEL. SEALING ELEMENTS SHALL BE EPDM RUBBER.

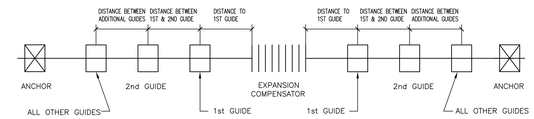
9 P4.8 WATER TIGHT SEAL (CORED CONCRETE)
NOT TO SCALE



NOTE:
HWBS–1 SHALL BE USED ON CIRCULATION PIPING MAINS AND ON THE CIRCULATION PUMPS TO BALANCE FLOWS.

NOTE:
HWBS–2 SHALL BE USED ON CIRCULATION PIPNG SERVING BRANCHES AND RISERS. TWO CIRCUIT SOLVERS SHALL NOT BE PIPED IN SERIES.

10 P4.8 HOT WATER CIRCULATION FLOW BALANCING STATIONS (HWBS)
NOT TO SCALE

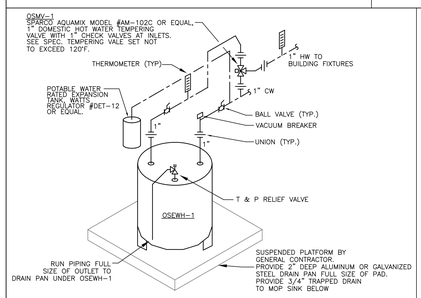


NOTE: 1) EXPANSION JOINT NEAR CENTER OF PIPING.
2) GUIDE SPACING SHALL BE SIMILIAR FOR EXPANSION LOOPS

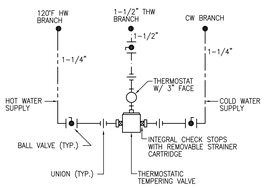
TYPICAL PIPE GUIDE INSTALLATION
NOT TO SCALE

PIPE SIZE (D)	MAXIMUM DISTANCE FROM BELLOWS TO 1st GUIDE OR ANCHOR	APPROX. DISTANCE BETWEEN 1st TO 2nd GUIDE	APPROX. DISTANCE BETWEEN ADDITIONAL PIPE GUIDES (IN FEET)	
			STEEL PIPE	COPPER PIPE
3/4"	3"	10"	14'	5'
1"	4"	1'–4"	16'	6'
1–1/4"	5"	1'–5"	18'	9'
1–1/2"	6"	1'–9"	22'	9'
2"	8"	2'–4"	24'	12'
2–1/2"	10"	2'–11"	30'	15'
3"	1'–0"	3'–6"	32'	
3–1/2"	1'–2"	4'–1"	36'	
4"	1'–4"	4'–8"	40'	
5"	1'–8"	5'–10"	35'	
6"	2'–0"	7'–0"	40'	
8"	2'–8"	9'–4"	50'	

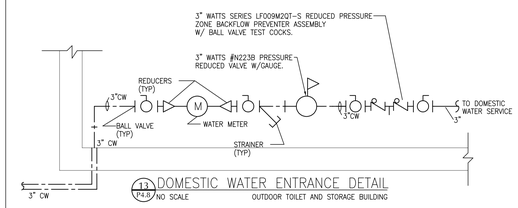
15 P4.7 PIPE GUIDE INSTALLATION DETAIL AND SPACING SCHEDULE
NOT TO SCALE



11 P4.8 OSEWH–1 ELECTRIC WATER HEATER DETAIL
NO SCALE



12 P4.8 DETAIL OF PIPING AT THERMOSTATIC MIXING VALVE
NOT TO SCALE

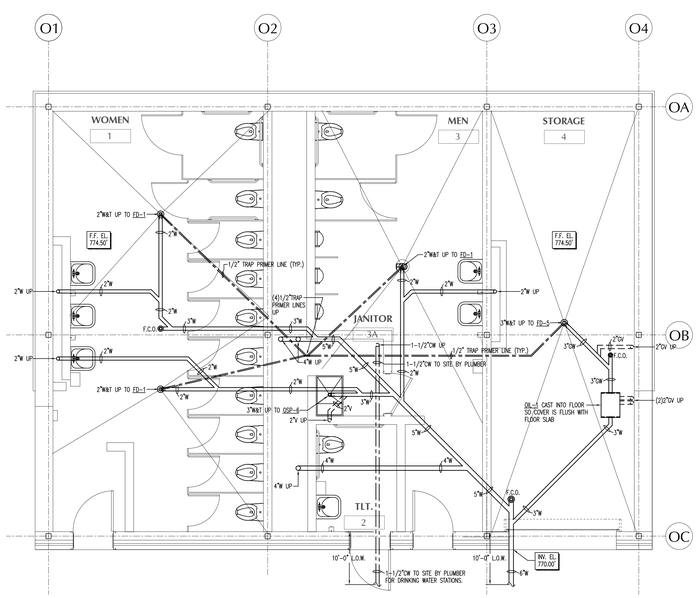


13 P4.8 DOMESTIC WATER ENTRANCE DETAIL
NO SCALE OUTDOOR TOILET AND STORAGE BUILDING

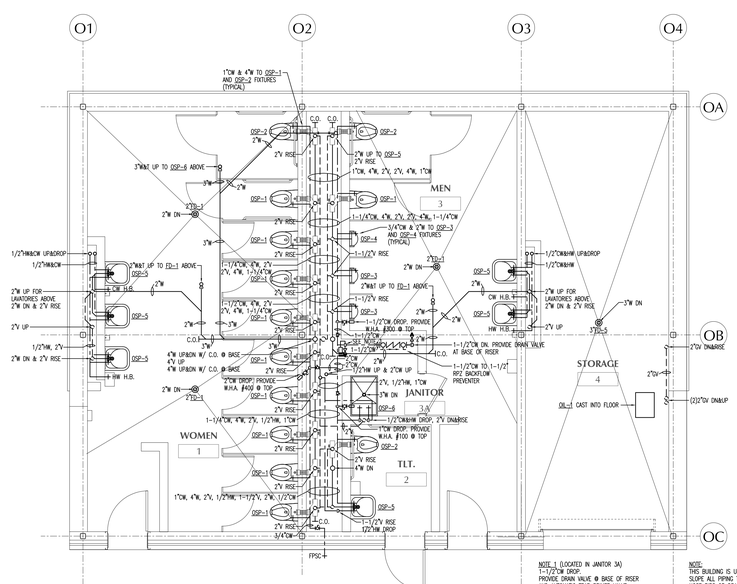
GENERAL NOTES:

1. OBTAIN PROPER SIZE AND TYPE WATER METERS FROM WATER DEPARTMENT. VERIFY WATER SERVICE CONFIGURATION WITH LOCAL WATER DEPARTMENT PRIOR TO INSTALLATION.
2. SECURELY SUPPORT SERVICES WITH COPPER CLAD HANGERS AND SUPPORTS.
3. PROVIDE PRESSURE GUAGES AT EACH SIDE OF PRESSURE REDUCING VALVE ASSEMBLY.

14 P4.8 GAS–FIRED WATER HEATER PIPING DETAIL, GWH–1
NO SCALE



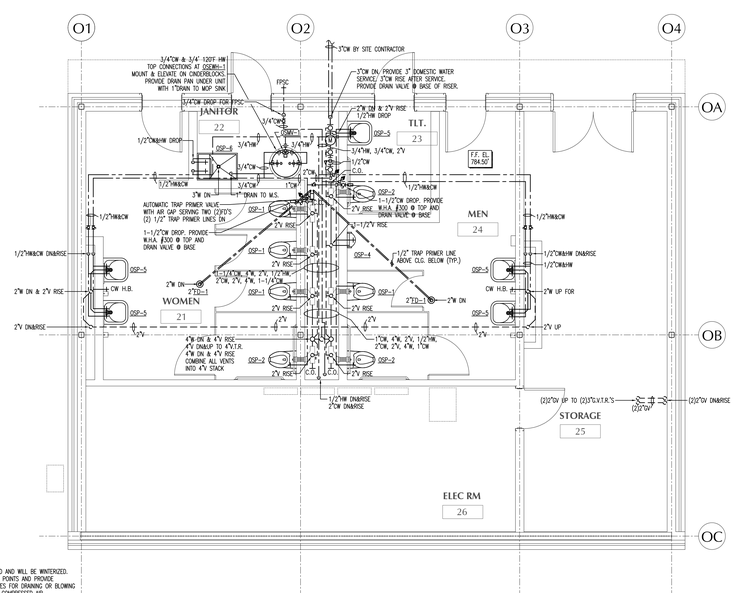
16 P4.8 First Floor Below Grade Plumbing Plan
Scale: 1/4" = 1'-0" Outdoor Toilet and Storage Building



NOTE 1 (LOCATED IN JANITOR 3A)
1–1/2"CW DROP.
PROVIDE DRAIN VALVE @ BASE OF RISER AND AUTOMATIC TRAP PRIMER VALVE WITH AIR GAP SERVING FOUR (4)FD'S (4) 1/2" TRAP PRIMER LINES DN

NOTE:
THIS BUILDING IS UNHEATED AND WILL BE WINTERIZED. SLOPE ALL PIPING TO LOW PONTS AND PROVIDE HOSE BIBS OR DRAIN VALVES FOR DRAINING OR BLOWING OUT PIPING SYSTEMS WITH COMPRESSED AIR.

17 P4.8 First Floor Above Grade Plumbing Plan
Scale: 1/4" = 1'-0" Outdoor Toilet and Storage Building



18 P4.8 Second Floor Plumbing Plan
Scale: 1/4" = 1'-0" Outdoor Toilet and Storage Building

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OWNER

Worcester Public Schools

Worcester, MA

Project North

PROJECT

FINAL BID PACKAGE

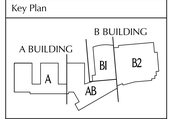
South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Plumbing Details & Toilet/Storage Building Plumbing Plans

Key Plan



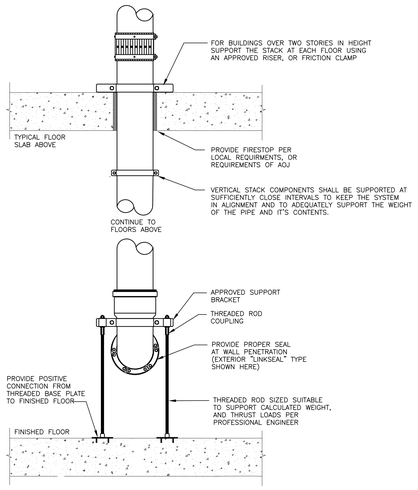
REVISIONS

No.	Description	Date

FILE:

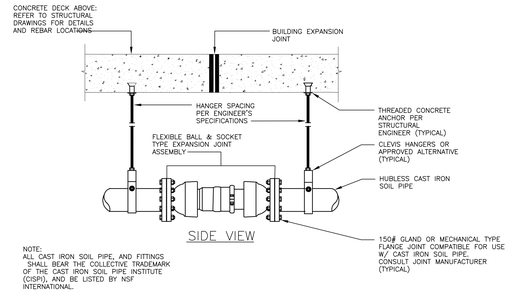
DWN. BY: CDR | JOB NO: #1611
CKD. BY: KRS | SCALE: AS NOTED
DATE: January 31, 2019

P4.8



CAST IRON DWV/STORM PIPE BASE SUPPORT DETAIL

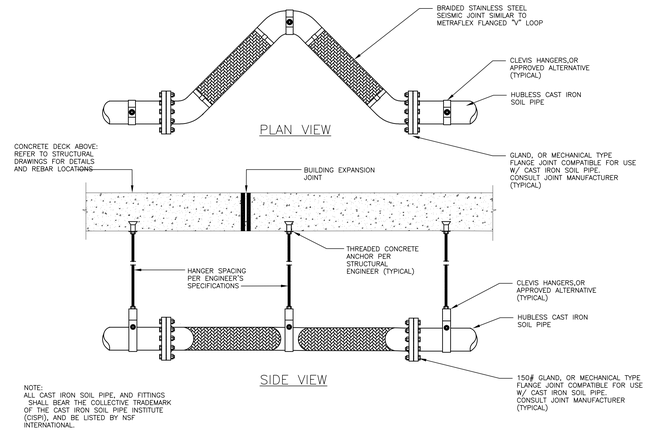
NOT TO SCALE



NOTE:
ALL CAST IRON SOIL PIPE, AND FITTINGS SHALL BEAR THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI), AND BE LISTED BY NSF INTERNATIONAL.

CAST IRON DWV/STORM PIPE WITH FLEXIBLE BALL TYPE EXPANSION JOINT DETAIL

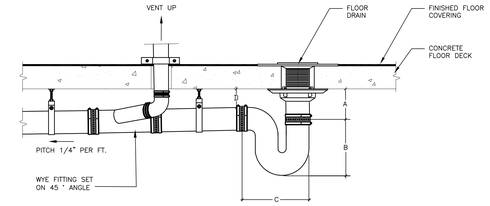
NOT TO SCALE



NOTE:
ALL CAST IRON SOIL PIPE, AND FITTINGS SHALL BEAR THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI), AND BE LISTED BY NSF INTERNATIONAL.

CAST IRON DWV/STORM PIPE WITH "V" TYPE EXPANSION JOINT DETAIL

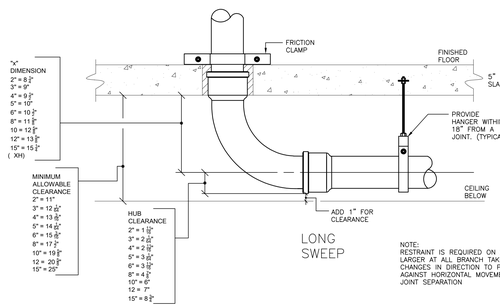
NOT TO SCALE



A	"A" DIMENSION IS DEPENDANT ON SPECIFIC FLOOR DRAIN MODEL, AND FLOOR SYSTEM INSTALLED. A 1" INSERTION INTO THE COUPLING IS ASSUMED.	
B	3" NH P-TRAP = 7 1/8" 4" NH P-TRAP = 8 3/4"	
C	3" NH P-TRAP = 10 5/8" 4" NH P-TRAP = 12 3/4"	
	NOTE: ALL "B", & "C" DIMENSIONS ARE BASED ON CHARLOTTE PIPE PART NUMBER NH-42.	

FLOOR DRAIN CLEARANCE DETAIL

NOT TO SCALE

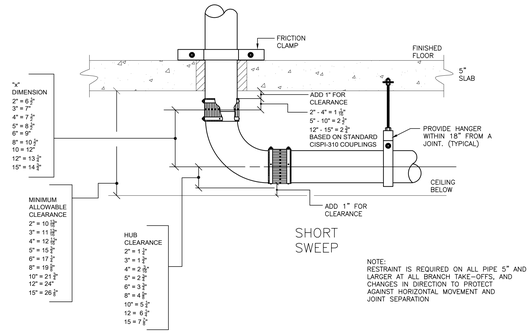


LONG SWEEP

NOTE:
RESTRAINT IS REQUIRED ON ALL PIPE 5" AND LARGER AT ALL BRANCH TAKE-OFFS, AND CHANGES IN DIRECTION TO PROTECT AGAINST HORIZONTAL MOVEMENT AND JOINT SEPARATION

START OF ELEVATION USING LONG SWEEP

NOT TO SCALE

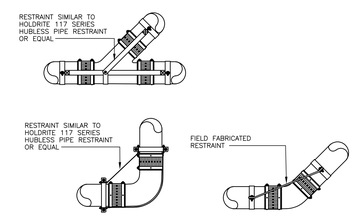


SHORT SWEEP

NOTE:
RESTRAINT IS REQUIRED ON ALL PIPE 5" AND LARGER AT ALL BRANCH TAKE-OFFS, AND CHANGES IN DIRECTION TO PROTECT AGAINST HORIZONTAL MOVEMENT AND JOINT SEPARATION

START OF ELEVATION USING NO-HUB SHORT SWEEP

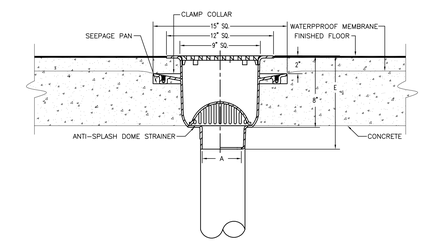
NOT TO SCALE



HORIZONTAL PIPE AND FITTINGS 5" AND LARGER SHALL BE SUITABLY BRACED TO PREVENT HORIZONTAL MOVEMENT. THIS MUST BE DONE AT EVERY BRANCH OPENING OR CHANGE IN DIRECTION BY THE USE OF BRACES, BLOCKS, RODDING OR OTHER SUITABLE METHOD, TO PREVENT MOVEMENT OR JOINT SEPARATION. THIS BRACING MAY BE FIELD FABRICATED OR A MANUFACTURED SYSTEM. THE DETAILS SHOWN ON THIS PAGE ILLUSTRATES SEVERAL METHODS OF BRACING.

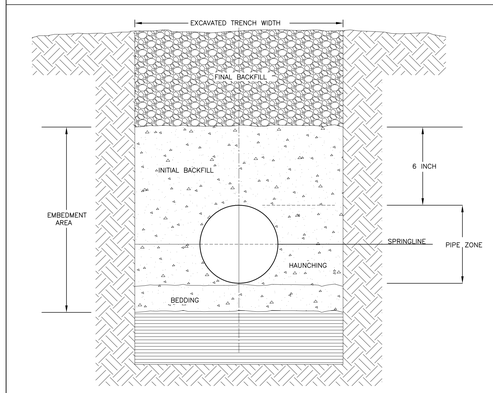
HUBLESS CAST IRON DWV/STORM PIPE WITH THRUST RESTRAINT DETAIL

NOT TO SCALE



FLOOR SINK INSTALLATION DETAIL

NOT TO SCALE



UNDERGROUND PLASTIC PIPE SYSTEM INSTALLATION DETAIL

NOT TO SCALE

UNDERGROUND INSTALLATION OF PLASTIC PIPE

PLASTIC PIPE SHOULD ALWAYS BE BURIED IN STRICT ACCORDANCE WITH THE ASTM STANDARD RELEVANT TO THE TYPE OF PLASTIC PIPING SYSTEM BEING INSTALLED. THOSE STANDARDS ARE:

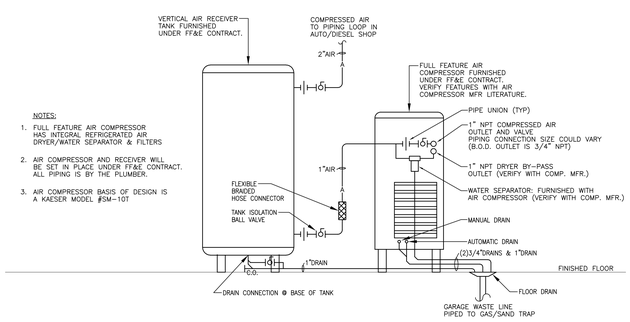
ASTM D2321 STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY-FLOW APPLICATIONS.

ASTM D2774 STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PRESSURE PIPING.

NOTE: IN ADDITION TO THESE STANDARDS, PIPE SHOULD ALWAYS BE INSTALLED IN ACCORDANCE WITH ALL LOCAL CODE REQUIREMENTS.

RECOMMENDATIONS FOR UNDERGROUND INSTALLATION OF PLASTIC DRAINAGE PIPE:

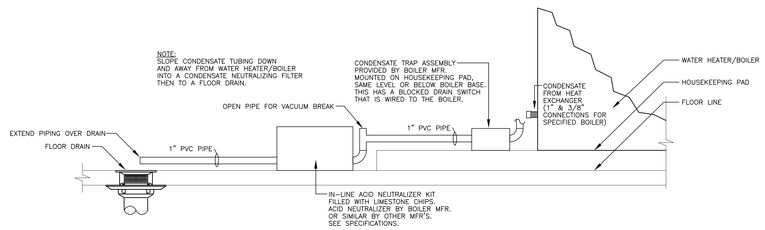
1. THE MINIMUM WIDTH OF THE TRENCH SHOULD BE THE PIPE OD (OUTSIDE DIAMETER) PLUS 16 INCHES OR THE PIPE OUTSIDE DIAMETER TIMES 1.25 PLUS 12 INCHES. THIS WILL ALLOW ADEQUATE ROOM FOR JOINING THE PIPE, SNAKING THE PIPE IN THE TRENCH TO ALLOW FOR EXPANSION AND CONTRACTION WHERE APPROPRIATE AND SPACE FOR BACKFILLING AND COMPACTION OF BACKFILL. THE SPACE BETWEEN THE PIPE AND TRENCH WALL MUST BE WIDER THAN THE COMPACTION EQUIPMENT USED TO COMPACT THE BACKFILL.
2. PROVIDE A MINIMUM OF 4 INCHES OF FIRM, STABLE AND UNIFORM BEDDING MATERIAL IN THE TRENCH BOTTOM. IF ROCK OR UNYIELDING MATERIAL IS ENCOUNTERED, A MINIMUM OF 6 INCHES OF BEDDING SHALL BE USED. BLOCKING SHOULD NOT BE USED TO CHANGE PIPE GRADE OR TO INTERMITTENTLY SUPPORT PIPE OVER LOW SECTIONS IN THE TRENCH.
3. THE PIPE SHOULD BE SURROUNDED WITH AN AGGREGATE MATERIAL WHICH CAN BE EASILY WORKED AROUND THE SIDES OF THE PIPE. BACKFILLING SHOULD BE PERFORMED IN LAYERS OF 6 INCHES WITH EACH LAYER BEING SUFFICIENTLY COMPACTED TO 85% TO 95% COMPACTION.
4. A MECHANICAL TAMPER IS RECOMMENDED FOR COMPACTING SAND AND GRAVEL. THESE MATERIALS CONTAIN FINE-GRAINS, SUCH AS SILT AND CLAY. IF A TAMPER IS NOT AVAILABLE, COMPACTING SHOULD BE DONE BY HAND.
5. THE TRENCH SHOULD BE COMPLETELY FILLED. THE BACKFILL SHOULD BE PLACED AND SPREAD IN UNIFORM LAYERS TO PREVENT ANY UNFILLED SPACES OR VOIDS. LARGE ROCKS, STONES, FROZEN CLODS, OR OTHER LARGE DEBRIS SHOULD BE REMOVED. STONE BACKFILL SHALL PASS THROUGH AN 1-1/2" SIEVE. ROCK SIZE SHOULD BE ABOUTONE-TENTH OF THE PIPE OUTSIDE DIAMETER. HEAVY TAMPERS OR ROLLING EQUIPMENT SHOULD ONLY BE USED TO CONSOLIDATE THE FINAL BACKFILL.
6. TO PREVENT DAMAGE TO THE PIPE AND DISTURBANCE TO PIPE EMBEDMENT, A MINIMUM DEPTH OF BACKFILL ABOVE THE PIPE SHOULD BE MAINTAINED. PIPE SHOULD ALWAYS BE INSTALLED BELOW THE FROST LEVEL. TYPICALLY, IT IS NOT ADVISABLE TO ALLOW VEHICULAR TRAFFIC OR HEAVY CONSTRUCTION EQUIPMENT TO TRAVERSE THE PIPE TRENCH.



NOTES:
1. FULL FEATURE AIR COMPRESSOR HAS INTEGRAL REFRIGERATED AIR DRYER/WATER SEPARATOR & FILTERS
2. AIR COMPRESSOR AND RECEIVER WILL BE SET IN PLACE UNDER FF&E CONTRACT. ALL PIPING IS BY THE PLUMBER.
3. AIR COMPRESSOR BASIS OF DESIGN IS A KAESER MODEL #SM-10T

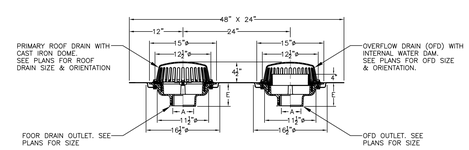
AIR COMPRESSOR AND AIR RECEIVER PIPING DETAIL

NO SCALE



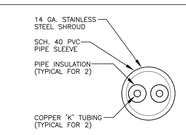
WATER HEATER/BOILER CONDENSATE NEUTRALIZER INSTALLATION DETAIL

NOT TO SCALE



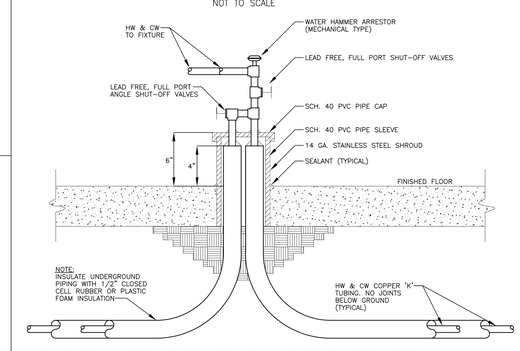
ROOF DRAIN DIMENSIONS - B.O.D.

NOT TO SCALE



SECTION CUT THROUGH PIPE SLEEVE LOOKING DOWN

NOT TO SCALE



BURIED WATER PIPE TO ISLAND FIXTURES DETAIL

NOT TO SCALE

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OWNER

Worcester Public Schools

Worcester, MA

Project North

PROJECT

FINAL BID PACKAGE

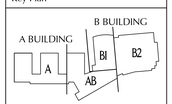
South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Plumbing Details

Key Plan



REVISIONS

No.	Description	Date

FILE:

DWN. BY: CDR | JOB NO: #1611

CKD. BY: KRS | SCALE: AS NOTED

DATE: January 31, 2019

P4.9

PUMP SCHEDULE

		RP-1 & RP-1A	RP-2	RP-3	RP-4	HP-1, HP-2 & HP-3 ②
UNIT NUMBER		RP-1 & RP-1A	RP-2	RP-3	RP-4	HP-1, HP-2 & HP-3 ②
SERVICE		120" HWR WATER LOOP ENTIRE BUILDING	EMERG. SHOWER HWR AUTO/DIESEL SHOP	LAB HWR SCIENCE LABS	EMERG. SHOWER HWR SCIENCE LABS	DOMESTIC WATER BOILER
MANUFACTURER ①		GRUNDFOS	GRUNDFOS	GRUNDFOS	GRUNDFOS	GRUNDFOS
MODEL #		MAGNA3 40-120 F N	MAGNA3 32-60 F N	MAGNA3 32-60 F N	MAGNA3 32-100 F N	TP 40-240
PRODUCT #		98126806	98126822	98126822	98126826	100297119
TYPE		CANNED-ROTOR	CANNED-ROTOR	CANNED-ROTOR	CANNED-ROTOR	IN-LINE CENTRIFUGAL
FLUID DATA	FLUID	WATER	WATER	WATER	WATER	WATER
	TEMPERATURE (F)	120°F	70°F	110°F	70°F	140°F
	FLOW RATE (GPM)	23	2.5	3	9	112
	T.D.H. (FT)	25	8	14	20	32
	MAX. PRESS. (PSI)	–	–	–	–	–
PUMP DATA	TYPE	ECM	ECM	ECM	ECM	ODP
	SPEED (RPM)	–	–	–	–	3450
	AMP RATING	0.26A – 3.96A	0.29A – 1.01A	0.29A – 1.01A	0.29A – 1.61A	10.7
	MOTOR POWER (W)	16W – 448W	8.45W – 106W	8.45W – 106W	9.7W – 178W	1 HP
	VOLTAGE-PH-Hz	115 – 1 – 60	115 – 1 – 60	115 – 1 – 60	115 – 1 – 60	208 – 3 – 60
STARTER DATA	TYPE	INTEGRAL V-F-D	INTEGRAL V-F-D	INTEGRAL V-F-D	INTEGRAL V-F-D	H-O-A
	NEMA SIZE	–	–	–	–	–
	CONTROL	TIMECLOCK	TIMECLOCK	TIMECLOCK	TIMECLOCK	AQUASTAT
	AUX. CONTACTS	–	–	–	–	–

– ALL PUMPS SHALL BE BRONZE FOR DOMESTIC HOT WATER USE.
① GRUNDFOS, TACO, ARMSTRONG, BELL AND GOSSETT, OR APPROVED EQUAL
② THE BOILER PUMPS ARE SHIPPED WITH THE BOILERS FOR INSTALLATION.

SCIENCE ROOM GAS FIRED HOT WATER HEATER SCHEDULE

UNIT NUMBER		GWH-1
SERVICE		DOMESTIC HOT WATER
MANUFACTURER		A.O. SMITH
MODEL #		CYCLONE Mxi BTH-120
STORAGE TANK CAPACITY (GALLONS)		60
NATURAL GAS INPUT (MBH)		120
GROSS OUTPUT (MBH)		114
EFFICIENCY A.F.U.E.		95%
MAX. WORKING PRESSURE (PSI)		125
FLUE CONNECTION		3"ø
COMBUSTION AIR INLET CONN.		3"ø
WATER SUPPLY TEMPERATURE		140°F
RECOVERY (GALLONS PER HOUR)		138
WATER TEMPERATURE RISE (°F)		100°F
MIN. GAS SUPPLY LINE SIZE		3/4" NPT
ELECTRICAL DATA	VOLTAGE/PH	120 V / 1ø
	AMPERAGE	< 5 AMPS
	FUSE SIZE	– –
	CONTROL	INTEGRAL
	NEMA SIZE	– –

–PROVIDE RELIEF VALVE AND ALL SAFETIES & CONTROL REQUIRED. INTERCONNECT UNITS SO THAT THEY CAN COMMUNICATE.

–A.O. SMITH CYCLONE Xi, RHEEM/RUUD SPIDERFIRE, BOCK OPTITHERM, STATE ULTRA FORCE, HTP PHOENIX OR APPROVED EQUAL

HOT WATER STORAGE TANK SCHEDULE

UNIT NUMBER	HWS-1, 2 & 3
MANUFACTURER ③	LOCHINVAR
MODEL	LOCK-TEMP #RCA0650
TYPE	VERTICAL
MAX. WORKING PRESSURE (PSI)	150
CAPACITY (GAL.)	650
WATER CONNECTION (INLET)	(2) 3" NPT-M
WATER CONNECTION (OUTLET)	2" NPT-M
DRAIN CONNECTION	1"
TANK SIZE: DIAMETER x HEIGHT	52"ø x 23-1/2"
WEIGHT – EMPTY	1,817 LBS
WEIGHT – FULL	7,243 LBS
STORAGE TANK WATER TEMP.	140°F
REMARKS	① ②

① FACTORY JACKETED & INSULATED, GLASS LINED STORAGE TANK
② ASME RATED
③ OR EQUAL BY A.O. SMITH, STATE, HEAT TRANSFER PRODUCTS, RUUD/RHEEM, AERCO, OR APPROVED EQUAL.

GAS FIRED HOT WATER SUPPLY BOILER SCHEDULE

UNIT NUMBER		BLR-1, 2, 3
SERVICE		DOMESTIC HOT WATER
MANUFACTURER ①		LOCHINVAR
MODEL #		ARMOR AWN1250NPM
GAS INPUT – LOW FIRE (MBH)		250
GAS INPUT – HIGH FIRE (MBH)		1,250
GROSS OUTPUT (MBH)		1,225
EFFICIENCY A.F.U.E.		98.0%
MAX. WORKING PRESSURE (PSI)		125
FLUE CONNECTION		6"ø
COMBUSTION AIR INLET CONN.		6"ø
GAS CONNECTION		1-1/2"
WATER CONNECTIONS		2-1/2"
SHIPPING WEIGHT (LBS)		1,519
WATER SUPPLY TEMPERATURE		140°F
RECOVERY (GALLONS PER HOUR)		1485
WATER TEMPERATURE RISE (°F)		100
SYSTEM FLOW & TEMP. RISE		112 GPM & 22°F
WATER PRESSURE DROP (FT HD)		23
ELECTRICAL DATA	VOLTAGE/PH	120 V / 1ø
	AMPERAGE	9.9
	FUSE SIZE	– –
	CONTROL	INTEGRAL
	CONTROL VOLTAGE	24V

–PROVIDE RELIEF VALVE AND ALL SAFETIES & CONTROL INCLUDING HIGH LIMIT AND FLOW SWITCH.

–PROVIDE 6" VERTICAL/ROOF TERMINATION KIT FOR FLUE

–PROVIDE CONDENSATE NEUTRALIZER KITS FOR EACH BOILER W/ SPARE REFILL FOR EACH

–PROVIDE LOW WATER CUT-OFF INTERFACE KIT W/ MANUAL RESET

–BOILERS HAVE TWO PUMPS THAT ARE SHIPPED WITH THEM FOR INSTALLATION, THE PUMPS ARE GRUNFOX MODEL #TP 40-160

① HEAT TRANSFER PRODUCTS, RBI, LOCKINVAR, AERCO OR APPROVED EQUAL.

INTERIOR GREASE INTERCEPTOR SCHEDULE

UNIT NUMBER	GI-1 & GI-2	GI-3
MANUFACTURER	ZURN	ZURN
MODEL	Z1172-1000-RE	Z1170-800-RE
SERVICE	KITCHEN APPLIANCES	KITCHEN APPLIANCES
TYPE	MANUAL CLEANING IN-FLOOR TYPE W/ RECEIVER	MANUAL CLEANING IN-FLOOR TYPE W/ RECEIVER
PIPE SIZE (IN)	3"	3"
FLOW RATE (GPM)	100	50
GREASE CAPACITY (LBS.)	200	100
OVERALL (L X W)	42-3/4" X 33-5/8"	36" X 24-1/2"
REMARKS	① ② ③	① ② ③

① THE WASTE FROM FOOD WASTE GRINDERS (GARBAGE DISPOSERS) SHALL NOT DISCHARGE TO THE SYSTEM THROUGH A GREASE INTERCEPTOR. PROVIDE STRAINERS TO PREVENT THIS, PER MA PLUMBING CODE.

② GREASE INTERCEPTORS SHALL BE EQUIPPED WITH DEVICES TO CONTROL THE RATE OF WATER FLOW THROUGH THE INTERCEPTORS SO THAT IT DOES NOT EXCEED THE RATED FLOW OF THE INTERCEPTORS, PER MA PLUMBING CODE.

③ INTERIOR GREASE INTERCEPTOR SHALL BE ZURN, JOSAM, JAY R. SMITH, WATTS DRAINAGE, MIFAB OR APPROVED EQUAL.

EXTERIOR GREASE INTERCEPTOR SCHEDULE – BY SITE CONTR.

UNIT NUMBER	EGI-1
MANUFACTURER	SHEA PRECAST INC.
MODEL	–
SERVICE	KITCHEN DRAINS
TYPE	PRECAST CONCRETE TANK W/ BAFFLES
INLET/OUTLET PIPE SIZE (IN)	4"
KITCHEN MEALS PREPARED/DAY	2,400
CODE REQUIRED SIZE (GALLONS)	12000
GREASE CAPACITY (GALLONS)	12000
BODY (H X W X L)	–
REMARKS	①

① SCHEDULE PROVIDED FOR REFERENCE ONLY. TANK MUST MEET CITY OF WORCESTER STANDARDS

MIXING VALVE SCHEDULE

UNIT NUMBER	MV-1	MV-2	MV-3	MV-4	MV-5 & 6	MV-7	MV-8	MV-9	MV-10	POINT-OF-USE
MANUFACTURER ①	POWERS	POWERS	POWERS	POWERS	POWERS	POWERS	POWERS	NOT USED	POWERS	POWERS
MODEL	LFIS200C00LP+	LFMM432	ETV-400	LFLM496-1	LFLM496-1	LFLM496-1	LFLM496-1	–	ES150	LFG480-11
SERVICE	120°F DOMESTIC HW	SCIENCE RM SINKS	TWO EMERG. SHOWERS	11 SINKS	12 LAVATORIES	7 HAND SINKS	9 LAVATORIES	–	ONE EMERG. EYEWASH	VARIOUS FIXTURES
TYPE	DIGITAL	THERMOSTATIC	THERMOSTATIC	THERMOSTATIC	THERMOSTATIC	THERMOSTATIC	THERMOSTATIC	–	THERMOSTATIC	THERMOSTATIC
MIXED WATER TEMPERATURE (°F)	120	110	70	110	110	110	110	–	70	110
PROBABLE FLOW RATE (GPM)	300	26.5	40	0.5	0.5	6	0.5	–	3	0.25
MIN. FLOW RATE (GPM)	0.5	0.5	3	0.17	0.17	.5	0.17	–	3	0.25
MAX. FLOW RATE (GPM)	405	30	48.1	1.36	2.04	8	1.36	–	7.1	3
MAX. PRESSURE DROP (PSI)	10	20	10	5 @ 4 GPM	5 @ 4 GPM	20	5 @ 4 GPM	–	20	45
WATER PRESSURE DROP (PSIG)	5	7.5	8	1	1	11	1	–	<5	–
INLET PIPE SIZE (IN)	2-1/2"	3/4"	1-1/4"	3/4"	3/4"	3/4"	3/4"	–	1/2"	3/8"
OUTLET PIPE SIZE (IN)	3"	1"	1-1/2"	3/4"	3/4"	3/4"	3/4"	–	1/2"	3/8"
RETURN PIPE SIZE (IN)	2"									

– WATER PRESSURE DROP IN @ PROBABLE FLOW RATE.
① MIXING VALVES SHALL BE POWERS, LEONARD VALVE COMPANY, SYMMONS, LAWLER, ARMSTRONG RADA OR APPROVED EQUAL

ELECTRIC WATER HEATER SCHEDULE

UNIT NUMBER		EWH-1	EWH-2	OSEWH-1
SERVICE		3 SINKS @ SCHOOL	1 SINK @ SCHOOL	OUTDOOR TOILET BUILDING
MANUFACTURER		BOSCH	BOSCH	RUUD
MODEL #		ES8	ES4	ELD80-6
TYPE		POINT-OF-USE	POINT-OF-USE	COMMERCIAL TANK TYPE
DIMENSIONS (DIAMETER X HEIGHT)		17.5" X 17.5" X 14.5"	13-1/2" CUBE	24-1/2"ø X 59"H
WEIGHT EMPTY (LBS)		29.5	17.3	200
FLUID DATA	STORAGE CAPACITY (GAL)	7	4	80
	STORED TEMPERATURE (F)	110°F	110°F	140°F
	RECOVERY RATE (GPH)	6.8	6.8	24
	TEMPERATURE RISE (°F)	90°F	90°F	100°F
ELEC. DATA	TOTAL WATTAGE (KW)	1.44	1.44	6.0
	AMP RATING (A)	12	12	28.8
	HEATING (BTU/HR)	4,915	4,915	20,478
	VOLTAGE-PH-Hz	120 – 1 – 60	120 – 1 – 60	208 – 1 – 60
REMARKS		①	①	②

① WATER HEATER MOUNTED IN BASE CABINET ON REAR WALL. EWH-1 IS HARD WIRED & EWH-2 IS PLUG-IN. PROVIDE CUP UNDER T&P RELIEF VALVE OUTLET TO PROTECT BASE CABINET.

② PROVIDE DRAIN PAN UNDER WATER HEATER WITH SIMILAR TO WATTS MODEL #WM-26, 26" SQUARE

INTERIOR OIL INTERCEPTOR SCHEDULE

UNIT NUMBER	OIL-1
MANUFACTURER ①	WATTS DRAINAGE
MODEL	OI-10
SERVICE ②	ONE GARAGE FLOOR DRAIN
TYPE	RECESSED MOUNTED EPOXY COATED STEEL OIL INTERCEPTOR
PIPE CONNECTION SIZE (IN)	3"
FLOW RATE (GPM)	10
BODY (L X W)	22-1/4" X 16-3/4"
REMARKS	PROVIDE EXTENSION

① INTERIOR OIL INTERCEPTOR SHALL BE WATTS DRAINAGE, MIFAB #MI-O-HU-A, JAY R. SMITH #8510 OR APPROVED EQUAL.

② INTERIOR OIL INTERCEPTOR LOCATED ON 16/P4.8 IN OUTDOOR TOILET AND STORAGE BUILDING

PLUMBING FIXTURE SCHEDULE

THE FOLLOWING ITEMS SHALL BE FURNISHED AND INSTALLED BY THE PLUMBING SUB-CONTRACTOR

P-#	ITEM	CONNECTIONS CW	HW	S	W	V	REMARKS
P-1	WATER CLOSET	1"	–	4"	–	2"	WALL HUNG-SEAT 15" A.F.F.
P-2	WATER CLOSET	1"	–	4"	–	2"	WALL HUNG-HDCP-SEAT 18" A.F.F.
P-3	WATER CLOSET	1"	–	4"	–	2"	CHILD FLOOR MOUNTED-SEAT 11" A.F.F.
P-4	URINAL	3/4"	–	2"	–	1-1/2"	WALL HUNG – LIP @ 24"
P-5	URINAL	3/4"	–	2"	–	1-1/2"	WALL HUNG – HDCP LIP 17" A.F.F.
P-6	LAVATORY	1/2"	1/2"	–	1-1/2"	1-1/2"	WALL HUNG – RIM 30" A.F.F.
P-7	LAVATORY	1/2"	1/2"	–	1-1/2"	1-1/2"	WALL HUNG – HDCP – RIM 34" A.F.F.
P-8	COUNTERTOP SINK, CLASSROOM, NO BUBBLER	1/2"	1/2"	–	2"	1-1/2"	SINGLE COMPARTMENT, HDCP
P-9	COUNTERTOP SINK, PLANNING ROOMS	1/2"	1/2"	–	2"	1-1/2"	SINGLE COMPARTMENT, HDCP
P-10	ART ROOM SINK	1/2"	1/2"	–	2"	1-1/2"	SINGLE COMPARTMENT, SOLIDS INTERCEPTOR
P-11	ART ROOM SINK	1/2"	1/2"	–	2"	1-1/2"	SINGLE COMPARTMENT, HDCP, SOLIDS INTERCEPTOR
P-12	COUNTERTOP SINK, EXAM ROOMS	1/2"	1/2"	–	2"	1-1/2"	SINGLE COMPARTMENT, HDCP
P-13	COUNTERTOP SINK, CLASSROOM, BUBBLER	1/2"	1/2"	–	2"	1-1/2"	SINGLE COMPARTMENT, HDCP
P-14	LAVATORY	1/2"	1/2"	–	1-1/2"	1-1/2"	COUNTERTOP – HDCP – RIM 34" A.F.F.
P-15	LAVATORY	1/2"	1/2"	–	1-1/2"	1-1/2"	WALL HUNG, CHILD HDCP – RIM 27" A.F.F.
P-16	COUNTERTOP SINK	1/2"	1/2"	–	2"	1-1/2"	SINGLE COMPARTMENT, HDCP
P-17	SHOWER W/ TERRAZZO BASE	1/2"	1/2"	–	–	–	
P-18	SHOWER	1/2"	1/2"	–	–	–	HDCP
P-19	2-USER LAVATORY @ GARAGE	1/2"	1/2"	–	2"	2"	WALL HUNG – HDCP – RIM 34" A.F.F.
P-20	REAR COUNTER MOUNTED SWING ARM EYEWASH	–	1/2"	–	–	–	TEMPERED HOT WATER FEED
P-21	ELECTRIC WATER COOLER	1/2"	–	–	1-1/2"	1-1/4"	RECESSED MOUNTED, BI-LEVEL – HDCP
P-22	ELECTRIC WATER COOLER W/ BOTTLE FILLER	1/2"	–	–	1-1/2"	1-1/4"	RECESSED MOUNTED, BI-LEVEL – HDCP
P-23	MOP SERVICE BASIN	1/2"	1/2"	–	3"	2"	
P-24	CLOTHES WASHER CONNECTION	1/2"	1/2"	–	2"	1-1/2"	WALL BOX
P-25	COUNTER MOUNTED SWING ARM EYEWASH	–	1/2"	–	–	–	TEMPERED HOT WATER FEED
P-26	WALL MOUNTED EYEWASH	–	1/2"	–	–	–	TEMPERED HOT WATER FEED
P-27	WHIRLPOOL	1/2"	1/2"	–	–	–	THE WHIRLPOOL HAS NO PLUMBING CONNECTIONS BUT THE WHIRLPOOL HAS A MIXING VALVE/FILL ACCESSORY THAT HAS CW&HW CONNECTIONS
FPSC	WALL HYDRANT	3/4"	–	–	–	–	MOUNT UNIT 24" ABOVE FIN. GRADE
H.B.	HOSE BIBB	3/4"	–	–	–	–	MOUNT UNIT 24" ABOVE FIN. FLOOR

FOR FIXTURES P-10 & P-11, SEE PLAN FOR SOLIDS INTERCEPTOR REQUIREMENT (NOTE: ART ROOM SINKS)

OUTDOOR TOILET & STORAGE BUILDING PLUMBING FIXTURE SCHEDULE

THE FOLLOWING ITEMS SHALL BE FURNISHED AND INSTALLED BY THE PLUMBING SUB-CONTRACTOR

OSP-#	ITEM	CONNECTIONS CW	HW	S	W	V	REMARKS
OSP-1	WATER CLOSET	1"	–	4"	–	2"	SS, WALL HUNG-SEAT 15" A.F.F.
OSP-2	WATER CLOSET	1"	–	4"	–	2"	SS, HUNG-HDCP-SEAT 18" A.F.F.
OSP-3	URINAL	3/4"	–	2"	–	1-1/2"	SS, WALL HUNG – LIP @ 24"
OSP-4	URINAL	3/4"	–	2"	–	1-1/2"	SS, WALL HUNG – HDCP LIP 17" A.F.F.
OSP-5	LAVATORY	1/2"	1/2"	–	1-1/2"	1-1/2"	SS, WALL HUNG – HDCP – RIM 34" A.F.F.
OSP-6	MOP SERVICE BASIN	1/2"	1/2"	–	3"	2"	

SCIENCE ROOM EQUIPMENT SCHEDULE

MARK	ITEM	PLUMBING CONNECTIONS LHW	LCW	AW	AV	GAS	REMARKS
L-1	STUDENT TABLE (2-FAUCETS)	---	1/2"	1-1/2"	1-1/2"	---	TWO LCW ONLY FAUCETS
L-2	HC STUDENT TABLE (1-FAUCET)	---	1/2"	1-1/2"	1-1/2"	---	ONE LCW ONLY FAUCETS, PIPE INSULATION UNDER
L-3	DEMONSTRATION TABLE (1-FAUCET)	---	1/2"	2"	2"	---	ONE LCW ONLY FAUCETS
L-4	EMERGENCY EYE WASH/SHOWER – RECESSED	*	*	1-1/4"	---	---	*1-1/4" TEMPERED HW, FURNISHED BY P.C.
L-4A	EMERGENCY EYE WASH/SHOWER – EXPOSED	*	*	1-1/4"	---	---	*1-1/4" TEMPERED HW, FURNISHED BY P.C.
L-5	CLASSROOM HAND SINK AND PREP ROOM SINK	1/2"	1/2"	2"	1-1/2"	---	ONE MIXING FAUCET
L-6	PASS THROUGH FUME HOOD	---	1/2"	2"	2"	1/2"	INTEGRAL GAS TURRET & FAUCET

–SCIENCE ROOM FIXTURES FURNISHED BY G.C. AND INSTALLED BY PLUMBER (P.C.) UNLESS OTHERWISE NOTED (SEE FIXTURE L-4 FOR EXCEPTION).
–PLUMBER TO INSTALL SCIENCE ROOM FIXTURES, FAUCETS AND ACCESSORIES.
–SEE SPECIFICATION FOR FAUCETS, ETC...
–GAS TURRETS DO NOT HAVE CALLOUTS, BUT THEY ARE FURNISHED AND INSTALLED BY THE PLUMBING CONTRACTOR. SEE SPEC. GAS TURRETS ARE STRAIGHT BALL VALVE STYLE INSTALLED THROUGH BACKSPLASH.
–PROVIDE OFFSET PIPING AND UNDERSINK PIPE INSULATION FOR LAB FIXTURE L-2 SIMILAR TO THAT FOR A HC LAVATORY.

PLUMBING NOTES:

1. CONTRACTOR RESPONSIBLE FOR PROVIDING ALL MATERIAL, LABOR, SUPERVISION AND TRANSPORTATION REQUIRED TO COMPLETE THE WORK DESCRIBED ON THESE DRAWINGS AND IN THE SPECIFICATIONS UNLESS NOTED OTHERWISE.
2. PLUMBING CONTRACTOR TO FURNISH AND INSTALL VENTING TO DOMESTIC WATER BOILERS FROM LOWER LEVEL MECHANICAL ROOM THROUGH ROOF. THE VENTING MUST BE INSTALLED BY A LICENSED PLUMBER OR GASFITTER PER THE MA PLUMBING CODE. PLUMBER SHALL INSTALL COMBUSTION AIR PIPING FOR DOMESTIC HOT WATER BOILERS. SEE PLANS FOR ROUTING
3. CONTRACTOR TO VERIFY ALL DIMENSIONS AND LOCATION IN THE FIELD.
4. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS.
5. ALL PIPING TO BE INSTALLED PER LOCAL, STATE, AND FEDERAL CODES.
6. CONTRACTOR IS RESPONSIBLE FOR ALL OFFSETS AND MODIFICATIONS AS REQUIRED TO CLEAR BUILDING STRUCTURES.
7. ALL FLOOR DRAINS SHALL HAVE TRAP PRIMERS UNLESS OTHERWISE NOTED. TRAP PRIMER VALVES SHALL HAVE AN AIR GAP FITTING INSTALLED BEFORE DISTRIBUTION UNIT. SEE DETAIL.
8. FLOOR CLEANOUTS (F.C.O.) SHALL BE LOCATED CLEAR OF ANY BUILT-IN OR STATIONARY EQUIPMENT.
9. EXACT LOCATION OF ALL WALL HYDRANTS TO BE DETERMINED IN THE FIELD BY THE ARCHITECT.
10. ALL PIPING TO BE PRESSURE TESTED BEFORE INSULATION. LEAVE VALVES OPEN, READY FOR OPERATION.
11. INSULATE ALL COLD, HOT AND HOT WATER RECIRCULATION LINES INSTALLED, TEMPERED WATER PIPING FOR EMERGENCY FIXTURES IS NOT INSULATED. INSULATE STORM DRAIN PIPING INCLUDING EMERGENCY OVERFLOW DRAIN PIPING. SEE SPECIFICATION.
12. REPAIR OF ANY DAMAGE TO THE NEW CONSTRUCTION DURING THE EXECUTION OF THIS WORK SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR.
13. ALL EXPOSED PIPING/FITTINGS TO BE CHROME PLATED COPPER/BRASS, INCLUDING KITCHEN PIPING.
14. ALL WATER SUPPLY PIPING TO BE RIGID TYPE L COPPER UNLESS STATED OTHERWISE. SEE SPEC.
15. ALL WASTES, VENT AND STORM DRAIN PIPING TO BE CAST IRON OR DWV COPPER AS ALLOWED BY THE MA PLUMBING CODE.
16. ALL WASTE AND STORM DRAIN PIPING 4" AND UNDER TO HAVE A CLEANOUT EVERY 50 FT AND AT EACH CHANGE IN PIPE SIZE. NOT ALL CLEANOUTS SHOWN ON DRAWINGS. CLEANOUTS SHALL BE EVERY 100 FT PER PIPING OVER 4" IN SIZE.
17. PIPING RUNS ARE SHOWN AS REPRESENTATIVE OF REQUIRED SIZES. ROUTING MAY BE CHANGED BY CONTRACTOR AS NECESSITATED BY STRUCTURAL CONSIDERATIONS.
18. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS AND ELEVATION OF PLUMBING FIXTURES.
19. ALL EXTERIOR HOSE BIBS SHALL BE FREEZE PROOF AND AN APPROVED BACKFLOW PREVENTER DEVICE SHALL BE INSTALLED ON EACH.
20. A WATER HAMMER ARRESTOR (MECHANICAL DEVICE) SHALL BE INSTALLED ON EACH SUPPLY LINE (HOT AND COLD) AT ALL SINKS AND RESTROOMS (FAST ACTING ELECTRONIC METERING FAUCETS).
21. ALL DOMESTIC AND WASTE PIPING IS DIAGRAMMATIC. CONTRACTOR IS RESPONSIBLE TO PROVIDE COMPLETE AND WORKING FIXTURES.
22. FLOOR DRAINS IN MECHANICAL ROOMS TO BE COORDINATED WITH THE MECHANICAL CONTRACTOR TO PROPER LOCATION, IN PARTICULAR HEATING BOILER FLOOR DRAINS FOR BOILER CONDENSATE.
23. ALL DISHWASHERS, CLOTHES WASHERS, GAS OVENS AND FIXTURES IN CASEWORK TO BE PROVIDED AND INSTALLED BY OTHERS, UNLESS OTHERWISE NOTED. PLUMBING SUBCONTRACTOR TO MAKE ALL FINAL CONNECTIONS. THIS INCLUDES REFRIGERATOR ICE MAKERS.
24. PROVIDE PIPE GUIDES AND ANCHORS AS DETAILED AND REQUIRED FOR ALL EXPANSION LOOPS SHOWN ON THE DRAWINGS.
25. THERE IS AN UNDERSLAB DRAINAGE SYSTEM INSTALLED IN THE BUILDING. THIS PIPING IS MOSTLY DEEPER THAN THE PROPOSED PLUMBING LINES TAKE CARE NOT TO DISTURB THE UNDERSLAB DRAINAGE SYSTEM WHEN EXCAVATING FOR UNDERGROUND PLUMBING. COORDINATE WITH G.C.
26. REFER TO DRAWING H6.2 BOILER PLANT PIPING & CONTROL DIAGRAM FOR BMS CONTROL SYSTEM POINTS/NODES ASSOCIATED WITH THE PLUMBING SYSTEMS. COORDINATE WITH HVAC CONTRACTOR AND THEIR ATC SUBCONTRACTOR FOR INTERFACING AND MOUNTING OF THESE CONTROLS IN OR ONTO THE PLUMBING EQUIPMENT SHOWN.

NATURAL GAS PIPING NOTES:

1. CONTRACTOR RESPONSIBLE FOR PROVIDING ALL MATERIAL, LABOR, SUPERVISION AND TRANSPORTATION REQUIRED TO COMPLETE THE WORK DESCRIBED ON THESE DRAWINGS.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS AND LOCATION IN THE FIELD.
3. ALL PIPING TO BE INSTALLED PER LOCAL, STATE AND FEDERAL CODES.
4. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PLUMBING PERMITS.
5. ALL INTERIOR PIPING WILL BE SCHEDULE 40 BLACK STEEL PIPE W/ THREADED TYPE STEEL FITTINGS FOR PIPE SIZES 2" & BELOW, AND WELDED FITTINGS OVER 2" RATED FOR 125 PSIG SERVICE. MALLEABLE OR DUCTILE IRON SCREW TYPE FITTINGS WILL BE USED. CAST IRON FITTINGS ARE NOT ALLOWED.
6. VALVES: ALL VALVES WILL BE AGA APPROVED WITH AGA STAMPED ON VALVE BODY.
7. PIPE SYSTEM WILL BE PRESSURE TESTED TO 100 PSIG FOR ONE HOUR. SEE SPECIFICATION.
8. AFTER TESTING AND PRIOR TO PLACING PIPE SYSTEM IN SERVICE, THE GAS PIPE LINE WILL BE PURGED WITH CO2 OR NITROGEN GAS TO EXPEL AIR PRIOR TO CHARGING WITH FUEL GAS.
9. A MASTER SHUT-OFF VALVE WILL BE MOUNTED IN THE BOILER ROOM AND LABELED.
10. ALL EQUIPMENT TO HAVE MASSACHUSETTS APPROVED GAS TRAINS AND BE PRODUCT APPROVED.
11. PLUMBER SHALL BE PRESENT AT START-UP OF GAS-FIRED EQUIPMENT IN THE BUILDING EVEN IF THE EQUIPMENT WAS NOT INSTALLED UNDER YOUR CONTRACT.

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OWNER

Worcester Public Schools

Worcester, MA

Project North

PROJECT

FINAL BID PACKAGE

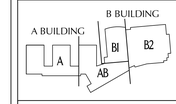
South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Plumbing Notes & Schedules

Key Plan



REVISIONS

No.	Description	Date

FILE:

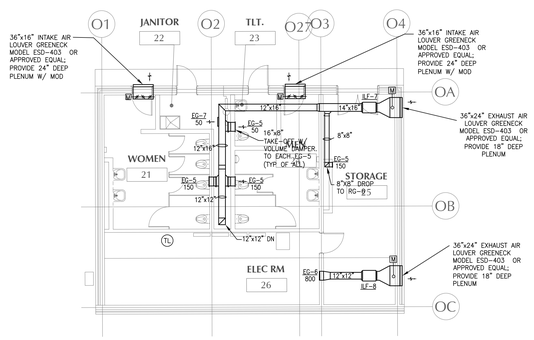
DWN. BY: CDR | JOB NO: #1611
CKD. BY: KRS | SCALE: AS NOTED
DATE: January 31, 2019

P4.10

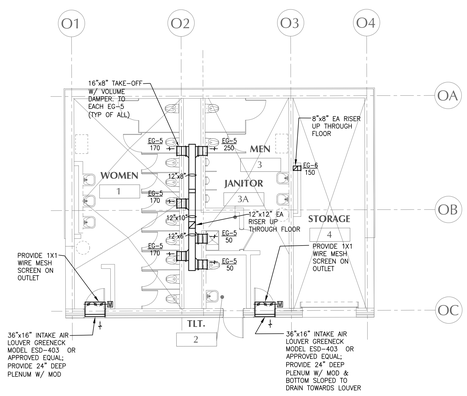
SYMBOLS LEGEND

- DIRECTION OF AIRFLOW
- VOLUME DAMPER
- LINEAR DIFFUSER
- SUPPLY DIFFUSER
- RETURN REGISTER/GRILLE
- FLEXIBLE DUCTWORK
- DUCTWORK
- INTERNALLY LINED DUCTWORK AS SHOWN OR AS SPECIFIED
- DUCT ELBOW WITH TURNING VANES
- SUPPLY RISE OR DROP
- RETURN RISE OR DROP
- FLEXIBLE DUCT CONNECTOR
- SA-# DUCT SILENCER
- HWS — HOT WATER SUPPLY PIPING (HWS)
- HWR — HOT WATER RETURN PIPING (HWR)
- C — CONDENSATE DRAIN PIPING
- EXPANSION COMPENSATOR W/ PIPE GUIDES
- PIPE ANCHOR
- R — REFRIGERANT PIPING
- SD-1 CFM — DIFFUSER CALLOUT CUBIC FEET PER MINUTE (CFM)
- AHU-1 — EQUIPMENT CALLOUT
- THERMOSTAT
- TL — LINE VOLTAGE THERMOSTAT
- SD — DUCT SMOKE DETECTOR

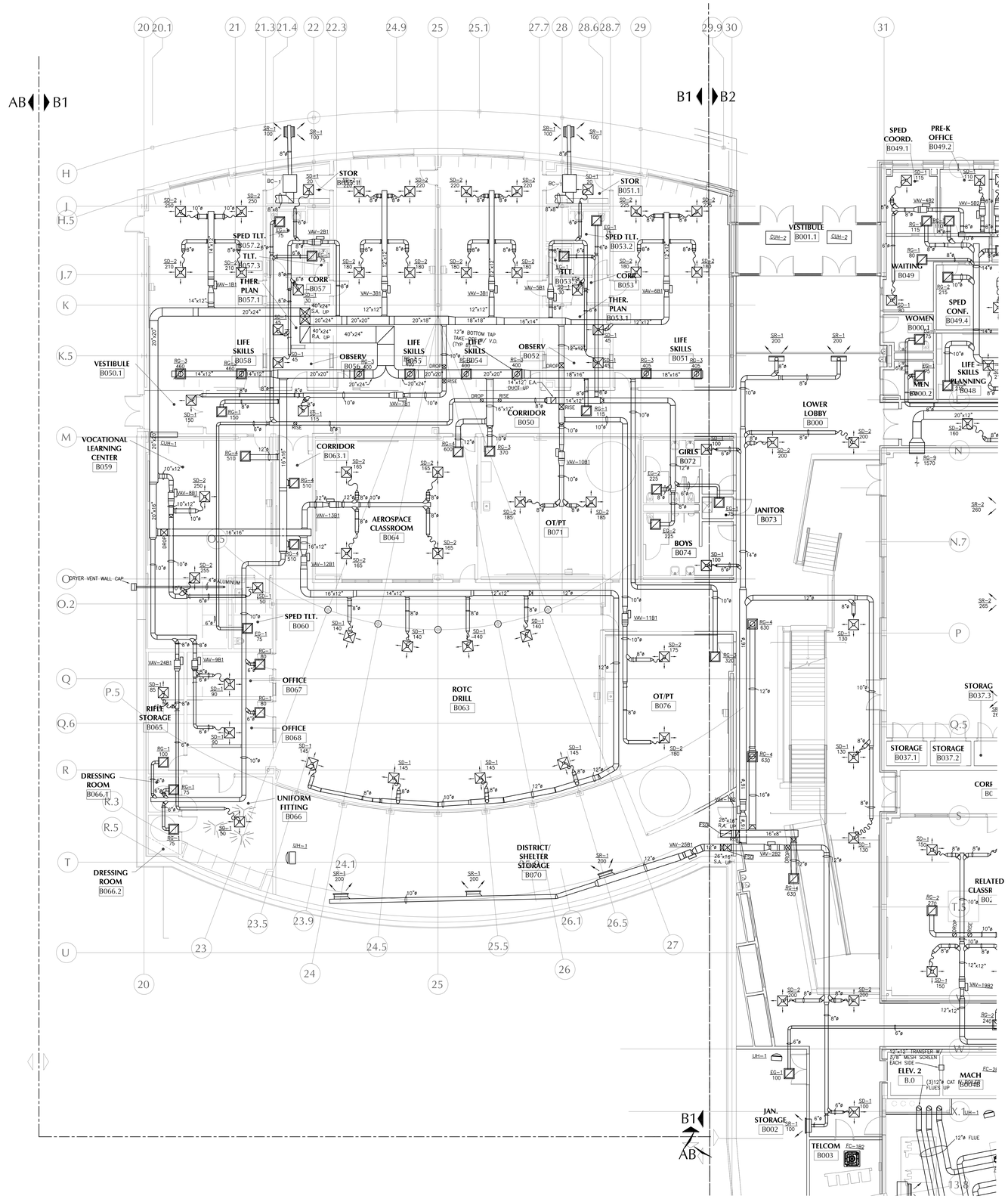
EWT	ENTERING WATER TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
EAT	ENTERING AIR TEMPERATURE
	PRESSURE GUAGE W/GAUGE COCK
	CHECK VALVE SWING OR NO-SLAM AS SPECIFIED
	BALL VALVE (FULL PORT)
	2-WAY CONTROL VALVE
	3-WAY CONTROL VALVE
	BALANCING VALVE
	UNION
	THERMOMETER W/ WELL
	BUTTERFLY VALVE W/ MEMORY STRAP
	FLEXIBLE PIPE CONNECTION
FSD	FIRE/SMOKE DAMPER W/ ACCESS DOOR
	FIRE DAMPER W/ ACCESS DOOR
COVER / ELEMENT	FINTUBE RADIATION
	FINTUBE CALLOUT TYPE ELEMENT (FT)
M	MOTORIZED DAMPER (MOD)
	GRAVITY DAMPER
A.L.	ALUMINUM
C.O.	CLEAN OUT
S.S.	STAINLESS STEEL
S.A.	SUPPLY AIR
R.A.	RETURN AIR
T.A.	TRANSFER AIR
S.L.	SOUND LINED



2 A3.1 Outdoor Toilet and Storage Building Plan
Scale: 1/8" = 1'-0"



2 A3.1 Outdoor Toilet and Storage Building Plan
Scale: 1/8" = 1'-0"



1 H3.1 Ground Level HVAC Floor Plan - Section B1
Scale: 1/8" = 1'-0"

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OWNER

Worcester Public Schools

Worcester, MA

Project North

PROJECT

FINAL BID PACKAGE

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

TITLE

Ground Level HVAC Floor Plan Section B1

Key Plan

A BUILDING — B BUILDING — A — AB — B2

REVISIONS

No.	Description	Date

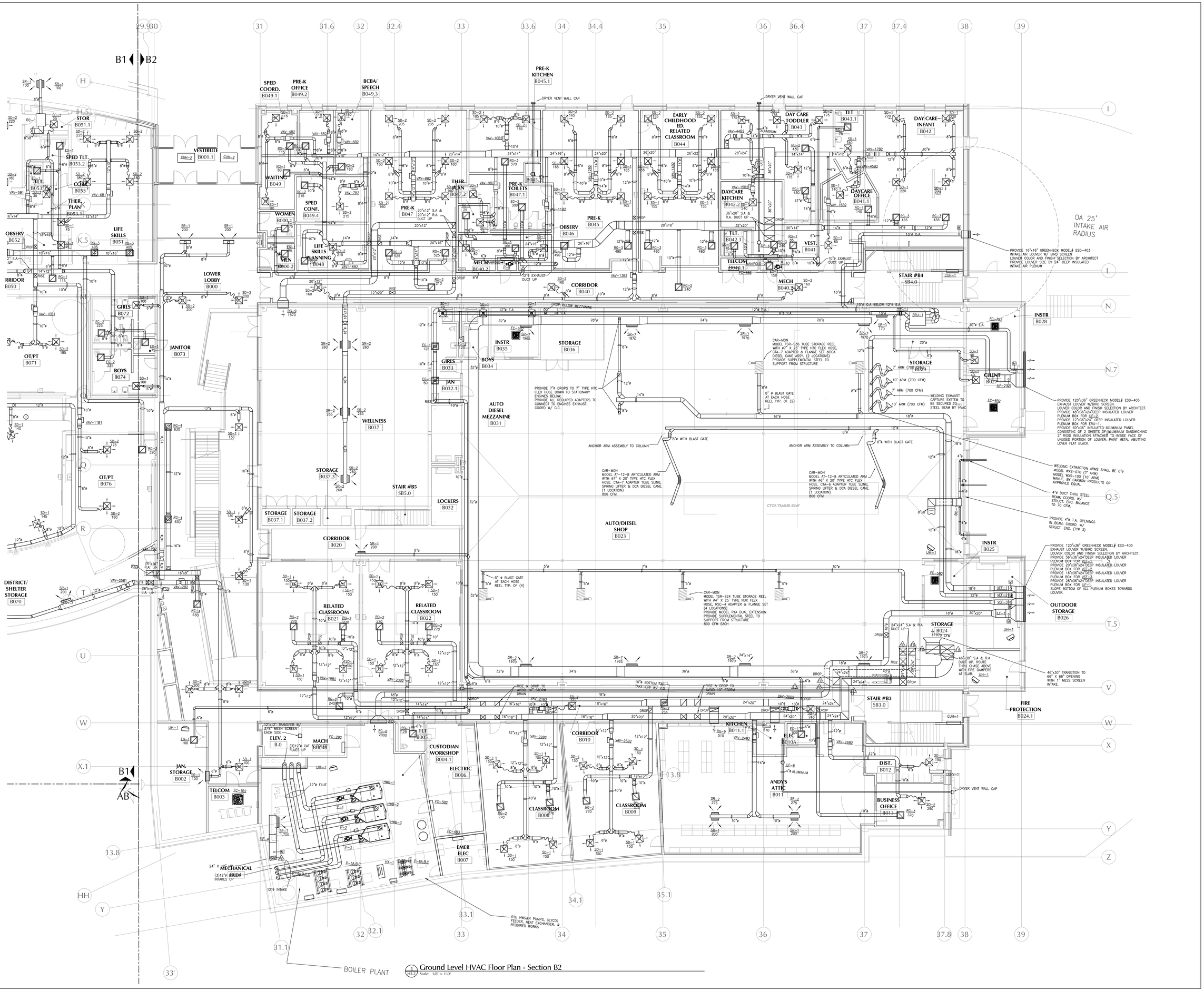
FILE:

DWN. BY: DJM | JOB NO: #1611

CKD. BY: KRS | SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

H3.1



1 Ground Level HVAC Floor Plan - Section B2
H3.2 Scale: 1/8" = 1'-0"

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TITLE

Ground Level HVAC Floor Plan Section B2

Key Plan

A BUILDING
B BUILDING
A
AB
BI

REVISIONS

No.	Description	Date

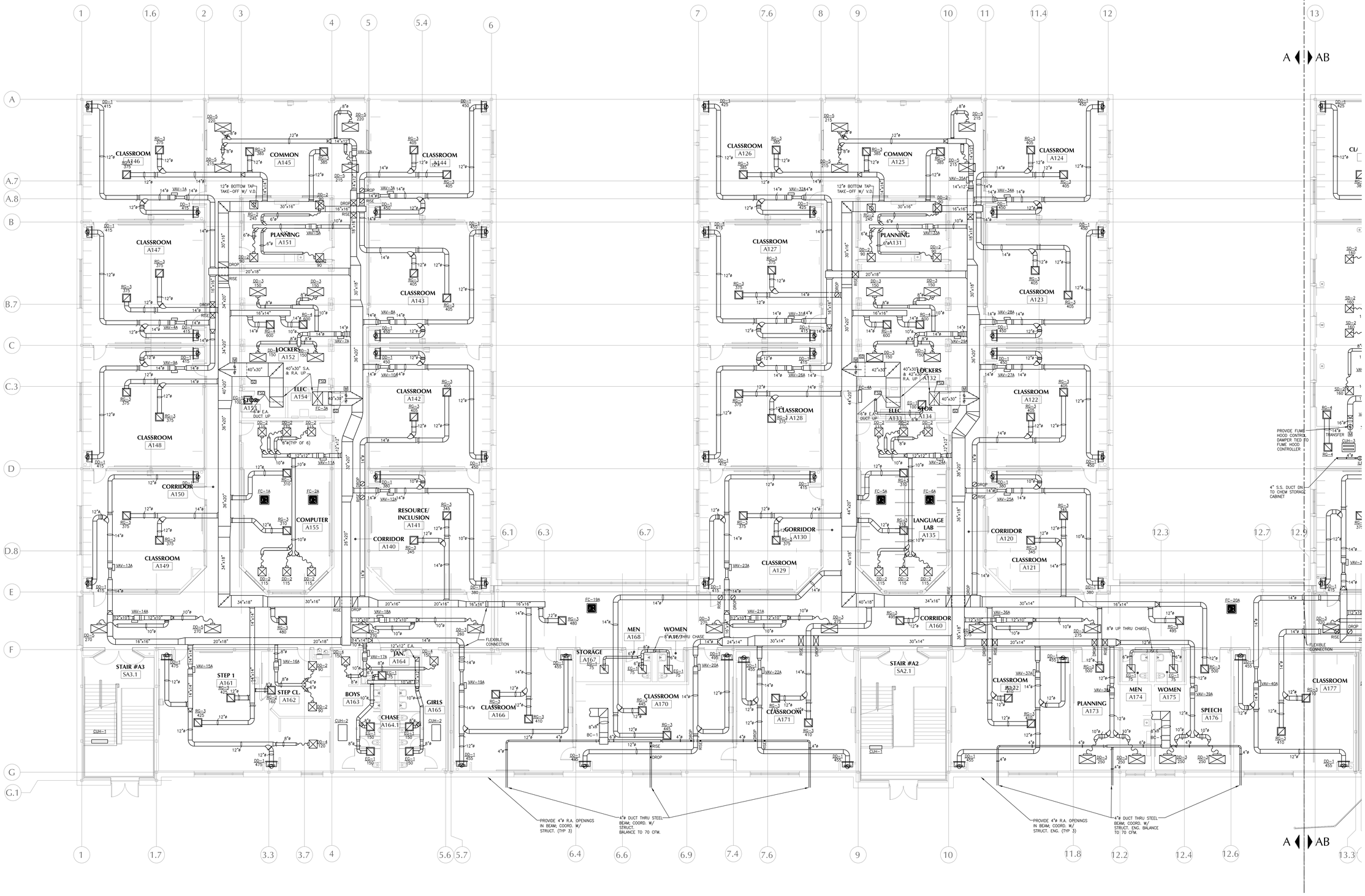
FILE:

DWN. BY: DJM | JOB NO: #1611

CKD. BY: KRS | SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

H3.2



1 / H3.3 First Floor HVAC Plan - Section A
Scale: 1/8" = 1'-0"

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South High Community School

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TITLE

First Floor HVAC Plan Section A

Key Plan

A BUILDING
B BUILDING
B1
B2
AB

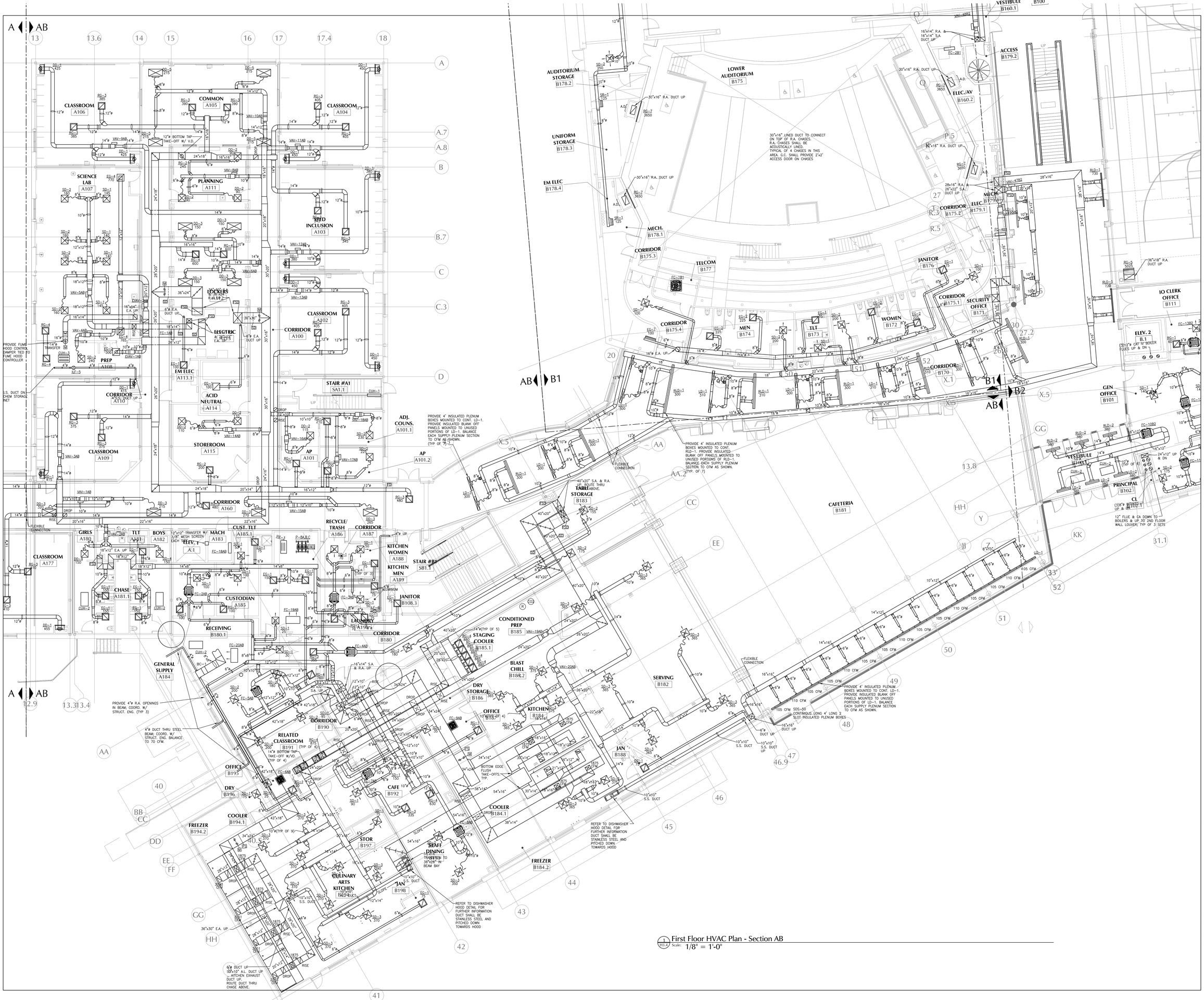
REVISIONS

No.	Description	Date

FILE:

DWN. BY: DJM	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

H3.3



1 First Floor HVAC Plan - Section AB
H3.4 Scale: 1/8" = 1'-0"

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170 Apricot Street, Worcester, MA 01603

TITLE

TITLE

First Floor HVAC Plan Section AB

Key Plan

A BUILDING B BUILDING A B1 B2

REVISIONS

No.	Description	Date

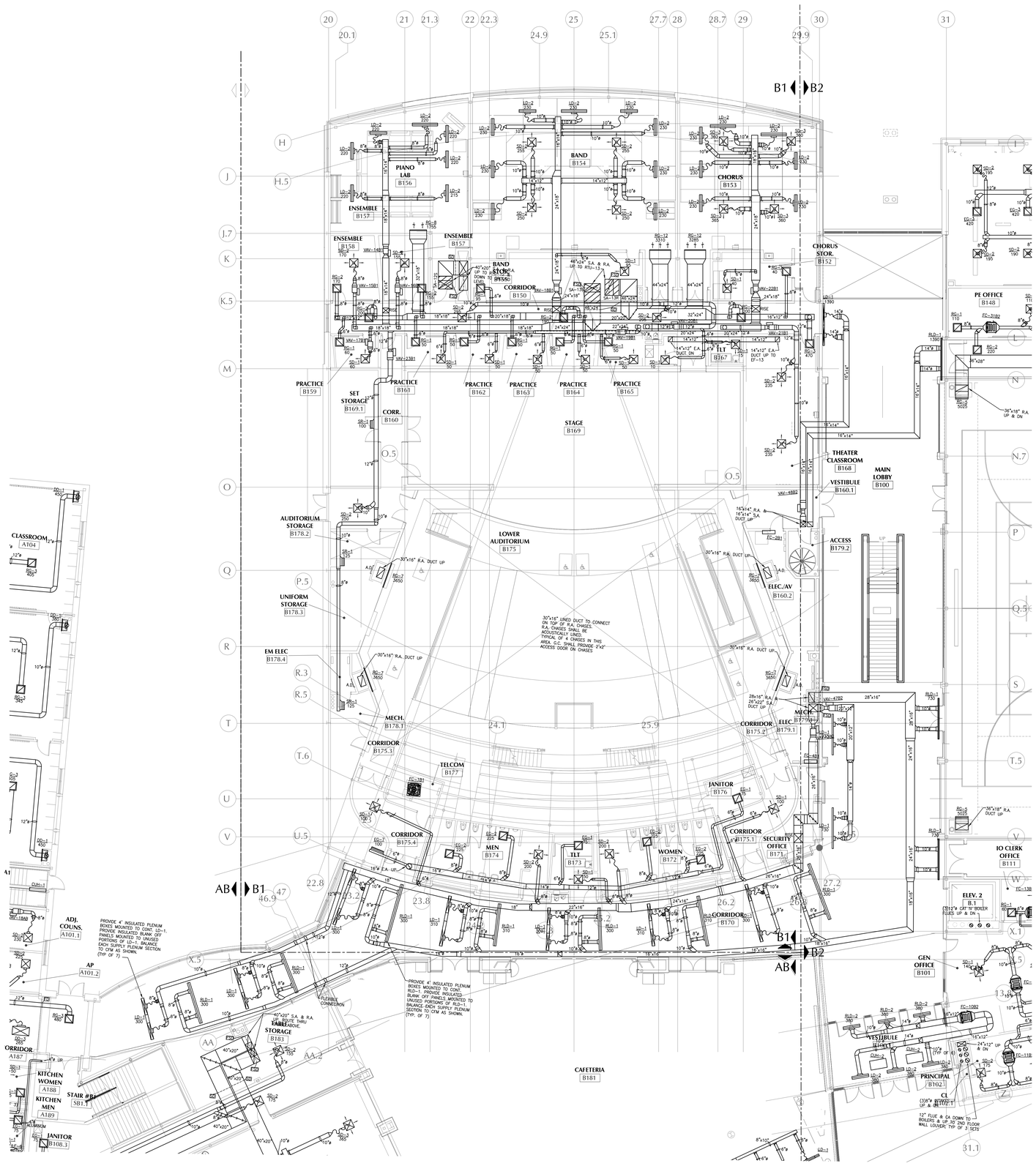
FILE:

DWN. BY: DJM | JOB NO: #1611

CKD. BY: KRS | SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

H3.4



H3.5 First Floor HVAC Plan - Section B1
Scale: 1/8" = 1'-0"

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170 Apricot Street, Worcester, MA 01603

TITLE

First Floor HVAC Plan Section B1

Key Plan

A BUILDING B BUILDING

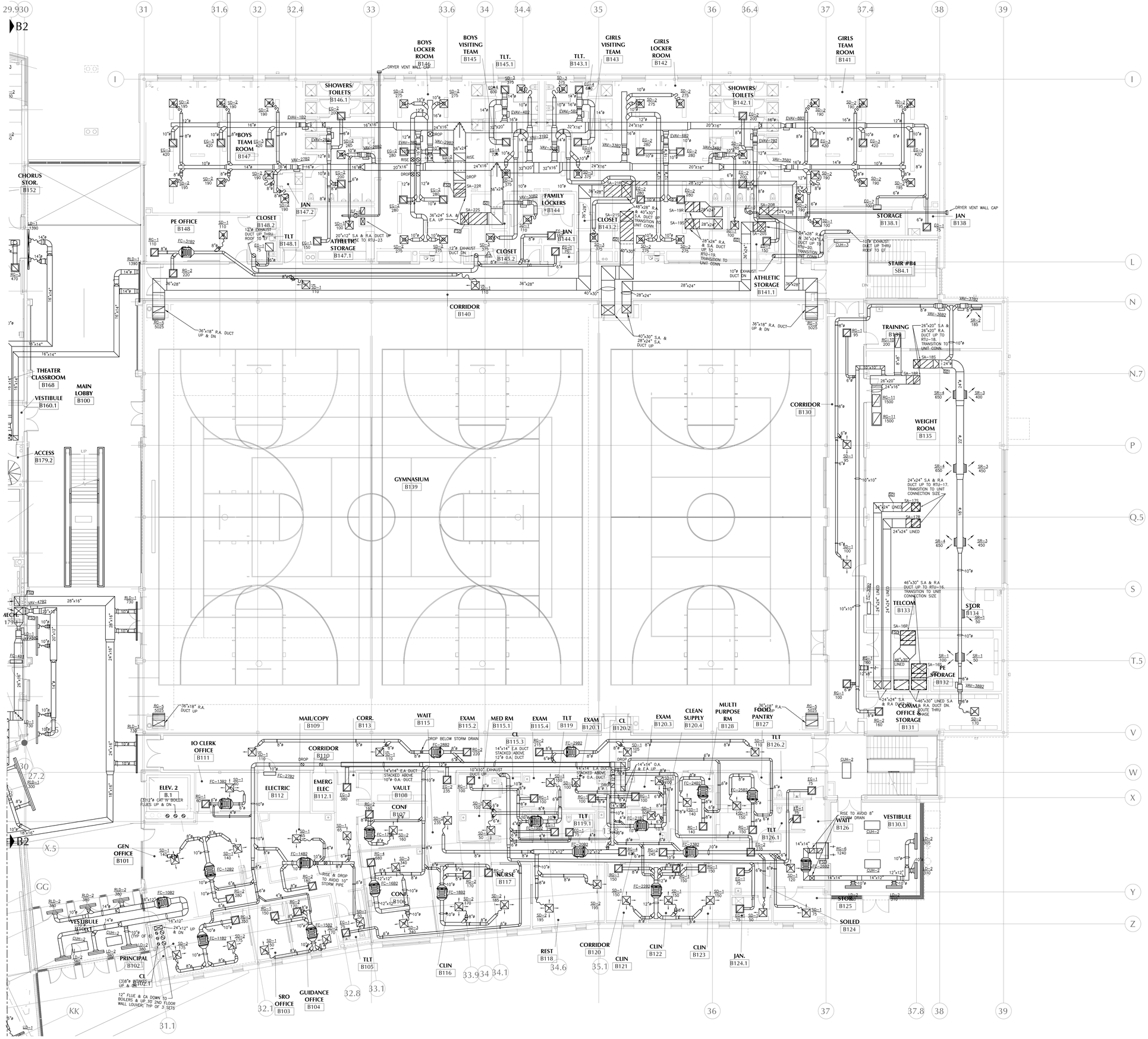
REVISIONS

No.	Description	Date

FILE:

DWN. BY: DJM	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

H3.5



1 H3.6 First Floor Plan - Section B2
Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

First Floor HVAC Plan Section B2

Key Plan

A BUILDING
B BUILDING

REVISIONS

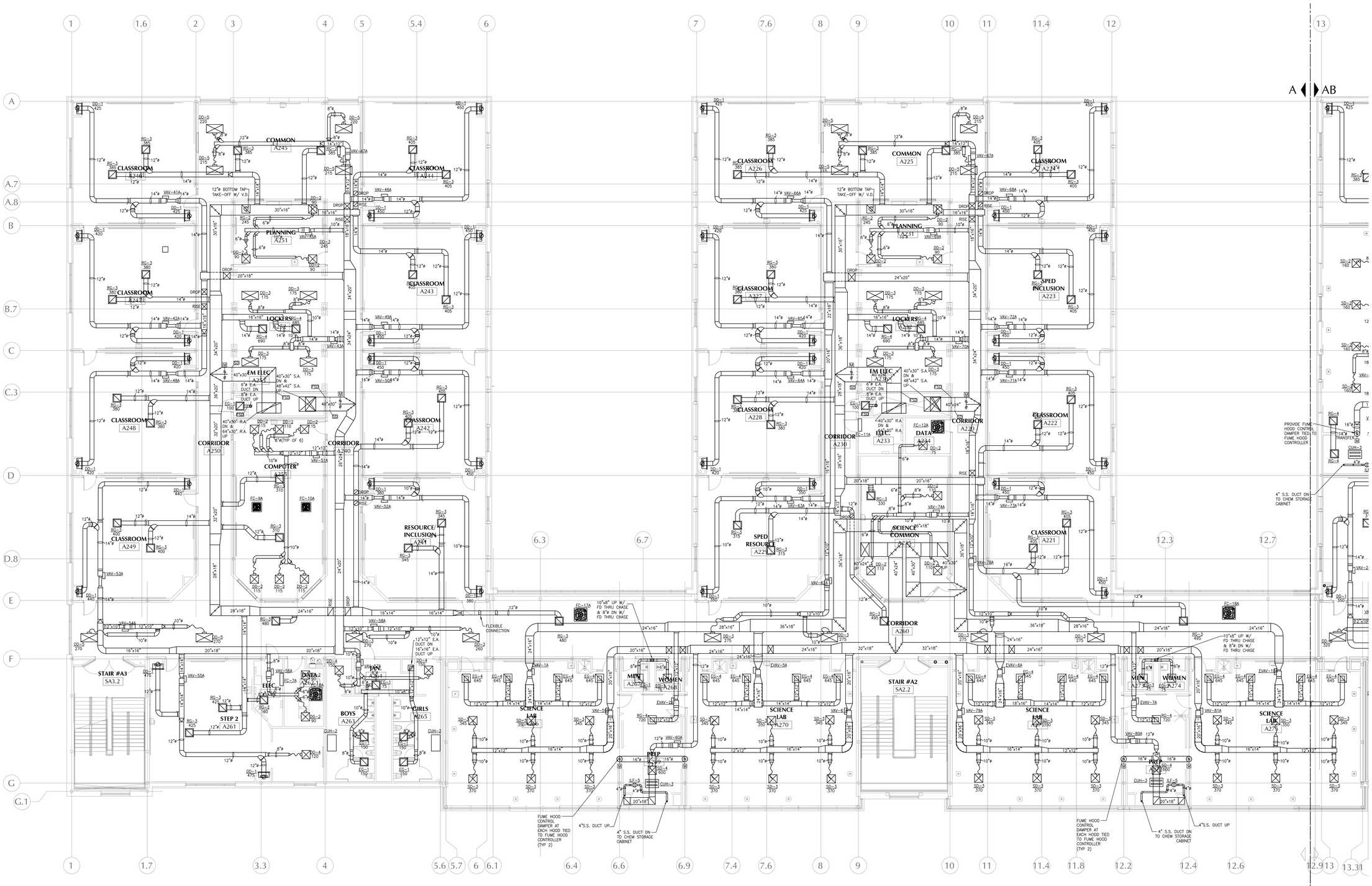
No.	Description	Date

FILE:

DWN. BY: DJM	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

H3.6



1 Second Floor HVAC Plan - Section A
H3.7 Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Second Floor HVAC Plan Section A

Key Plan

A BUILDING

B BUILDING

B1 B2 AB

REVISIONS

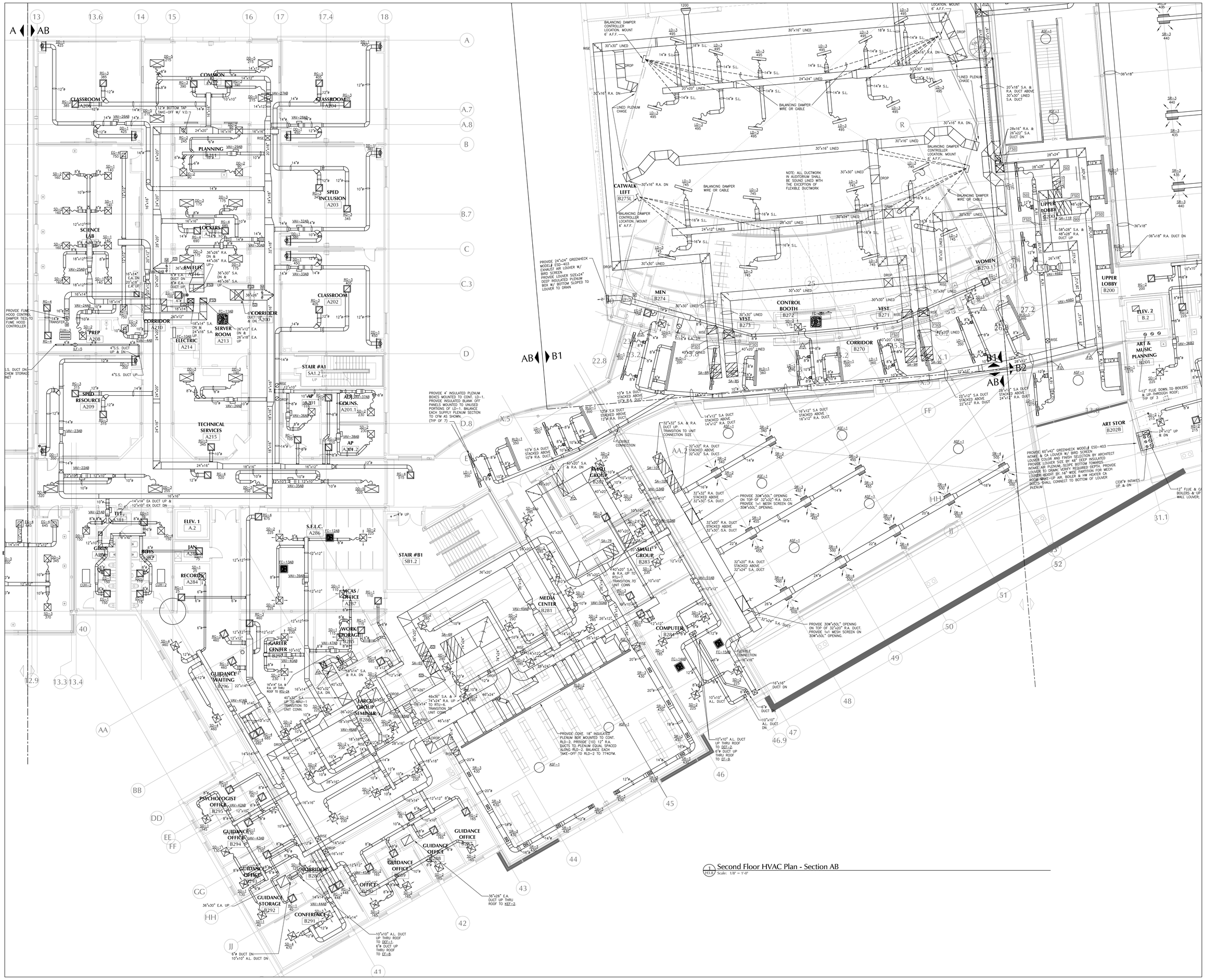
No.	Description	Date

FILE:

DWN. BY: DJM	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

H3.7



1 Second Floor HVAC Plan - Section AB
H3.8 Scale: 1/8" = 1'-0"

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South High Community School
170 Apricot Street, Worcester, MA 01603

TITLE
Second Floor HVAC Plan Section AB

Key Plan
A BUILDING: A
B BUILDING: B1, B2

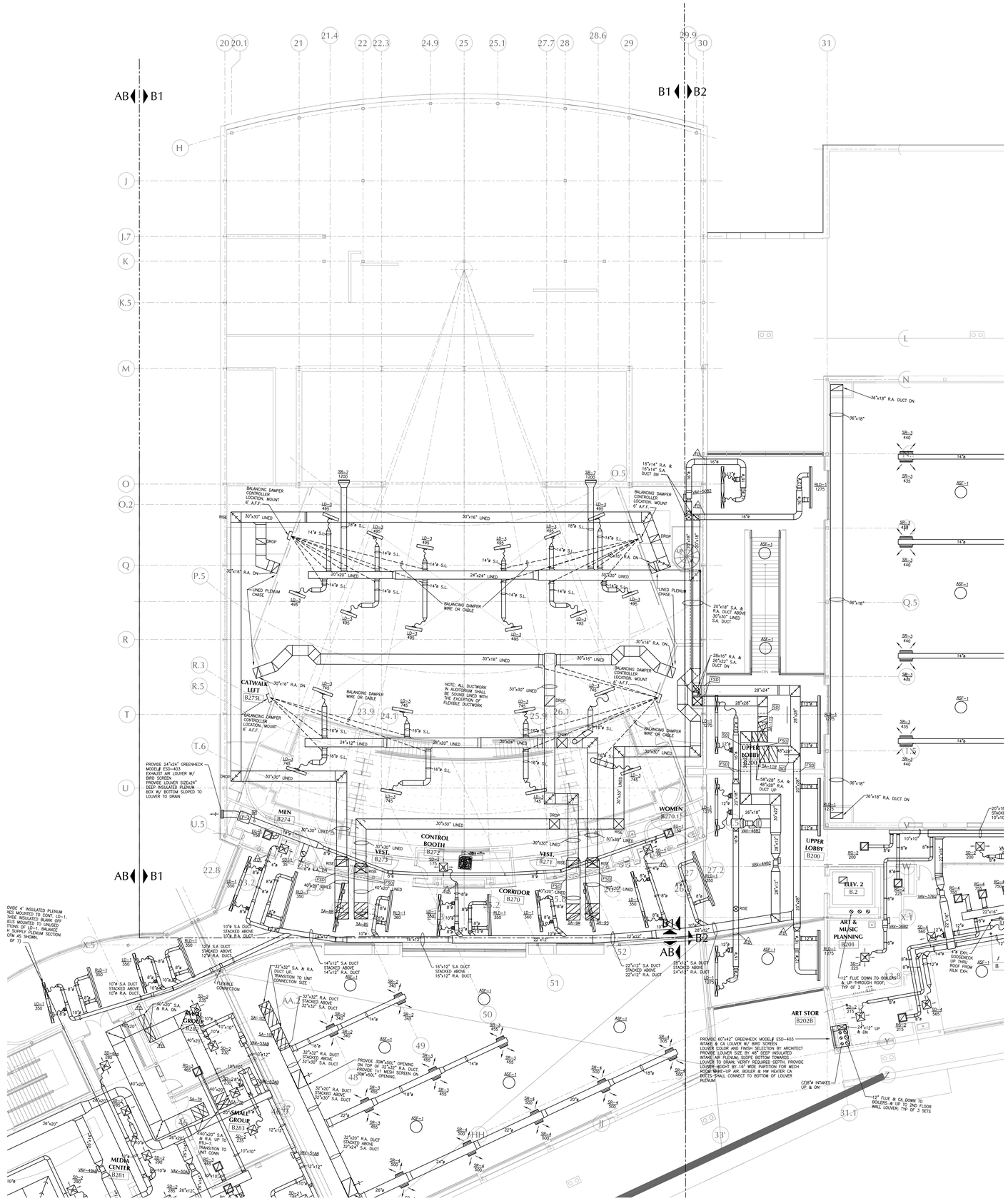
REVISIONS

No.	Description	Date

FILE:

DWN. BY: DJM	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

H3.8



1 H3.9 Second Floor HVAC Plan - Section B1
Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Second Floor HVAC Plan Section B1

Key Plan

A BUILDING B BUILDING

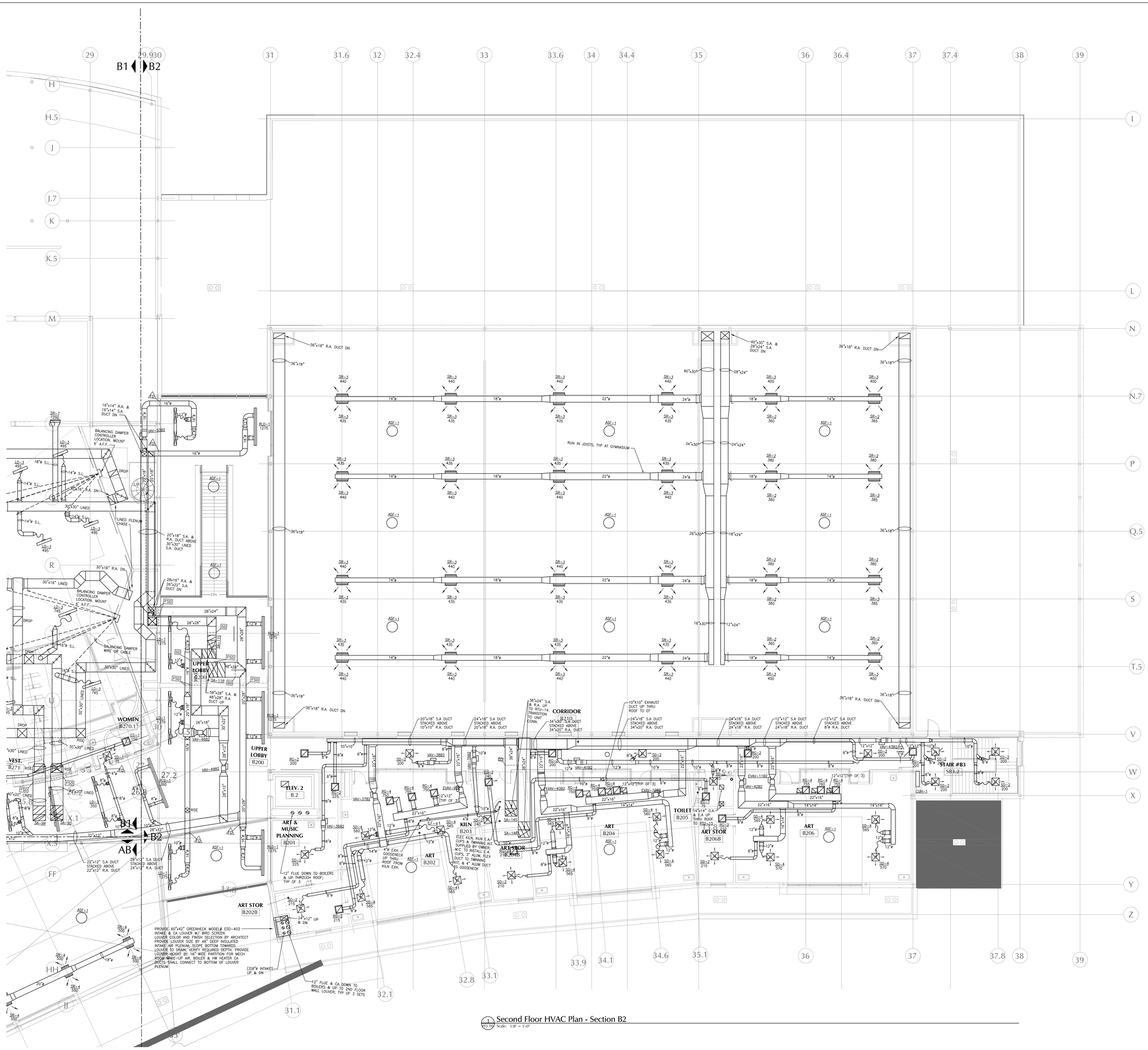
REVISIONS

No.	Description	Date

FILE:

DWN. BY: DJM	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

H3.9



1 Second Floor HVAC Plan - Section B2
H3.10 Scale: 1/8" = 1'-0"

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170 Apricot Street, Worcester, MA 01603

TITLE

Second Floor HVAC Plan Section B2

Key Plan

A BUILDING
B BUILDING
A
AB
BI

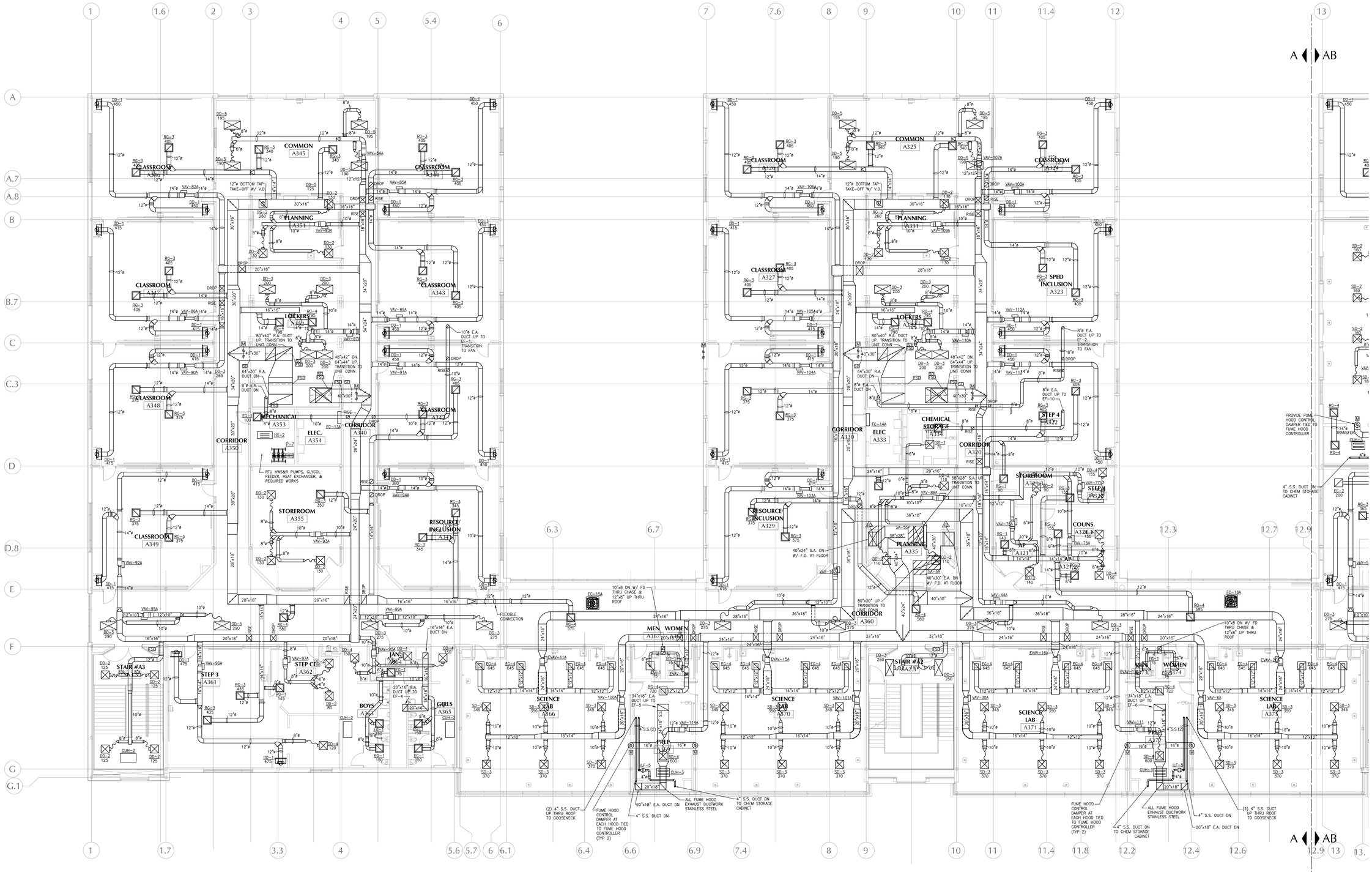
REVISIONS

No.	Description	Date

FILE:

DWN. BY: DJM	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

H3.10



1 Third Floor HVAC Plan - Section A
H3.11 Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Third Floor HVAC Plan Section A

Key Plan

A BUILDING
B BUILDING
B1
B2
AB

REVISIONS

No.	Description	Date

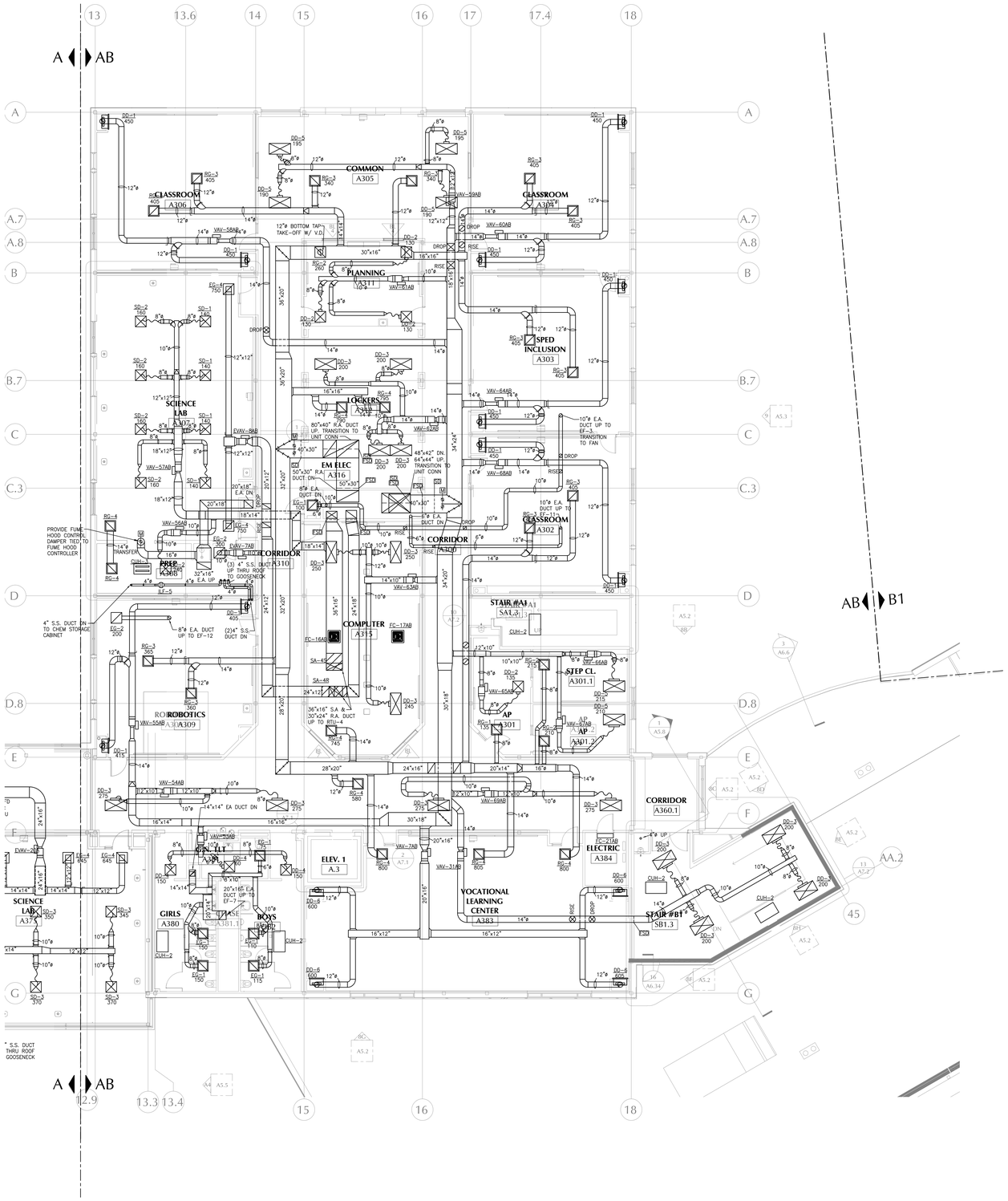
FILE:

DWN. BY: DJM | JOB NO: #1611

CKD. BY: KRS | SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

H3.11



1 Third Floor HVAC Plan - Section AB
A3.12 Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Third Floor HVAC Plan Section AB

Key Plan

A BUILDING B BUILDING

REVISIONS

No.	Description	Date

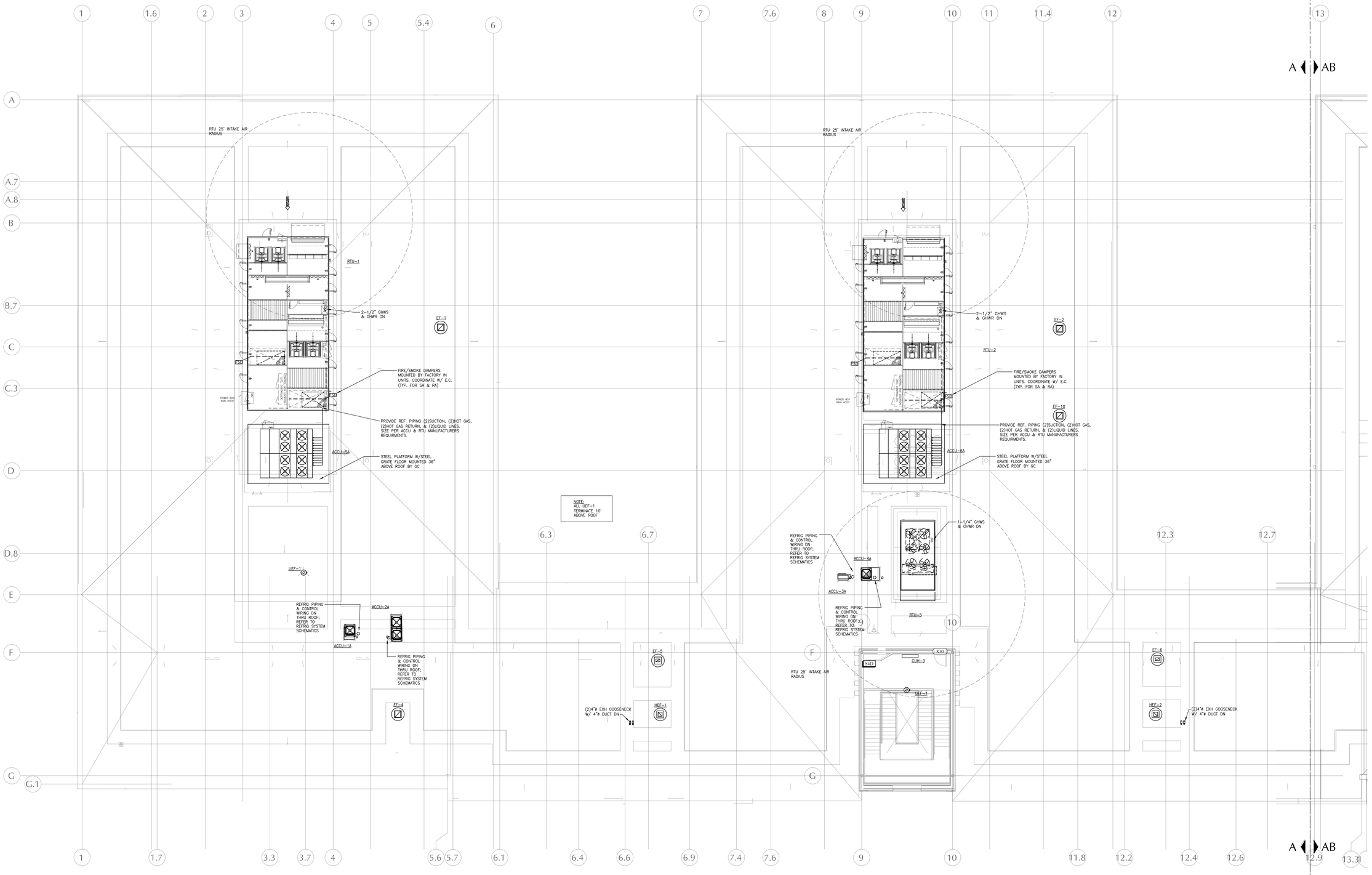
FILE:

DWN. BY: DJM JOB NO: #1611

CKD. BY: KRS SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

H3.12



1 Roof HVAC Plan - Section A
H3.13 Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Roof HVAC Plan Section A

Key Plan

A BUILDING
B BUILDING
B1
B2
AB

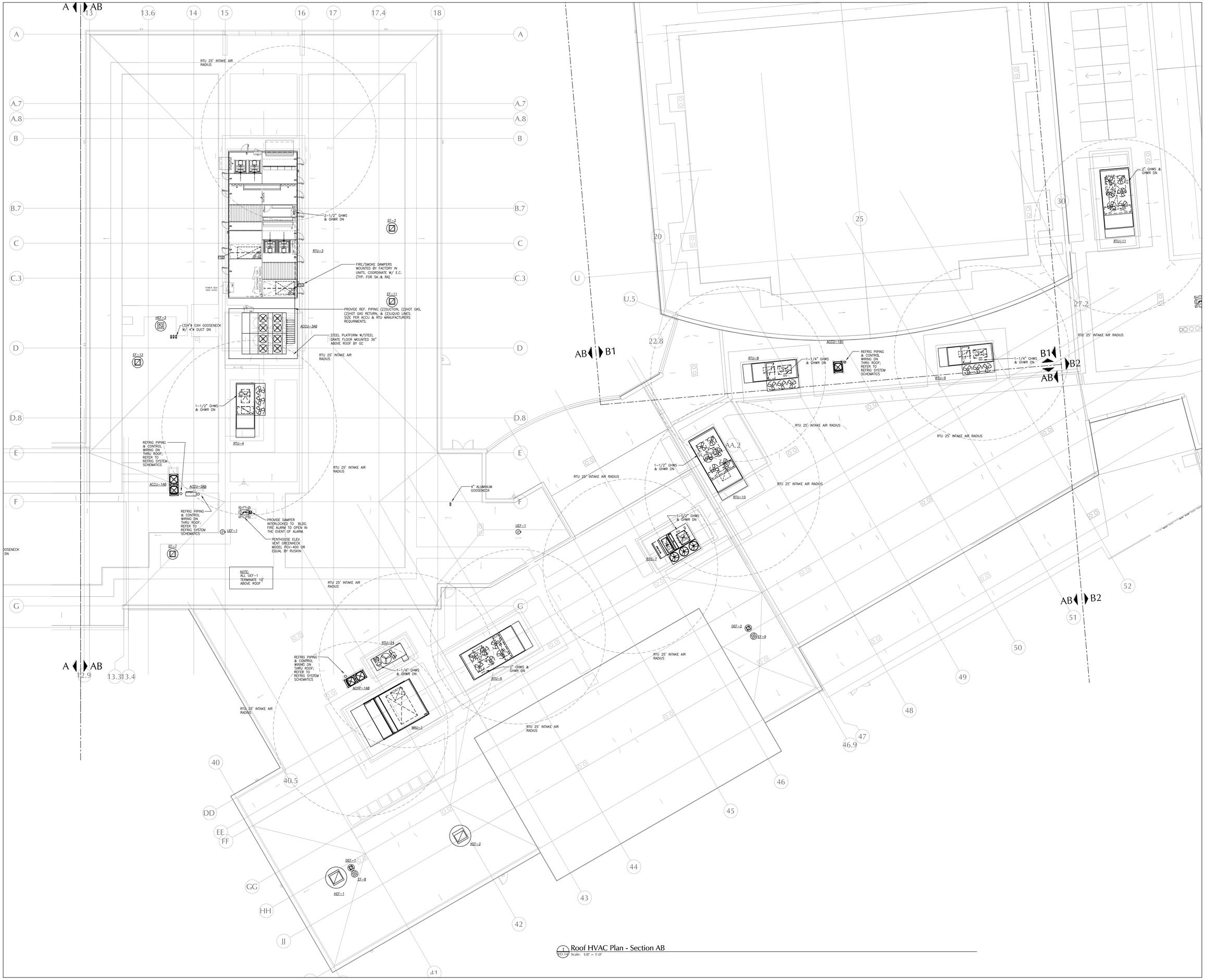
REVISIONS

No.	Description	Date

FILE:

DWN. BY: DJM	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

H3.13



1 Roof HVAC Plan - Section AB
H3.14 Scale: 1/8" = 1'-0"

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Project North

PROJECT

FINAL BID PACKAGE

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Roof HVAC Plan Section A

Key Plan

A BUILDING
B BUILDING
A
B1
B2

REVISIONS

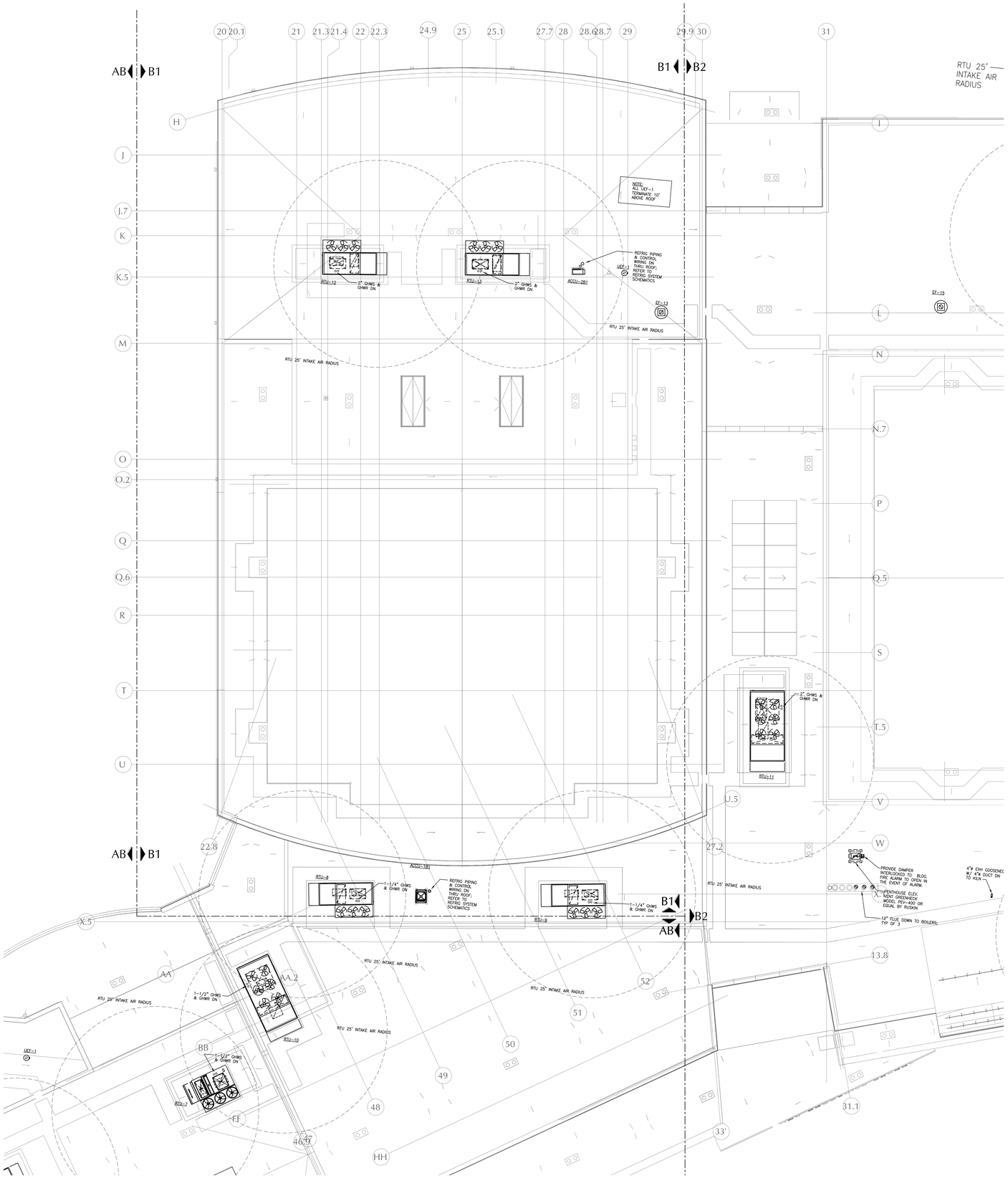
No.	Description	Date

FILE:

DWN. BY: DJM	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

H3.14



1 Roof HVAC Plan - Section B1
H3.15 Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Roof HVAC Plan Section B1

Key Plan

A BUILDING
B BUILDING
A
AB
B2

REVISIONS

No.	Description	Date

FILE:

DWN. BY: DJM | JOB NO: #1611

CKD. BY: KRS | SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

H3.15

1 Roof HVAC Plan - Section B2
H3.16 Scale: 1/8" = 1'-0"

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TITLE

Roof HVAC Plan Section B2

Key Plan

A BUILDING
B BUILDING
A
AB
BI

REVISIONS

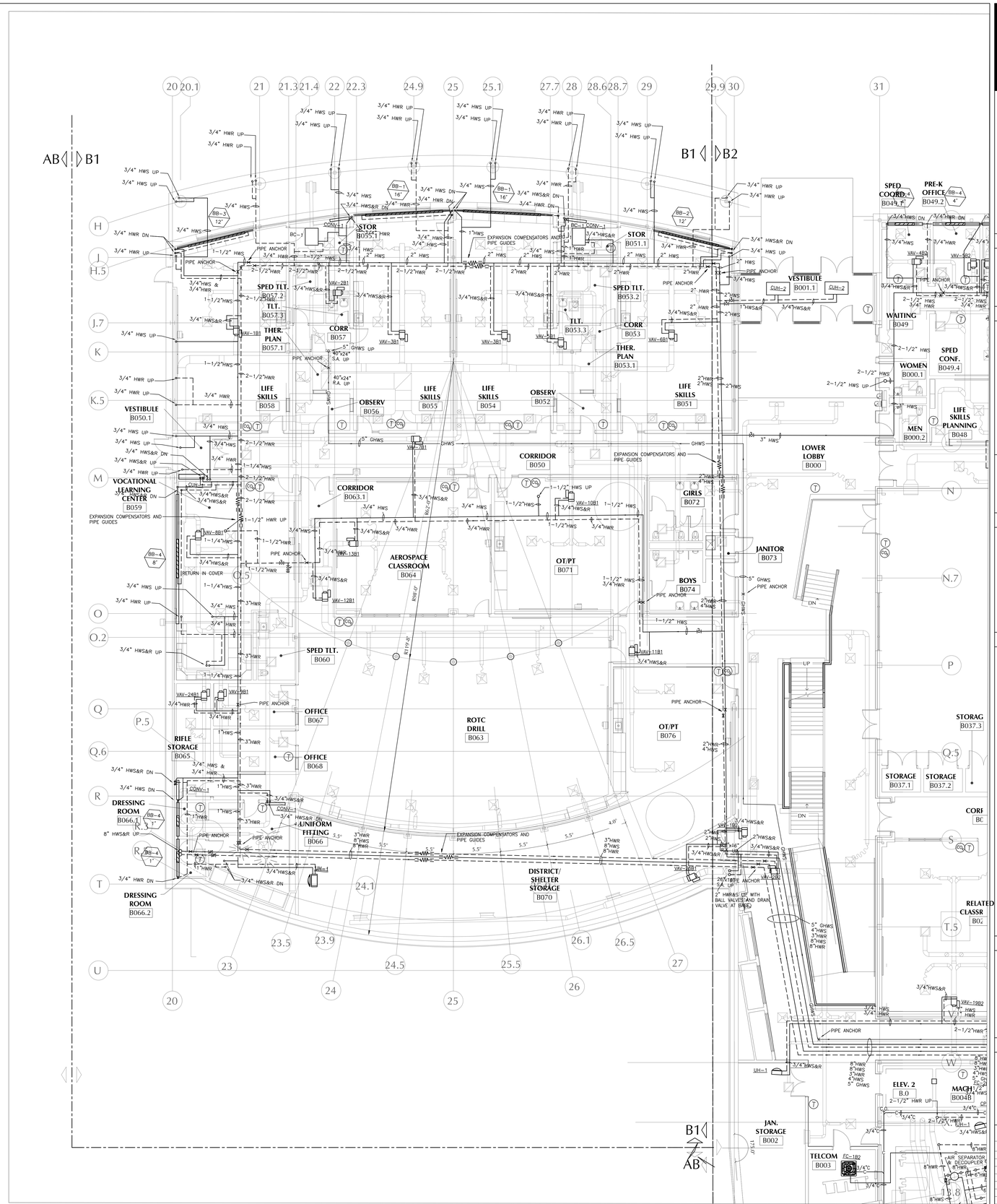
No.	Description	Date

FILE:

DWN. BY: DJM	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

H3.16



1 H4.1 Ground Level HVAC Piping Floor Plan - Section B1
Scale: 1/8" = 1'-0"

LAMOUREUX PAGANO ASSOCIATES. ARCHITECTS
108 GROVE STREET, SUITE 300
WORCESTER, MASSACHUSETTS 01605

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Worcester, MA

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PROJECT

Final Bid Package

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Ground Level HVAC Piping Floor Plan Section B1

Key Plan

A BUILDING B BUILDING

REVISIONS

No.	Description	Date

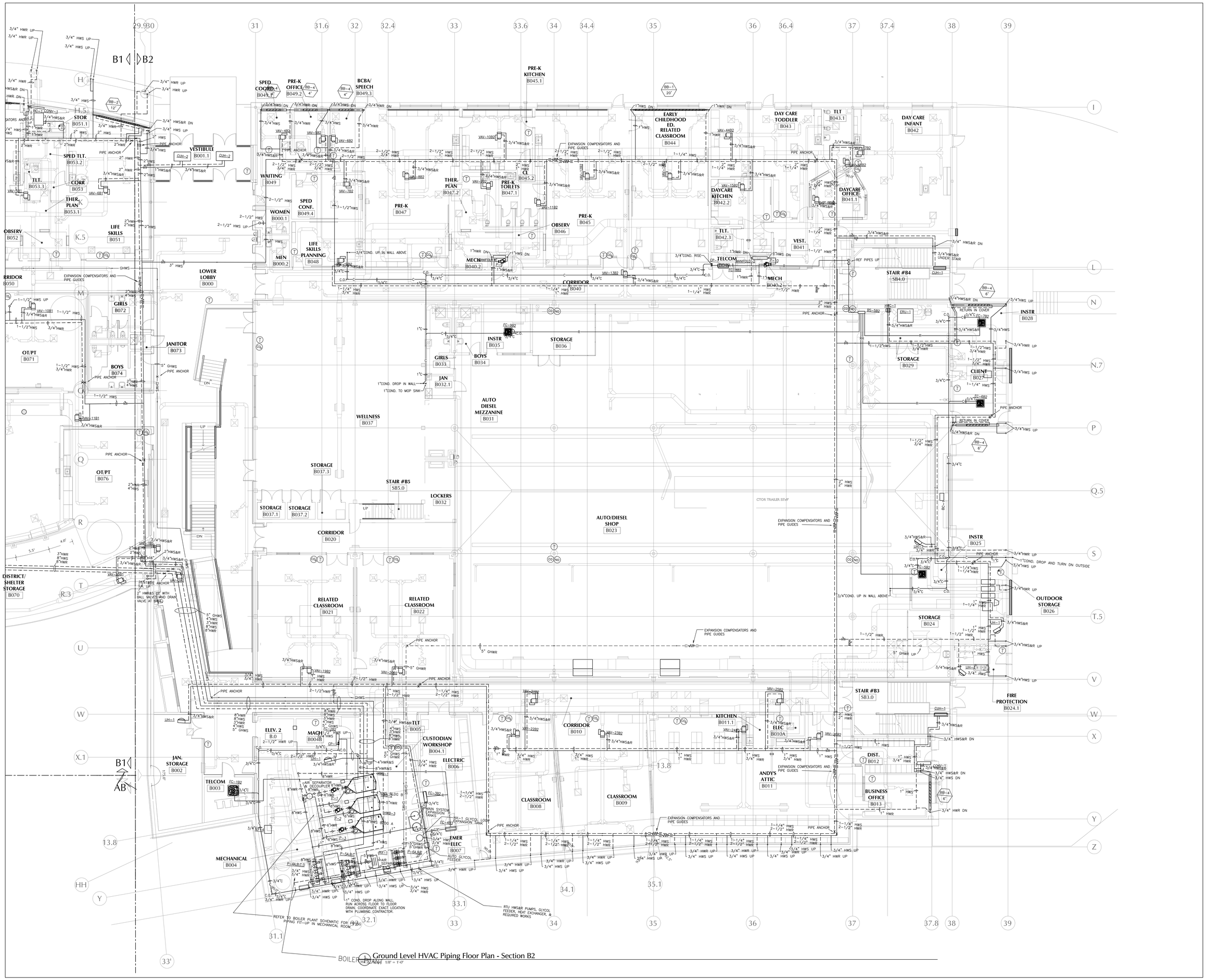
FILE:

DWN. BY: DJM | JOB NO: #1611

CKD. BY: KRS | SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

H4.1



Ground Level HVAC Piping Floor Plan - Section B2
1/8" = 1'-0"

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FINAL BID PACKAGE

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Ground Level HVAC Piping Floor Plan Section B2

Key Plan

A BUILDING
B BUILDING

REVISIONS

No.	Description	Date

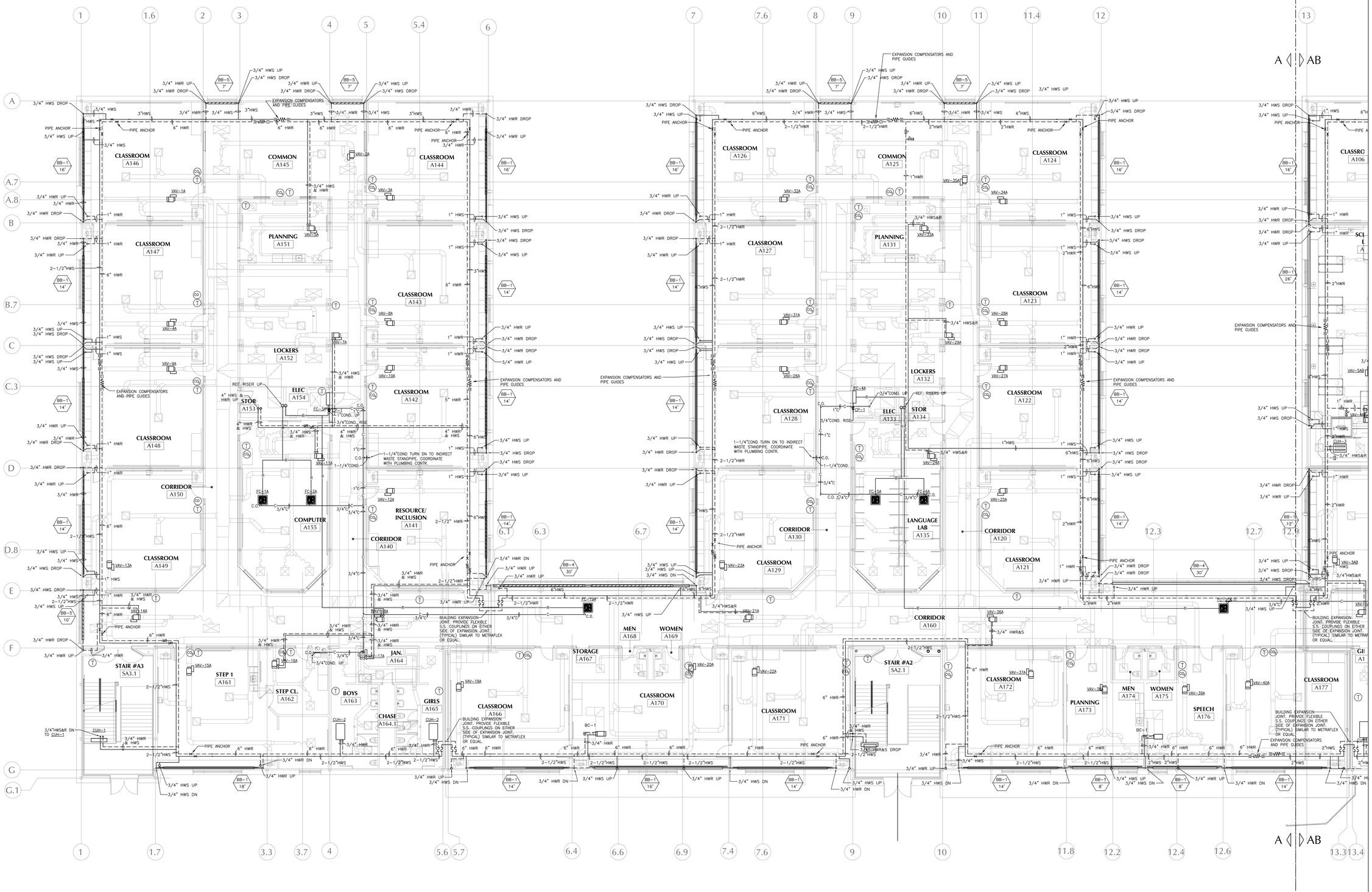
FILE:

DWN. BY: DJM | JOB NO: #1611

CKD. BY: KRS | SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

H4.2



1 First Floor HVAC Piping Plan - Section A
H4.3 Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

First Floor HVAC Piping Plan Section A

Key Plan

A BUILDING

B BUILDING

B1 B2 AB

REVISIONS

No.	Description	Date

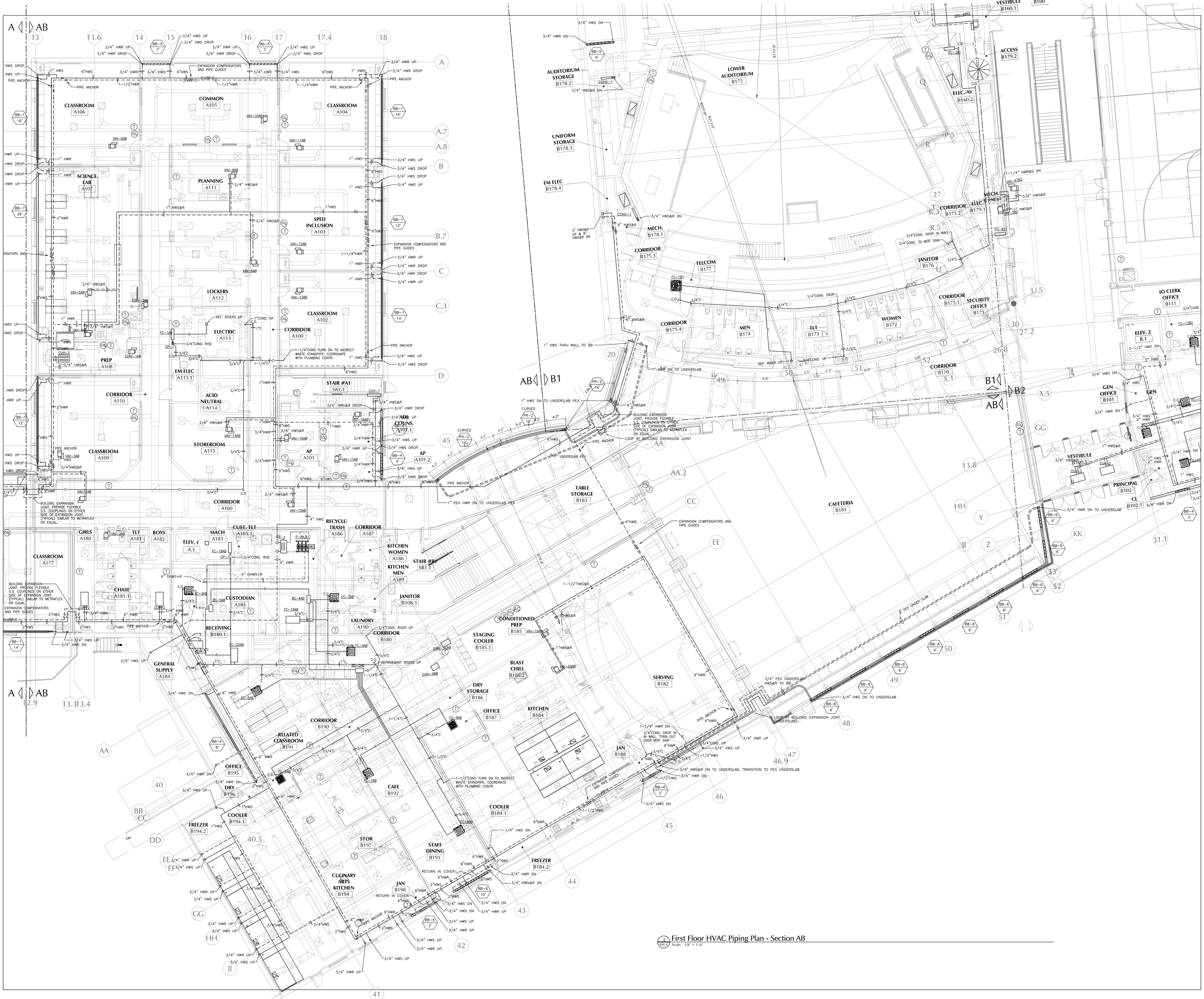
FILE:

DWN. BY: DJM | JOB NO: #1611

CKD. BY: KRS | SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

H4.3



1 First Floor HVAC Piping Plan - Section AB
H4.4 Scale: 1/8" = 1'-0"

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Final Bid Package

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

First Floor HVAC Piping Plan Section AB

Key Plan

A BUILDING | B BUILDING | A | BI | B2

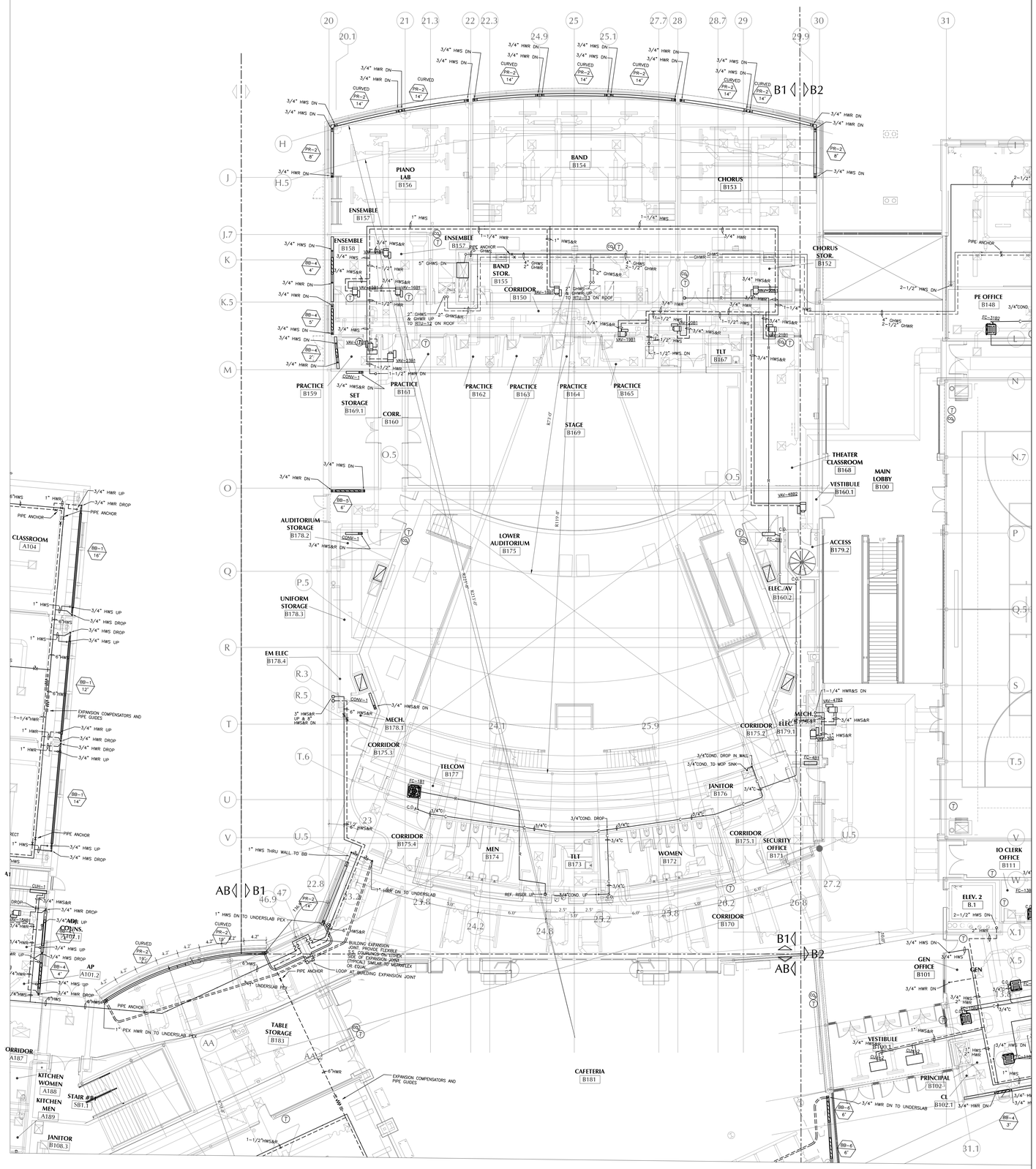
REVISIONS

No.	Description	Date

FILE:

DWN. BY: DJM	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

H4.4



1 (H4.5) First Floor HVAC Piping Plan - Section B1
Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

First Floor HVAC Piping Plan Section B1

Key Plan

A BUILDING — B BUILDING

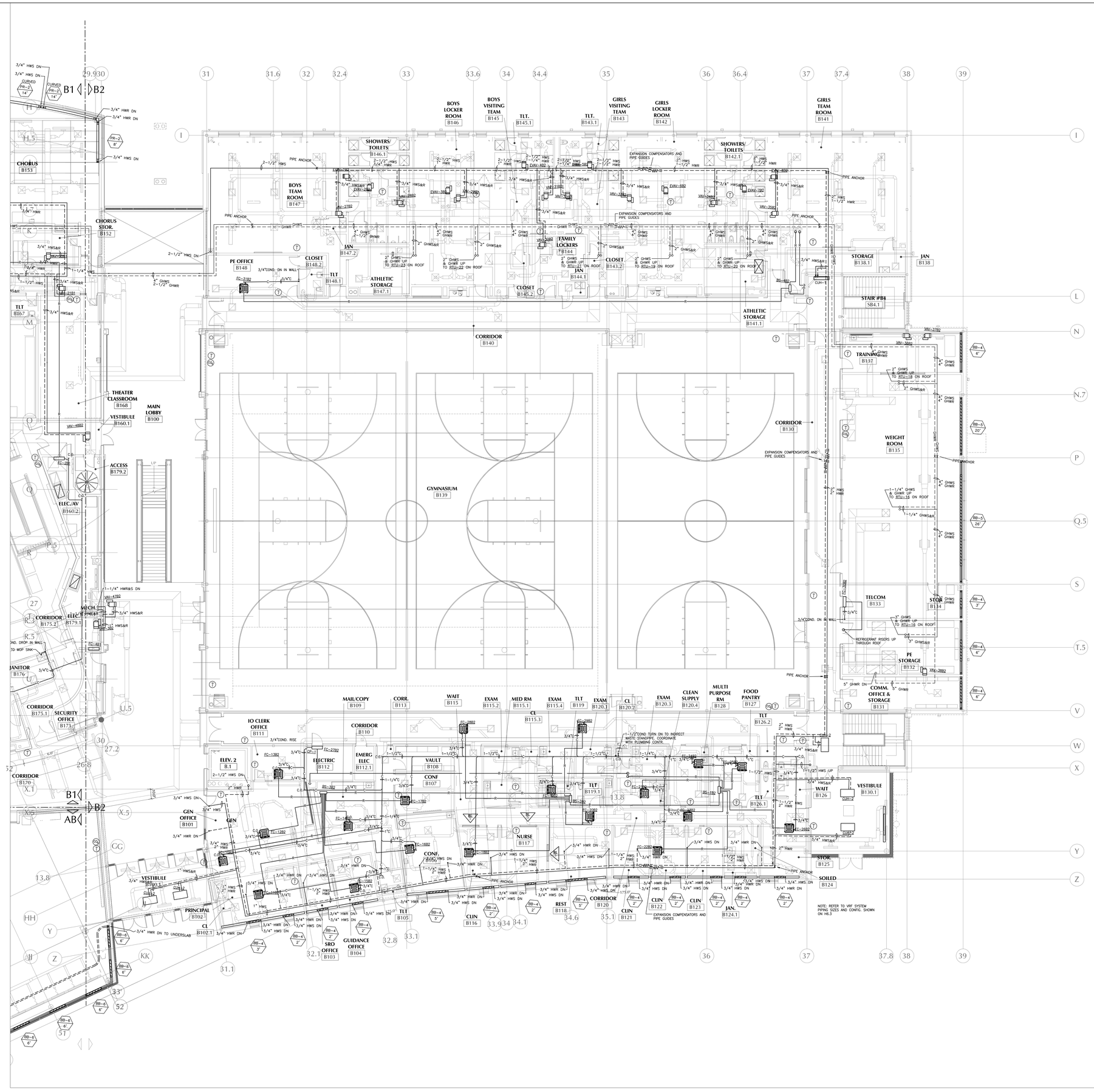
REVISIONS

No.	Description	Date

FILE:

DWN. BY: DJM	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

H4.5



1 First Floor HVAC Piping Plan - Section B2
H4.6 Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

First Floor HVAC Piping Plan Section B2

Key Plan

A BUILDING
B BUILDING

REVISIONS

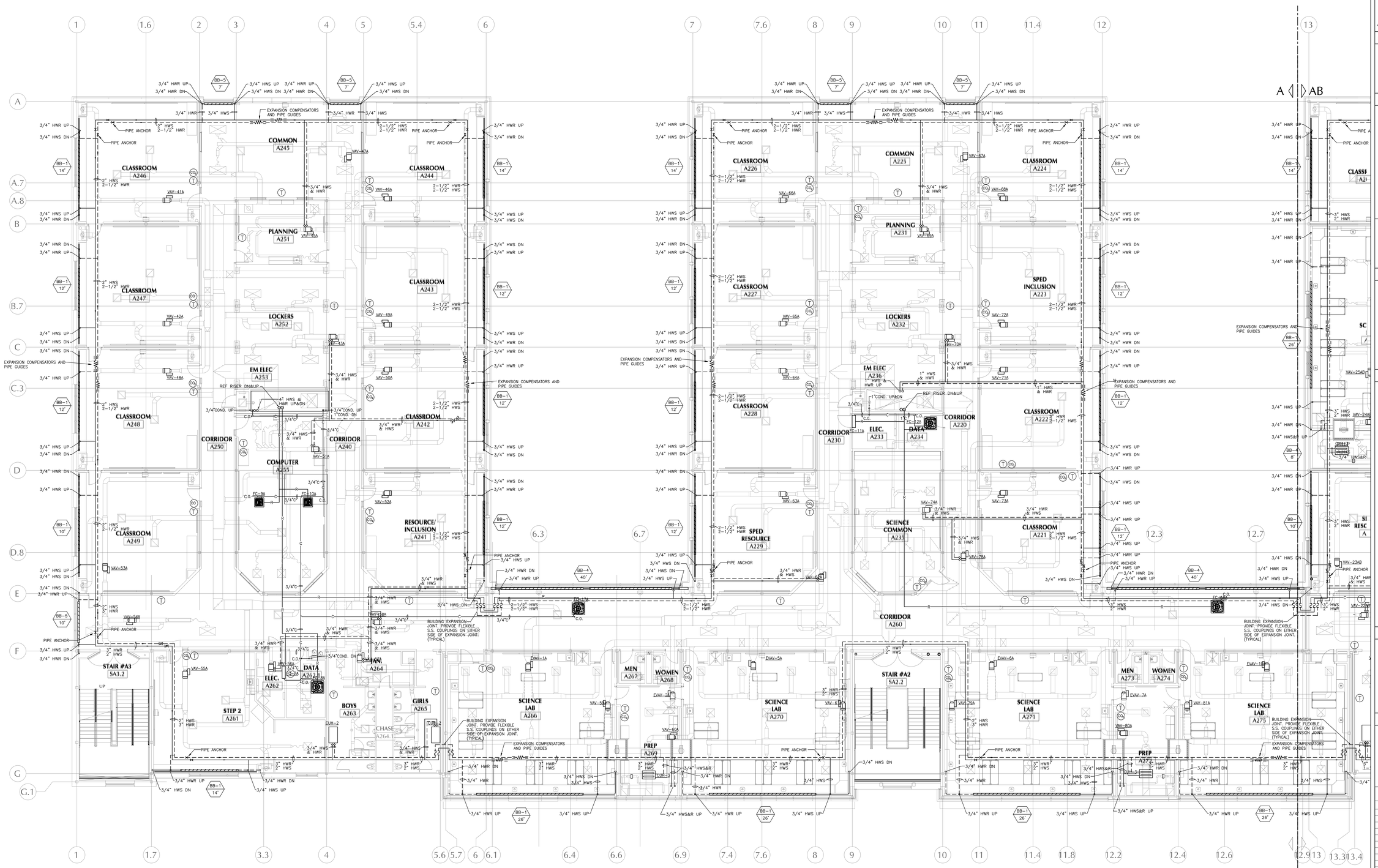
No.	Description	Date

FILE:

DWN. BY: DJM	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

H4.6



1 (H4.7) Second Floor HVAC Piping Plan - Section A
Scale: 1/8" = 1'-0"

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Final Bid Package
South High Community School
170 Apricot Street, Worcester, MA 01603

TITLE
Second Floor HVAC Piping Plan Section A

Key Plan
A BUILDING
B BUILDING
BI
B2
AB

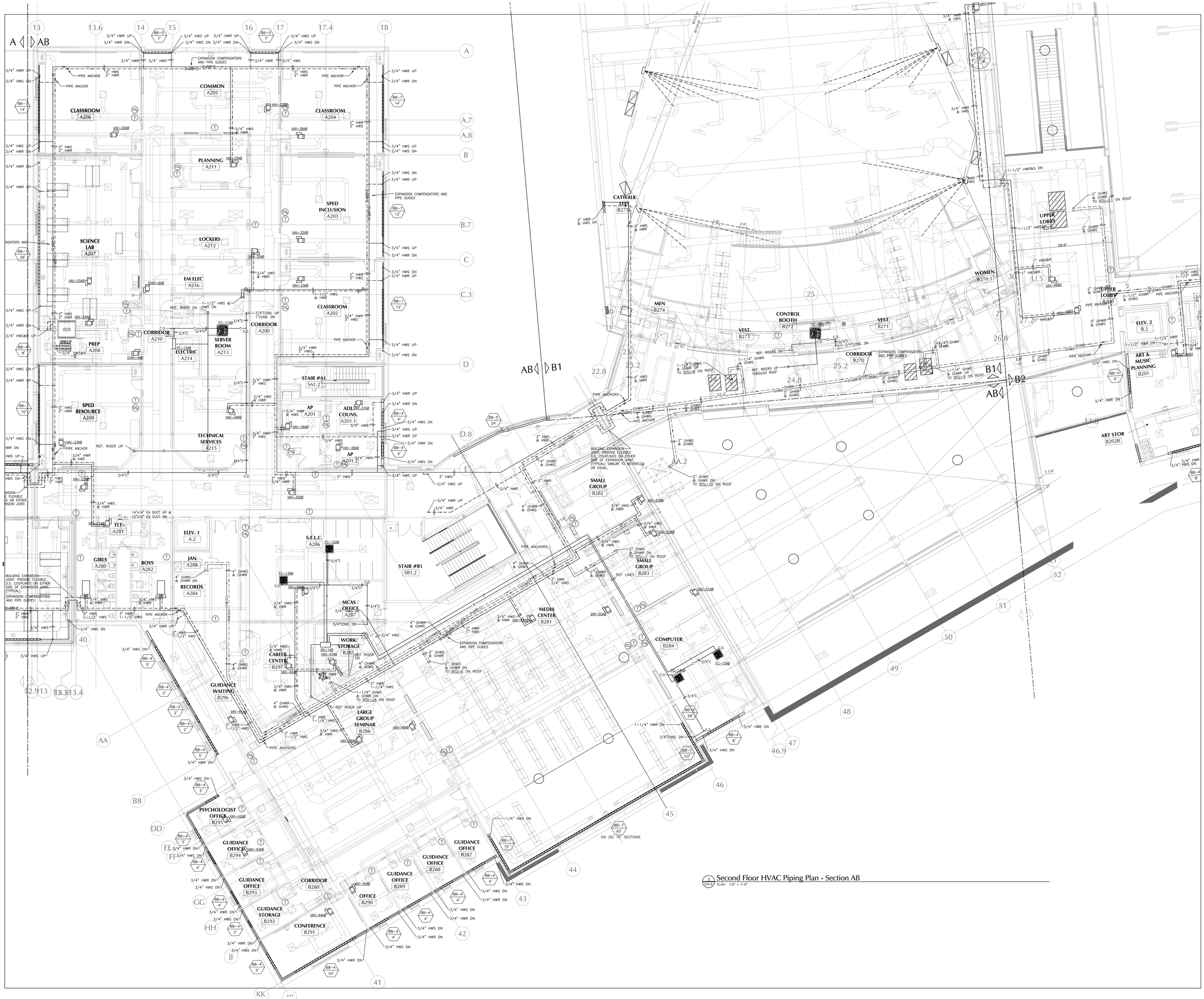
REVISIONS

No.	Description	Date

FILE:

DWN. BY: DJM	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

H4.7



1 Second Floor HVAC Piping Plan - Section AB
H4.8 Scale: 1/8" = 1'-0"

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PROJECT
Final Bid Package
South High Community School
170 Apricot Street, Worcester, MA 01603

TITLE
Second Floor HVAC Piping Plan Section AB

Key Plan
A BUILDING
B BUILDING
A
B1
B2

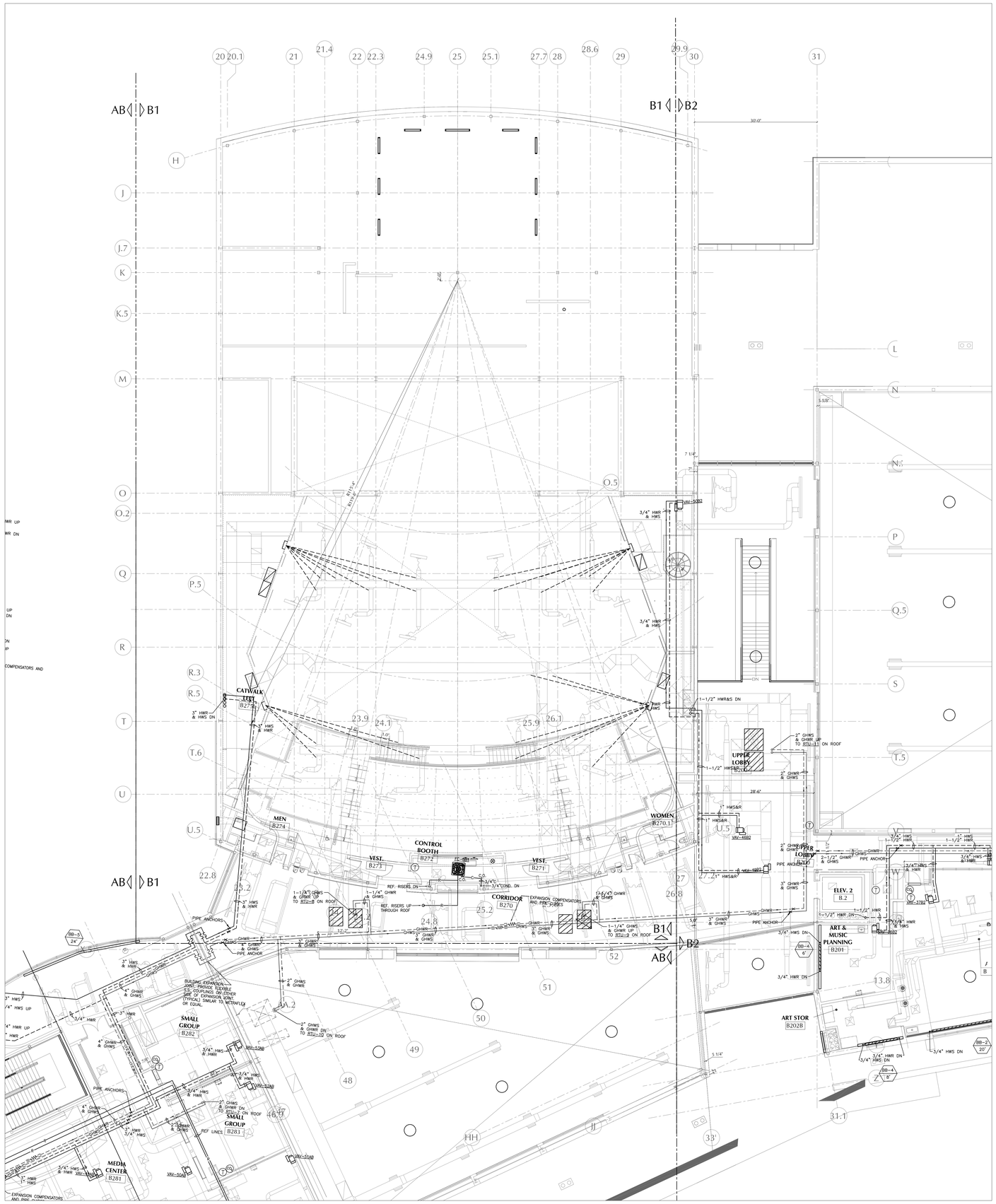
REVISIONS

No.	Description	Date

FILE:

DWN. BY: DJM	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

H4.8



1 H4.9 Second Floor HVAC Piping Plan - Section B1
Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Second Floor HVAC Piping Plan Section B1

Key Plan

A BUILDING B BUILDING

REVISIONS

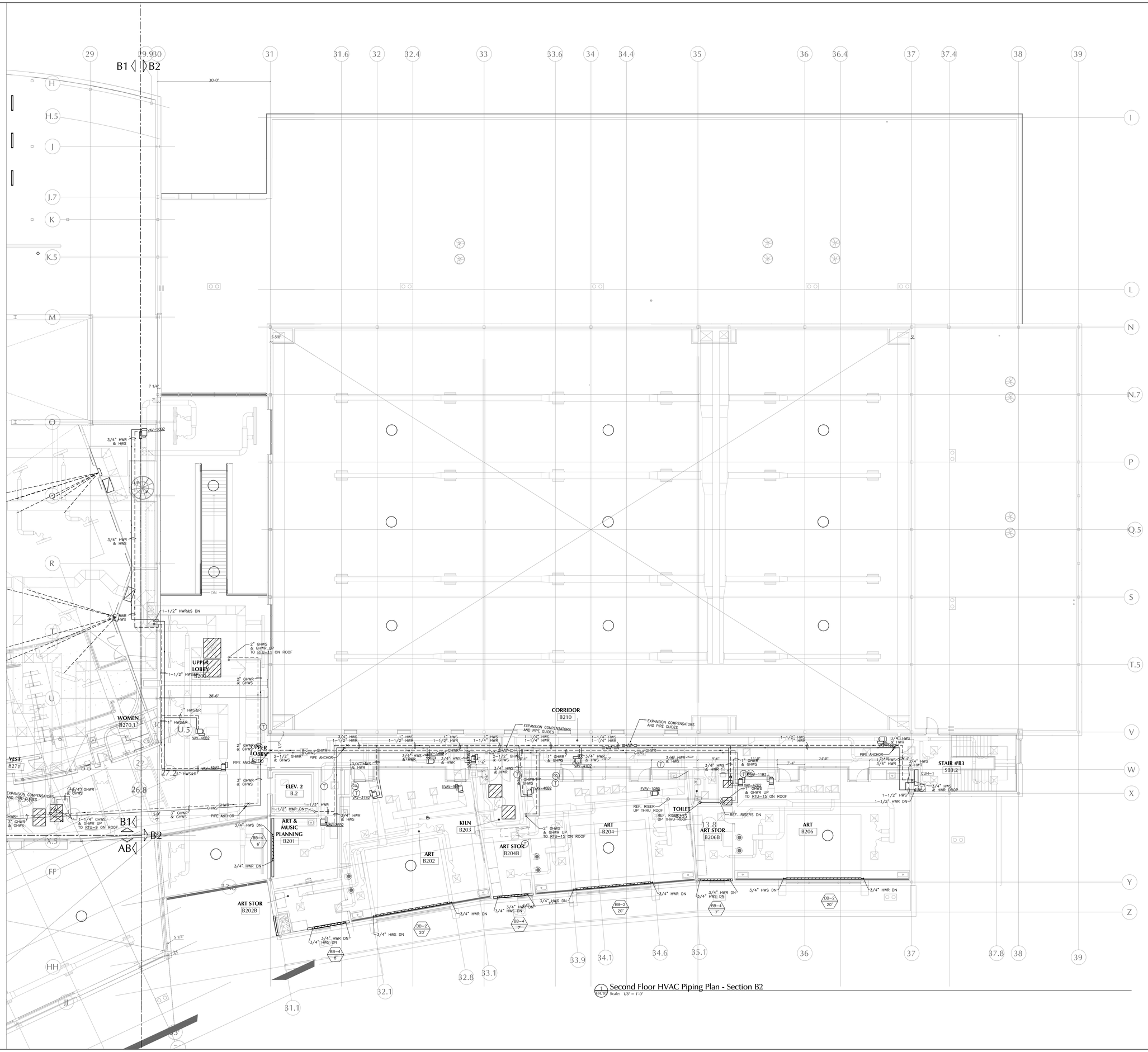
No.	Description	Date

FILE:

DWN. BY: DJM	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

H4.9



1 Second Floor HVAC Piping Plan - Section B2
H4.10 Scale: 1/8" = 1'-0"

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Second Floor HVAC Piping Plan Section B2

Key Plan

A BUILDING
B BUILDING

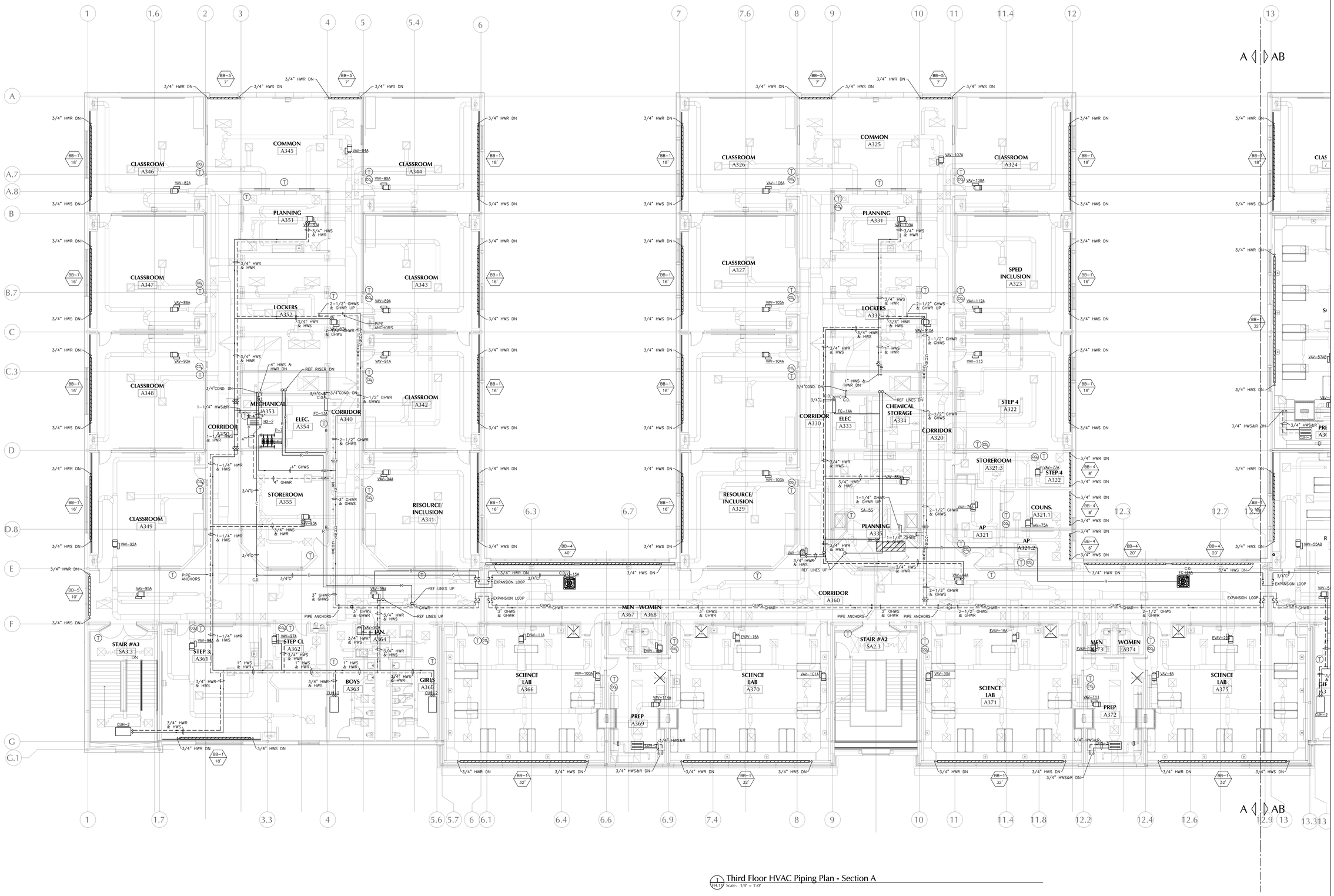
REVISIONS

No.	Description	Date

FILE:

DWN. BY: DJM | JOB NO: #1611
CKD. BY: KRS | SCALE: 1/8" = 1'-0"
DATE: January 31, 2019

H4.10



1 Third Floor HVAC Piping Plan - Section A
H4.11 Scale: 1/8" = 1'-0"

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Final Bid Package

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

Third Floor HVAC Piping Plan Section A

Key Plan

A BUILDING
B BUILDING
B1
B2
AB

REVISIONS

No.	Description	Date

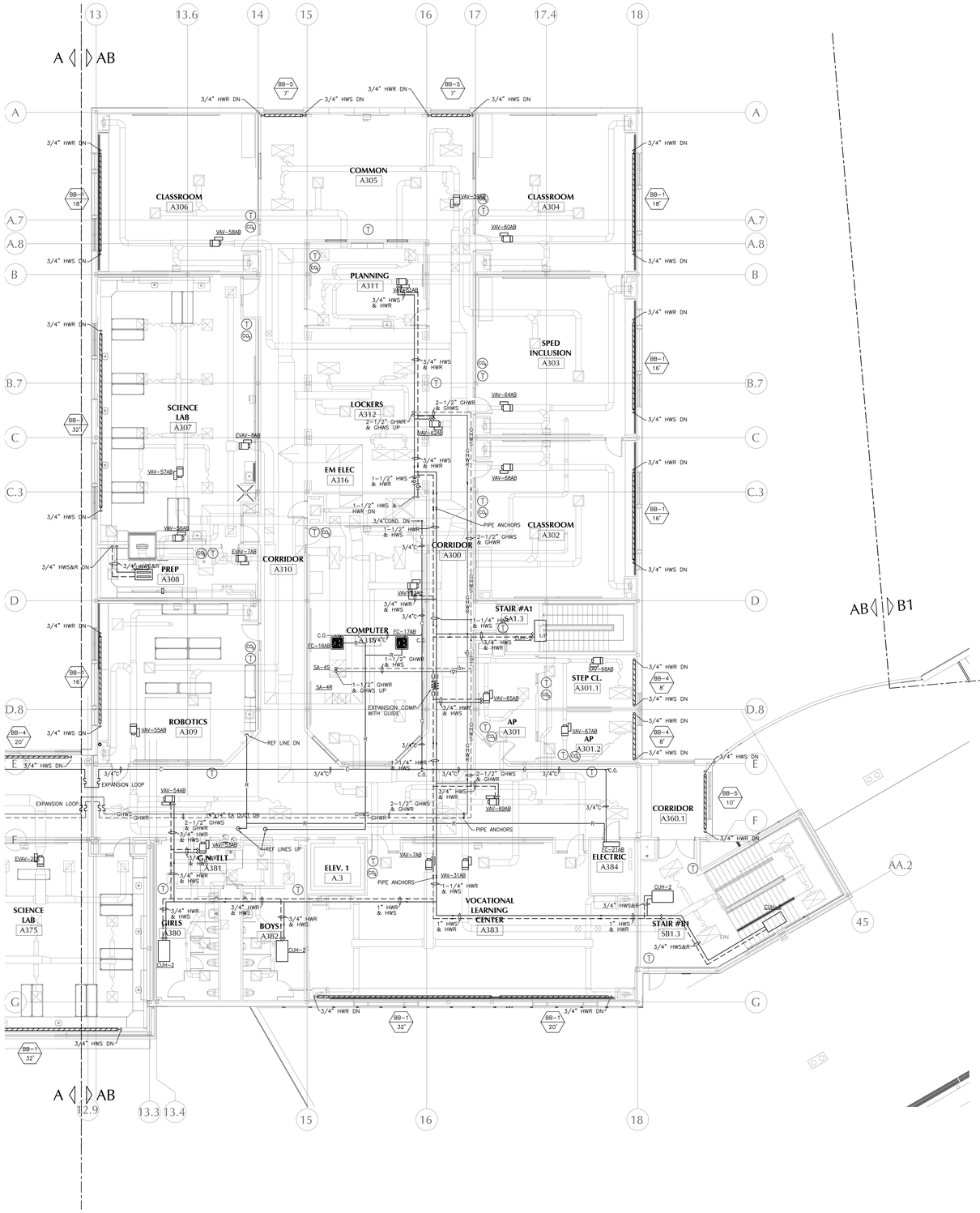
FILE:

DWN. BY: DJM | JOB NO: #1611

CKD. BY: KRS | SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

H4.11



1 Third Floor HVAC Piping Plan - Section AB
(H4.12) Scale: 1/8" = 1'-0"

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TITLE

Third Floor HVAC Piping Plan Section AB

Key Plan

A BUILDING

B BUILDING

REVISIONS

No.	Description	Date

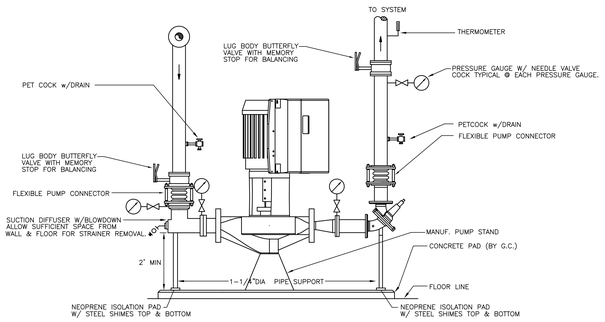
FILE:

DWN. BY: DJM | JOB NO: #1611

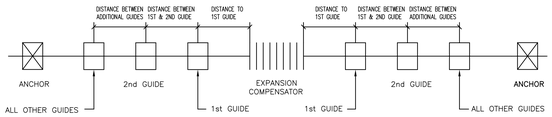
CKD. BY: KRS | SCALE: 1/8" = 1'-0"

DATE: December 20, 2018

H4.12



TYPICAL VERTICAL IN-LINE PUMP DETAIL
NOT TO SCALE

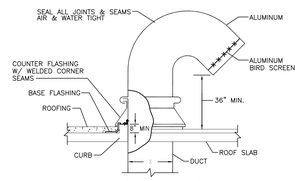


NOTE: 1) EXPANSION JOINT NEAR CENTER OF PIPING.
2) GUIDE SPACING SHALL BE SIMILAR FOR EXPANSION LOOPS

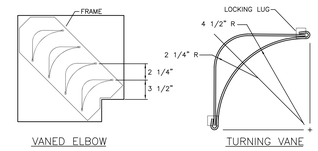
TYPICAL PIPE GUIDE INSTALLATION
NOT TO SCALE
TYPICAL

PIPE SIZE (D)	MAXIMUM DISTANCE FROM BELLOWS TO 1st GUIDE OR ANCHOR	APPROX. DISTANCE BETWEEN 1st TO 2nd GUIDE	APPROX. DISTANCE BETWEEN ADDITIONAL PIPE GUIDES (IN FEET)	
			STEEL PIPE	COPPER PIPE
3/4"	4'	1'-4"	21'	15'
1"	4'	1'-4"	21'	15'
1-1/4"	5'	1'-5"	23'	17'
1-1/2"	6'	1'-9"	28'	20'
2"	8'	2'-4"	32'	23'
2-1/2"	10'	2'-11"	35'	28'
3"	1'-0"	3'-6"	38'	
3-1/2"	1'-2"	4'-1"	45'	
4"	1'-4"	4'-8"	52'	
5"	1'-8"	5'-10"	63'	
6"	2'-0"	7'-0"	68'	
8"	2'-8"	9'-4"	87'	

PIPE GUIDE INSTALLATION DETAIL AND SPACING SCHEDULE
NOT TO SCALE
TYPICAL



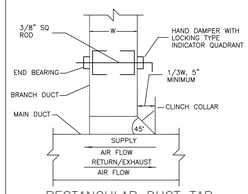
EXHAUST GOOSENECK DETAIL
NO SCALE
TYPICAL



VANED ELBOW
TURNING VANE

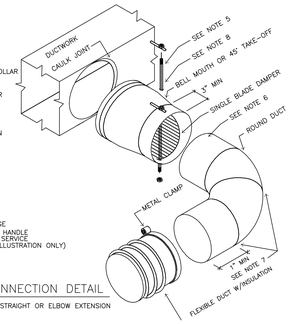
NOTES:
1. LOCKING LUGS INTEGRAL WITH VANE
2. MAXIMUM UNSUPPORTED VANE LENGTH 48"
3. FRAMES-BOLTED OR RIVETED TO ELBOW
4. VANES AND FRAMES-SAME GAUGE AS ELBOW

DOUBLE THICKNESS TURNING VANES FOR SQUARE ELBOW
NO SCALE
TYPICAL

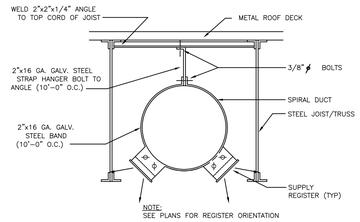


RECTANGULAR DUCT TAP WITH VOLUME DAMPER
NO SCALE TYPICAL

NOTES:
1 SUPPORT AS RECOMMENDED BY SMACNA
2 BAND FLEX TO COLLAR 1/2" MIN FROM OUTBOARD END OF COLLAR
3 INSTALL DAMPER IN OPEN POSITION; FINAL ADJUSTMENT BY TAB CONTRACTOR
4 PROVIDE INSULATION OVER ROUND DUCT ELL TO EDGE OF RECTANGULAR DUCTWORK; SEAL VAPOR BARRIER WITH GREY TAPE TO PREVENT MOISTURE MIGRATION
5 PROVIDE EXTENSION RODS TO ACCOMMODATE INSULATION, PULL TO EDGE OF DUCTWORK AS REQD AND SEAL TO EFFECT VAPOR BARRIER
6 SHEET METAL SCREWS, MIN 3 EA AT 120° INTERVALS, CONNECTING 90 ELL TO TAKE-OFF. ENSURE THAT SCREWS DO NOT INTERFERE W/DAMPER
7 SEAL JOINTS TO PREVENT LEAKAGE
8 INSTALL LOCKING QUADRANT AND HANDLE ON BOTTOM OF DUCT FOR EASY SERVICE. (SHOWN ON TOP FOR EASE OF ILLUSTRATION ONLY)

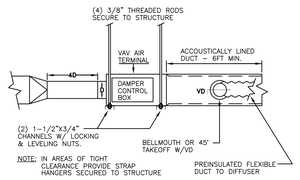


FLEXIBLE DUCT CONNECTION DETAIL
NO SCALE TYP. FOR BOTH STRAIGHT OR ELBOW EXTENSION



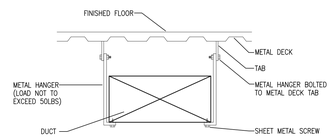
NOTE:
SEE PLANS FOR REGISTER ORIENTATION

TYPICAL EXPOSED SPIRAL DUCT SUPPORT DETAIL
NO SCALE
TYPICAL



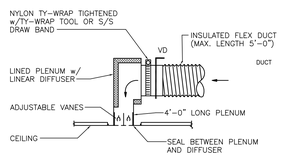
NOTE: IN AREAS OF TIGHT CLEARANCE PROVIDE STRAP HANGERS SECURED TO STRUCTURE

VAV TERMINAL INSTALLATION DETAIL
NOT TO SCALE
TYPICAL

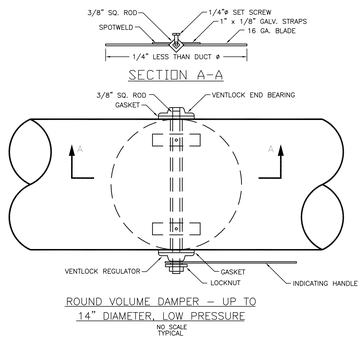


NOTES:
1. DUCTS SHALL NOT BE HUNG FROM OR SUPPORTED BY HUNG CEILING
2. FOR DUCTS NOT EXCEEDING 2 SQ.FT. IN CROSS-SECTIONAL AREA, HANGERS SHALL BE OF METAL NOT LESS THAN 1" BY 1/16".
3. FOR DUCTS LARGER THAN 2 SQ.FT. IN CROSS-SECTIONAL AREA, HANGERS SHALL BE OF METAL NOT LESS THAN 1/8"
4. FOR ALL DUCTS, HANGERS SHALL BE TURNED UNDER AND FASTENED TO THE BOTTOM OF DUCT AS SHOWN ABOVE
5. WHERE CROSS-SECTIONAL AREA OF DUCT EXCEEDS 8 SQ.FT., HANGERS SHALL BE SPACED NOT MORE THAN 4 FT. ON CENTERS

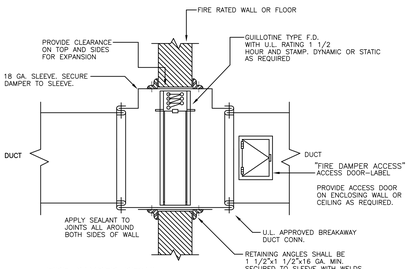
DUCT SUPPORT FROM METAL DECK
NO SCALE



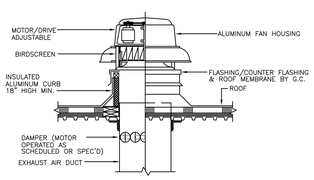
LINEAR DIFFUSER CONNECTION
NO SCALE
TYPICAL



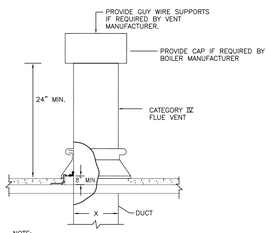
ROUND VOLUME DAMPER - UP TO 14" DIAMETER, LOW PRESSURE
NO SCALE
TYPICAL



FIRE DAMPER DETAIL
NOT TO SCALE
TYPICAL

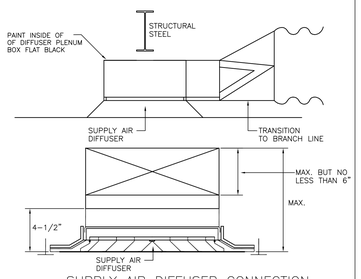


TYPICAL ROOF EXHAUST FAN DETAIL
NOT TO SCALE
TYPICAL

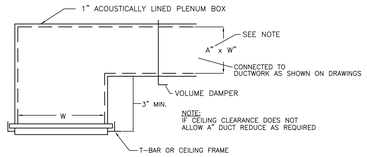


NOTE:
LOCATE FLUE TO TERMINATE 3 FEET ABOVE ANY OUTDOOR AIR INTAKE
PROVIDE GUY WIRES AS REQUIRED
TYPICAL OF (2)

BOILER FLUE VENT DETAIL
NOT TO SCALE
TYPICAL OF (2)

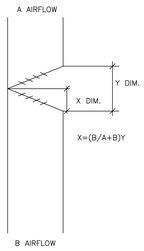


SUPPLY AIR DIFFUSER CONNECTION TYPICAL AT ALL OBSTRUCTIONS TO STRUCTURAL STEEL OR OTHER
NO SCALE TYPICAL

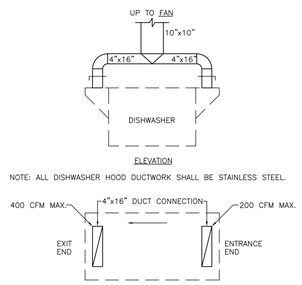


NOTE:
IF CEILING CLEARANCE DOES NOT ALLOW A" DUCT REDUCE AS REQUIRED

TYPICAL RETURN/EXHAUST GRILLE DETAIL
NOT TO SCALE

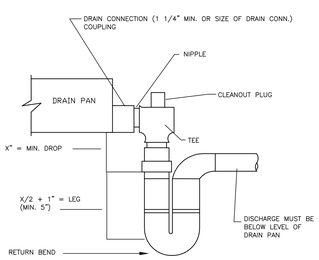


TYPICAL DUCTWORK SPLIT DETAIL
NOT TO SCALE



NOTE: ALL DISHWASHER HOOD DUCTWORK SHALL BE STAINLESS STEEL.

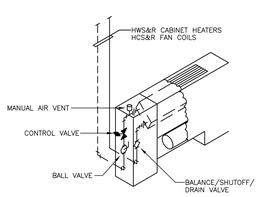
DISHWASHER HOOD DETAI TYPICAL
NOT TO SCALE



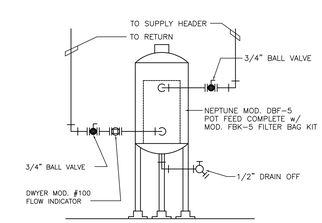
X = NEGATIVE INTERNAL STATIC PRESSURE AT FAN INLET

NOTES:
1. ALLOW SUFFICIENT SPACE BELOW DRAIN PAN FOR TRAP
2. PITCH DRAIN FOR PROPER RUN-OFF
3. MANUALLY PRIME FILL TRAP BEFORE START-UP TO FORM INITIAL DRAIN SEAL.
4. SUPPORT LENGTHY DRAIN LINES TO PREVENT SAG AND CONDENSATE OVERFLOW

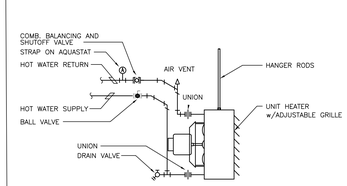
DRAIN PAN WATER SEAL PIPING - DETAIL - TYPICAL
NOT TO SCALE



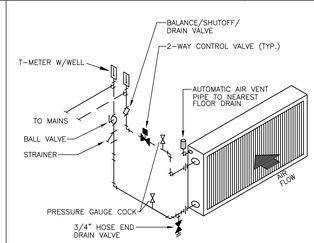
TYPICAL CABINET HEATER
NOT TO SCALE



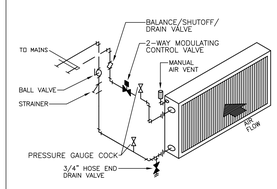
HEATING SYSTEM CHEMICAL FEED DETAIL
NO SCALE



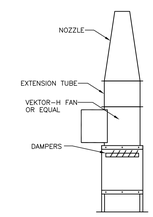
TYPICAL HOT WATER UNIT HEATER DETAIL
NO SCALE



MAU & RTU HOT WATER COIL PIPING DETAIL - TYPICAL
NOT TO SCALE



TYPICAL UH, CUH, VAV, FVAV, AND BC-1 HOT WATER COIL PIPING DETAIL
NOT TO SCALE



HEF-1&2 ROOF MOUNTED HOOD EXHAUST FAN DETAIL
NO SCALE

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Millbury, MA 01527 fx:508-865-1401

OWNER

Worcester Public Schools

Worcester, MA

Project North

PROJECT

FINAL BID PACKAGE

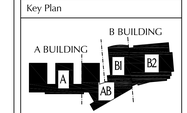
South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

HVAC Details

Key Plan



REVISIONS

No.	Description	Date

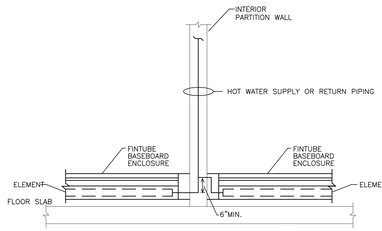
FILE:

DWN. BY: DJM | JOB NO: #1611

CKD. BY: KRS | SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

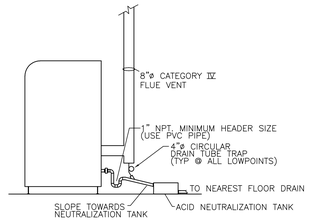
H5.1



NOTE:
1. PROVIDE AT EVERY LOCATION WHERE RADIATION IS FED OR RETURNED FROM A COMMON RISER.
2. VALVING NOT SHOWN FOR CLARITY.

BASEBOARD EXPANSION CONTROL JOINT DETAIL–TYPICAL

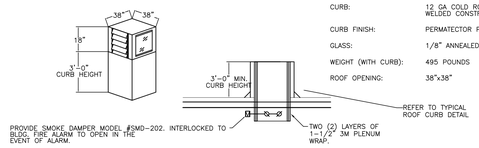
NOT TO SCALE



BOILER & FLUE CONDENSATE DETAIL

NOT TO SCALE

GREENHECK PENTHOUSE ELEVATOR VENT MODEL #PEV-400



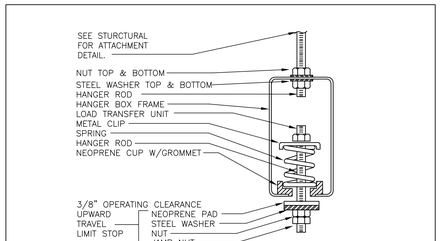
STANDARD CONSTRUCTION

LOUVERED PERIMETER:	.081" THICK 6063–T5 EXTRUDED ALUMINUM, 4"x.081" NOMINAL DIMENSION.
BIRDSCREEN:	3/4"x.051" FLATTENED AND EXPANDED ALUMINUM ON OUTSIDE OF LOUVER
LOUVER FINISH:	BY ARCHITECT, MILL, CLEAR ANODIZE, INTEGRAL COLOR ANADIZE BAKED ENAMEL, OR KYNAR.
SIZE:	38"x38"x18". IT SITS ON A 36" HIGH CURB
HOOD:	.100 FORMED ALUMINUM WITH 1/2" INSULATION
BOX CORNER:	.100 FORMED ALUMINUM
CURB:	12 GA COLD ROLLED STEEL; 4" MOUNTING FLANGE, WELDED CONSTRUCTION
CURB FINISH:	PERMATECTOR PAINT FINISH
GLASS:	1/8" ANNEALED CLEAR
WEIGHT (WITH CURB):	495 POUNDS
ROOF OPENING:	38"x38"

ELEVATOR VENT DETAIL

NO SCALE

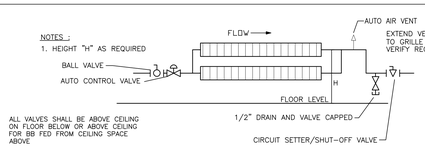
NOTE:
1. REFER TO THE BOARD OF ELEVATOR REGULATIONS SECTION 17.03: VENTING OF HOISTWAYS, FOR ADDITIONAL INFOMATION.



NOTES:
1. ADJUST VERTICAL TRAVEL LIMIT STOP AFTER SYSTEM IS OPERATIONAL
2. UPWARD TRAVEL LIMIT STOP MUST NOT SHORT CIRCUIT ISOLATOR OR REDUCE ISOLATION PERFORMANCE.

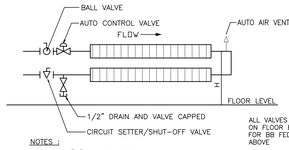
VIBRATION ISOLATOR DETAIL | NTS

NOTES :
1. HEIGHT "H" AS REQUIRED



HOT WATER 2 TIER FINNED–TUBE RADIATION DETAIL – WHERE SUPPLY AND RETURN ON OPPOSITE END.

NOT TO SCALE

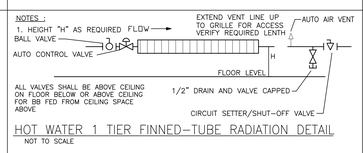


NOTES :
1. HEIGHT "H" AS REQUIRED

HOT WATER 2 TIER FINNED–TUBE RADIATION DETAIL – WHERE SUPPLY AND RETURN ON SAME END.

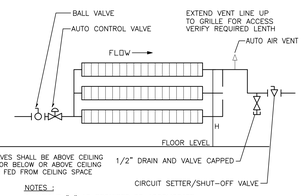
NOT TO SCALE

NOTES :
1. HEIGHT "H" AS REQUIRED FLOW
BALL VALVE
AUTO CONTROL VALVE



HOT WATER 1 TIER FINNED–TUBE RADIATION DETAIL

NOT TO SCALE

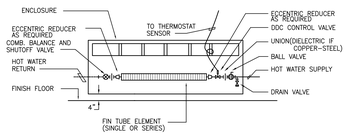


NOTES :
1. HEIGHT "H" AS REQUIRED TO ACCOMODATE ENCLOSURE.
2. 2–TIER SIMILAR MINUS 1 SECTION.

HOT WATER MULTI TIER FINNED–TUBE RADIATION DETAIL – WHERE SUPPLY AND RETURN ON OPPOSITE END.–TYPICAL

NOT TO SCALE

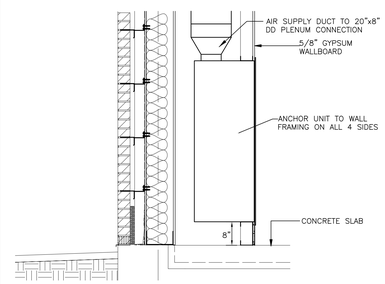
NOTE: ALL BASEBOARD LOCATED WITHIN MILLWORK, ZONE & SHUTOFF VALVES SHALL BE LOCATED ABOVE ACCESSIBLE CLG.



TYPICAL HOT WATER RADIATION W/ COVER PIPING DETAIL – 1 TIER

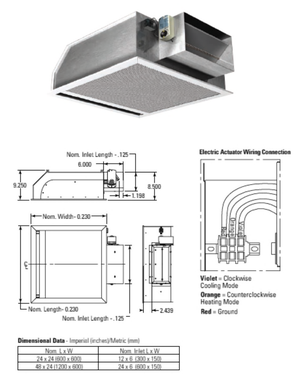
NO SCALE

REFER TO BARE–ELEMENT PIPING DETAILS FOR MULTI–TIER SYSTEMS



DISPLACEMENT DIFFUSER DETAIL (DD–1)

NOT TO SCALE
TYPICAL

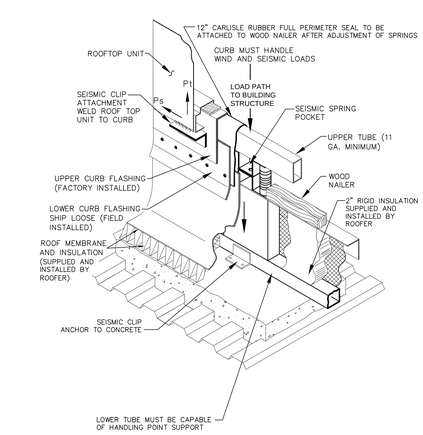


Dimensional Data - Imperial (inches)/Metric (mm)

Nom. L x W	Nom. Inlet L x W
24 x 24 (600 x 600)	12 x 6 (300 x 150)
48 x 24 (1200 x 600)	24 x 6 (600 x 150)

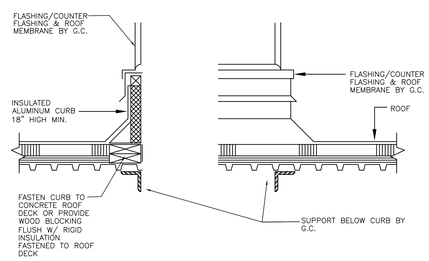
DISPLACEMENT DIFFUSER W/ CHANGEOVER DAMPER DETAIL

NOT TO SCALE



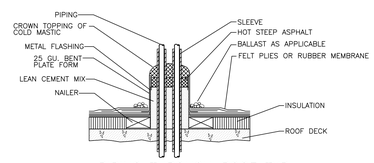
ATTACHMENT OF ISOLATED WIND AND SEISMIC ROOF CURB ON LEVEL CONCRETE ROOF

NO SCALE
TYPICAL FOR ALL RTU'S AND AHU'S



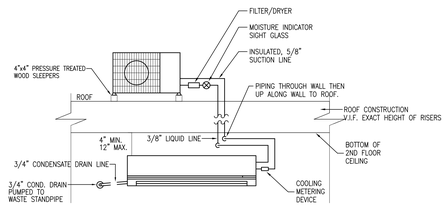
TYPICAL ROOF CURB DETAIL

NOT TO SCALE
TYPICAL



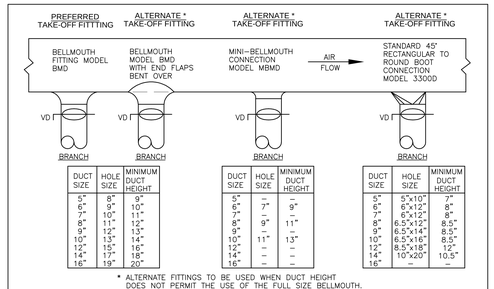
PIPING THROUGH ROOF TYP.

NO SCALE



WALL HUNG DUCTLESS SPLIT SYSTEM PIPING DIAGRAM

NO SCALE



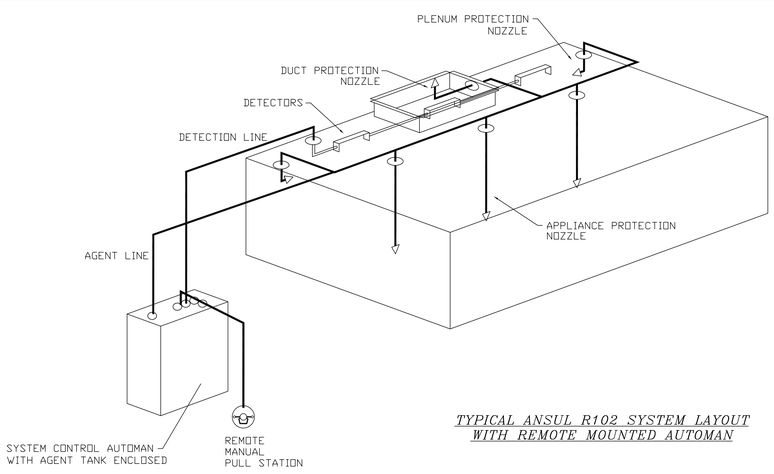
DUCT SIZE	HOLE SIZE	MINIMUM DUCT HEIGHT
5"	8"	9"
6"	9"	10"
7"	10"	11"
8"	11"	12"
9"	12"	13"
10"	13"	14"
12"	15"	16"
14"	17"	18"
16"	19"	20"

DUCT SIZE	HOLE SIZE	MINIMUM DUCT HEIGHT
5"	–	–
6"	7"	9"
7"	–	–
8"	9"	11"
9"	–	–
10"	11"	13"
12"	–	–
14"	–	–
16"	–	–

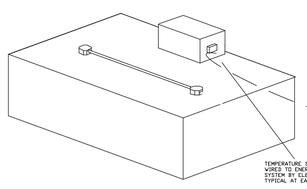
DUCT SIZE	HOLE SIZE	MINIMUM DUCT HEIGHT
5"	5"x10"	7"
6"	6"x12"	8"
7"	6"x12"	8"
8"	6.5"x12"	8.5"
9"	6.5"x14"	8.5"
10"	6.5"x16"	8.5"
12"	8.5"x18"	12"
14"	10"x20"	10.5"
16"	–	–

* ALTERNATE FITTINGS TO BE USED WHEN DUCT HEIGHT DOES NOT PERMIT THE USE OF THE FULL SIZE BELLMOUTH.

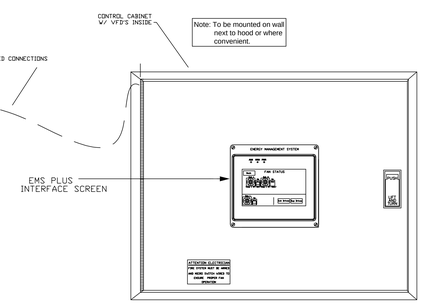
ALTERNATE ROUND BRANCH DUCT TAKE–OFF | NTS



TYPICAL ANSUL R102 SYSTEM LAYOUT WITH REMOTE MOUNTED AUTOMAN



TYPICAL ENERGY MANAGEMENT SYSTEM



DETAIL OF REMOTE S/S BOX

PRE–WIRE PACKAGE

DUCT SIZE	HOLE SIZE	MINIMUM DUCT HEIGHT
6x4	7.5x5.5	7.5
10x4	11.5x5.5	7.5
16x4	17.5x5.5	7.5
24x4	25.5x5.5	7.5
6x5	7.5x6.5	8.5
10x5	11.5x6.5	8.5
16x5	17.5x6.5	8.5
24x5	25.5x6.5	8.5
6x6	7.5x7.5	9.5
10x6	11.5x7.5	9.5
16x6	17.5x7.5	9.5
24x6	25.5x7.5	9.5
8x8	9.5x9.5	11.5
16x8	17.5x9.5	11.5
24x8	25.5x9.5	11.5
10x10	11.5x11.5	13.5
16x10	17.5x11.5	13.5
24x10	25.5x11.5	13.5

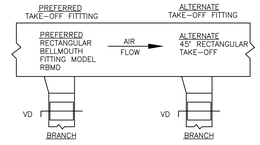
NOTES:

ALL ROUND AND RECTANGULAR BELLMOUTH FITTINGS SHALL BE INCLUDED WITH THE FOLLOWING STANDARD FEATURES:

1. NEOPRENE GASKET TO MINIMIZE AIR LEAKAGE.
2. PRE–DRILLED HOLES FOR QUICK MOUNTING.
3. CONSTRUCTED OF HEAVY DUTY GALVANIZED STEEL

OPTIONAL FEATURES SHALL INCLUDE THE FOLLOWING:

1. 26 GUAGE GALVANIZED QUANDRANT VOLUME DAMPER WITH TIGHT FITTING GASKETING TO MINIMIZE LEAKAGE AT DAMPER PIVOT POINTS.
2. HEAVY DUTY HARDWARE IS AVAILABLE FOR APPLICATIONS WITH INCREASED STATIC PRESSURE.



ALTERNATE RECTANGULAR BRANCH DUCT TAKE–OFF | NTS

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Millbury, MA 01527 fx:508-865-1401

OWNER

Worcester Public Schools

Worcester, MA

Project North

PROJECT

FINAL BID PACKAGE

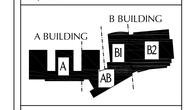
South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

HVAC Details

Key Plan



REVISIONS

No.	Description	Date

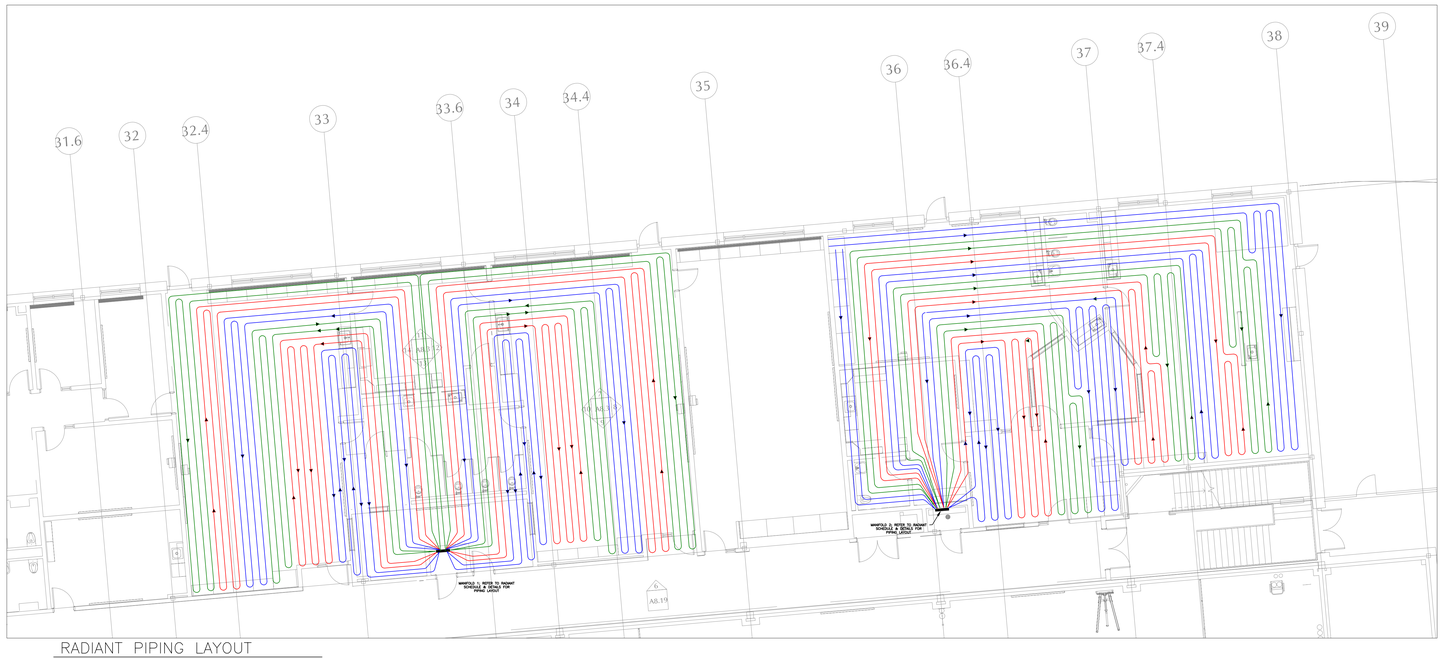
FILE:

DWN. BY: DJM | JOB NO: #1611

CKD. BY: KRS | SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

H5.2



RADIANT PIPING LAYOUT
1/4"=1'-0"

RADIANT HEAT LOOP SCHEDULE

MANIFOLD #	ZONE #	#LOOPS	TOTAL LENGTH	SERVICE ROOMS	AREA (FT²)	HEAT LOAD MBH	TUBE SPACING	RADIANT PIPE SIZE	FLOW RATE (GPM)	HEAD LOSS (FT)	WATER TEMP. (°F)
1	1	12	3516	PRE-K	4000	66.8	12	5/8"	6	16.8	109
2	1	10	2900	DAY CARE	3000	48.6	12	5/8"	5	13	109

SYSTEM BASED ON VIEJA PIPING, MANIFOLDS, & CONTROLS

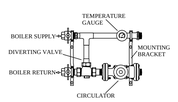
1.) RECOMMENDED MAXIMUM SURFACE TEMPERATURE IS 80°F.

2.) VARIATIONS IN TEMPERATURE REQUIRED IN COMMON ZONE LOOPS SHALL BE COMPENSATED BY ADJUSTING FLOW IN RESPECTIVE LOOPS.

3.) PROVIDE PUMP CONTROLS, ZONE VALVES, TELESTAT II CONTROLS, ETC. AS REQUIRED TO FULLY ZONE SYSTEM. THERE ARE FIVE (2) INDIVIDUAL CONTROL ZONES AS INDICATED IN THE RADIANT HEAT LOOP SCHEDULE.

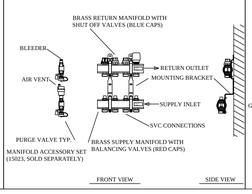
DETAIL A

BASE MIXING STATION



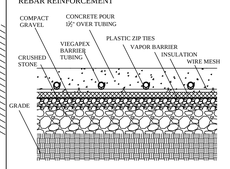
DETAIL B

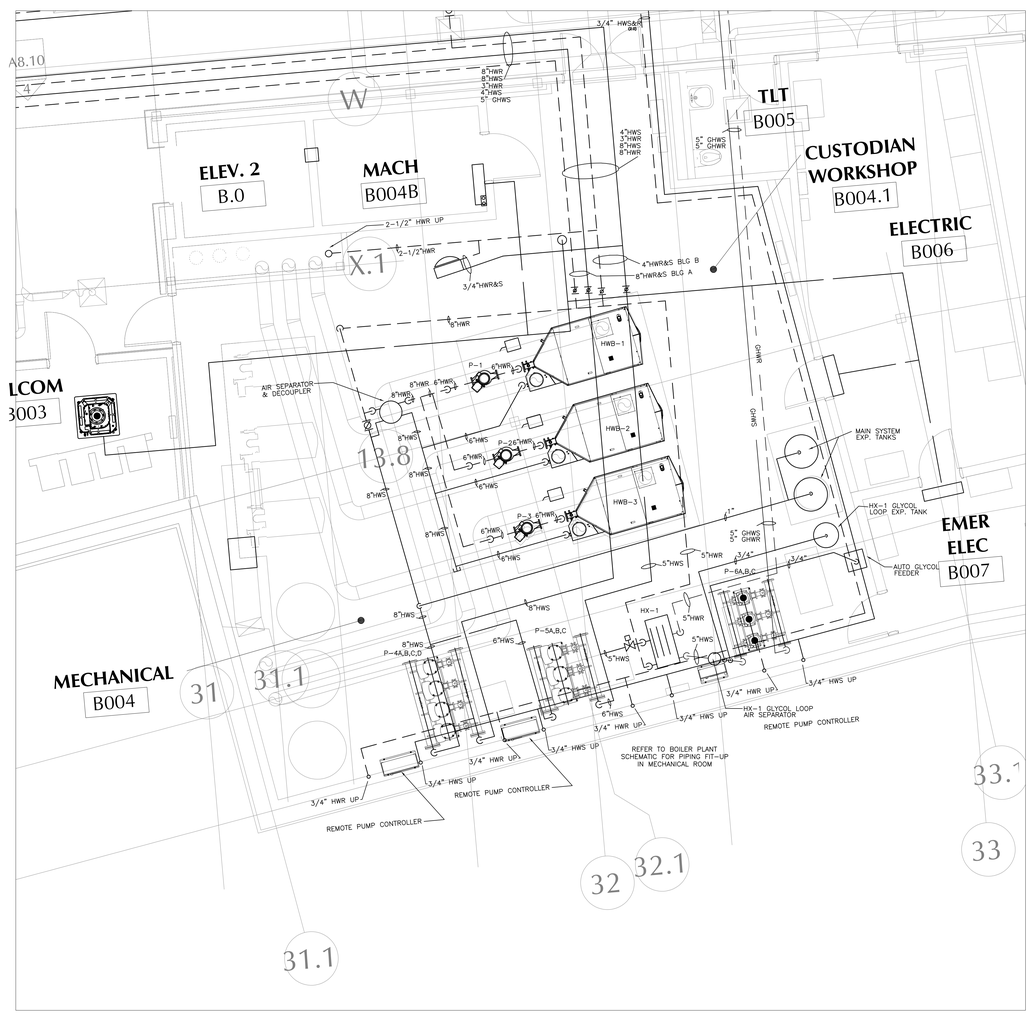
1-1/4" MANIFOLD



DETAIL C

SLAB ON GRADE USING PLASTIC ZIP TIES WITH REBAR REINFORCEMENT





ENLARGED BOILER ROOM PLAN
1/4"=1'-0"

LAMOUREUX PAGANO ASSOCIATES. ARCHITECTS
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OWNER

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Project North

PROJECT

FINAL BID PACKAGE

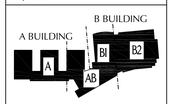
South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

HVAC Enlarged boiler room & Radiant heating

Key Plan



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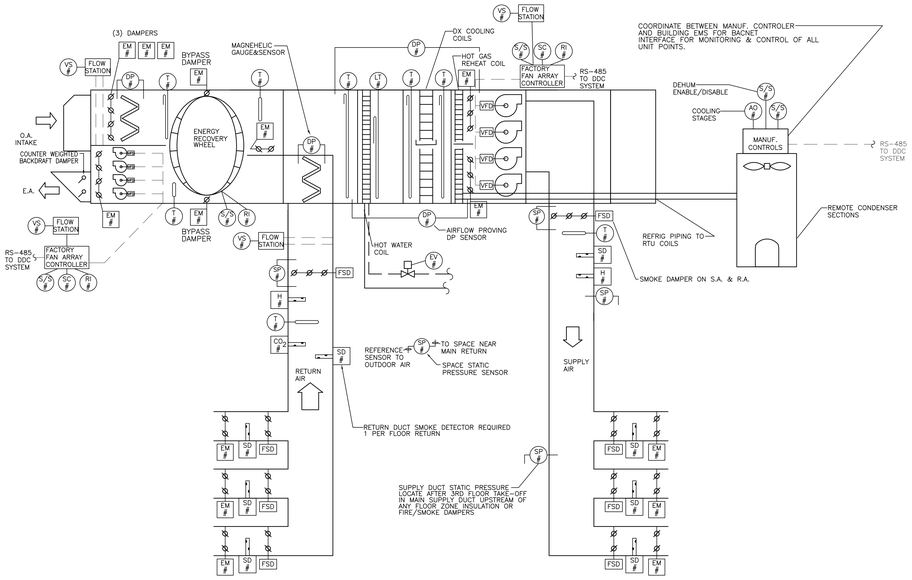
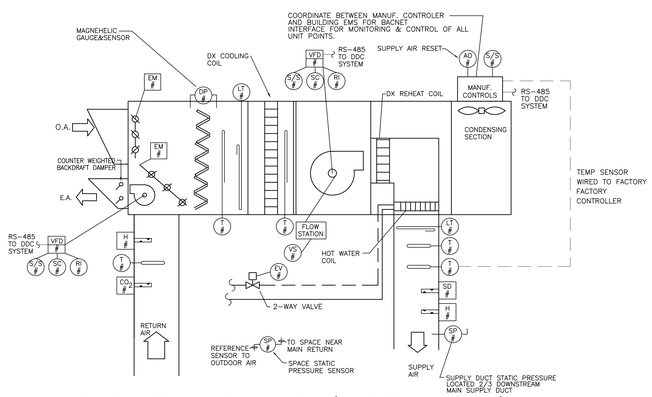
H5.3



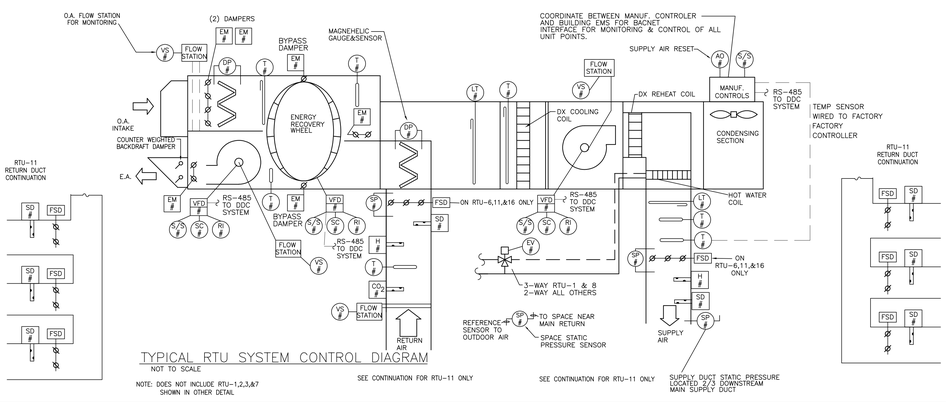
RTU-1,2&3 SYSTEM CONTROL DIAGRAM

NOT TO SCALE



RTU-7 SYSTEM CONTROL DIAGRAM (NO ENERGY RECOVERY)

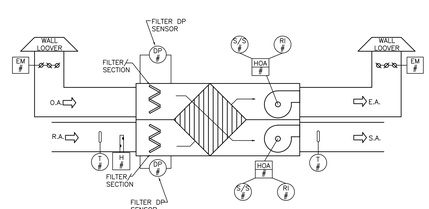
NOT TO SCALE



TYPICAL RTU SYSTEM CONTROL DIAGRAM

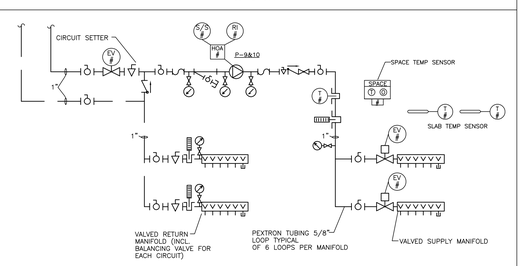
NOT TO SCALE

NOTE: DOES NOT INCLUDE RTU-1,2,3,&7 SHOWN IN OTHER DETAIL

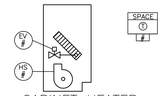


ERV-1 CONTROL DIAGRAM

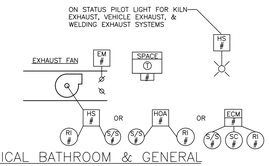
NO SCALE



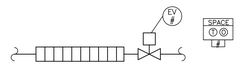
RADIANT LOOP MANIFOLD PIPING DETAIL – TYP OF (2)



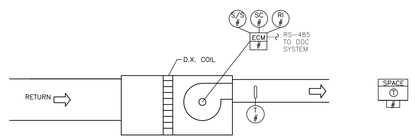
CABINET HEATER CONTROL DIAGRAM – TYP.



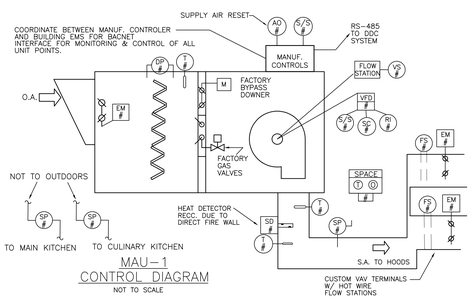
TYPICAL BATHROOM & GENERAL EXHAUST FAN CONTROL DIAGRAM



BASEBOARD HEAT CONTROL DIAGRAM – TYP.

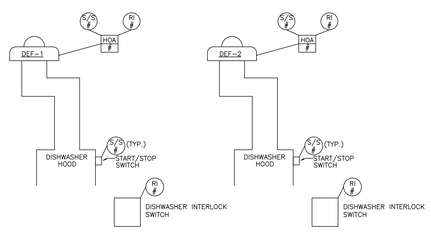


BC-1 FAN COIL UNIT CONTROL DIAGRAM TYPICAL

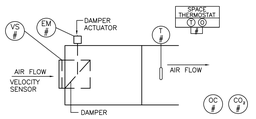


MAU-1 CONTROL DIAGRAM

NOT TO SCALE



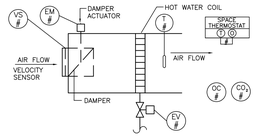
DISHWASHER EXHAUST CONTROL DIAGRAM



NOTE:
1. MECHANICAL CONTRACTOR TO COORDINATE INTERLOCKING HARDWARE, DAMPER & VALVE ACTUATORS AND VELOCITY FLOW TRANSDUCERS W/ CONTROLS CONTRACTOR & TERMINAL MANUF. BEFORE ORDERING.
2. INTERLOCK HEAT WITH PERIMETER RADIATION IN APPLICABLE ZONES.

VAV TERMINAL CONTROL DIAGRAM – TYP.

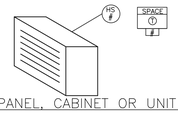
NO SCALE



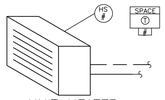
NOTE:
1. MECHANICAL CONTRACTOR TO COORDINATE INTERLOCKING HARDWARE, DAMPER & VALVE ACTUATORS AND VELOCITY FLOW TRANSDUCERS W/ CONTROLS CONTRACTOR & TERMINAL MANUF. BEFORE ORDERING.
2. INTERLOCK HEAT WITH PERIMETER RADIATION IN APPLICABLE ZONES.

VAV TERMINAL WITH HOT WATER COIL CONTROL DIAGRAM – TYP.

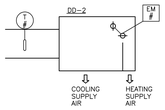
NO SCALE



ELECTRIC PANEL, CABINET OR UNIT HEATER

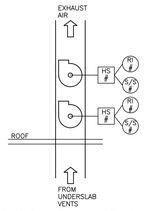


UNIT HEATER CONTROL DIAGRAM – TYP.



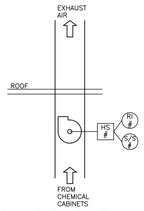
CHANGEOVER DISPLACEMENT DUFFUSERS, TYP FOR ALL DD-2

NOT TO SCALE



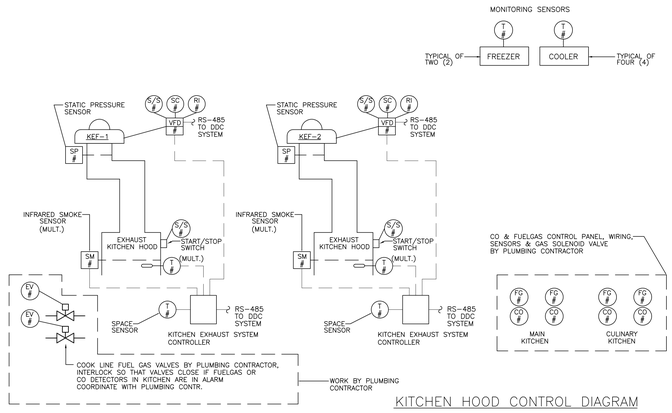
RADON EXHAUST FAN CONTROL DIAGRAM

NOT TO SCALE

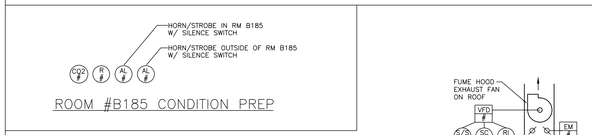


CHEMICAL CABINET EXHAUST FAN CONTROL DIAGRAM

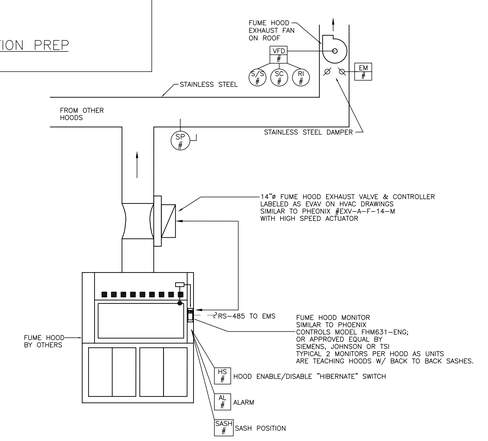
NOT TO SCALE



KITCHEN HOOD CONTROL DIAGRAM



ROOM #B185 CONDITION PREP



FUME HOOD MONITOR/CONTROL DETAIL

NOT TO SCALE — TYPICAL

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Worcester, MA

Project North

PROJECT

FINAL BID PACKAGE

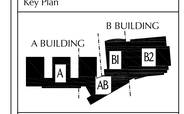
South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

HVAC Schematics & Controls

Key Plan



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FILE:

DWN. BY: DJM	JOB NO: #1611
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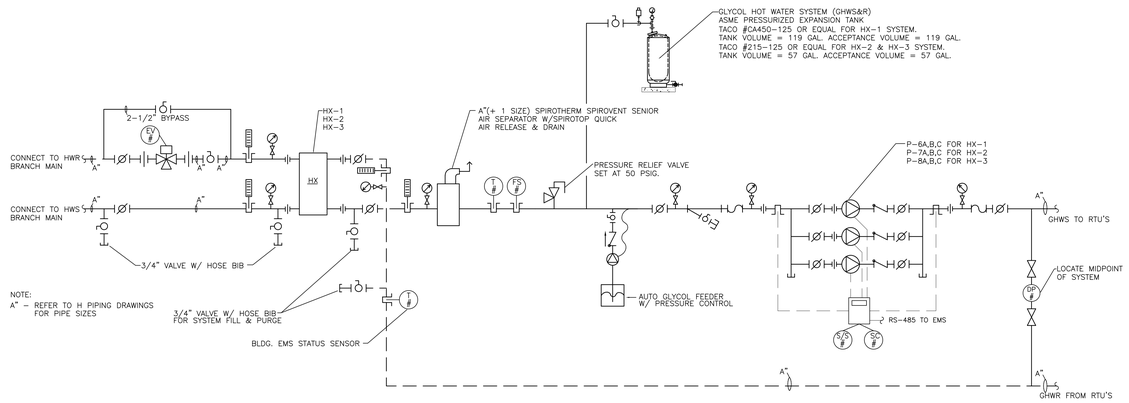
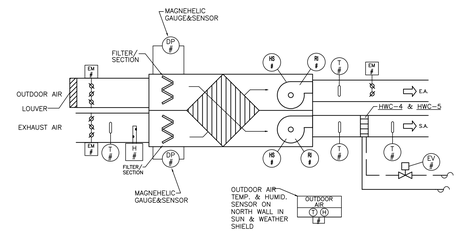
H6.1



WATER TO GLYCOL HEAT EXCHANGER PIPING & CONTROL DIAGRAM-TYPICAL OF (3)

NO SCALE

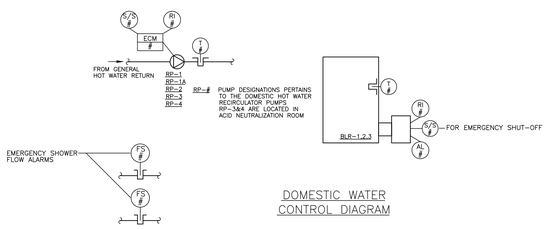


ERU-1 CONTROL DIAGRAM

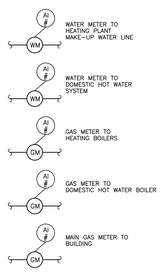
NO SCALE

CONTROLS LEGEND

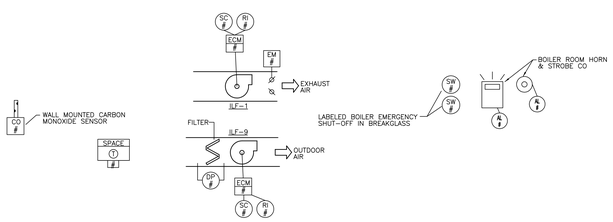
SPACE T O #	WALL MOUNTED SPACE TEMPERATURE THERMOSTAT AND/OR OCCUPANCY OVER-RIDE BUTTON
T #	WATER TEMPERATURE SENSOR/THERMOSTAT
FS #	FLOW STATION
DP #	FILTER DIFFERENTIAL PRESSURE SENSOR
VS #	VELOCITY TRANSDUCER
AO	ANALOG OUTPUT FROM EMS
EV #	ELECTRONIC VALVE ACTUATOR
EM #	ELECTRONIC DAMPER MOTOR ACTUATOR
T #	DUCT MOUNTED TEMPERATURE SENSOR/THERMOSTAT
H #	DUCT MOUNTED RELATIVE HUMIDITY SENSOR
LT #	DUCT MOUNTED LOW TEMP. FREEZE THERMOSTAT
T #	DUCT MOUNTED AVERAGING THERMOSTAT
HS #	AUTO-OFF SWITCH
HOA #	HAND-AUTO-OFF STARTER
SD #	DUCT SMOKE DETECTOR (FURNISHED BY OTHERS)
OS #	OCCUPANCY SENSOR (COORDINATE W/ ELECTRICIAN)
AL #	ALARM (DIGITAL AND ANALOG)
SM	KITCHEN HOOD SMOKE SENSOR
VS #	VELOCITY SENSOR
CO_2	CO_2 SENSOR
CO	CO SENSOR
R	REFRIGERANT SENSOR
SC #	SPEED CONTROL SIGNAL
SP #	STATIC PRESSURE SENSOR
S/S #	STATIC PRESSURE SENSOR
RI #	RUN INDICATOR
VFD #	VARIABLE FREQUENCY DRIVE
ECM #	EC MOTOR
FSD	FIRE SMOKE DAMPER
AI #	ANALOG INPUT



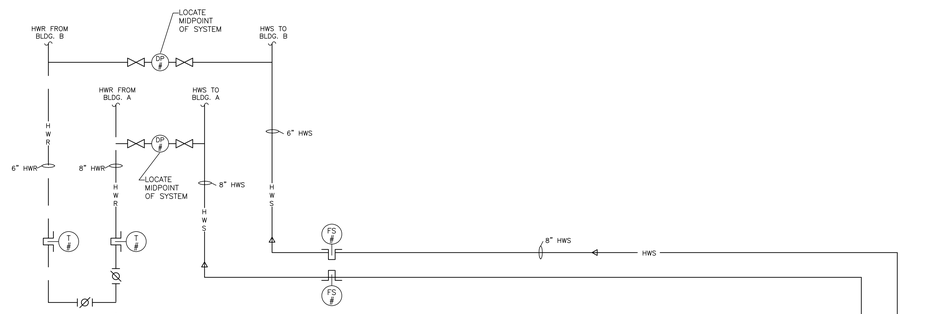
DOMESTIC WATER CONTROL DIAGRAM

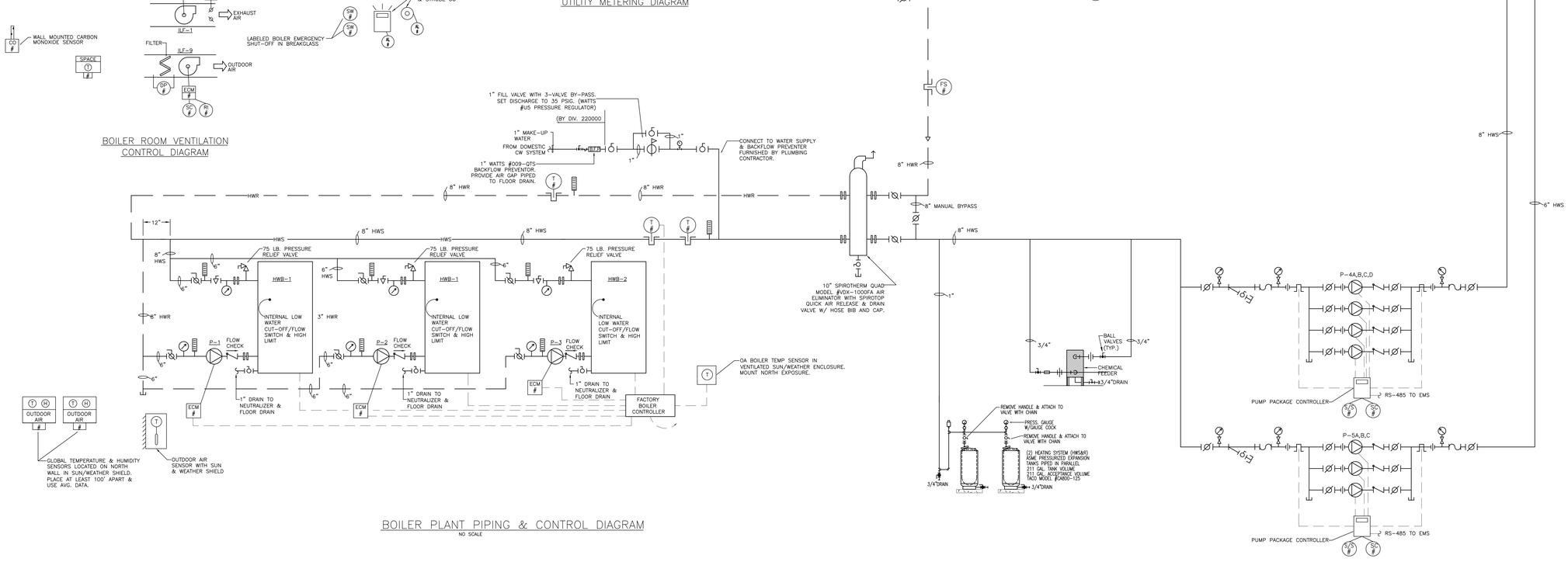


UTILITY METERING DIAGRAM



BOILER ROOM VENTILATION CONTROL DIAGRAM





BOILER PLANT PIPING & CONTROL DIAGRAM

NO SCALE

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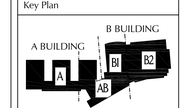
HVAC Piping Schematics & Controls

Key Plan



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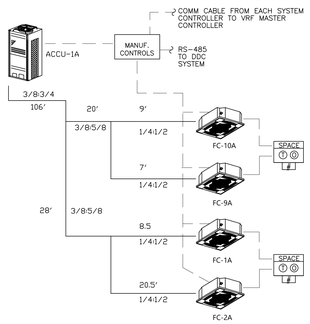
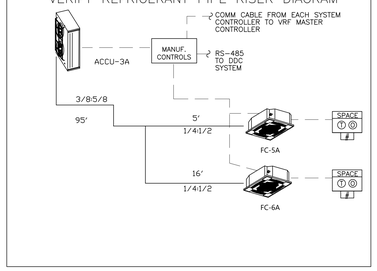
H6.2

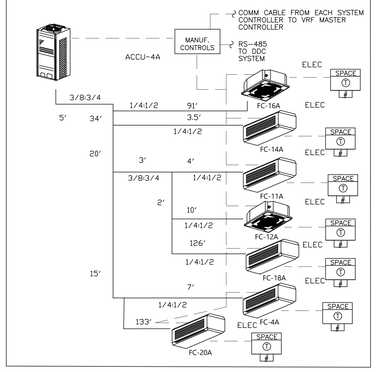
ACCU-1A SYSTEM
VERIFY REFRIGERANT PIPE RISER DIAGRAM



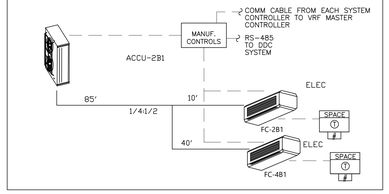
ACCU-3A SYSTEM
VERIFY REFRIGERANT PIPE RISER DIAGRAM



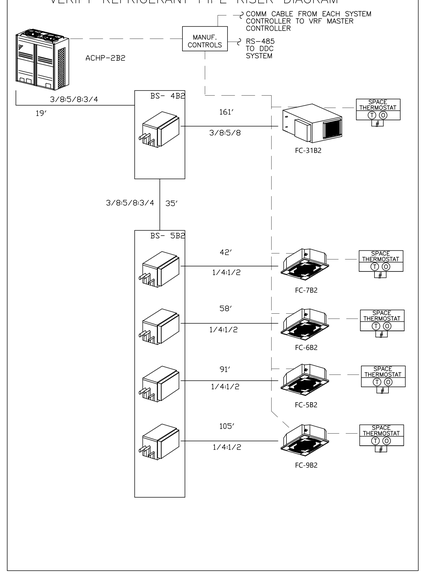
ACCU-4A SYSTEM
VERIFY REFRIGERANT PIPE RISER DIAGRAM



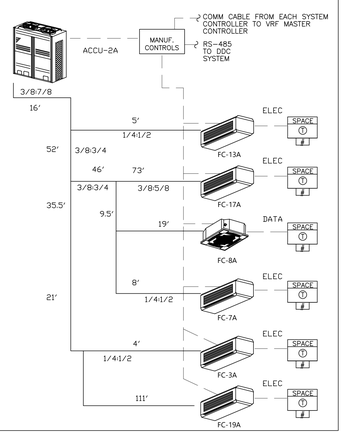
ACCU-2B1 SYSTEM
VERIFY REFRIGERANT PIPE RISER DIAGRAM



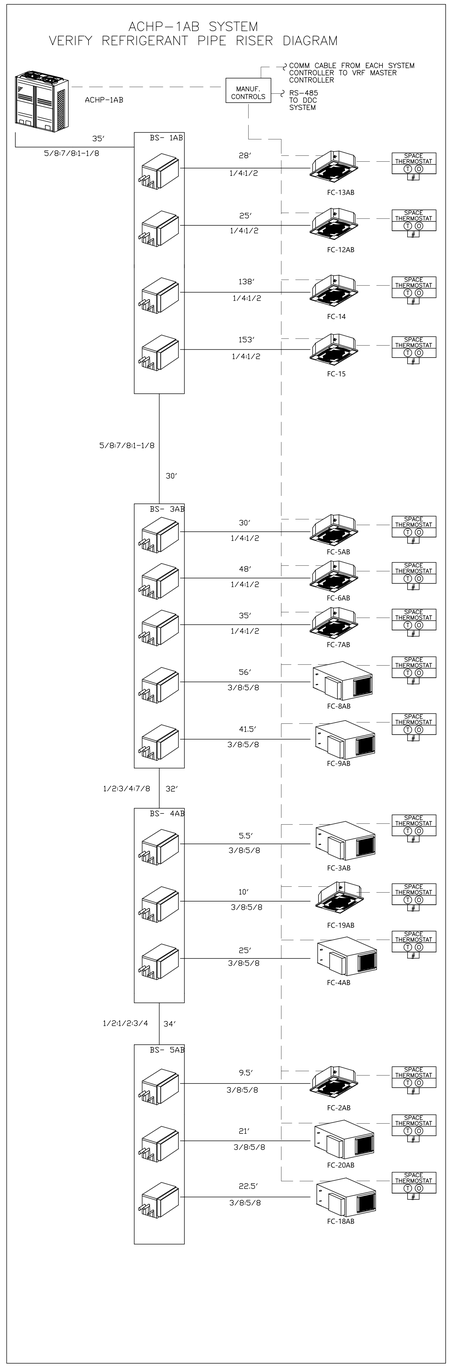
ACHP-2B2 SYSTEM
VERIFY REFRIGERANT PIPE RISER DIAGRAM



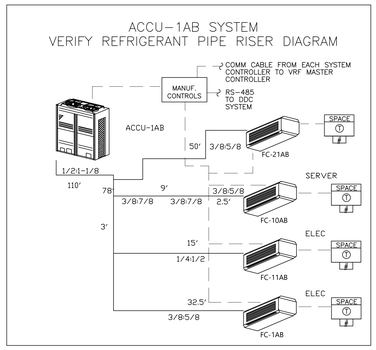
ACCU-2A SYSTEM
VERIFY REFRIGERANT PIPE RISER DIAGRAM



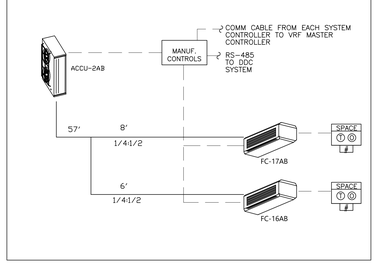
ACHP-1AB SYSTEM
VERIFY REFRIGERANT PIPE RISER DIAGRAM



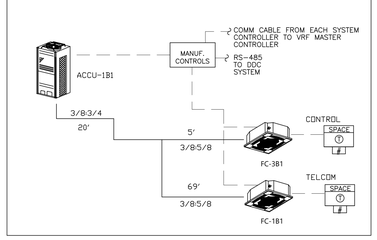
ACCU-1AB SYSTEM
VERIFY REFRIGERANT PIPE RISER DIAGRAM



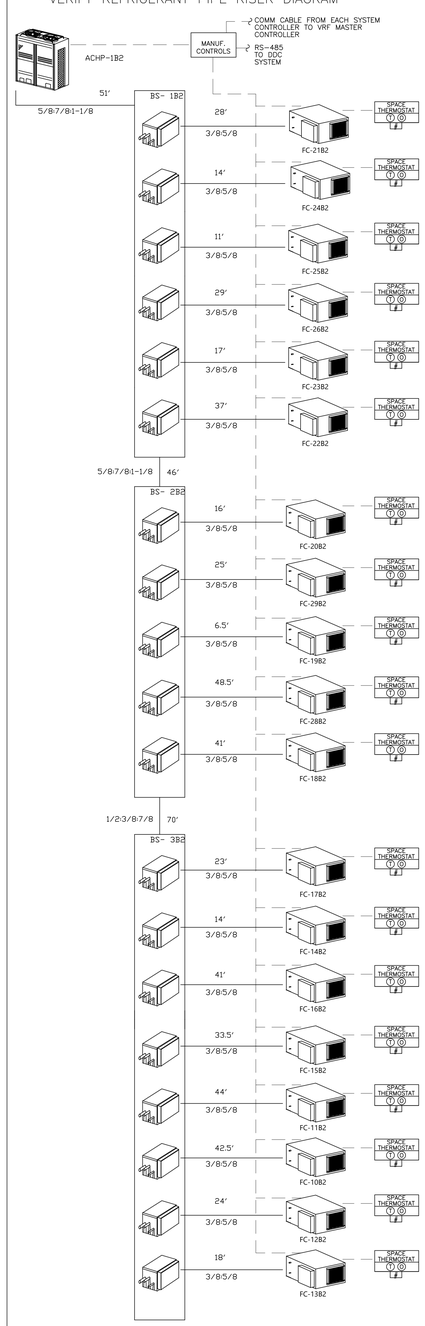
ACCU-2AB SYSTEM
VERIFY REFRIGERANT PIPE RISER DIAGRAM



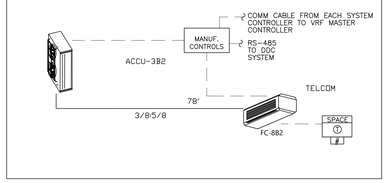
ACCU-1B1 SYSTEM
VERIFY REFRIGERANT PIPE RISER DIAGRAM



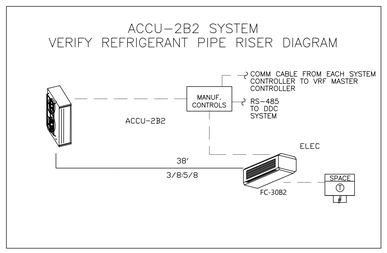
ACHP-1B2 SYSTEM
VERIFY REFRIGERANT PIPE RISER DIAGRAM



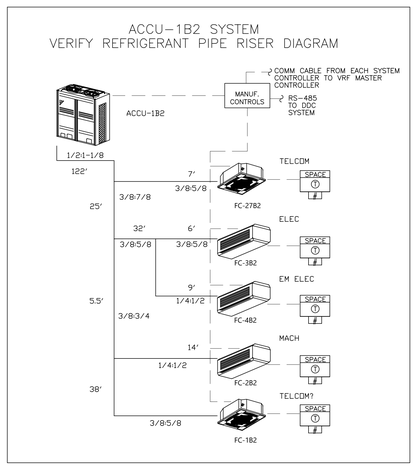
ACCU-3B2 SYSTEM
VERIFY REFRIGERANT PIPE RISER DIAGRAM

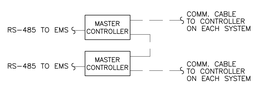


ACCU-2B2 SYSTEM
VERIFY REFRIGERANT PIPE RISER DIAGRAM



ACCU-1B2 SYSTEM
VERIFY REFRIGERANT PIPE RISER DIAGRAM





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Millbury, MA 01527 fx:508-865-1401

OWNER

Worcester Public Schools

Worcester, MA

Project North

PROJECT

FINAL BID PACKAGE

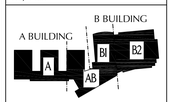
South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

VRF system & controls schematic

Key Plan



REVISIONS

No.	Description	Date

FILE:

DWN. BY: DJM	JOB NO: #1611
CKD. BY: KRS	SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

H6.3

CUSTOM FABRICATED ROOFTOP UNIT SCHEDULE

		Supply Fan Data						Exhaust Fan Data					Energy Recovery Wheel Performance										Cooling Coil Data						Heating Coil Data								Electrical Data	
Tag	Area Served	Supply CFM	Outside CFM	ESP (in wg)	TSP (in wg)	SA Fan RPM	SA Fan BHP	Return CFM	ESP	TSP	RA/EA Fan RPM	RA/EA Fan BHP	Summer EAT DB	Summer EAT WB	Summer LAT DB	Summer LAT WB	Summer Efficiency	Winter OAT DB	Winter OAT WB	Winter LAT DB	Winter LAT WB	Winter Efficiency	Coil EAT DB	Coil EAT WB	Coil LAT DB	Coil LAT WB	Total Cap (MBH)	Sen Cap (MBH)	Heater EADB	Heater LAT DB	HW Total Cap (MBH)	% PG	Entering Fluid T	Leaving Fluid T	GPM	Fluid Pressure Drop	Voltage	
RTU-1	NW Classroom RTU	39600	12000	2.5	6.09	1781	13.1	39600	1	3.11	1303	6.73	91	71	79.6	65.2	71%/66%	0	-1.6	51.2	45.9	73%/68%	76.4	63	52.4	51.9	1280.8	1029.2	64.3	77	543.6	35	140	116.2	49.1	0.99	460	See notes
RTU-2	NE Classroom RTU	40325	12000	2.5	6.21	1806	13.61	40325	1	2.89	1292	6.43	91	71	79.6	65.2	71%/66%	0	-1.6	51.2	45.9	73%/68%	76.4	63	52.2	51.7	1322	1059	64.4	80.3	690.7	35	140	110.1	49.48	3.15	460	See notes
RTU-3	SE Classroom RTU	32700	7200	2.5	6.01	1913	10.73	32700	1	3.01	1187	5.33	91	71	79.6	65.3	71%/66%	0	-1.6	50.9	45.7	73%/68%	76.1	62.8	52.2	51.7	1051.5	845.4	65.6	75.2	338.3	35	140	119.6	35.54	0.55	460	See notes

① PROVIDE MERV 8 PRE–FILTERS & MERV 13 FINAL FILTERS. REFER TO SPEC FOR SPARE FILTERS.
② PROVIDE PREMIUM EFFICIENCY O.D.P. MOTORS, PROVIDE V–F–D ON SUPPLY AND EXHAUST FAN
③ PROVIDE ROOF CURB, DOUBLE WALL CONSTRUCTION & IAQ DRAIN PAN.
④ HOT WATER COILS SIZED FOR 140F ENTERING AND 120°F LEAVING WATER TEMPERATURES
⑤ MANUFACTURER TO PROVIDE FLOW STATIONS ON OUTDOOR, RETURN AND SUPPLY AIR.
⑥ REFER TO SPECIFICATIONS FOR CONTROL REQUIREMENTS
⑦ PROVIDE NEMA 3R DISCONNECT SWITCH.
⑧ REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION
⑨ ALL UNITS SHALL HAVE HEAT RECOVERY SYSTEM
⑩ RTUs BASED ON CLIMATECRAFT, ACCEPTABLE MFR'S INCLUDE DAIKIN & INNOVENT
⑪ ALL UNITS SHALL HAVE INTEGRAL SOUND ATTENUATORS
⑫ CONDENSER PACKAGE SHALL BE ON PLATFORM WITH SLOPED DECK; PROVIDE VRF HEAT PUMP SYSTEM WITH ALL PIPING AND CONTROLS REQUIRED.
⑬ RTU–1 SHALL HAVE 1 POINT POWER (AHU–MCA=198)
RTU–2 SHALL HAVE 1 POINT POWER (AHU–MCA=198)
RTU–3 SHALL HAVE 1 POINT POWER (AHU–MCA=180)
⑭ UNITS TO HAVE INTEGRAL SOUND ATTENUATORS AT INLET AND OUTLET OF UNIT. REFER TO SOUND ATTENUATOR SCHEUDLE FOR PERFORMANCE REQUIREMENTS

PACKAGED ROOFTOP UNIT SCHEDULE

Tag	Model String	Area Servied	Supply CFM	Outside CFM	Return CFM	OA DB/WB (°F) Summer	Winter	Cooling Coil EADB (°F)	Coil EAWB (°F)	Coil LADB (°F)	Coil LAWB (°F)	Unit LADB (°F)	Unit LAWB (°F)	Total Cap (MBH)	Sen Cap (MBH)	ESP (in wg)	TSP (in wg)	SA Fan RPM	SA Fan BHP	SA Fan Model	Heat Pump DX Coil EADB (°F)	EAWB (°F)	LADB (°F)	LAWB (°F)	Output (MBH)	Hot Water Coil Heating EADB (°F)	EAWB (°F)	LADB (°F)	LAWB (°F)	EWT (°F)	Heat Output (MBH)	HWC (GPM)	HWC PD (FT)	RA/EA Fan RPM	RA/EA Fan BHP	RA/EA Fan Model	Heat Recovery Wheel Summer HW LA WB/DB (°F)	HW Total Cap (MBH)	Heat Recovery Wheel Winter HW LA WB/DB (°F)	HW Total Cap (MBH)	HW Model	Voltage	MCA	MOCP
RTU-4	RN-016-3-0-EA09-EHN	SE Science Classrooms	5100	5100	5100	91/71	0/0	80.60	65.67	53.98	52.94	57.38	54.35	186.93	143.53	3	5.21	1562	6.81	1 X 270D60	N/A	N/A	N/A	N/A	N/A	45.5	41.2	65.1	50.4	140	113.2	20	1.4	1603	3.7	1 x RM220A	80.42/65.48	97.42	44.17/40.59	349.7	1 x ERC-5245	460/3/60	51	60
RTU-5	RN-031-3-0-EB0A-EHJ	SW Science Classrooms	13300	13300	13330	91/71	0/0	76.13	62.81	53.12	52.69	57.80	54.62	377.06	326.52	4.5	6.06	1763	12.42	2 x 270D	N/A	N/A	N/A	N/A	N/A	65.1	54.9	72.5	57.6	140	108	11	0.6	1194	4.59	2 x RM270	78.07/64.11	111.15	55.15/48.18	397.42	2 c ERC-5245	460/3/60	121	125
RTU-6	RN-040-3-0-EB0A-EJN	Media Center	15975	3800	15975	91/71	0/0	75.64	62.46	52.83	52.32	57.87	54.41	452.02	389.19	4	6.32	1595	16.09	2 x 300	N/A	N/A	N/A	N/A	N/A	66.9	56.1	90.6	64.4	140	405.1	30	5.3	1153	4.07	2 x RM270	77.71/63.89	92.57	56.90/49.32	330.66	2 x ERC-5245	460/3/60	151	175
RTU-7	RN-020-3-0-E60E-EJL	Kitchens	7000	7000	7000	91/71	0/0	80.00	67.00	56.63	55.94	58.52	56.68	232.24	173.22	1.5	3.2	1039	3.4	1 x 270	49.1	49.1	64.1	54.1	100.3	49.1	49.1	88.5	64.1	140	309.8	20	2.2	1039	3.4	1 x 270	N/A	N/A	N/A	N/A	N/A	460/3/60	67	80
RTU-8	RN-020-3-0-E60E-EHN	Auditorium Front	7300	3500	7300	91/71	0/0	76.92	63.30	53.20	52.39	55.69	53.43	222.60	184.39	2.5	4.24	1605	7.14	1 x 245	60.8	52.3	75.4	58.1	122.3	60.8	52.3	73.4	57.2	140	97.6	15	0.8	1837	5.18	1 x RM220A	79.00/64.66	76.46	50.72/45.23	273.95	1 x ERC-5245	460/3/60	67	80
RTU-9	RN-020-3-0-E60F-EHN	Auditorium Back	7400	3500	7400	91/71	0/0	76.89	63.28	53.35	52.51	55.85	53.56	222.92	185.57	2.5	4.05	1587	6.91	1 x 245	60.9	52.3	74.7	57.9	122.4	60.9	52.3	73.1	57.1	140	99.2	15	0.8	1857	5.33	1 x RM220A	79.00/64.66	76.46	50.72/45.23	273.95	1 x ERC-5245	460/3/60	67	80
RTU-10	RN-026-3-0-EBOA-EJN	Cafeteria	10700	5000	10700	91/71	0/0	76.55	63.11	53.39	53.07	56.01	54.15	302.56	264.16	3	4.31	1611	11.16	1 x 270D	N/A	N/A	N/A	N/A	N/A	63.2	53.6	90.3	63.5	140	317	23	3.6	1013	2.79	2 x RM270	78.19/64.19	117.07	54.57/47.81	418.7	2 x ERC-5245	460/3/60	83	100
RTU-11	RN-050-3-0-EA0A-EJN	Lobby	16900	2100	16900	91/71	0/0	75.25	62.18	49.62	49.39	53.66	51.17	584.24	462.47	4	5.88	1743	13.62	2 x 270D	N/A	N/A	N/A	N/A	N/A	68.8	57.2	92	65.2	140	394.5	30	5.3	1172	4.23	2 x RM270	76.97/63.45	54.07	60.42/51.53	192.74	2 x ERC-5245	460/3/60	149	150
RTU-12	RN-020-3-0-EA0A-EJN	Life Skills	7060	2500	7060	91/71	0/0	76.13	62.79	51.62	50.97	55.01	52.43	230.76	184.52	4	5.79	2105	9.43	1 x 220	N/A	N/A	N/A	N/A	N/A	64.5	54.6	92.6	64.6	140	215.9	30	4.5	1764	4.56	1 x RM220A	78.20/64.19	58.53	54.56/47.80	209.35	1 x ERC-5245	460/3/60	63	80
RTU-13	RN-026-3-0-EA0A-EJN	Music/Theater	10205	2500	10205	91/71	0/0	75.78	62.55	53.92	52.73	56.97	54.00	281.52	238.19	4	5.15	1664	12.43	1 x 270D	N/A	N/A	N/A	N/A	N/A	66.2	55.7	97.1	66.3	140	343.1	30	5.2	894	1.93	2 x RM270	77.15/63.56	63.53	59.56/50.99	226.57	2 x ERC-5245	460/3/60	83	100
RTU-14	RN-026-3-0-EB0A-EJM	Art	9305	9305	9305	91/71	0/0	79.93	65.20	54.04	53.84	56.56	54.86	305.93	255.19	2	4.25	1514	9.36	1 x 270D	N/A	N/A	N/A	N/A	N/A	46.3	42.1	87.8	59.7	140	435.3	50	2.8	1120	2.66	2 x RM270B70	79.92/65.19	186.41	46.41/42.21	668.89	2 x ERC-5245	460/3/60	83	100
RTU-15	RQ-003-3-V-EA09-EJM	Admin Ventilation	1100	1100	1100	91/71	0/0	81.92	66.39	54.36	53.64	57.66	54.98	40.93	31.98	1.5	3.49	1955	1.27	1 x RQ185D60-VFD	N/A	N/A	N/A	N/A	N/A	40.3	38.3	85.2	58.3	140	56.5	15	1.4	1421	0.34	1 x RN150D70	81.97/66.42	15.84	40.01/38.05	63.33	1 x ERC-2108	460/3/60	15	20
RTU-16	RN-055-3-0-LA0A-EJN	Auto/Diesel Shop	15750	15750	15757	91/71	0/0	81.37	65.86	51.70	51.21	54.03	52.21	653.52	493.22	1.5	3.44	1313	7.2	2 x RNE270	N/A	N/A	N/A	N/A	N/A	39.8	37.9	95.9	62	140	1012.5	135	12	971	4.63	2 x RNE300	81.37/65.86	282.07	39.76/37.89	1003.73	1 x ERC-81146C	460/3/60	163	175
RTU-17	RN-014-3-0-GA05-EHJ	Business Classrooms	5100	1400	5100	91/71	0/0	75.60	62.50	52.40	51.90	54.70	52.90	148.90	126.40	3	3.9	1369	4.6	1 x 270D60	N/A	N/A	N/A	N/A	N/A	67	56.1	76.5	59.5	140	52.9	10	0.4	1748	3	1 x RM220AB70	77.28/63.64	35.2	58.93/50.60	125.69	1 x ERC-5245	460/3/60	43	50
RTU-18	RN-014-3-0-GA05-EHJ	Weight Room	3500	3500	3500	91/71	0/0	79.14	64.83	50.15	49.92	53.59	51.42	144.39	107.51	3	4.65	1699	4.62	1 x 245D60	N/A	N/A	N/A	N/A	N/A	51.9	45.7	94.4	62.6	140	166.4	25	3.5	1346	2.17	1 x RM220A	79.00/64.66	76.46	50.73/45.24	273.95	1 x ERC-5245	460/3/60	36	40
RTU-19	RN-020-3-0-EA0A-EJN	Pre-K	7075	2500	7075	91/71	0/0	76.13	62.78	51.62	50.97	55.02	52.43	230.81	184.89	4	5.79	2107	9.45	1 x 220	N/A	N/A	N/A	N/A	N/A	64.5	54.6	92.5	64.6	140	216	30	4.5	1767	4.58	1 x RM220A	78.20/64.19	58.53	54.56/47.80	209.35	1 x ERC-5245	460/3/60	63	80
RTU-20	RN-016-3-0-EAOA-EJN	Gym Small court	6100	2300	6100	91/71	0/0	76.14	62.80	53.45	52.23	56.17	53.37	178.88	147.60	3	4.4	1832	6.2	1 x 220	64.5	54.6	79.2	60.2	106.7	64.5	54.6	94.8	65.3	140	202.2	30	4.6	1576	3.3	1 x RM220A	78.03/64.09	54.57	55.34/48.31	195.11	1 x ERC-5245	460/3/60	51	60
RTU-21	RN-040-3-0-E60F-EJN	Gym Main Court	14000	8200	14000	91/71	0/0	77.63	63.75	53.21	52.36	55.73	53.41	447.51	363.59	2	3.9	1389	13.2	1 x 300D	57.4	50.1	72.3	56.3	251.7	57.4	50.1	87.6	61.7	140	468	30	5.5	1151	4.1	2 x RM270	79.48/64.94	171.41	48.45/43.65	614.66	2 x ERC-5245	460/3/60	124	150
RTU-22	RN-026-3-0-EB0A-EJN	Locker Rooms	9100	9100	9100	91/71	0/0	79.85	65.16	53.71	53.56	56.96	54.89	304.80	251.98	3	5.19	1631	11.78	1 x 270D	N/A	N/A	N/A	N/A	N/A	46.7	42.4	90.6	60.8	140	450.5	40	8.1	1106	2.56	2 x RM270B70	79.84/65.15	183.77	46.79/42.48	659.36	2 x ERC-5245	460/3/60	83	100
RTU-23	RQ-005-3-V-EA09-EJM	Wellness Center	1570	1180	1570	91/71	0/0	80.67	65.59	52.39	51.92	55.69	53.31	61.32	46.93	1.5	3.72	2190	1.81	1 x RQ185D60-VFD	N/A	N/A	N/A	N/A	N/A	43.6	40.4	87.9	59.5	140	78.9	40	9.4	1420	0.44	1 x RN150	82.60/66.75	15.84	34.66/32.96	57.38	1 x ERC-2108	460/3/60	17	25
RTU-24	RQ-003-3-V-EA09-EJM	Kitchen Culinary Vent	1335	1335	1335	91/71	0/0	80.67	65.59	52.39	51.92	55.69	53.31	61.32	46.93	1.5	3.72	2190	1.81	1 x RQ185D60-VFD	N/A	N/A	N/A	N/A	N/A	43.6	40.4	87.9	59.5	140	78.9	9	1.2	1420	0.44	1 x RN150	83.64/68.71	9.89	32.56/32.10	63.33	1 x ERC-2108	460/3/60	17	25

① PROVIDE MERV 8 PRE–FILTERS & MERV 13 FINAL FILTERS. REFER TO SPEC FOR SPARE FILTERS.
② PROVIDE PREMIUM EFFICIENCY O.D.P. MOTORS, PROVIDE V–F–D ON SUPPLY AND EXHAUST FAN
③ PROVIDE SPRING CURB VIBRATION ISOLATION, DOUBLE WALL CONSTRUCTION & IAQ DRAIN PAN.
④ HOT WATER COILS SIZED FOR 140F ENTERING AND 120°F LEAVING WATER TEMPERATURES WITH 30% GLYCOL.
⑤ MANUFACTURER TO PROVIDE FLOW STATIONS ON OUTDOOR, RETURN AND SUPPLY AIR.
⑥ REFER TO SPECIFICATION FOR CONTROL REQUIREMENTS
⑦ PROVIDE NEMA 3R DISCONNECT SWITCH.
⑧ REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION
⑨ ALL UNITS SHALL HAVE TOTAL ENERGY RECOVERY SYSTEMS UNLESS NOTED OTHERWISE(RTU–7 HAS NO ER WHEEL)
⑩ RTUs BASED ON AAON, ACCEPTABLE MFR'S INCLUDE DAIKIN OR VALENT

FAN SCHEDULE

			EF–1	EF–2	EF–3	EF–4	EF–5,6	EF–7	EF–8,9	EF–10	EF–11	EF–12	EF–13	EF–14	EF–15
	UNIT NUMBER		EF–1	EF–2	EF–3	EF–4	EF–5,6	EF–7	EF–8,9	EF–10	EF–11	EF–12	EF–13	EF–14	EF–15
	SERVICE		SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS
	TYPE		EXHAUST FAN	EXHAUST FAN	EXHAUST FAN	EXHAUST FAN	EXHAUST FAN	EXHAUST FAN	EXHAUST FAN	EXHAUST FAN	EXHAUST FAN	EXHAUST FAN	EXHAUST FAN	EXHAUST FAN	EXHAUST FAN
FANS	MANUFACTURER		GREENHECK	GREENHECK	GREENHECK	GREENHECK	GREENHECK	GREENHECK	GREENHECK	GREENHECK	GREENHECK	GREENHECK	GREENHECK	GREENHECK	GREENHECK
	MODEL #		G–095–VG	G–097–VG	G–095–VG	G–163–VG	G–098–VG	G–163–VG	G–097–VG	G–097–VG	G–097–VG	G–103HP–VG	G–123–VG	G–099–VG	G–009–VG
	C.F.M.		300	200	300	2250	450	3125	75	175	150	300	1000	525	750
	STATIC PRESS. (IN WG)		0.75"	0.75"	0.75"	1.5"	1.0"	1.5"	0.5"	0.75"	0.75"	1.0"	1.0"	1.0"	1.0"
	FAN RPM		1639	1582	1639	1422	1680	1576	1117	1681	1626	1709	1441	1589	1706
	FAN BHP		0.11	0.09	0.11	1.01	0.16	1.48	0.02	0.10	0.09	0.13	0.27	0.17	0.24
	HVI RATED FAN SONES		11.1	8.3	11.1	16.6	10.1	21	4.4	9.0	8.3	9.9	11.7	9.7	11.5
MOTOR & STARTER	MOTOR	TYPE	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM
		H.P	1/6	1/4	1/6	2	1/4	2	1/4	1/4	1/4	1/4	1/2	1/4	1/4
		WATTS	–	–	–	–	–	–	–	–	–	–	–	–	–
		AMPS	–	–	–	–	–	–	–	–	–	–	–	–	–
		VOLTAGE/PHASE	115–1	115–1	115–1	208–1	115–1	208–1	115–1	115–1	115–1	115–1	115–1	115–1	115–1
	STARTER	TYPE	ECM(M)	ECM(M)	ECM(M)	ECM(M)	ECM(M)	ECM(M)	ECM(M)	ECM(M)	ECM(M)	ECM(M)	ECM(M)	ECM(M)	ECM(M)
		NEMA SIZE	–	–	–	–	–	–	–	–	–	–	–	–	–
		CONTROL	EMS	EMS	EMS	EMS	EMS	EMS	EMS	EMS	EMS	EMS	EMS	EMS	EMS
		AUX. CONTACTS	–	–	–	–	–	–	–	–	–	–	–	–	–
			①	①	①	①	①	①	①	①	①	①	①	①	①

			HEF–1,2	HEF–3	KEF–1	KEF–2	DEF–1,2	UEF–1(2 FANS)	VEF–1	VEF–2	VEF–3
	UNIT NUMBER		HEF–1,2	HEF–3	KEF–1	KEF–2	DEF–1,2	UEF–1(2 FANS)	VEF–1	VEF–2	VEF–3
	SERVICE		SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS
	TYPE		HOOD EXHAUST FAN	HOOD EXHAUST FAN	KITCHEN EXH. FAN	KITCHEN EXH. FAN	DISHWASH EXH. FAN	UNDERSLAB EXH. FAN	VEHICLE EXH. FAN	VEHICLE EXH. FAN	VEHICLE EXH. FAN
FANS	MANUFACTURER		GREENHECK	GREENHECK	GREENHECK	GREENHECK	GREENHECK	FANTECH	GREENHECK	GREENHECK	GREENHECK
	MODEL #		VEKTOR–H–22	VEKTOR–H–16	CUBE–360HP–VGD–75	CUBE–360HP–VGD–75	CUE–099–VG	(2)HP220	QEI–15–II–75	QEI–9–II–30	QEI–9–II–30
	C.F.M.		(MAX)5600(MIN)1400	(MAX)4200(MIN)1400	11360	10635	600	260	(MAX)4500(MIN)500	(MAX)1600(MIN)800	(MAX)1200(MIN)300
	STATIC PRESS. (IN WG)		1.5"	1.5"	2.0"	2.0"	1.0"	1.0"	5.0"	5.0"	5.0"
	FAN RPM		(MAX)1722(MIN)1595	(MAX)2431(MIN)2369	805	786	1649	–	(MAX)3093	(MAX)3653	(MAX)3380
	FAN BHP		6.14	4.68	6.34	5.87	0.19	–	6.34	2.57	2.04
	HVI RATED FAN SONES		75(db)	78(db)	25	24	9.6	–	13.5	12.9	12.3
MOTOR & STARTER	MOTOR	TYPE	VFD	VFD	ODP(VFD)	ODP(VFD)	ECM	ECM	ODP(VFD)	ODP(VFD)	ODP(VFD)
		H.P	5	5	7–1/2	7–1/2	1/4	–	7–1/2	3	3
		WATTS	–	–	–	–	–	(2)152	–	–	–
		AMPS	–	–	–	–	–	(2)1.3	–	–	–
		VOLTAGE/PHASE	460–3	460–3	460–3ø	460–3ø	115–1	115–1	208V–3	208V–3	208V–3
	STARTER	TYPE	V–F–D	V–F–D	V–F–D	V–F–D	ECM(M)	ECM(M)	V–F–D	V–F–D	V–F–D
		NEMA SIZE	–	–	–	–	–	–	–	–	–
		CONTROL	HOOD CONTROLS	HOOD CONTROLS	HOOD CONTROLLER	HOOD CONTROLLER	D.W. INT. & SW.	EMS	EMS	EMS	EMS
		AUX. CONTACTS	–	–	–	–	–	–	–	–	–
			②	③	④	④	⑤	⑥	⑦	⑦	⑦

			ILF–1	ILF–2	ILF–3	ILF–4	ILF–5	ILF–6	ILF–7	ILF–8	ILF–9
	UNIT NUMBER		ILF–1	ILF–2	ILF–3	ILF–4	ILF–5	ILF–6	ILF–7	ILF–8	ILF–9
	SERVICE		SEE PLANS	SEE PLANS	SEE PLANS	KILN	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS
	TYPE		INLINE EXH. FAN	INLINE EXH. FAN	INLINE EXH. FAN	INLINE EXH. FAN	INLINE EXH. FAN	INLINE EXH. FAN	INLINE EXH. FAN	INLINE EXH. FAN	INLINE EXH. FAN
FANS	MANUFACTURER		GREENHECK	GREENHECK	GREENHECK	SKUTT	FANAM	FANTECH	GREENHECK	GREENHECK	GREENHECK
	MODEL #		SQ–140–VG	QEID–12–65–M20	SQ–160–VG	ENVIROVENT 2	ICF150	DBF110	SQ–120–VG	SQ–99–VG	–
	C.F.M.		2175	2800	1450	140	80	120	1300	800	1700
	STATIC PRESS. (IN WG)		0.75"	4.8"	0.75"	0.25"	0.5"	0.5"	1.0"	0.5"	0.5"
	FAN RPM		1458	4373	988	–	–	2761	–	–	–
	FAN BHP		0.60	1.93	0.31	–	–	–	–	–	–
	HVI RATED FAN SONES		9.6	41	5.1	–	–	–	–	–	–
MOTOR & STARTER	MOTOR	TYPE	ECM	OPD(VFD)	ECM	ODP	ODP	ODP	ECM	ECM	ECM
		H.P	3/4	2	3/4	–	–	–	1/2	1/4	1/4
		WATTS	–	–	–	–	–	78	–	–	–
		AMPS	–	–	–	1.4	2.5	–	–	–	–
		VOLTAGE/PHASE	115–1	460V–3	115–1	115–1	115–1	115–1	115–1	115–1	115–1
	STARTER	TYPE	ECM(M)	V–F–D	ECM(M)	INTEGRAL	ECM(M)	INTEGRAL	ECM(M)	ECM(M)	ECM(M)
		NEMA SIZE	–	–	–	–	–	–	–	–	–
		CONTROL	EMS	WELDING SWITCH	EMS	KILN CONTROL	EMS	AUTOMATIC	ALL LIGHT SWITCHES	TSTAT	TSTAT
		AUX. CONTACTS	–	–	–	–	–	–	–	–	–
			⑧	⑧	⑧	⑧	⑧	⑧⑨	⑧	⑧	⑧⑩

– APPROVED MANUFACTURERS ARE GREENHECK, TWIN CITY, COOK OR EQUAL, ECM(M) = ECM W/MOUNTED POTENTIOMETER DIAL; ECM = ECM WITH INTEGRAL TRANSFORMER FOR 0–10V EMS SIGNAL CONTROL

① PROVIDE INSULATED ROOF CURB, PREMIUM EFFICIENT MOTOR, NEMA 3R WEATHER PROOF DISCONNECT SWITCH, AND MOTORIZED DAMPER. PROVIDE MOTOR–VARI–GREEN ECM(M) W/MOUNTED POTENTIOMETER DIAL.

② PROVIDE INSULATED DOUBLE WALLED SEISMIC ROOF CURB; INLET POSITION A–PLENUM W/ BOTTOM EXHAUST INTAKE LOCATION, MOTORIZED S.S. ISOLATION DAMPER. HI–PRO POLYESTER COATING–INDUSTRIAL GREY, ROOF CURB–GPF–LE. CLASS F MOTOR INSULATION. INVERTER RATED MOTOR. DISCONNECT SWITCH NEMA 3R, UL705 LISTED. 18" NOZZLE SIZE, PLUME HEIGHT 27.7'

③ PROVIDE INSULATED DOUBLE WALLED SEISMIC ROOF CURB; INLET POSITION A–PLENUM W/ BOTTOM EXHAUST INTAKE LOCATION, MOTORIZED S.S. ISOLATION DAMPER. HI–PRO POLYESTER COATING–INDUSTRIAL GREY, ROOF CURB–GPF–LE. PREMIUM EFFICIENT MOTOR. DISCONNECT SWITCH NEMA 3R, UL705 LISTED. 15" NOZZLE SIZE, PLUME HEIGHT 26.6'

④ PROVIDE NFPA 96 VENTILATED HINGED ROOF CURB, PREMIUM EFFICIENT MOTOR. PROVIDE UL–762 LISTED, HEAT BAFFLE, CLEAN OUT PORT, AND GREASE TRAP WITH ABSORBANT AND DRAIN CONNECTION. INTERFACE FAN OPERATION WITH RESPECTIVE HOOD FAN SWITCH.

⑤ PROVIDE INSULATED ROOF CURB, PREMIUM EFFICIENT MOTOR, NEMA 3R WEATHER PROOF DISCONNECT SWITCH, AND MOTORIZED DAMPER. PROVIDE MOTOR–VARI–GREEN ECM W/ MOUNTED POTENTIOMETER DIAL. INTERFACE FAN OPERATION WITH RESPECTIVE HOOD FAN SWITCH. PROVIDE STAINLESS STEEL FASTENERS.

⑥ FURNISH FANS FOR RADON UNDERSLAB VENT SYSTEM; TWO FANS IN SERIES PER RADON VENT RISER. FURNISH FANS TO PLUMBING CONTRACTOR. RADON VENT SYSTEM BY P.C. MECHANICAL CONTRATOR TO PROVIDE CONTROL OF FAN BY EMS.

⑦ PROVIDE INVERTER RATED MOTOR (ECM WHERE NOTED). DISCONNECT SWITCH, AND VIBRATION ISOLATION HANGER SYSTEM, PROVIDE CONTROLS AS SCHEDULED; STARTER WHERE SCHEDULED H–O–A OR VFD'S WHERE SCHEDULED. REFER TO VE DETAILS

⑧ PROVIDE INVERTER RATED MOTOR (ECM WHERE NOTED). DISCONNECT SWITCH, AND VIBRATION ISOLATION HANGER SYSTEM, PROVIDE CONTROLS AS SCHEDULED; STARTER WHERE SCHEDULED H–O–A OR VFD'S WHERE SCHEDULED.

⑨ PROVIDE DRYER RATED FAN W/ INTEGRAL PRESSURE SWITCH & TIMER CONTROL

⑩ PROVIDE INTAKE FILTER RACK W/ MERV 8 FILTERS. SEE SPEC FOR SPARE FILTERS

EQUIPMENT NOTES:

CP–1 LITTLE GIANT MODEL #VCM–20ULS AUTOMATIC CONDENSATE PUMP
30 GPM @ 9' HEAD, 1/50 HP, 115 V – 1ø; PROVIDE
SAFETY SWITCH AND CHECK VALVE.

ASF–1 AIRIUS THERMAL EQUALIZER FAN, DESIGNER SERIES MODEL #Q–50–EC–STD–100–130–C
120 VOLT–1 PHASE, 0–110 WATTS, 0–1450 RPM
0–1450 CFM. PROVIDE ELECTRICALLY COMMUTATED 92% EFFICIENT MOTOR
PROVIDE EMS INTERFACE, VARIABLE SPEED FAN CONTROL OPTION

BC–1 INDOOR BLOWER COIL PRICE MODEL FCHCP–06
120 VOLT–1 PHASE 1/10HP, 1.8A; PROVIDE (1 RW HEATING COIL)
200 CFM @ 0.25"ESP. PROVIDE ELECTRICALLY COMMUTATED 92% EFFICIENT MOTOR
PROVIDE EMS INTERFACE, VARIABLE SPEED FAN CONTROL OPTION

ENERGY RECOVERY UNIT SCHEDULE

	UNIT NUMBER	ERU–1			
	MANUFACTURER	GREENHECK			
	MODEL NUMBER	MINICORE–5			
	SERVICE	OUTDOOR AIR		EXHAUST AIR	
	SEASON	SUMMER	WINTER	SUMMER	WINTER
AIR DATA	FLOW RATE (CFM)	375		425	
	TEMP. ENTERING (DB/WB)	91°F/74°F	0	75°F	70°F
	TEMP. LEAVING (DB/WB)	78/65	50	–	–
	EXT. STATIC PRESS.	0.6"		0.7"	
	EXCHANGER EFFICIENCY	71.6%			
	FAN HP	1/3 H.P.		1/3 H.P.	
	MCA	17.6			
	MOCP	25			
	VOLTS–PH–HZ	115–1ø–60HZ			
	NOTES:	SEE NOTES BELOW			

① PROVIDE 2" PLEATED MERV 13 INTAKE & MERV 8 EXHAUST FILTERS & SPARE SETS AS SPECIFIED.
② PROVIDE OUTDOOR AND EXHAUST AIR LOW LEAKAGE MOTORIZED DAMPER
③ PROVIDE DOUBLE WALL CONSTRUCTION, ECOMOMIZER ENTHALPY WHEEL OVERRIDE CONTROLS
④ PROVIDE PREMIUM EFFICIENCY MOTOR, PROVIDE NEMA 3R DISCONNECT SWITCH
⑤ COORDINATE CONTROL INTERFACE WITH CONTROLS CONTRACTOR.
⑥ PROVIDE DIRTY FILTER SENSOR OUTDOOR AND EXHAUST

FAN COIL SCHEDULE

		FC–6AB,9AB	FC–1A,2A,5A,6A,9A 10A,12AB,13AB,14AB 15AB,16AB,17AB, 5B2,6B2,7B2,9B2, 31B2	FC–3B1	FC–8A,12A,1B1,1B2 11AB,27B2,21AB	FC–4B2	FC–3A,4A,30B2	FC–10AB,2B1	FC–7A,11A,13A,14A, 8B2	FC–18AB,2B2
FAN COIL	SERVICE	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS
	TONS	.42	1.5	3	4	0.42	.6	.75	1	1.5
	MANUFACTURER MAKE	LG	LG	LG	LG	LG	LG	LG	LG	LG
	MANUFACTURER MODEL #	053TRD4	183TQD4	363TMA4	483TMC4	053SJA4	073SJA4	093SJA4	123SJA4	183SKA4
	C.F.M.	265/247/212	396/388/353	918/812/706	1130/953/883	240/230/208	254/240/208	300/254/240	300/254/240	494/424/371
	E.S.P. (IN WG)	–	–	–	–	–	–	–	–	–
	FAN RPM (SPEED)	–	–	–	–	–	–	–	–	–
	HP	–	–	–	–	–	–	–	–	–
	MIN. OUTDOOR AIR (CFM)	–	–	–	–	–	–	–	–	–
ELEC	V–PH–HZ	208V–1ø	208V–1ø	208V–1ø	208V–1ø	208V–1ø	208V–1ø	208V–1ø	208V–1ø	208V–1ø
	MCA / MOCP	0.2 / 15	0.2 / 15	1.3 / 15	1.3 / 15	0.25 / 15	0.25 / 15	0.25 / 15	0.25 / 15	0.52 / 15
	–	–	–	–	–	–	–	–	–	–
DX COOLING	AMBIENT TEMP (°F)	91	91	91	91	91	91	91	91	91
	TOTAL / SENSIBLE CAPACITY (MBH)	5.1 / 3.6	17.7 / 12.8	33.6 / 24.2	44.7 / 32.2	5.1 / 4.5	6.9 / 5.6	8.9 / 6.7	11.4 / 8.0	17.7 / 12.6
	COOLING EDB / EWB (°F)	81 / 67	81 / 67	81 / 67	81 / 67	81 / 67	81 / 67	81 / 67	81 / 67	81 / 67
	COOLING LDB / LWB (°F)	55 / 53	55 / 53	55 / 53	55 / 53	55 / 53	55 / 53	55 / 53	55 / 53	55 / 53
	ENTERING REFRIGERANT TEMP. (°F)	–	–	–	–	–	–	–	–	–
	SATURATED SUCTION TEMP. (°F)	–	–	–	–	–	–	–	–	–
DX HEAT	AMBIENT TEMP (°F)	0	0	0	0	0	0	0	0	0
	CAPACITY (MBH)	4.6	16.2	30.7	38.7	4.6	6.4	8.2	10.3	16.2
	HEATING EDB (°F)	68	68	68	68	68	68	68	68	68
	HEATING LDB (°F)	90	90	90	90	90	90	90	90	90
	ENTERING REFRIGERANT TEMP (°F)	–	–	–	–	–	–	–	–	–
	SATURATED SUCTION TEMP. (°F)	–	–	–	–	–	–	–	–	–
	REMARKS	①②	①②	①②	①②	①②	①②	①②	①②	①②

		FC–1AB,3B2	FC–2AB,3AB,12B2 13B2,14B2,15B2 17B2,19B2,21B2 23B2,24B2,25B2 28B2,29B2	FC–7AB,11B2,18B2	FC–4AB,22B2	FC–8AB,16B2,20B2	FC–5AB	FC–10B2	FC–26B2	FC–19AB,20AB
FAN COIL	SERVICE	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS
	TONS	2.5	.6	.75	1	1.25	1.5	2	2.4	2
	MANUFACTURER MAKE	LG	LG	LG	LG	LG	LG	LG	LG	LG
	MANUFACTURER MODEL #	303SVA4	073BGA4	093BGA4	123BGA4	153BGA4	183BGA4	243BGA4	283BGA4	243TTD4
	C.F.M.	812/706/600	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	515/470/406
	E.S.P. (IN WG)	–	0.5	0.5	0.5	0.5	0.5	0.5	0.5	–
	FAN RPM (SPEED)	–	–	–	–	–	–	–	–	–
	HP	–	–	–	–	–	–	–	–	–
	MIN. OUTDOOR AIR (CFM)	–	–	–	–	–	–	–	–	–
ELEC	V–PH–HZ	208V–1ø	208V–1ø	208V–1ø	208V–1ø	208V–1ø	208V–1ø	208V–1ø	208V–1ø	208V–1ø
	MCA / MOCP	0.51 / 15	2.65 / 15	2.65 / 15	2.65 / 15	2.65 / 15	2.65 / 13.8	2.65 / 15	2.65 / 15	2.65 / 15
	–	–	–	–	–	–	–	–	–	–
DX COOLING	AMBIENT TEMP (°F)	91	91	91	91	91	91	91	91	91
	TOTAL / SENSIBLE CAPACITY (MBH)	27.9 / 20.1	6.9 / 5.1	8.9 / 6.5	11.4 / 8.3	14.3 / 11.9	11.0 / 7.9	22.5 / 17.5	26.0 / 19.2	6.9 / 5.1
	COOLING EDB / EWB (°F)	81 / 67	81 / 67	81 / 67	81 / 67	81 / 67	81 / 67	81 / 67	81 / 67	81 / 67
	COOLING LDB / LWB (°F)	55 / 53	55 / 53	55 / 53	55 / 53	55 / 53	55 / 53	55 / 53	55 / 53	55 / 53
	ENTERING REFRIGERANT TEMP. (°F)	–	–	–	–	–	–	–	–	–
	SATURATED SUCTION TEMP. (°F)	–	–	–	–	–	–	–	–	–
DX HEAT	AMBIENT TEMP (°F)	0	0	0	0	0	0	0	0	0
	CAPACITY (MBH)	24.2	6.4	8.2	10.3	12.9	16.2	20.6	23.8	6.4
	HEATING EDB (°F)	68	68	68	68	68	68	68	68	68
	HEATING LDB (°F)	90	90	90	90	90	90	90	90	90
	ENTERING REFRIGERANT TEMP (°F)	–	–	–	–	–	–	–	–	–
	SATURATED SUCTION TEMP. (°F)	–	–	–	–	–	–	–	–	–
	REMARKS	①②	①②③	①②③	①②③	①②③	①②③	①②③	①②③	①②

① COUNTER–SWIRL FILTER SHALL BE 2" PLEATED, THROWAWAY DX COOLING COIL SHALL BY 4–ROW W/ REFRIGERANT R–410A. PROVIDE 3 SPARE SETS OF FILTERS FOR THE FAN COIL UNIT

② WIRE CONDENSATE PUMP TO FAN COIL CONTROL CIRCUIT FOR SHUT–DOWN COOLING MODE FLOAT ALARM.

③ ALL FC W/ OA DUCT CONNECTIONS CONNECTED TO ERU SHALL BE BALANCED AS INDICATED UNLESS NOTED OTHERWISE:
FC–12B2(75 CFM);FC–14B2 & 25B2(30 CFM EACH);FC–13B2, 18B2, 19B2, 21B2, 22B2, 24B2(40 CFM EACH);FC–23B2(45 CFM);
FC–15B2, 17B2, 28B2, 29B2(50 CFM EACH);FC–11B2(70 CFM); FC–20B2(75 CFM);FC–16B2(125 CFM);FC–2AB(35 CFM);FC–3AB(25 CFM);
FC–4AB(120 CFM);FC–5AB(490 CFM);FC–7AB(190 CFM);FC–8AB(360 CFM)

GAS–FIRED MAKE–UP AIR ROOFTOP UNIT SCHEDULE

	UNIT NUMBER		MAU–1
	SERVICE		SEE PLANS
	NOMINAL COOLING CAPACITY(TONS)		NO COOLING
	MANUFACTURER MAKE		AAON
	MANUFACTURER MODEL #		RN–040–3–0–0000
VENT FAN	C.F.M.		15000
	EXT. STATIC PRESS. (IN WG)		1.5"
	FAN RPM		1073
	FAN BHP		3.27
	ENT. AIR DB/WB (°F)		91/71
	LVG. AIR DB/WB (°F)		93/71
	MIN. OUTDOOR AIR (CFM)		15000
HEAT	HEATING INPUT MBH (NAT. GAS)		1250
	OUTPUT CAPACITY BTUH		1000
	AFUE		80%
	ENT. AIR DB/WB (°F)		0
	LVG. AIR DB/WB (°F)		60
ELECTRICAL	V–PH–HZ		460–3–60
	MCA		20
	MOCP		25
	STARTER	TYPE	INTEGRAL
		NEMA SIZE	INTEGRAL
		CONTROL	INTEGRAL
		AUX. CONTACTS	INTEGRAL
ACCESSORIES			①②③④

– MODEL & DATA BASED ON AAON OR EQUAL BY DAIKIN, TRANE OR APPROVED EQUAL
① PROVIDE DOUBLE WALL CONSTRUCTION. PROVIDE NEMA 3R DISCONNECT SWITCH
② PROVIDE SEISMIC SPRING ROOF CURB FOR CONFIGURATION AS A VERTICAL DISCHARGE UNIT.
③ PROVIDE 2" PLEATED MERV 13 FILTERS. REFER TO SPEC FOR SPARE SETS.
④ PROVIDE EMS INTERFACE KIT

HOT WATER COIL SCHEDULE

UNIT NUMBER			HWC–1
SERVICE			SEE PLANS
MANUFACTURER			PRICE
MODEL #			–
FINNED LENGTH			12"
FINNED HEIGHT			12"
TUBE/FIN MATERIAL			CU/AL
AIRFLOW (CFM)			375
HEATING COIL	MAX FACE VEL. (FPM)		500
	AIR DATA	TEMP. ENTERING (°F)	50
		TEMP. LEAVING (°F)	95
		PRESS. DROP (IN WG)	0.44"
	WATER DATA	GPM	2.0
		CAPACITY (MBH)	20.4
		PRESS. DROP (FT. HD)	1.09
		ROWS / FINS PER FT	1/109
			–
NOTES			

HOT WATER COILS SIZED FOR 140F ENTERING AND 120°F LEAVING WATER TEMPERATURES.

LAMOUREUX PAGANO ASSOCIATES, ARCHITECTS
108 GROVE STREET, SUITE 300
WORCESTER, MASSACHUSETTS 01605

MEMBER OF
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OWNER
Worcester Public Schools
Worcester, MA

Project North

PROJECT
FINAL BID PACKAGE
South High Community School
170 Apricot Street, Worcester, MA 01603

TITLE
HVAC Schedules

Key Plan
A BUILDING
B BUILDING
A
AB
BI
B2

REVISIONS

No.	Description	Date

FILE:
DWN. BY: DJM | JOB NO: #1611
CKD. BY: KRS | SCALE: 1/8" = 1'-0"
DATE: January 31, 2019

H7.1

GAS FIRED BOILER SCHEDULE

UNIT NUMBER		HWB-1,2,3
SERVICE		BUILDING
MFR MAKE AND MODEL		LOCHINVAR
MFR SPEC. TYPE		FBN-4000
GAS INPUT (MBH)		4000
GROSS OUTPUT (MBH)		3720
EFFIECIENCY A.F.U.E.		92%
MAX. WORKING PRESSURE (PSIG)		75
FLUE CONNECTION		12"ø
COMBUSTION AIR CONNECTION		12"ø
WATER SUPPLY TEMPERATURE		140°F
WATER TEMPERATURE RISE		20°F
ELECTRICAL DATA	VOLTAGE	460V-3ø
	MAX AMP DRAW	4
	STARTER	INTEGRAL
	FUSE SIZE	– –
	CONTROL	INTEGRAL
	NEMA SIZE	
REMARKS		①②③④⑤⑥⑦

① COORDINATE WITH CONTROL SYSTEM
② PROVIDE MASS. CODE GAS TRAIN, LOW WATER CUT-OFF, HIGH LIMIT & FLOW SWITCHES
③ PROVIDE MODULATING GAS VALVE.
④ PROVIDE 2 ACID NEUTRALIZATION KITS PER BOILER
⑤ PROVIDE DISCONNECT SWITCH
⑥ PROVIDE DIRECT VENT VERTICAL CONFIGURATION
⑦ REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.

RADIATION SCHEDULE

UNIT NUMBER		BB-1	BB-2	BB-3	BB-4	BB-5	BB-6	BB-7	BB-8	BB-9
MANUFACTURER		RITTLING	RITTLING	RITTLING	RITTLING	RITTLING	RITTLING	RITTLING	RITTLING	RITTLING
MODEL NUMBER		ELEMENT ONLY	ELEMENT ONLY	ELEMENT ONLY	FS5	FS5	ETL	FS5	FS5	FS5
ELEMENT	PIPE SIZE (TYPE)	3/4" (COPPER)	3/4" (COPPER)	3/4" (COPPER)	3/4" (COPPER)	3/4" (COPPER)	3/4" (COPPER)	1" (COPPER)	1" (COPPER)	3/4" (COPPER)
	ELEMENT SIZE	4-1/4x4-1/4	4-1/4x4-1/4	4-1/4x4-1/4	4-1/4x4-1/4	4-1/4x4-1/4	4-1/4x4-1/4	4-1/4x4-1/4	4-1/4x4-1/4	4-1/4x4-1/4
	FIN PER FOOT	48	48	48	48	48	48	48	48	48
	OUTPUT	440 (BTUH PER FT)	670 (BTUH PER FT)	885 (BTUH PER FT)	580 (BTUH PER FT)	790 (BTUH PER FT)	455 (BTUH PER FT)	570 (BTUH PER FT)	795 (BTUH PER FT)	1005 (BTUH PER FT)
COVER HEIGHT		14"	14"	14"	14"	20"	4"	14"	20"	24"
MOUNTING HEIGHT		18"	18"	18"	18"	24"	6"	18"	24"	28"
NOTES:		SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES

APPROVED MANUFACTURERS ARE RITTLING, STERLING, VULCAIN.
① PROVIDE CONT. WALL TO WALL ENCLOSURE OR AS SHOWN ON DRAWINGS; HINGED END CAPS AND ALL TRIM NECESSARY FOR COMPLETE INSTALLATION; AND HINGED VALVE COVERS AT BALANCING VALVES & CONTROL VALVE LOCATIONS; ALL COVERS SHALL BE 14 GAUGE; CAFETERIA & WEIGHT ROOM AREAS SHALL HAVE S.S. COVERS
② SELECTION BASED ON 140°F EWT, 15°F WATER TEMP. DROP, & 70°F EAT, 30% PROPYLENE GLYCOL
③ COLOR SELECTION BY ARCH.
④

BB-1 BALANCING SCHEDULE							
FLOW (GPM)	0.5	1.0	1.5	2.0	2.5	3.0	3.5
FEET	<11	12-22	23-33	34-44	45-55	56-66	67-77

BB-2 BALANCING SCHEDULE							
FLOW (GPM)	0.5	1.0	1.5	2.0	2.5	3.0	3.5
FEET	<7	8-14	16-21	22-29	31-36	37-43	44-51

BB-3 BALANCING SCHEDULE							
FLOW (GPM)	0.5	1.0	1.5	2.0	2.5	3.0	3.5
FEET	<5	6-11	12-16	17-22	23-27	28-33	34-38

BB-4 BALANCING SCHEDULE							
FLOW (GPM)	0.5	1.0	1.5	2.0	2.5	3.0	3.5
FEET	<8	9-16	17-25	26-33	34-42	43-50	51-59

BB-5 BALANCING SCHEDULE							
FLOW (GPM)	0.5	1.0	1.5	2.0	2.5	3.0	3.5
FEET	<6	7-12	13-18	19-24	25-31	32-37	38-43

BB-6 BALANCING SCHEDULE							
FLOW (GPM)	0.5	1.0	1.5	2.0	2.5	3.0	3.5
FEET	<10	11-21	22-32	33-43	44-53	64-64	65-75

BB-7 BALANCING SCHEDULE							
FLOW (GPM)	1.0	2.0	3.0	4.0	5.0	6.0	7.0
FEET	<17	18-34	35-51	52-68	69-85	86-103	104+

BB-8 BALANCING SCHEDULE							
FLOW (GPM)	1.0	2.0	3.0	4.0	5.0	6.0	7.0
FEET	<12	13-24	25-36	37-49	50-61	62-73	74+

BB-9 BALANCING SCHEDULE							
FLOW (GPM)	1.0	2.0	3.0	4.0	5.0	6.0	7.0
FEET	<9	10-19	20-29	30-39	40-48	49-58	59+

PANEL RADIATOR SCHEDULE

UNIT NUMBER		PR-1	PR-2
MANUFACTURER		RITTLING	RITTLING
MODEL NUMBER		PR-5	PR-6
ELEMENT	PIPE SIZE (TYPE)	–	–
	ELEMENT SIZE	–	–
	FIN PER FOOT	–	–
	DERATED OUTPUT	338 (BTUH PER FT)	407 (BTUH PER FT)
COVER HEIGHT		14 3/8"	17 1/4"
MOUNTING HEIGHT		18"	21"
NOTES:		see notes	see notes

APPROVED MANUFACTURERS ARE RITTLING, STERLING, VULCAIN, RUNTAL.
① SELECTION BASED ON 140°F EWT, 20°F WATER TEMP. DROP, & 65°F EAT.
③ PROVIDE ALL TRIM & ACCESSORIES NECESSARY FOR COMPLETE INSTALLATION. CENTER, END, END CAP, AND VERTICAL PIPE TRIM
④ COLOR SELECTION BY ARCH.

PR-1 BALANCING SCHEDULE							
FLOW (GPM)	0.5	1.0	1.5	2.0	2.5	–	–
FEET	<14	15-28	29-43	44-57	58-72	–	–

PR-1 BALANCING SCHEDULE							
FLOW (GPM)	0.5	1.0	1.5	2.0	2.5	–	–
FEET	<12	13-24	25-36	37-48	49-60	–	–

UNIT/CABINET HEATER SCHEDULE

SYMBOL	GPM	EWT	LWT	CFM	DERATED BTUH	ELECTRICAL H.P.	PHASE	VOLTS	MFG. MODEL NO.	REMARKS
CUH-1	2.0	140	120	220	14,900	1/4	1	120	RITTLING MODEL #RFRW-340-04 (2 ROW) (RECESSED WALL)	①②③
CUH-2	2.0	140	120	220	14,900	1/4	1	120	RITTLING MODEL #RFRC-420-04 (2 ROW) (RECESSED CEILING)	①②③
CUH-3	1.0	140	120	125	6,100	1/15	1	120	RITTLING MODEL #RFRC-420-04 (1 ROW) (RECESSED CEILING)	①②③
UH-1	1.0	140	120	950	15,500	1/10	1	120	RITTLING MODEL #RV-42	①②③

– APPROVED MANUFACTURERS ARE RITTLING, STERLING, VULCAIN.
① PROVIDE UNIT MOUNTED DISCONNECT SWITCH.
② ENAMEL FINISH- COLOR BY ARCH.
③ CAPACITY BASED ON 140°F EWT AND 60°F EAT.
④ RECESS UNITS AS FAR INTO WALL FRAMING AS POSSIBLE. V.I.F.

CONVECTOR SCHEDULE

SYMBOL	GPM	EWT	LWT	CFM	DERATED BTUH	ELECTRICAL H.P.	PHASE	VOLTS	MFG. MODEL NO.	REMARKS
CONV-1	1.0	140	124	–	4200	–	–	–	RITTLING MODEL #SL-32-48-04	①②③

– APPROVED MANUFACTURERS ARE RITTLING, STERLING, VULCAIN.
① ENAMEL FINISH- COLOR BY OWNER/ARCH.
② CAPACITY BASED ON 140°F EWT AND 65°F EAT.
③ SLOPED TOP OPTION, PERF. TOP, 14 GAUGE CONST.

PUMP SCHEDULE

UNIT NUMBER		P-1,2,3	P-4A,B,C,D	P-5A,B,C	P-6A,B,C	P-7A,B,C	P-8A,B,C	P-9	P-10
SERVICE		BOILER PUMPS	CLASSROOM HW SYSTEM PUMPS	ALL OTHER HW SYSTEM PUMPS	RTU GLYCOL SYSTEM HX-1	RTU GLYCOL SYSTEM HX-2	RTU GLYCOL SYSTEM HX-3	RADIANT HEAT LOOPS	RADIANT HEAT LOOPS
MFR MAKE & MODEL		GRUNDFOS VLSE 50707-4P-7.5HP	GRUNDFOS HYDRO MPC-E (4)CRE 45-2	GRUNDFOS HYDRO MPC-E (3)CRE 64-1	GRUNDFOS HYDRO MPC-E (3)CRE 45-1	GRUNDFOS HYDRO MPC-E (3)CRE 15-1	GRUNDFOS HYDRO MPC-E (3)CRE 20-2	GRUNDFOS UPS 26-150F	GRUNDFOS UPS 26-150F
MFR SPEC. TYPE		VERTICAL	IN-LINE SKID MOUNT	IN-LINE	IN-LINE	IN-LINE	IN-LINE	IN-LINE	IN-LINE
FLUID DATA	FLUID	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
	TEMPERATURE (F)	145°	145°	145°	135°	135°	135°	140°	140°
	FLOW RATE (GPM)	350	858 TOTAL (286 PER PUMP)	632 TOTAL (316 PER PUMP)	405 TOTAL (202.5 PER PUMP)	167 TOTAL (83.5 PER PUMP)	207 TOTAL (103.5 PER PUMP)	6	5
	T.D.H. (FT)	25'	140'	96'	84'	42'	73'	30'	25'
PUMP DATA	TYPE	IN-LINE	IN-LINE	IN-LINE	IN-LINE	IN-LINE	IN-LINE	IN-LINE	IN-LINE
	SPEED (RPM)	1775	–	–	–	–	–	4590	4590
	BRAKE H.P.	2.96	–	–	–	–	–	–	–
	MOTOR H.P.	7.5	15HP EACH	15HP EACH	10HP EACH	2HP EACH	5HP EACH	0.24	0.24
	MCA/MOCP	–	74/100	56/80	38/58	10/15	21/30	1.7/15	1.7/15
	VOLTAGE-PH-Hz	460 / 3 / 60	460 / 3 / 60	460 / 3 / 60	460 / 3 / 60	208 / 1 / 60	208 / 1 / 60	115 / 1 / 60	115 / 1 / 60
STARTER DATA	TYPE	V-F-D	ECM-FACTORY PACKAGE	ECM-FACTORY PACKAGE	ECM-FACTORY PACKAGE	ECM-FACTORY PACKAGE	ECM-FACTORY PACKAGE	RELAY	RELAY
	NEMA SIZE	AS REQUIRED	AS REQUIRED	AS REQUIRED	AS REQUIRED	AS REQUIRED	AS REQUIRED	AS REQUIRED	AS REQUIRED
	CONTROL	AS REQUIRED	AS REQUIRED	AS REQUIRED	AS REQUIRED	AS REQUIRED	AS REQUIRED	AS REQUIRED	AS REQUIRED
	AUX. CONTACTS	AS REQUIRED	AS REQUIRED	AS REQUIRED	AS REQUIRED	AS REQUIRED	AS REQUIRED	AS REQUIRED	AS REQUIRED

① COORDINATE WITH CONTROL SYSTEM
② PUMPS P4ABCD, P5ABC, P6ABC HAVE INTEGRAL DRIVES AND ARE SKID MOUNTED PRE-PIPED PUMP SYSTEM W/ REMOTE CONTROL CENTER. SINGLE POINT POWER CONNECTION
③ PUMPS P7ABC & P8ABC HAVE INTEGRAL DRIVES AND ARE SKID MOUNTED PRE-PIPED PUMP SYSTEM W/ ATTACHED CONTROL CENTER. SINGLE POINT POWER CONNECTION
④ REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.

WATER TO WATER HEAT EXCHANGER SCHEDULE

UNIT NUMBER		HX-1	HX-2	HX-3
MANUFACTURER & MODEL #		BELL & GOSSETT, GPX	BELL & GOSSETT, GPX	BELL & GOSSETT, GPX
LOCATION		SEE PLANS	SEE PLANS	SEE PLANS
SYSTEM SERVED		ROOFTOP EQUIPMENT	ROOFTOP EQUIPMENT	ROOFTOP EQUIPMENT
WATER HOT SIDE	GPM	405	167	207
	P.D. (FT. HD)	13.81	14.65	13.74
	E.W.T. (°F)	145	145	145
	L.W.T. (°F)	126	126	120
35% PROP GLYCOL COLD SIDE	GPM	405	167	167
	E.W.T. (°F)	120	120	120
	L.W.T. (°F)	140	140	140
	FOULING FACTOR	–	–	–
	P.D. (FT. HD)	14.67	14.15	14.88
	MBTUH	3559	1564	1939
NUMBER OF PLATES		144	62	77
NUMBER OF PASSES/CHANNELS		1/71	1/30	1/38
REMARKS:	PLATE & FRAME TYPE			

– MODEL & DATA BASED ON BELL & GOSSET GPX OR EUQAL BY ALFA LAVAL, SONDOX, GEA OR APPROVED EQUAL

DIFFUSER & REGISTER SCHEDULE

KEY	SD-1	SD-2	SD-3	SD-4	SD-5	LD-1	LD-2	LD-3	LD-4	RLD-1	RLD-2	RLD-3	SR-1	SR-2	SR-3	SR-4	SR-5	SR-6	SR-7
MANUFACTURER	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE
MODEL	AMDA	AMDA	AMDA	AMDA	AMDA	SDS100 2SLOT	SDS100 2SLOT	JSPI215 2SLOT	JSPI215 2SLOT	SDS100 2SLOT	SDS100 2SLOT	SDS100 4SLOT	620 SERIES	620 SERIES	620 SERIES	620 SERIES	620 SERIES	620 SERIES	620 SERIES
NECK SIZE	9"x9"-8"ø	12"x12"-10"ø	15"x15"-12"ø	18"x18"-14"ø	21"x21"-16"ø	CONTINUUOS	4'-0"LONG	4'-0" LONG	5'-0" LONG	CONTINUUOS	4'-0" LONG	CONTINUUOS	10"x4"	12"x6"	12"x8"	18"x8"	22"x10"	26"x10"	26"x16"
MODULE SIZE	24"x24"	24"x24"	24"x24"	24"x24"	24"x24"	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BORDER	LAY-IN	LAY-IN	LAY-IN	LAY-IN	LAY-IN	LAY-IN	LAY-IN	SURFACE	SURFACE	LAY-IN	LAY-IN	SURFACE	SURFACE	SURFACE	SURFACE	SURFACE	SURFACE	SURFACE	SURFACE
FINISH	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4
THROW PATTERN	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	–	–	–	–	–	–	–	DBL DEFL	DBL DEFL	DBL DEFL	DBL DEFL	DBL DEFL	DBL DEFL	–
DAMPER	OBD	OBD	OBD	OBD	OBD	NONE	NONE	NONE	NONE	NONE	NONE	NONE	OBD	OBD	OBD	OBD	OBD	OBD	–
NOTES	①②⑤	①②③	①②③	①②③	①②③	①②③⑤	①②③⑤	①②③⑤	①②③⑤	①②③⑤	①②③⑤	①②③⑤	①②③	①②③	①②③	①②③	①②③	①②③	①②③

① COORDINATE WITH ARCHITECTURAL CEILING PLAN FOR FINAL LOCATION;
② TRANSITION FROM DIFFUSER/REGISTER/GRILLE CONNECTION SIZE TO DUCT SIZE
③ REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION & APPROVED ALTERNATIVE EQUIPMENT MANUFACTURERS.
④ FINISH AND COLOR SELECTION BY ARCHITECT.
⑤ PROVIDE PRICE SDA SERIES INSULATED PLENUM BOX. NECK SIZE AS SHOWN ON DWG. MATCH BRANCH DUCT SIZE.
⑥ REQUIRES 2 PIECE SPLIT REGISTER. PROVIDE ALL REQUIRED MULLIONS
⑦ HEAVY DUTY GRILLE
⑧ CUSTOM COLOR, SELECTED BY ARCH

DISPLACEMENT DIFFUSER SCHEDULE

KEY	DD-1	DD-2	DD-3	DD-4	DD-5
MANUFACTURER	PRICE	PRICE	PRICE	PRICE	PRICE
MODEL	DF1W	DF1L-HC	DF1L	DF1L	DF1L-HC
NECK SIZE	30"x48"16"D	–	–	–	–
MODULE SIZE	–	24"x24"	24"x24"	24"x48"	24"x48"
BORDER	TYPE 17P	TYPE 17P	TYPE 17P	TYPE 17P	TYPE 17P
FINISH	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4
THROW PATTERN	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS
DAMPER	NONE	NONE	NONE	NONE	NONE
NOTES	①③⑤	①②	①②	①	①②

① PROVIDE OPTIONAL 1/2" THICK ALUMINUM FOIL INSULATION
② PROVIDE ELECTRIC ACTUATOR, 24V FLOATING POINT
③ PROVIDE EXTENDED CUSTOM PLENUM; 20"x8" INLET SHALL BE ON TOP OR BACK; SEE PLANS. REFER TO DD-1 DETAIL.
④ COLOR SELECTION BY ARCHITECT
⑤ WALL DD SHALL BE 16 GAUGE W/ HEAVY DUTY FRAME & STIFFENERS BEHIND FACE OF DD.

GRILLE SCHEDULE

KEY	RG-1	RG-2	RG-3	RG-4	RG-5	RG-6	RG-7	RG-8	RG-9	RG-10	RG-11	RG-12	EG-1	EG-2	EG-3	EG-4	EG-5	EG-6	EG-7
MANUFACTURER	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE
MODEL	70 DAL	70 DAL	70 DAL	70 DAL	99S	70 DAL	82	70 DAL	70 DAL	70 DAL	70 DAL	70 DAL	70 DAL	70 DAL	70 DAL	70 DAL	MSL	MSL	70 DAL
NECK SIZE	10"x10"	14"x14"	18"x18"	22"x22"	36"x72"	36"x18"	72"x12"	48"x24"	28"x12"	16"x8"	36"x24"	54"x42"	10"x10"	14"x14"	18"x18"	22"x22"	6"x6"	8"x8"	6"x6"
MODULE SIZE	24"x24"	24"x24"	24"x24"	24"x24"	–	–	–	–	–	–	–	–	24"x24"	24"x24"	24"x24"	24"x24"	–		
BORDER	LAY-IN	LAY-IN	LAY-IN	LAY-IN	SURFACE	SURFACE	SURFACE	SURFACE	SURFACE	SURFACE	SURFACE	SURFACE	LAY-IN	LAY-IN	LAY-IN	LAY-IN	SURFACE	SURFACE	SURFACE
FINISH	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4	SEE NOTE 4
THROW PATTERN	45° FIXED	45° FIXED	45° FIXED	45° FIXED	30° FIXED	45° FIXED	EGGCRATE	45° FIXED	45° FIXED	45° FIXED	45° FIXED	45° FIXED	45° FIXED	45° FIXED	45° FIXED	45° FIXED	LATTICE FACE	LATTICE FACE	45° FIXED
DAMPER	OBD	OBD	OBD	OBD	OBD	OBD	OBD	OBD	OBD	OBD	OBD	OBD	OBD	OBD	OBD	OBD	–	–	OBD
NOTES	①②③⑨	①②③⑨	①②③⑨	①②③⑧	①②③	①②③	①②③⑥⑦	①②③	①②③	①②③	①②③	①②③	①②③	①②③	①②③	①②③	①②③	①②③	①②③

① COORDINATE WITH ARCHITECTURAL CEILING PLAN FOR FINAL LOCATION;
② TRANSITION FROM DIFFUSER/REGISTER/GRILLE CONNECTION SIZE TO DUCT SIZE
③ REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION & APPROVED ALTERNATIVE EQUIPMENT MANUFACTURERS.
④ FINISH AND COLOR SELECTION BY ARCHITECT.
⑤ PROVIDE PRICE SDA SERIES INSULATED PLENUM BOX. NECK SIZE AS SHOWN ON DWG. MATCH BRANCH DUCT SIZE.
⑥ REQUIRES SPLIT REGISTER. PROVIDE ALL REQUIRED MULLIONS
⑦ HEAVY DUTY GRILLE
⑧ CUSTOM COLOR, SELECTED BY ARCH
⑨ RG FOR RETURN AIR TO DUCTED FC UNITS SHALL BE PRICE MODEL 630FF W/2" FILTER MEDIA SLOT OR APPROVED EQUAL; PROVIDE MERV-13 FILTERS; REMOVE OR OMIT FILTERS IN DUCTED FCUs

AIR COOLED HEAT PUMP SCHEDULE

UNIT NUMBER		ACHP-1AB	ACHP-1B2	ACHP-2B2
SERVICE		SEE PLANS & VRF RISER SCHEMATIC	SEE PLANS & VRF RISER SCHEMATIC	SEE PLANS & VRF RISER SCHEMATIC
MANUFACTURER		LG	LG	LG
MODEL		ARUM192DTES	ARUM192DTES	ARUM072DTES
TOTAL CAPACITY COOLING (MBH)		179.0	179.0	71.4
TOTAL CAPACITY HEATING (MBH)		174.4	174.4	65.8
DESIGN AMBIENT TEMP SUM/WINT(F)		91 / 0	91 / 0	91 / 0
REFRIGERANT		R-410	R-410	R-410
LINE SIZE O.D. GAS		1-1/8 (7/8HP)	1-1/8 (7/8HP)	3/4 (5/8)
LINE SIZE O.D. LIQUID		5/8	5/8	3/8
IEER (SEER)		25.9	25.9	28.4
COP (HSPF)		3.75	3.75	3.83
CONDENSER FAN MOTOR – HP		–	–	–
CONDENSER FAN MOTOR – RPM		–	–	–
ELECTRICAL DATA	VOLTAGE	460V-3ø-60	460V-3ø-60	460V-3ø-60
	MCA	35.7	35.7	12.8
	MOCP	50	50	20
	RLA / LRA	–	–	–
NOTES		SEE NOTES	SEE NOTES	SEE NOTES

① PROVIDE LOW AMBIENT CONTROLS
② PROVIDE HARD START ASSIST KIT WITH CRANKCASE HEATER.
③ PROVIDE ANTI-SHORT CYCLE TIMER.
④ REFRIGERANT LINE SIZES SHALL BE BY EQUIP. MFR. RECOMMENDED SIZES PER RUN LGTH. VERIFY W/ MFR.
⑤ SPACING BETWEEN BLDG & ADJ CU UNITS SHALL BE PROVIDED AS SPEC. BY EQUIP. MFR.
⑥ PROVIDE EQUIP SUPPORTS FLASHED IN TO ROOFING SYSTEM BY OTHERS
⑦ EACH FC SHALL HAVE LOCAL T'STAT SUPPLIED BY MANUF. PROVIDE ALL CONTROL WIRING REQUIRED FOR SYSTEM OPERATION

AIR COOLED CONDENSING UNIT SCHEDULE

UNIT NUMBER		ACCU-1A	ACCU-2A	ACCU-3A	ACCU-4A	ACCU-5A	ACCU-6A	ACCU-1AB	ACCU-2AB	ACCU-3AB	ACCU-1B1	ACCU-2B1	ACCU-1B2	ACCU-2B2	ACCU-3B2
SERVICE		SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS	SEE PLANS
MANUFACTURER		LG	LG	LG	LG	AAON	AAON	LG	LG	AAON	LG	LG	LG	LG	LG
MODEL		ARUM072DTES	ARUM096DTES	ARUN36GSS4	ARUM072DTES	CNA120C03CA00B	CNA1200C03CA00E	ARUM121DTES	ARUN36GSS4	CNA090B03CA00E	ARUM072DTES	ARUN12GSS4	ARUM144DTES	ARUN18GSS4	ARUN30GSS4
NOMINAL COOLING CAPACITY (TONS)		6.0	8.0	3.25	6.0	120.0	120.0	10.0	3.25	90.0	6.0	1.0	12.0	1.5	2.5
TOTAL COOLING CAPACITY (MBH)		75.6	91.5	37.8	74.3	1393.6	1279.6	123.6	37.8	123.6	75.6	12.0	149.2	18	30
DESIGN AMBIENT TEMP (F)		91	91	91	91	91	91	91	91	91	91	91	91	91	91
TOTAL HEATING CAPACITY (MBH)		69.3	80.9	34.6	65.8	N/A	N/A	110.1	34.6	N/A	66.2	12.0	130.5	18	30
DESIGN AMBIENT TEMP (F)		0	0	0	0	N/A	N/A	0	0	N/A	0	0	0	0	0
REFRIGERANT		R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A
LINE SIZE O.D. GAS		3/4"	7/8"	5/8"	3/4"	(4)1-5/8"	(4)1-5/8"	1-1/8"	5/8"	(4)1-5/8"	3/4"	1/2	1-1/8"	5/8	3/4
LINE SIZE O.D. LIQUID		3/8"	3/8"	3/8"	3/8"	(4)1-1/8"	(4)1-1/8	1/2"	3/8"	(4)1-1/8	3/8"	1/4	1/2"	3/8	3/8
IEER (SEER)		28.4	33.0	17.0	28.4	12.2	12.2	29.6	17.0	12.4	28.4	28.4	28.6	28.6	28.6
COP (HSPF)		3.83	4.33	9.0	3.83	–	–	3.97	9.0	–	3.83	3.83	3.84	3.84	3.84
CONDENSER FAN MOTOR – HP		–	–	–	–	–	–	–	–	–	–	–	–	–	–
CONDENSER FAN MOTOR – RPM		–	–	–	–	–	–	–	–	–	–	–	–	–	–
ELECTRICAL DATA	VOLTAGE	460V-3ø-60	460V-3ø-60	208V-1ø-60	460V-3ø-60	460V-3ø-60	460V-3ø-60	460V-3ø-60	460V-3ø-60	460V-3ø-60	460V-3ø-60	208V-1ø-60	460V-3ø-60	208V-1ø-60	208V-1ø-60
	MCA	12.8	16.4	25.0	12.8	197	197	18.4	25.0	165	12.8	12.8	26.4	13.2	15
	MOCP	20	20	35	20	225	225	25	35	225	20	20	35	20	20
	RLA / LRA	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NOTES		SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES

① PROVIDE LOW AMBIENT CONTROLS. PROVIDE DISCONNECT SWITCH.
② PROVIDE HARD START ASSIST KIT WITH CRANKCASE HEATER.
③ PROVIDE ANTI-SHORT CYCLE TIMER.
④ REFRIGERANT LINE SIZES SHALL BE BY EQUIP. MFR. RECOMMENDED SIZES PER RUN LGTH. VERIFY W/ MFR.
⑤ SPACING BETWEEN BLDG & ADJ CU UNITS SHALL BE PROVIDED AS SPEC. BY EQUIP. MFR.
⑥ PROVIDE 18" HIGH SEISMICALLY BRACED QUICK SLING SUPPER STANDS AS MANUF. BY DIVERSITECH. STANDS SHALL HAVE 12" PADS ANCHORED TO EQUIPMENT SUPPORTS BY G.C. COORD REQUIRED WIDTH, LENGTHS & LOCATIONS OF EQUIPMENT SUPPORST W/ G.C.

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OWNER

Worcester Public Schools

Worcester, MA

Project North

PROJECT

FINAL BID PACKAGE

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

HVAC Schedules

Key Plan

A BUILDING B BUILDING

REVISIONS

No.	Description	Date

FILE:

DWN. BY: DJM JOB NO: #1611

CKD. BY: KRS SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

H7.2

VARIABLE AIR VOLUME TERMINAL (VAV) SCHEDULE–SECTION A

Tag	Model	Unit Size	Max Primary (CFM)	Min Primary (CFM)	Inlet SP (in. w.g.)	Min Oper PD (in. w.g.)	Reheat (CFM)	Max Dis NC	WC Capacity (MBH)	Fluid Flow (GPM)	EAT (°F)	LAT (°F)	EWT (°F)	LWT (°F)	FPD (ft. w.g.)	Fluid Type	Glycol %	Rows
VAV-1A	SDV5	10	830	850	1.50	0.01		25 (2)										
VAV-2A	SDV5	10	870	265	1.50	0.01		25 (2)										
VAV-3A	SDV5	10	900	270	1.50	0.01		25 (2)										
VAV-4A	SDV5	10	830	250	1.50	0.01		25 (2)										
VAV-5A	SDV5	6	270	85	1.50	0.19	125	31 (2)	4.05	0.50	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-6A	SDV5	14	2150	645	1.50	0.40		23 (2)										
VAV-7A	SDV5	8	600	180	1.50	0.15	270	22 (2)	8.75	1.00	65.00	95.00	140.00	120.00	0.04	WTR	0.00	2L
VAV-8A	SDV5	10	900	270	1.50	0.01		26 (2)										
VAV-9A	SDV5	10	830	250	1.50	0.01		25 (2)										
VAV-10A	SDV5	8	900	270	1.50	0.15		22 (2)										
VAV-11A	SDV5	10	685	210	1.50	0.24	310	23 (2)	10.04	1.50	65.00	95.00	140.00	120.00	0.21	WTR	0.00	2R
VAV-12A	SDV5	9	760	230	1.50	0.01		25 (3)										
VAV-13A	SDV5	10	830	250	1.50	0.01		25 (2)										
VAV-14A	SDV5	8	540	165	1.50	0.01	245	29 (2)										
VAV-15A	SDV5	12	1070	325	1.50	0.30		21 (3)										
VAV-16A	SDV5	6	180	55	1.50	0.09	85	26 (2)	2.75	0.50	65.00	95.00	140.00	120.00	0.01	WTR	0.00	2R
VAV-17A	SDV5	8	300	90	1.50	0.12	135	20 (2)	4.37	0.50	65.00	95.00	140.00	120.00	0.03	WTR	0.00	2L
VAV-18A	SDV5	8	530	160	1.50	0.28	240	26 (2)	7.78	1.00	65.00	95.00	140.00	120.00	0.13	WTR	0.00	2R
VAV-19A	SDV5	10	910	275	1.50	0.01		26 (2)										
VAV-20A	SDV5	10	990	300	1.50	0.01		27 (2)										
VAV-21A	SDV5	8	550	165	1.50	0.30	250	27 (2)	8.10	1.00	65.00	95.00	140.00	120.00	0.14	WTR	0.00	2R
VAV-22A	SDV5	10	910	275	1.50	0.01		26 (2)										
VAV-23A	SDV5	10	830	250	1.50	0.01		25 (2)										
VAV-24A	SDV5	12	685	205	1.50	0.01	310	25 (2)	10.04	1.50	65	95.00	140.00	120	0.14	WTR	0.00	2R
VAV-25A	SDV5	12	760	230	1.50			26 (2)										
VAV-26A	SDV5	10	830	250	1.50	0.01		25 (2)										
VAV-27A	SDV5	10	900	270	1.50	0.01		26 (2)										
VAV-28A	SDV5	10	900	270	1.50	0.01		26 (2)										
VAV-29A	SDV5	10	600	180	1.50	0.32	270	22 (2)	8.75	1.00	65.00	95.00	140.00	120.00	0.38	WTR	0.00	2R
VAV-30A	SDV5	14	2150	645	1.50	0.45		22 (2)										
VAV-31A	SDV5	10	830	250	1.50	0.01		25 (2)										
VAV-32A	SDV5	10	850	255	1.50	0.01		25 (2)										
VAV-33A	SDV5	12	270	85	1.50		125	26 (2)										
VAV-34A	SDV5	10	900	270	1.50	0.01		26 (2)										
VAV-35A	SDV5	10	860	260	1.50	0.34		23 (2)	0.00	0.00	65.00	95.00	140.00	120.00	0.43	WTR	0.00	2R
VAV-36A	SDV5	8	550	165	1.50	0.30	250	27 (2)	8.10	1.00	65.00	95.00	140.00	120.00	0.14	WTR	0.00	2R
VAV-37A	SDV5	10	910	275	1.50	0.01		26 (2)										
VAV-38A	SDV5	12	500	150	1.50			26 (2)										
VAV-39A	SDV5	12	500	150	1.50			26 (2)										
VAV-40A	SDV5	10	910	275	1.50	0.01		26 (2)										
VAV-41A	SDV5	10	850	255	1.50	0.01		25 (2)										
VAV-42A	SDV5	10	840	255	1.50	0.01		25 (2)										
VAV-43A	SDV5	9	700	210	1.50	0.27	315	23 (2)	10.21	1.50	65.00	95.00	140.00	120.00	0.27	WTR	0.00	2R
VAV-44A	SDV5	7	550	165	1.50	0.47	250	23 (2)	8.10	1.00	65.00	95.00	140.00	120.00	0.27	WTR	0.00	2R
VAV-45A	SDV5	6	270	85	1.50	0.19	125	31 (2)	4.05	0.50	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-46A	SDV5	10	900	270	1.50	0.01		26 (2)										
VAV-47A	SDV5	10	870	265	1.50	0.01		25 (2)										
VAV-48A	SDV5	10	840	255	1.50	0.01		25 (2)										
VAV-49A	SDV5	10	900	270	1.50	0.01		26 (2)										
VAV-50A	SDV5	10	900	270	1.50	0.01		26 (2)										
VAV-51A	SDV5	10	685	210	1.50	0.01	310	25 (2)	10.04	1.50	65.00	95.00	140.00	120.00	0.27	WTR	0.00	2R
VAV-52A	SDV5	9	760	230	1.50	0.01		25 (3)										
VAV-53A	SDV5	10	880	265	1.50	0.01		26 (2)										
VAV-54A	SDV5	8	540	165	1.50	0.01		28 (2)										
VAV-55A	SDV5	12	1070	325	1.50	0.01		24 (3)										
VAV-56A	SDV5	6	180	55	1.50	0.03	85	26 (2)	2.75	0.50	65.00	95.00	140.00	120.00	0.27	WTR	0.00	2R
VAV-57A	SDV5	6	300	90	1.50	0.08	135	30 (3)	4.37	0.50	65.00	95.00	140.00	120.00	0.27	WTR	0.00	2R
VAV-58A	SDV5	8	530	160	1.50	0.28	240	26 (2)	7.78	1.00	65.00	95.00	140.00	120.00	0.13	WTR	0.00	2R
VAV-59A	SDV5	14	2150	645	1.50	0.01		24 (2)										
VAV-60A	SDV5	8	600	180	1.50	0.01		30 (2)										
VAV-61A	SDV5	14	2150	645	1.50	0.52		26 (2)										
VAV-62A	SDV5	8	550	165	1.50	0.30	250	27 (2)	8.10	1.00	65.00	95.00	140.00	120.00	0.14	WTR	0.00	2R
VAV-63A	SDV5	8	700	210	1.50	0.01		32 (2)										
VAV-64A	SDV5	10	840	255	1.50	0.01		25 (2)										
VAV-65A	SDV5	10	840	255	1.50	0.01		25 (2)										
VAV-66A	SDV5	10	850	255	1.50	0.01		25 (2)										
VAV-67A	SDV5	10	860	260	1.50	0.01		25 (2)										
VAV-68A	SDV5	10	900	270	1.50	0.01		26 (2)										
VAV-69A	SDV5	12	270	80	1.50	0.01	125	26 (2)	4.05	0.50	65.00	95.00	140.00	120.00	0.14	WTR	0.00	2R
VAV-70A	SDV5	10	700	210	1.50	0.32	315	22 (2)	10.21	1.50	65.00	95.00	140.00	120.00	0.38	WTR	0.00	2R
VAV-71A	SDV5	10	900	270	1.50	0.32		22 (2)										
VAV-72A	SDV5	10	900	270	1.50	0.01		26 (2)										
VAV-73A	SDV5	10	900	270	1.50	0.01		26 (2)										
VAV-74A	SDV5	12	405	125	1.50	0.01	185	26 (2)	5.99	1.00	65.00	95.00	140.00	120.00	0.38	WTR	0.00	2R
VAV-75A	SDV5	6	155	50	1.50	0.01		26 (2)										
VAV-76A	SDV5	5	250	75	1.50	0.47	105	26 (2)	3.40	0.50	65.00	95.00	140.00	120.00	0.38	WTR	0.00	2R
VAV-77A	SDV5	6	155	50	1.50	0.01		26 (2)										
VAV-78A	SDV5	8	550	165	1.50	0.30	250	27 (2)	8.10	1.00	65.00	95.00	140.00	120.00	0.14	WTR	0.00	2R
VAV-79A	SDV5	14	2150	645	1.50	0.01		24 (2)										
VAV-80A	SDV5	8	600	180	1.50	0.01		30 (2)										
VAV-81A	SDV5	14	2150	645	1.50	0.01		24 (2)										
VAV-82A	SDV5	10	900	270	1.50	0.01		26 (2)										
VAV-83A	SDV5	8	390	120	1.50	0.01	175	24 (2)	5.67	1.00	65.00	95.00	140.00	120.00	0.14	WTR	0.00	2R
VAV-84A	SDV5	9	770	235	1.50	0.01		25 (3)										
VAV-85A	SDV5	10	900	270	1.50	0.01		26 (2)										
VAV-86A	SDV5	10	830	250	1.50	0.01		25 (2)										
VAV-87A	SDV5	10	800	240	1.50	0.30	360	22 (2)	11.66	1.50	65.00	95.00	140.00	120.00	0.33	WTR	0.00	2R
VAV-88A	SDV5	10	795	240	1.50	0.30	360	22 (2)	11.66	1.50	65.00	95.00	140.00	120.00	0.33	WTR	0.00	2R
VAV-89A	SDV5	10	900	270	1.50	0.01		26 (2)										
VAV-90A	SDV5	10	830	250	1.50	0.01		25 (2)										
VAV-91A	SDV5	10	900	270	1.50	0.01		26 (2)										
VAV-92A	SDV5	10	830	250	1.50	0.01		25 (2)										
VAV-93A	SDV5	8	390	120	1.50	0.17	180	23 (2)	5.83	1.00	65.00	95.00	140.00	120.00	0.06	WTR	0.00	2R
VAV-94A	SDV5	9	760	230	1.50	0.01		25 (3)										
VAV-95A	SDV5	8	580	175	1.50	0.01	265	29 (2)										
VAV-96A	SDV5	12	1070	325	1.50	0.01		24 (3)										
VAV-97A	SDV5	6	160	50	1.50	0.07	75	24 (2)	2.43	0.50	65.00	95.00	140.00	120.00	0.01	WTR	0.00	2R
VAV-98A	SDV5	8	360	110	1.50	0.15	165	22 (2)	5.35	1.00	65.00	95.00	140.00	120.00	0.04	WTR	0.00	2R
VAV-99A	SDV5	8	550	165	1.50	0.30	250	27 (2)	8.10	1.00	65.00	95.00	140.00	120.00	0.14	WTR	0.00	2R
VAV-100A	SDV5	14	2150	645	1.50	0.01		24 (2)										
VAV-101A	SDV5	14	2150	645	1.50	0.01		24 (2)										
VAV-102A	SDV5	8	550	165	1.50	0.30	250	27 (2)	8.10	1.00	65.00	95.00	140.00	120.00	0.14	WTR	0.00	2R
VAV-103A	SDV5	10	830	250	1.50	0.01		25 (2)										
VAV-104A	SDV5	10	830	250	1.50	0.01		25 (2)										
VAV-105A	SDV5	10	830	250	1.50	0.01		25 (2)										
VAV-106A	SDV5	10	900	270	1.50	0.01		26 (2)										
VAV-107A	SDV5	9	770	235	1.50	0.01		25 (3)										
VAV-108A	SDV5	10	900	270	1.50	0.01		26 (2)										
VAV-109A	SDV5	8	390	120	1.50	0.17	180	23 (2)	5.83	1.00	65.00	95.00	140.00	120.00	0.06	WTR	0.00	2R
VAV-110A	SDV5	10	800	240	1.50	0.30	360	22 (2)	11.66	1.50	65.00	95.00	140.00	120.00	0.33	WTR	0.00	2R
VAV-111A	SDV5	8	600	180	1.50	0.30		22 (2)										
VAV-112A	SDV5	10	900	270	1.50	0.01		26 (2)										
VAV-113A	SDV5	10	900	270	1.50	0.01		26 (2)										
VAV-114A	SDV5	8	600	180	1.50	0.01		26 (2)										

① COORDINATE W/ CONTROLS CONTRACTOR & PROVIDE SAME MANUFACTURER CONTROLLER & ACTUATORS.
② HOT WATER COILS SIZED FOR 140F ENTERING AND 120°F LEAVING WATER TEMPERATURES
③ PROVIDE DISCONNECT SWITCH
④ SCHEDULE IS BASED ON PRICE. ACCEPTABLE MANUFACTURERS INCLUDE PRICE, TITUS, NAILOR OR APPROVED EQUAL.

VARIABLE AIR VOLUME TERMINAL (VAV) SCHEDULE–SECTION AB

Tag	Model	Unit Size	Max Primary (CFM)	Min Primary (CFM)	Inlet SP (in. w.g.)	Min Oper PD (in. w.g.)	Reheat (CFM)	Max Dis NC	WC Capacity (MBH)	Fluid Flow (GPM)	EAT (°F)	LAT (°F)	EWT (°F)	LWT (°F)	FPD (ft. w.g.)	Fluid Type	Glycol %	Rows
VAV-1AB	SDV5	8	535	165	0.25	0.29	245	26 (2)	7.94	1.00	65.00	95.00	140.00	120.00	0.14	WTR	0.00	2R
VAV-2AB	SDV5	8	300	90	0.25	0.12	135	20 (2)	4.37	0.50	65.00	95.00	140.00	120.00	0.03	WTR	0.00	2L
VAV-3AB	SDV5	10	830	250	0.25	0.01		25 (2)										
VAV-4AB	SDV5	8	240	75	0.25	0.01		21 (2)										
VAV-5AB	SDV5	12	1210	365	0.25	0.01		25 (3)										
VAV-6AB	SDV5	10	600	180	0.25	0.23	270	23 (2)	8.75	1.00	65.00	95.00	140.00	120.00	0.19	WTR	0.00	2R
VAV-7AB	SDV5	10	2405	722	0.25	0.23	1080	23 (2)	34.99	4.00	65.00	95.00	140.00	120.00	0.19	WTR	0.00	2R
VAV-8AB	SDV5	6	270	85	0.25	0.19	125	31 (2)	4.05	0.50	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-9AB	SDV5	10	850	255	0.25	0.01		25 (2)										
VAV-10AB	SDV5	10	860	260	0.25	0.01		25 (2)										
VAV-11AB	SDV5	10	900	270	0.25	0.01		26 (2)										
VAV-12AB	SDV5	9	760	230	0.25	0.01		25 (3)										
VAV-13AB	SDV5	10	900	270	0.25	0.01		26 (2)										
VAV-14AB	SDV5	6	220	70	0.25	0.12	105	28 (2)	3.40	0.50	65.00	95.00	140.00	120.00	0.01	WTR	0.00	2R
VAV-15AB	SDV5	8	535	165	0.25	0.29	245	26 (2)	7.94	1.00	65.00	95.00	140.00	120.00	0.14	WTR	0.00	2R
VAV-16AB	SDV5	4	115	35	0.25	0.01	55	24 (2)	1.78	0.50	65.00	95.00	140.00	120.00	0.14	WTR	0.00	2R
VAV-17AB	SDV5	6	225	70	0.25	0.05		29 (2)										
VAV-18AB	SDV5	6	230	70	0.25	0.05		29 (2)										
VAV-19AB	SDV5	16	3500	1050	0.25	0.01	475	27 (2)										
VAV-20AB	SDV5	24x16	4410	1325	0.25	0.62	1985	27 (3)	64.31	7.00	65.00	95.00	140.00	120.00	5.22	WTR	0.00	2R
VAV-21AB	SDV5	8	300	90	0.25	0.12		20 (2)	0.00	0.00	65.00	95.00	140.00	120.00	0.03	WTR	0.00	2L
VAV-22AB	SDV5	8	575	175	0.25	0.29	260	26 (2)	8.42	1.00	65.00	95.00	140.00	120.00	0.14	WTR	0.00	2R
VAV-23AB	SDV5	9	700	210	0.25	0.01		26 (2)										
VAV-24AB	SDV5	8	240	75	0.25	0.01		21 (2)										
VAV-25AB	SDV5	12	1200	360	0.25	0.01		25 (3)										
VAV-26AB	SDV5	10	850	255	0.25	0.01		25 (2)										
VAV-27AB	SDV5	10	860	260	0.25	0.01		25 (2)										
VAV-28AB	SDV5	10	900	270	0.25	0.01		26 (2)										
VAV-29AB	SDV5	6	270	85	0.25	0.19	125	31 (2)	4.05	0.50	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-30AB	SDV5	10	700	210	0.25	0.28	315	22 (2)	10.21	1.50	65.00	95.00	140.00	120.00	0.29	WTR	0.00	2R
VAV-31AB	SDV5	10	800	240	0.25	0.23	60	23 (2)	1.94	0.50	65.00	95.00	140.00	120.00	0.19	WTR	0.00	2R
VAV-32AB	SDV5	9	760	230	0.25	0.01		25 (3)										
VAV-33AB	SDV5	10	900	270	0.25	0.01		26 (2)										
VAV-34AB	SDV5	8	380	115	0.25	0.17	175	23 (2)	5.67	1.00	65.00	95.00	140.00	120.00	0.05	WTR	0.00	2L
VAV-35AB	SDV5	8	570	175	0.25	0.30	260	27 (2)	8.42	1.00	65.00	95.00	140.00	120.00	0.14	WTR	0.00	2R
VAV-36AB	SDV5	4	115	35	0.25	0.01	55	24 (2)	1.78	0.50	65.00	95.00	140.00	120.00	0.14	WTR	0.00	2R
VAV-37AB	SDV5	8	230	70	0.25	0.01		21 (2)										
VAV-38AB	SDV5	8	230	70	0.25	0.01		21 (2)										
VAV-39AB	SDV5	10	675	205	0.25	0.23	305	23 (2)	9.88	1.50	65.00	95.00	140.00	120.00	0.20	WTR	0.00	2R
VAV-40AB	SDV5	8	460	140	0.25	0.23	210	25 (2)	6.80	1.00	65.00	95.00	140.00	120.00	0.09	WTR	0.00	2L
VAV-41AB	SDV5	10	945	285	0.25	0.01		26 (2)										
VAV-42AB	SDV5	4	145	45	0.25	0.01		29 (2)										
VAV-43AB	SDV5	8	425	130	0.25	0.01		25 (2)										
VAV-44AB	SDV5	10	895	270	0.25	0.01		26 (2)										
VAV-45AB	SDV5	9	660	200	0.25	0.01		25 (2)										
VAV-46AB	SDV5	14	2055	620	0.25	0.48	925	--	29.97	3.50	65.00	95.00	140.00	120.00	1.23	WTR	0.00	2R
VAV-47AB	SDV5	6	225	70	0.25	0.14	105	29 (2)	3.40	0.50	65.00	95.00	140.00	120.00	0.01	WTR	0.00	2R
VAV-48AB	SDV5	16	2580	775	0.25	0.01		24 (3)										
VAV-49AB	SDV5	16	2580	775	0.25	0.49	1165	--	37.75	4.00	65.00	95.00	140.00	120.00	2.02	WTR	0.00	2R
VAV-50AB	SDV5	16	2580	775	0.25	0.01		24 (3)										
VAV-51AB	SDV5	10	820	250	0.25	0.01		25 (2)										
VAV-52AB	SDV5	8	465	140	0.25	0.01	210	26 (2)	6.80	1.00	65.00	95.00	140.00	120.00	0.14	WTR	0.00	2R
VAV-53AB	SDV5	8	360	108	0.25	0.01	165	26 (2)	5.35	1.00	65.00	95.00	140.00	120.00	0.14	WTR	0.00	2R
VAV-54AB	SDV5	12	550	165	0.25		250		8.10	1.00	65.00	95.00	140.00	120.00	0.14	WTR	0.00	2R
VAV-55AB	SDV5	10	820	250	0.25	0.01		25 (2)										
VAV-25AB	SDV5	8	240	75	0.25	0.01		21 (2)										
VAV-57AB	SDV5	12	1200	360	0.25	0.01		25 (3)										
VAV-58AB	SDV5	10	900	270	0.25	0.01		26 (2)										
VAV-59AB	SDV5	9	770	235	0.25	0.01		25 (3)										
VAV-60AB	SDV5	10	900	270	0.25	0.01		26 (2)										
VAV-61AB	SDV5	8	390	120	0.25	0.17	180	23 (2)	5.83	1.00	65.00	95.00	140.00	120.00	0.06	WTR	0.00	2R
VAV-62AB	SDV5	10	800	240	0.25	0.30	360	22 (2)	11.66	1.50	65.00	95.00	140.00	120.00	0.33	WTR	0.00	2R
VAV-63AB	SDV5	10	745	225	0.25	0.30	340	22 (2)	11.02	1.50	65.00	95.00	140.00	120.00	0.33	WTR	0.00	2R
VAV-64AB	SDV5	10	900	270	0.25	0.01		26 (2)										
VAV-65AB	SDV5	4	135	40	0.25	0.01	60	29 (2)	1.94	0.50	65.00	95.00	140.00	120.00	0.33	WTR	0.00	2R
VAV-66AB	SDV5	5	215	65	0.25	0.01		29 (2)										
VAV-67AB	SDV5	6	210	65	0.25	0.01		29 (2)										
VAV-68AB	SDV5	8	900	270	0.25	0.01		29 (2)										
VAV-69AB	SDV5	10	550	165	0.25	0.01		29 (2)										

① COORDINATE W/ CONTROLS CONTRACTOR & PROVIDE SAME MANUFACTURER CONTROLLER & ACTUATORS.
② HOT WATER COILS SIZED FOR 140F ENTERING AND 120°F LEAVING WATER TEMPERATURES
③ PROVIDE DISCONNECT SWITCH
④ SCHEDULE IS BASED ON PRICE. ACCEPTABLE MANUFACTURERS INCLUDE PRICE, TITUS, NAILOR OR APPROVED EQUAL.

VARIABLE AIR VOLUME TERMINAL (VAV) SCHEDULE–SECTION B1

Tag	Model	Unit Size	Max Primary (CFM)	Min Primary (CFM)	Inlet SP (in. w.g.)	Min Oper PD (in. w.g.)	Reheat (CFM)	Max Dis NC	WC Capacity (MBH)	Fluid Flow (GPM)	EAT (°F)	LAT (°F)	EWT (°F)	LWT (°F)	FPD (ft. w.g.)	Fluid Type	Glycol %	Rows
VAV-1B1	SDV5	12	920	280	0.25	0.23	415	20 (3)	13.45	1.50	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-2B1	SDV5	4	140	45	0.25	0.02	65	20 (2)	2.11	0.50	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-3B1	SDV5	10	800	240	0.25	0.01	360	24 (2)	11.66	1.50	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-4B1	SDV5	10	800	240	0.25	0.01	360	24 (2)	11.66	1.50	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-5B1	SDV5	4	95	30	0.25	0.01	45	20 (2)	1.46	0.50	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-6B1	SDV5	10	810	245	0.25	0.31	365	22 (2)	11.83	1.50	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-7B1	SDV5	8	265	80	0.25	0.12	120	20 (2)	3.89	0.50	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-8B1	SDV5	8	555	165	0.25	0.27	250	26 (2)	8.10	1.00	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-9B1	SDV5	4	180	55	0.25	0.01	80	27 (2)	2.59	0.50	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-10B1	SDV5	8	370	115	0.25	0.01	165	23 (2)	5.35	1.00	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-11B1	SDV5	8	355	110	0.25	0.01	160	24 (2)	5.18	1.00	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-12B1	SDV5	12	1140	345	0.25	0.01	515	23 (3)	16.69	2.00	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-13B1	SDV5	9	660	200	0.25	0.01	295	24 (3)	9.56	1.00	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-14B1	SDV5	14	1755	530	0.25	0.01	790	22 (2)	25.60	3.00	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-15B1	SDV5	6	170	55	0.25	0.08	80	25 (2)	2.59	0.50	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-16B1	SDV5	6	155	50	0.25	0.02	70	24 (2)	2.27	0.50	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-17B1	SDV5	4	60	20	0.25	0.01	30	--	0.97	0.50	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-18B1	SDV5	16	3405	1025	0.25	0.01	1535	27 (2)	49.73	5.50	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-19B1	SDV5	8	250	75	0.25	0.01	115	22 (2)	3.73	0.50	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-20B1	SDV5	8	590	175	0.25	0.13	265	21 (2)	8.59	1.00	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-21B1	SDV5	8	470	145	0.25	0.23	215	25 (2)	6.97	1.00	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-22B1	SDV5	24x16	3325	1000	0.25	0.39	1500	26 (3)	48.60	5.00	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-23B1	SDV5	14	600	180	0.25	0.01	1460	24 (2)	47.30	5.00	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R
VAV-24B1	SDV5	8	135	40	0.25	0.01	60	29 (2)	1.94	0.50	65.00	95.00	140.00	120.00	0.02	WTR	0.00	2R

① COORDINATE W/ CONTROLS CONTRACTOR & PROVIDE SAME MANUFACTURER CONTROLLER & ACTUATORS.
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③ PROVIDE DISCONNECT SWITCH
④ SCHEDULE IS BASED ON PRICE. ACCEPTABLE MANUFACTURERS INCLUDE PRICE, TITUS, NAILOR OR APPROVED EQUAL.

VARIABLE AIR VOLUME TERMINAL (VAV) SCHEDULE–SECTION B2

Tag	Model	Unit Size	Max Primary (CFM)	Min Primary (CFM)	Inlet SP (in. w.g.)	Min Oper PD (in. w.g.)	Reheat (CFM)	Max Dis NC	WC Capacity (MBH)	Fluid Flow (GPM)	EAT (°F)	LAT (°F)	EWT (°F)	LWT (°F)	FPD (ft. w.g.)	Fluid Type	Glycol %	Rows
VAV-1B2	SDV5	12	1390	420	0.25	0.46	630	21 (3)	20.4	0.5	65.00	95.00	140	120	1.58	WTR	0.00	2R
VAV-2B2	SDV5	8	600	180	0.25	0.35	270	27 (2)	8.7	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-3B2	SDV5	24x16	3245	974	0.25	0.01	1460	24(2)	47.3	0.5	65.00	95.00	140	120	1.58	WTR	0.00	2R
VAV-4B2	SDV5	6	195	60	0.25	0.03	80	26 (2)	1.3	0.5	65.00	80.00	140	120	0.18	WTR	0.00	2R
VAV-5B2	SDV5	4	110	35	0.25	0.01	50	23 (2)	0.8	0.5	65.00	80.00	140	120	0.18	WTR	0.00	2R
VAV-6B2	SDV5	6	180	55	0.25	0.03	80	26 (2)	1.3	0.5	65.00	80.00	140	120	0.18	WTR	0.00	2R
VAV-7B2	SDV5	6	215	65	0.25	0.04	100	28 (2)	1.6	0.5	65.00	80.00	140	120	0.18	WTR	0.00	2R
VAV-8B2	SDV5	12	1050	315	0.25	0.01	475	23 (3)	7.7	0.5	65.00	80.00	140	120	0.18	WTR	0.00	2R
VAV-9B2	SDV5	4	125	40	0.25	0.03	65	28 (2)	1.1	0.5	65.00	80.00	140	120	0.38	WTR	0.00	1R
VAV-10B2	SDV5	8	370	110	0.25	0.01	165	23 (2)	2.7	0.5	65.00	80.00	140	120	0.18	WTR	0.00	2R
VAV-11B2	SDV5	4	160	50	0.25	0.01	75	23 (2)	1.2	0.5	65.00	80.00	140	120	0.18	WTR	0.00	2R
VAV-12B2	SDV5	10	980	295	0.25	0.01	445	27 (2)	7.2	0.5	65.00	80.00	140	120	0.18	WTR	0.00	2R
VAV-13B2	SDV5	8	480	145	0.25	0.24	215	25 (2)	7.0	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-14B2	SDV5	10	920	278	0.25	0.01	420	24 (2)	6.8	0.5	65.00	80.00	140	120	0.18	WTR	0.00	2R
VAV-15B2	SDV5	10	240	75	0.25	0.01	415	26 (2)	6.7	0.5	65.00	80.00	140	120	0.18	WTR	0.00	2R
VAV-16B2	SDV5	4	85	30	0.25	0.01	60	28 (2)	1.0	0.5	65.00	80.00	140	120	0.18	WTR	0.00	2R
VAV-17B2	SDV5	12	870	260	0.25	0.01	480	24 (3)	7.8	0.5	65.00	80.00	140	120	0.18	WTR	0.00	2R
VAV-18B2	SDV5	10	800	240	0.25	0.11	360	28 (2)	11.7	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-19B2	SDV5	8	600	180	0.25	0.35	270	27 (2)	8.7	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-20B2	SDV5	8	600	180	0.25	0.35	270	27 (2)	8.7	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-21B2	SDV5	8	235	75	0.25	0.08	110	21 (2)	3.6	0.5	65.00	95.00	140	120	0.01	WTR	0.00	2R
VAV-22B2	SDV5	8	600	180	0.25	0.01	270	30 (2)	8.7	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-23B2	SDV5	8	600	180	0.25	0.01	270	30 (2)	8.7	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-24B2	SDV5	10	950	285	0.25	0.01	430	27 (2)	13.9	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-25B2	SDV5	8	240	75	0.25	0.08	110	21 (2)	3.6	0.5	65.00	95.00	140	120	0.01	WTR	0.00	2R
VAV-26B2	SDV5	8	440	135	0.25	0.01	200	25 (2)	3.2	0.5	65.00	80.00	140	120	0.18	WTR	0.00	2R
VAV-27B2	SDV5	14	1340	405	0.25	0.01	605	21 (3)	19.6	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-28B2	SDV5	8	365	110	0.25	0.01	165	23 (2)	5.3	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-29B2	SDV5	12	1100	330	0.25	0.01	495	24 (3)	16.0	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-30B2	SDV5	12	110	35	0.25	0.01	50	23 (2)	1.6	2.00	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-31B2	SDV5	12	1125	340	0.25	0.01	510	24 (3)	16.5	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-32B2	SDV5	12	1125	340	0.25	0.01	510	24 (3)	16.5	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-33B2	SDV5	12	1100	330	0.25	0.01	495	24 (3)	16.0	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-34B2	SDV5	8	365	110	0.25	0.16	165	22 (2)	5.3	0.5	65.00	95.00	140	120	0.04	WTR	0.00	2L
VAV-35B2	SDV5	14	1440	435	0.25	0.01	650	21 (3)	21.1	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-36B2	SDV5	6	225	70	0.25	0.14	105	29 (2)	3.4	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-37B2	SDV5	16	2470	745	0.25	0.01	115	24 (3)	3.7	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-38B2	SDV5	6	200	60	0.25	0.04	90	27 (2)	2.9	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-39B2	SDV5	8	240	75	0.25	0.01	110	21 (2)	3.6	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-40B2	SDV5	16	2465	740	0.25	0.01	1110	24 (3)	36.0	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-41B2	SDV5	8	425	130	0.25	0.20	195	24 (2)	6.3	0.5	65.00	95.00	140	120	0.07	WTR	0.00	2R
VAV-42B2	SDV5	16	2480	745	0.25	0.01	1120	24 (3)	36.3	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-43B2	SDV5	6	195	60	0.25	0.01	90	25 (3)	2.9	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-44B2	SDV5	12	860	260	0.25	0.01	85	26 (3)	2.8	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-45B2	SDV5	6	190	60	0.25	0.01	80	27 (3)	2.6	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-46B2	SDV5	24x16	3825	1150	0.25	0.01	1530	29 (2)	49.6	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-47B2	SDV5	14	1460	440	0.25	0.01	585	21(3)	19.0	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-48B2	SDV5	14	1390	420	0.25	0.01	560	21(3)	18.1	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-49B2	SDV5	24x16	3465	1040	0.25	0.01	1390	29(2)	45.0	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R
VAV-50B2	SDV5	14	1275	385	0.25	0.01	510	21(3)	16.5	0.5	65.00	95.00	140	120	0.18	WTR	0.00	2R

① COORDINATE W/ CONTROLS CONTRACTOR & PROVIDE SAME MANUFACTURER CONTROLLER & ACTUATORS.
② HOT WATER COILS SIZED FOR 140F ENTERING AND 120°F LEAVING WATER TEMPERATURES
③ PROVIDE DISCONNECT SWITCH
④ SCHEDULE IS BASED ON PRICE. ACCEPTABLE MANUFACTURERS INCLUDE PRICE, TITUS, NAILOR OR APPROVED EQUAL.

EXHAUST VARIABLE AIR VOLUME TERMINAL (VAV) SCHEDULE–SECTION A

Tag	Model	Unit Size	Max Primary (CFM)	Min Primary (CFM)	Min Oper PD (in. w.g.)	Max Dis NC	Max Rad NC	Weight (lbs)
EVAV-1A	SDE5	14	2580	0	0.30	22 (2)	25 (2)	73
EVAV-2A	SDE5	8	720	0	0.28	21 (2)	25 (2)	42
EVAV-3A	SDE5	12	1400	0	0.16	21 (2)	21 (4)	58
EVAV-4A	SDE5	12	1400	0	0.16	21 (2)	21 (4)	58
EVAV-5A	SDE5	14	2580	0	0.30	22 (2)	25 (2)	73
EVAV-6A	SDE5	14	2580	0	0.30	22 (2)	25 (2)	73
EVAV-7A	SDE5	8	720	0	0.28	21 (2)	25 (2)	42
EVAV-8A	SDE5	12	1400	0	0.16	21 (2)	21 (4)	58
EVAV-9A	SDE5	12	1400	0	0.16	21 (2)	21 (4)	58
EVAV-10A	SDE5	14	2580	0	0.30	22 (2)	25 (2)	73
EVAV-11A	SDE5	14	2580	0	0.30	22 (2)	25 (2)	73
EVAV-12A	SDE5	8	720	0	0.28	21 (2)	25 (2)	42
EVAV-13A	SDE5	12	1400	0	0.16	21 (2)	21 (4)	58
EVAV-14A	SDE5	12	1400	0	0.16	21 (2)	21 (4)	58
EVAV-15A	SDE5	14	2580	0	0.30	22 (2)	25 (2)	73
EVAV-16A	SDE5	14	2580	0	0.30	22 (2)	25 (2)	73
EVAV-17A	SDE5	8	720	0	0.28	21 (2)	25 (2)	42
EVAV-18A	SDE5	12	1400	0	0.16	21 (2)	21 (4)	58
EVAV-19A	SDE5	12	1400	0	0.16	21 (2)	21 (4)	58
EVAV-20A	SDE5	14	2580	0	0.30	22 (2)	25 (2)	73

① COORDINATE W/ CONTROLS CONTRACTOR & PROVIDE SAME MANUFACTURER CONTROLLER & ACTUATORS.
② PROVIDE DISCONNECT SWITCH
③ SCHEDULE IS BASED ON PRICE. ACCEPTABLE MANUFACTURERS INCLUDE PRICE, TITUS, NAILOR OR APPROVED EQUAL.

EXHAUST VARIABLE AIR VOLUME TERMINAL (VAV) SCHEDULE–SECTION A

Tag	Model	Unit Size	Max Primary (CFM)	Min Primary (CFM)	Min Oper PD (in. w.g.)	Max Dis NC	Max Rad NC	Weight (lbs)
EVAV-1AB	SDE5	6	300	0	0.23	21 (2)	--	38
EVAV-2AB	SDE5	12	1400	0	0.16	21 (2)	21 (4)	58
EVAV-3AB	SDE5	12	1535	0	0.19	21 (2)	21 (4)	58
EVAV-4AB	SDE5	6	300	0	0.23	21 (2)	--	38
EVAV-5AB	SDE5	12	1400	0	0.16	21 (2)	21 (4)	58
EVAV-6AB	SDE5	12	1500	0	0.18	21 (2)	21 (4)	58
EVAV-7AB	SDE5	6	300	0	0.23	21 (2)	--	38
EVAV-8AB	SDE5	12	1500	0	0.18	21 (2)	21 (4)	58

① COORDINATE W/ CONTROLS CONTRACTOR & PROVIDE SAME MANUFACTURER CONTROLLER & ACTUATORS.
② PROVIDE DISCONNECT SWITCH
③ SCHEDULE IS BASED ON PRICE. ACCEPTABLE MANUFACTURERS INCLUDE PRICE, TITUS, NAILOR OR APPROVED EQUAL.

EXHAUST VARIABLE AIR VOLUME TERMINAL (VAV) SCHEDULE–SECTION A

Tag	Model	Unit Size	Max Primary (CFM)	Min Primary (CFM)	Min Oper PD (in. w.g.)	Max Dis NC	Max Rad NC	Weight (lbs)
EVAV-1B2	SDE5	12	1260	0	0.13	20 (2)	20 (4)	58
EVAV-2B2	SDE5	8	550	0	0.16	--	21 (2)	42
EVAV-3B2	SDE5	10	1120	0	0.23	22 (2)	22 (2)	49
EVAV-4B2	SDE5	12	1325	0	0.14	20 (2)	20 (4)	58
EVAV-5B2	SDE5	12	1325	0	0.14	20 (2)	20 (4)	58
EVAV-6B2	SDE5	10	1120	0	0.23	22 (2)	22 (2)	49
EVAV-7B2	SDE5	8	550	0	0.16	--	21 (2)	42
EVAV-8B2	SDE5	12	1435	0	0.17	21 (2)	21 (4)	58
EVAV-9B2	SDE5	14	2470	0	0.27	21 (3)	24 (4)	73
EVAV-10B2	SDE5	14	2465	0	0.27	21 (3)	24 (4)	73
EVAV-11B2	SDE5	14	2480	0	0.28	21 (3)	24 (4)	73

① COORDINATE W/ CONTROLS CONTRACTOR & PROVIDE SAME MANUFACTURER CONTROLLER & ACTUATORS.
② PROVIDE DISCONNECT SWITCH
③ SCHEDULE IS BASED ON PRICE. ACCEPTABLE MANUFACTURERS INCLUDE PRICE, TITUS, NAILOR OR APPROVED EQUAL.

SOUND ATTENUATOR SCHEDULE

	Silencer Information							Duct System Information				Dynamic Insertion Loss (dB)							
Tag	Qty	Model	Width (in)	Height (in)	Length (in)	LegA (in)	LegB (in)	Air Direction	Flow (CFM)	Velocity (FPM)	PD (in. w.g.)	63	125	250	500	1k	2k	4k	8k
SA-1S	1	-	-	-	-	-	-	Forward	39600	1781	-	83	79	69	65	64	68	66	65
SA-1R	1	-	-	-	-	-	-	Reverse	39600	1303	-	88	92	103	95	92	87	81	77
SA-2S	1	-	-	-	-	-	-	Forward	40325	1806	-	83	80	69	66	64	68	66	66
SA-2R	1	-	-	-	-	-	-	Reverse	40325	1292	-	88	92	103	95	92	87	81	77
SA-3S	1	-	-	-	-	-	-	Forward	32700	1913	-	80	75	64	62	63	66	61	59
SA-3R	1	-	-	-	-	-	-	Reverse	32700	1187	-	88	92	98	91	88	83	77	74
SA-4S	1	ERMT60/2C	19.00	39.00	60.00	38.00	38.00	Forward	5100	1275	0.19	9	13	18	24	33	41	32	20
SA-4R	1	ERMT60/8A	Note 2	Note 2	60.00	28.00	48.00	Reverse	5100	756	0.03	9	13	14	17	21	25	20	13
SA-5S	1	ERMT60/8B	28.00	58.00	60.00	44.00	44.00	Forward	13300	1179	0.10	9	13	15	18	23	28	22	15
SA-5R	2	ERMT60/YA	33.00	43.00	60.00	41.50	41.50	Reverse	5880	597	0.03	9	12	12	14	18	22	17	11
SA-6S	2	ERMT66/5C	43.00	54.00	66.00	54.50	54.50	Forward	15975	991	0.11	10	14	18	23	30	36	29	18
SA-6R	1	ERMT72/1A	Note 4	Note 4	72.00	Note 4	Note 4	Reverse	15975	1136	0.11	10	14	20	27	36	44	33	19
SA-7S	1	ERMT60/YB	23.00	43.00	60.00	41.50	41.50	Forward	7000	1019	0.12	11	14	13	16	19	26	21	14
SA-7R	1	ERMT60/YA	23.00	43.00	60.00	41.50	41.50	Reverse	7000	1019	0.09	9	12	12	15	19	22	17	11
SA-8S	1	ERMT72/6B	23.00	43.00	72.00	47.50	47.50	Forward	7300	1063	0.08	10	14	17	23	28	33	26	17
SA-8R	1	ERMT72/YC	23.00	43.00	72.00	47.50	47.50	Reverse	7300	1063	0.18	14	17	17	20	25	31	26	16
SA-9S	1	ERMT72/YB	23.00	43.00	72.00	47.50	47.50	Forward	7400	1077	0.13	11	15	14	17	22	28	23	14
SA-9R	1	ERMT72/YB	23.00	43.00	72.00	47.50	47.50	Reverse	7400	1077	0.13	12	17	16	18	23	28	22	14
SA-10S	1	ERMT108/3B	35.00	35.00	108.00	71.50	71.50	Forward	10700	1258	0.16	14	17	24	35	42	53	42	24
SA-10R	1	ERMT90/3C	35.00	35.00	90.00	62.50	62.50	Reverse	10700	1258	0.19	14	19	26	34	42	48	38	22
SA-11S	1	ERMT72/VA	33.00	53.00	72.00	44.50	60.50	Forward	16900	1391	0.12	10	13	13	18	22	28	21	14
SA-11R	2	ERMT72/VA	33.00	53.00	72.00	52.50	52.50	Reverse	16900	1391	0.12	11	15	15	20	23	28	21	14
SA-12S	1	ERMT72/YA	23.00	43.00	72.00	36.00	59.00	Forward	7060	1028	0.09	9	12	12	16	20	26	20	13
SA-12R	1	RLT72/6C	23.00	43.00	72.00			Reverse	7060	1028	0.16	11	14	21	28	30	26	17	12
SA-13S	1	ERMT72/8B	27.00	49.00	72.00	49.50	49.50	Forward	10205	1111	0.09	10	14	16	22	27	32	25	16
SA-13R	1	ERMT84/1C	27.00	49.00	84.00	55.50	55.50	Reverse	10205	1111	0.17	12	18	27	34	44	54	42	24
SA-14S	1	ERMT72/8A	27.00	41.00	72.00	49.50	49.50	Forward	9305	1210	0.08	9	13	14	20	24	29	23	15
SA-14R	1	ERMT72/1C	27.00	41.00	72.00	49.50	49.50	Reverse	9305	1210	0.19	11	17	25	31	41	50	39	22
SA-15S	1	RLT36/VD	17.00	17.00	36.00			Forward	1100	548	0.06	8	10	12	16	14	15	11	9
SA-15R	1	RLT36/VC	17.00	17.00	36.00			Reverse	1100	548	0.04	8	10	11	14	13	13	10	8
SA-16S	1	ERMT96/VB	33.00	49.00	96.00	40.00	89.00	Forward	15750	1403	0.18	12	16	17	25	28	35	27	17
SA-16R	1	ERMT60/VA	33.00	49.00	60.00	40.00	53.00	Reverse	15750	1403	0.12	10	14	14	17	21	25	19	13
SA-17S	1	ERMT84/8C	27.00	27.00	84.00	55.50	55.50	Forward	5100	1007	0.12	11	16	19	26	32	37	29	18
SA-17R	1	ERMT60/8C	27.00	27.00	60.00	43.50	43.50	Reverse	5100	1007	0.12	11	15	17	21	27	30	23	15
SA-18S	1	ERMT120/6E	23.00	29.00	120.00	60.00	83.00	Forward	3500	756	0.13	18	25	32	41	49	55	43	25
SA-18R	1	ERMT60/YD	23.00	29.00	60.00	41.50	41.50	Reverse	3500	756	0.14	11	17	17	19	24	33	28	18
SA-19S	1	ERMT60/8A	27.00	31.00	60.00	43.50	43.50	Forward	7075	1217	0.08	9	12	13	16	20	25	20	14
SA-19R	1	ERMT132/1B	27.00	31.00	132.00	43.50	115.50	Reverse	7075	1217	0.21	18	22	33	47	55	55	54	28
SA-20S	1	ERMT108/1E	27.00	39.00	108.00	67.50	67.50	Forward	6100	834	0.20	17	23	34	41	47	55	55	32
SA-20R	1	ERMT84/1E	27.00	39.00	84.00	55.50	55.50	Reverse	6100	834	0.18	15	22	33	38	48	55	48	27
SA-21S	1	ERMT144/2A	33.00	43.00	144.00	88.50	88.50	Forward	14000	1421	0.19	15	18	25	46	53	55	51	28
SA-21R1	1	ERMT132/2A	31.00	15.00	132.00	81.50	81.50	Reverse	5000	1548	0.22	16	19	27	45	53	55	46	25
SA-21R2	1	ERMT120/2D	31.00	39.00	120.00	75.50	75.50	Reverse	9000	1072	0.23	19	26	37	44	52	55	51	27
SA-22S	1	ERMT132/8C	27.00	39.00	132.00	79.50	79.50	Forward	9100	1244	0.17	17	21	26	39	44	51	39	23
SA-22R	1	ERMT120/1B	27.00	39.00	120.00	42.00	105.00	Reverse	9100	1244	0.21	17	21	31	43	52	55	51	27
SA-23S	1	RLT36/4D	19.00	19.00	36.00			Forward	1570	626	0.09	7	10	14	20	23	25	18	12
SA-23R	1	RLT36/WE	19.00	19.00	36.00			Reverse	1570	626	0.11	9	13	15	18	17	16	12	9
SA-24S	1	RLT36/4B	19.00	17.00	36.00			Forward	1335	595	0.04	6	8	11	16	17	18	14	10
SA-24R	1	RLT36/4E	19.00	17.00	36.00			Reverse	1335	595	0.12	9	12	17	23	27	27	20	13
SA-MAU	1	RLT36/4E	19.00	17.00	36.00			Reverse	1335	595	0.12	9	12	17	23	27	27	20	13

① ATTENUATORS SHALL BE SAME SIZE OF DUCTWORK, CONSTRUCTED OF GALVANIZED STEEL, CL1 (22 GA) 22GA PERF LINER, FIBERGLASS, POLYMER FILM; VERIFY ALL DIMENSIONS
② SA–4R SHALL BE CUSTOM TEE TYPE ATTENUATOR W/ 36"x27" INLET, 27"x21" & 27"x15" OUTLET; VERIFY ALL DIMENSIONS
③ RTU–1,2,3 SHALL HAVE INTEGRAL SOUND ATTENUATORS; REFER TO DRAWINGS & SPECIFICATIONS FOR SIZING REQUIREMENTS
④ SA–6S SHALL BE CUSTOM TEE TYPE ATTENUATOR W/ 54"x43" INLET, 43"x27" OUTLETS; VERIFY ALL DIMENSIONS

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OWNER

Worcester Public Schools

Worcester, MA

Project North

PROJECT

FINAL BID PACKAGE

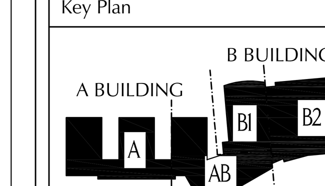
South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

HVAC Schedules

Key Plan



REVISIONS

No.	Description	Date

FILE:
DWN. BY: DJM | JOB NO: #1611
CKD. BY: KRS | SCALE: 1/8" = 1'-0"
DATE: January 31, 2019

H7.3

AUDIOVISUAL DEVICE KEY

DEVICE	DESCRIPTION	BACK BOX DESCRIPTION	MOUNTING HEIGHT ADVICE	COMMENTS
AL	ASSISTIVE LISTENING ANTENNA CONNECTION	ONE GANG ELECTRICAL BOX	PER ARCHITECT	
AV	AUDIO CONNECTION PANEL	TWO GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
AV4	AUDIOVISUAL CONNECTION PANEL	FOUR GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
BCP	BLEACHER CONNECTION PANEL	TWO GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
BM	BASIC MIX MICROPHONE CONNECTION PANEL	ONE GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	REFER TO ARCHITECT'S ELEVATION FOR STAGE APRON MOUNTING HEIGHTS
CA	CAMERA CONNECTION PANEL	THREE GANG ELECTRICAL BOX	PER ARCHITECT	
CC	CENTER CLUSTER LOUDSPEAKER WIRING	4"X4"X4" ELECTRICAL BOX	ABOVE LOUDSPEAKER LOCATION	PASS-THROUGH FACEPLATE
CP	CONTROL PANEL	THREE GANG ELECTRICAL BOX	PROJECT SWITCH HEIGHT	
CPA	CLASSROOM PROJECTOR AUDIO INPUT	ONE GANG ELECTRICAL BOX	NEXT TO PROJECTOR POWER AND DATA DEVICES	
D	DELAY LOUDSPEAKER WIRING	4"X4"X4" ELECTRICAL BOX	ABOVE LOUDSPEAKER LOCATION	PASS-THROUGH FACEPLATE
D4	CATEGORY CONNECTION PANEL	TWO GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
DC	DIMMER CONTROL WIRING	ONE GANG ELECTRICAL BOX	IN BACKPAN OF LIGHTING EQUIPMENT RACK	
FB1	FLOOR BOX - LARGE, 12 GANG	6" DEEP		REFERENCE MOUNTING DETAIL
FF	FRONT FILL LOUDSPEAKER	FRAMED CAVITY IN WALL, NO BACK BOX	PER ARCHITECT	REFER TO ARCHITECT'S ELEVATION FOR STAGE APRON MOUNTING HEIGHTS
I	INTERCOM CONNECTION PANEL	ONE GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
JB1	18-INCH WIDE, 6-INCH DEEP CABLE TRAY	AS REQUIRED	ABOVE EQUIPMENT RACK	
JB2	JUNCTION BOX FOR RACK WIRING	AS REQUIRED	ABOVE EQUIPMENT RACK	STAGE EQUIPMENT RACK
JB3	JUNCTION BOX FOR RACK WIRING	AS REQUIRED	ABOVE EQUIPMENT RACK	GYMNASIUM EQUIPMENT RACK
JB4	JUNCTION BOX FOR RACK WIRING	AS REQUIRED	ABOVE EQUIPMENT RACK	CAFETERIA EQUIPMENT RACK
JB5	JUNCTION BOX FOR RACK WIRING	AS REQUIRED	IN WALL BEHIND EQUIPMENT RACK LOCATION	LARGE GROUP SEMINAR RACK
JB6	JUNCTION BOX FOR RACK WIRING	AS REQUIRED	ABOVE EQUIPMENT RACK	ATHLETIC FIELD EQUIPMENT RACK
L2	LINE OUTPUT PANEL	ONE GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	REFER TO ARCHITECT'S ELEVATION FOR STAGE APRON MOUNTING HEIGHTS
LC1	LOUDPSEAKER WIRING DEVICE	4" X 4" BOX FLUSH MOUNTED IN LIGHT POLE	AT LOUDSPEAKER LOCATION	WITH WEATHERPROOF PASS-THROUGH GLAND
LG	LOUDSPEAKER WIRING DEVICE	4" X 4" X 4" SURFACE MOUNT BOX	ABOVE LOUDSPEAKER LOCATION	PASS-THROUGH FACEPLATE
M4	MICROPHONE CONNECTION PANEL	TWO GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
MM	MONITOR MICROPHONE CONNECTION PANEL	ONE GANG ELECTRICAL BOX	ABOVE MICROPHONE LOCATION	REFER TO ARCHITECT'S ELEVATION FOR STAGE APRON MOUNTING HEIGHTS
MR	MIX POSITION EQUIPMENT RACK CONNECTION	FOUR GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	PASS-THROUGH FACEPLATE
MX	MIX POSITION CONNECTION PANEL	12" x12" x 4" WALL BOX	PROJECT RECEPTACLE HEIGHT	
MXB	MIX POSITION CONNECTION PANEL	12" x12" x 4" WALL BOX	PROJECT RECEPTACLE HEIGHT	
PF	PRESS FEED PANEL	ONE GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
PK	PROJECTION SCREEN KEY SWITCH	ONE GANG ELECTRICAL BOX	PROJECT SWITCH HEIGHT	
PL	PROGRAM LOUDSPEAKER	ONE GANG ELECTRICAL BOX	BEHIND LOUDSPEAKER	
PS	PROJECTION SCREEN CONTROL CONNECTION	ONE GANG ELECTRICAL BOX	MOUNT TO SCREEN CASE	
R	RECORDING MICROPHONE CONNECTION - CATWALK	ONE GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
R2	RECORDING MICROPHONE CONNECTION - CEILING	ONE GANG ELECTRICAL BOX	ABOVE MICROPHONE LOCATION	
RC	CLASSROOM RACK CONNECTION PANEL	FIVE GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
S	CEILING LOUDSPEAKER, FLUSH	CEILING LOUDSPEAKER		
S2	FLUSH CEILING MOUNT LOUDSPEAKER, TYPE 2	LOUDSPEAKER-SPECIFIC BACK BOX		
SF	SIDE FILL LOUDSPEAKER	ONE GANG ELECTRICAL BOX	ABOVE LOUDSPEAKER LOCATION	PASS-THROUGH FACEPLATE, REFER TO ARCHITECT'S ELEVATION FOR MOUNTING HEIGHTS
SH	HIGH-CEILING PENDANT LOUDSPEAKER	OCTAGONAL CEILING BOX	ABOVE LOUDSPEAKER LOCATION	
SP	STAGE CONNECTION PANEL	12" X 12" X 4" WALL BOX	PROJECT RECEPTACLE HEIGHT	
USP	UPSTAGE CONNECTION PANEL	10" X 10" X 4" WALL BOX	PROJECT RECEPTACLE HEIGHT	
V	VOLUME CONTROL - DSP	ONE GANG ELECTRICAL BOX	PROJECT SWITCH HEIGHT	WITH PROTECTIVE COVER
VC	VOLUME CONTROL - 70V	ONE GANG ELECTRICAL BOX	PROJECT SWITCH HEIGHT	
VP	VIDEO PROJECTOR CONNECTION PANEL	TWO GANG ELECTRICAL BOX	AT OR ABOVE PROJECTOR LOCATION	
VP2	VIDEO PROJECTOR CONNECTION PANEL	ONE GANG ELECTRICAL BOX	ABOVE PROJECTOR LOCATION	
WA	WIRELESS MICROPHONE ANTENNA	ONE GANG ELECTRICAL BOX	PER ARCHITECT	
WB1	WALL CONNECTION BOX - TYPE 1	10" X 10" X 4" WALL BOX	PROJECT RECEPTACLE HEIGHT	IN PRESS BOOTH
WB2	WALL CONNECTION BOX - TYPE 2	FSR WB-X3-GNG WALL BOX WITH LOCKING COVER	PROJECT RECEPTACLE HEIGHT	
WBA	WALL CONNECTION BOX - TYPE A	FIVE GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
WBB	WALL CONNECTION BOX - TYPE B	FOUR GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
WBG	WALL BOX, GYM	8" x 8" x 6" WALL BOX RECESSED IN WALL	PROJECT RECEPTACLE HEIGHT	
WP1	WALL CONNECTION BOX - WEATHERPROOF TYPE 1	8" X 10" X 6" NEMA TYPE 4X	PROJECT RECEPTACLE HEIGHT	ON FILMING PLATFORM

PROJECTION SCREEN SCHEDULE

LOCATION	IMAGE HEIGHT	IMAGE WIDTH	TOP BLACK DROP LENGTH	SCREEN MATERIAL
LARGE MOTORIZED FRONT PROJECTION SCREEN, NON-TENSIONED				
CAFETERIA	96"	170 3/4"	23"	PER SPEC
GYMNASIUM	120"	213 1/4"	6"	PER SPEC
MEDIA CENTER	96"	170 3/4"	23"	PER SPEC
LARGE MOTORIZED FRONT PROJECTION SCREEN, TENSIONED				
AUDITORIUM	146"	259 1/2"	34"	PER SPEC
MOTORIZED FRONT PROJECTION SCREEN, NON-TENSIONED				
LARGE GROUP SEMINAR	70"	112"	6"	PER SPEC
LARGE GROUP SEMINAR	70"	112"	6"	PER SPEC

AUDIOVISUAL EQUIPMENT RACK SCHEDULE

LOCATION	HEAT LOAD, ACTIVE (BTU)	HEAT LOAD, STANDBY (BTU)	DESCRIPTION	COMMENTS
PIANO LAB	1,500	1,000	19" ROLLING EQUIPMENT RACK	
BAND	1,500	1,000	19" ROLLING EQUIPMENT RACK	
CHORUS	1,500	1,000	19" ROLLING EQUIPMENT RACK	
LARGE GROUP SEMINAR	3,500	3,000	19" WALL-MOUNTED SWING-OUT EQUIPMENT RACK	
ATHLETIC FIELD	5,000	3,000	19" PIVOTING EQUIPMENT RACK - 24 SPACE	
AUDITORIUM RACK ROOM	10,000	5,000	19" GANGABLE EQUIPMENT RACK	
PE STORAGE	5,000	3,000	19" PIVOTING EQUIPMENT RACK - 40 SPACE	
TABLE STORAGE	4,000	2,000	19" PIVOTING EQUIPMENT RACK - 40 SPACE	
AUDITORIUM STAGE LEFT	2,000	2,000	19" PIVOTING EQUIPMENT RACK - 40 SPACE	

AUDIOVISUAL SHEET LIST

SHEET NUMBER	SHEET NAME
AV0.0	AUDIOVISUAL KEYS, NOTES AND SCHEDULES
AV0.1	AUDIOVISUAL CONDUIT RISERS
AV0.2	AUDIOVISUAL DETAILS
AV3.4	AUDIOVISUAL DEVICE PLAN - FIRST FLOOR SECTION AB
AV3.5	AUDIOVISUAL DEVICE PLAN - FIRST FLOOR SECTION B1
AV3.6	AUDIOVISUAL DEVICE PLAN - FIRST FLOOR SECTION B2
AV3.8	AUDIOVISUAL DEVICE PLAN - SECOND FLOOR SECTION AB
AV3.9	AUDIOVISUAL DEVICE PLAN - SECOND FLOOR SECTION B1
AV3.10	AUDIOVISUAL DEVICE PLAN - SECOND FLOOR SECTION B2
AV3.12	AUDIOVISUAL DEVICE PLAN - THIRD FLOOR SECTION B1
AV3.18	ATHLETIC FIELD PLAN
AV4.4	AUDIOVISUAL RCP - FIRST FLOOR SECTION AB
AV4.5	AUDIOVISUAL RCP - FIRST FLOOR SECTION B1
AV4.8	AUDIOVISUAL RCP - SECOND FLOOR SECTION AB
AV4.9	AUDIOVISUAL DEVICE RCP - SECTION FLOOR SECTION B1
AV4.10	AUDIOVISUAL RCP - SECOND FLOOR SECTION B2
AV5.0	AUDIOVISUAL DIAGRAM KEY AND DETAILS
AV5.1	AUDIOVISUAL FUNCTIONAL DIAGRAM - AUDITORIUM
AV5.2	AUDIOVISUAL FUNCTIONAL DIAGRAM - AUDITORIUM
AV5.3	AUDIOVISUAL FUNCTIONAL DIAGRAMS - AUDITORIUM
AV5.4	AUDIOVISUAL FUNCTIONAL DIAGRAM - GYMNASIUM
AV5.5	AUDIOVISUAL FUN. DIAG. - CAFETERIA AND CLASSROOMS
AV5.6	AUDIOVISUAL FUNCTIONAL DIAG. - LARGE GROUP SEMINAR
AV5.7	AUDIOVIDUAL FUNCTION DIAGRAM - ATHLETIC FIELD
AV6.1	AUDIOVISUAL RACK ELEVATIONS
AV6.2	AUDIOVISUAL PLATE AND PANEL DETAILS
AV6.3	AUDIOVISUAL PLATE AND PANEL DETAILS
AV7.1	AUDIOVISUAL SECTIONS
AV7.2	LOUDSPEAKER DETAILS

ELECTRICAL NOTES

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AUDIOVISUAL DEVICE LEGEND

10 A XXX	AUDIOVISUAL DEVICE WITH POWER AND DATA DEVICES MOUNTED ADJACENT TO AUDIOVISUAL DEVICE
XXX	AUDIOVISUAL DEVICE WITH DATA DROP WITHIN AUDIOVISUAL DEVICE BOX
XXX	FLOOR MOUNTED DEVICE
XXX	WALL MOUNTED DEVICE, FLUSH
XXX	WALL MOUNTED DEVICE, SURFACE
XX A	CEILING MOUNTED DEVICE SUBSCRIPT INDICATES ZONE
	VIDEO PROJECTOR
PSE H" X W"	ELECTRIC, ROLL-DOWN FRONT PROJECTION SCREEN, IMAGE SIZE INDICATED
PSM H" X W"	MANUAL ROLL-DOWN FRONT PROJECTION SCREEN, IMAGE SIZE INDICATED
PSS H" X W"	STATIC FRONT PROJECTION SCREEN IMAGE SIZE INDICATED
FP - XX"	FLAT PANEL DISPLAY NOMINAL DIAGONAL IMAGE SIZE INDICATED
	VIDEO CAMERA, WALL MOUNTED
AV RACK	AUDIOVISUAL EQUIPMENT RACK

AUDIOVISUAL DEVICE KEY NOTES

1. ABBREVIATIONS
   P.S.H. = PROJECT SWITCH HEIGHT
   P.R.H. = PROJECT RECEPTABLE HEIGHT

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PROJECT

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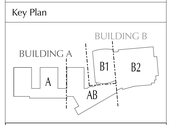
TITLE

AUDIOVISUAL KEYS, NOTES AND SCHEDULES

Key Plan



REVISIONS

No.	Description	Date

FILE:

DWN. BY: AGB/MM	JOB NO: #1611
CKD. BY: AGB	SCALE: As indicated
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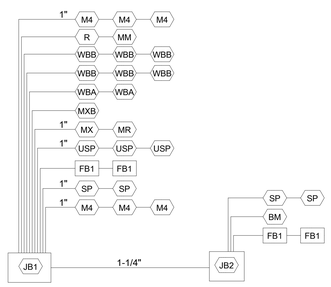
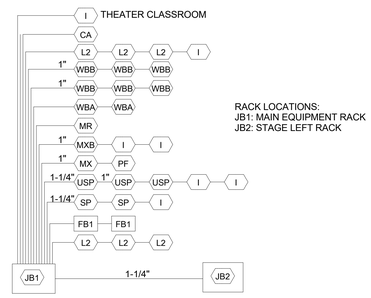
AV0.0

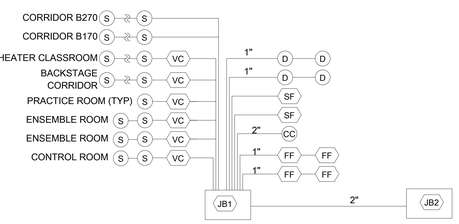


GROUP A CONDUIT

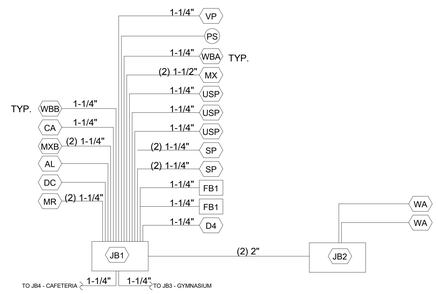


RACK LOCATIONS:
JB1: MAIN EQUIPMENT RACK
JB2: STAGE LEFT RACK

GROUP B CONDUIT

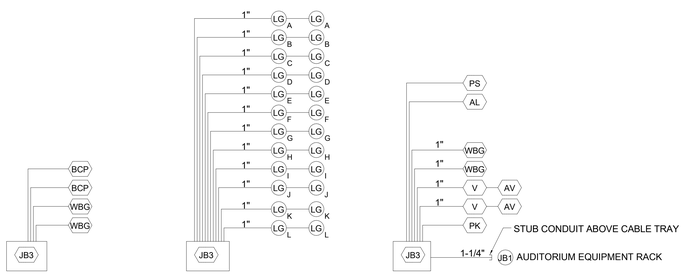


GROUP C CONDUIT



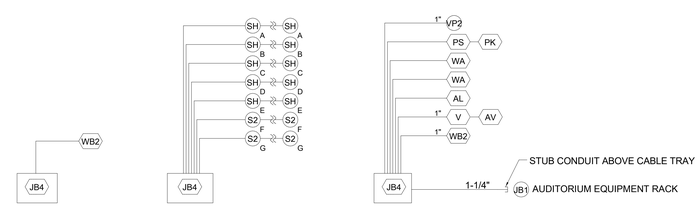
GROUP D CONDUIT

1 CONDUIT RISER - AUDITORIUM
NTS



GROUP B CONDUIT GROUP C CONDUIT GROUP D CONDUIT

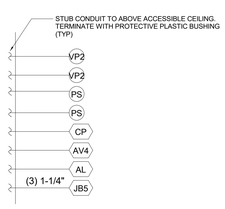
2 CONDUIT RISER - GYMNASIUM
NTS



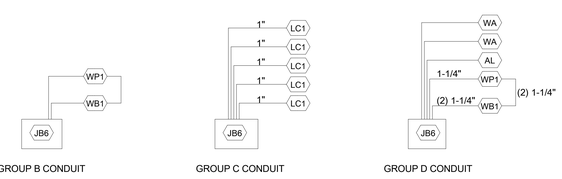
GROUP A CONDUIT GROUP C CONDUIT GROUP D CONDUIT

3 CONDUIT RISER - CAFETERIA
NTS

4 CONDUIT RISER - MEDIA CENTER
NTS

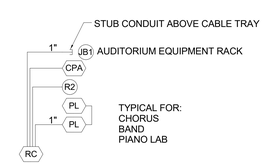


5 CONDUIT RISER - LARGE GROUP SEMINAR
NTS



GROUP B CONDUIT GROUP C CONDUIT GROUP D CONDUIT

6 CONDUIT RISER - ATHLETIC FIELD
NTS



7 CONDUIT RISER - MUSIC CLASSROOMS
NTS

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AUDIOVISUAL CONDUIT SEPARATION DISTANCES TABLE

GROUP	SIGNALS TYPES	GROUP A	GROUP B	GROUP C	GROUP D
A	MICROPHONE	ADJACENT	6"	18"	12"
B	LINE LEVEL ANALOG...	6"	ADJACENT	12"	12"
C	LOUDSPEAKER LEVEL	18"	12"	ADJACENT	3"
D	DATA, CONTROL,...	12"	12"	3"	ADJACENT
120VAC POWER		24"	18"	9"	9"
277VAC POWER		38"	24"	12"	12"
DIMMED POWER		36"	24"	12"	12"
NON-AV LOW-VOLTAGE		12"	6"	ADJACENT	ADJACENT

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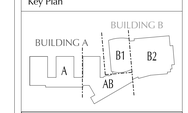
AUDIOVISUAL CONDUIT RISERS

Key Plan



REVISIONS

No.	Description	Date

FILE:

DWN. BY: AGB/EEL JOB NO: #1613
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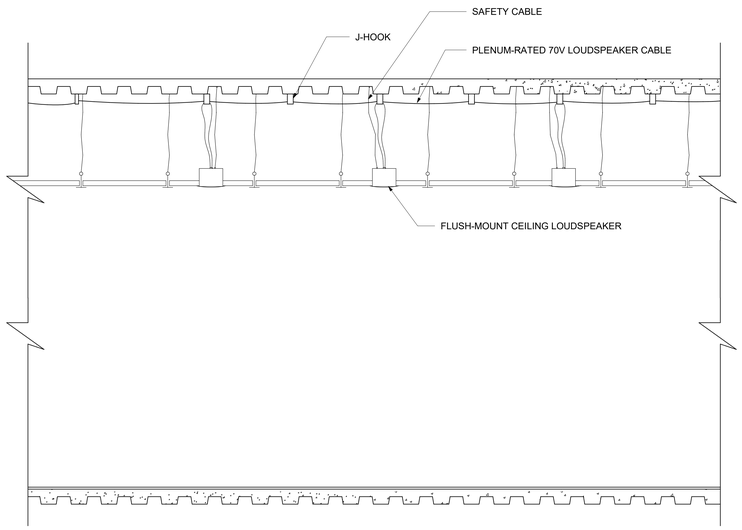
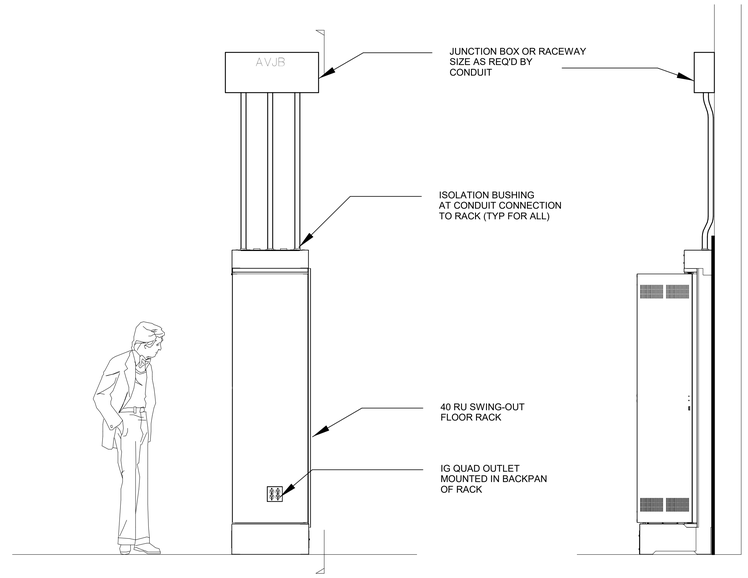
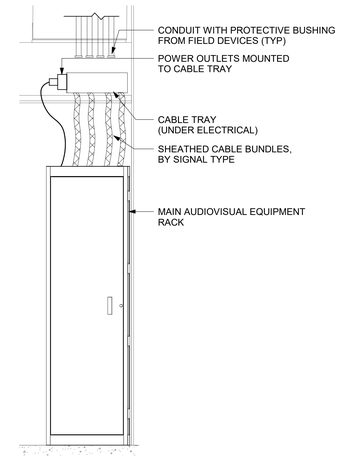


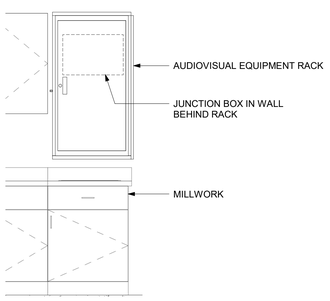
1 CEILING MOUNT LOUDSPEAKER DETAIL
3/4" = 1'-0"



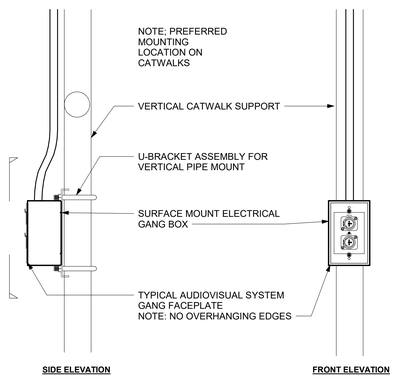
2 FLOOR-MOUNTED SWING-OUT EQUIPMENT RACK DETAIL
3/4" = 1'-0"



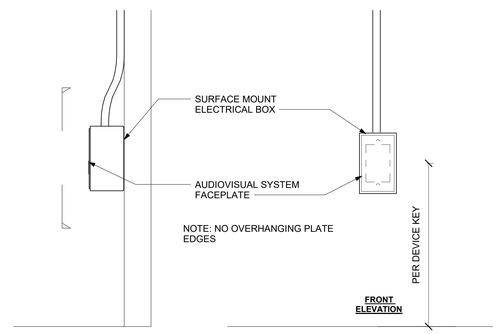
3 AUDITORIUM MAIN EQUIPMENT RACK
3/4" = 1'-0"



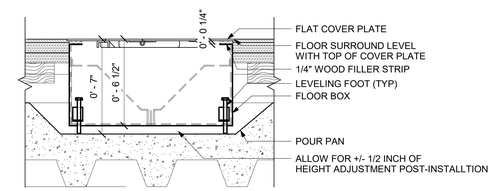
4 LARGE GROUP SEMINAR EQUIPMENT RACK
3/4" = 1'-0"



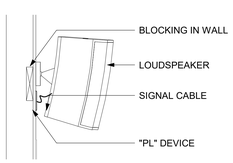
5 MOUNTING DETAIL - VERTICAL PIPE MOUNT DEVICE
3" = 1'-0"



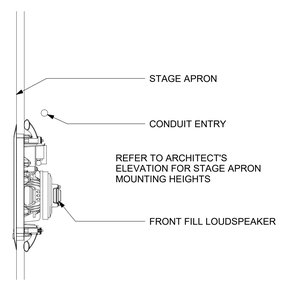
6 MOUNTING DETAIL - SURFACE MOUNT DEVICE
3" = 1'-0"



7 STAGE FLOOR BOX MOUNTING DETAIL
3" = 1'-0"



8 CLASSROOM WALL LOUDSPEAKER MOUNTING DETAIL (TYP)
1" = 1'-0"



9 FRONT FILL LOUDSPEAKER DETAIL SECTION
3" = 1'-0"

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PROJECT

Final Bid Package

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

AUDIOVISUAL DETAILS

Key Plan

REVISIONS

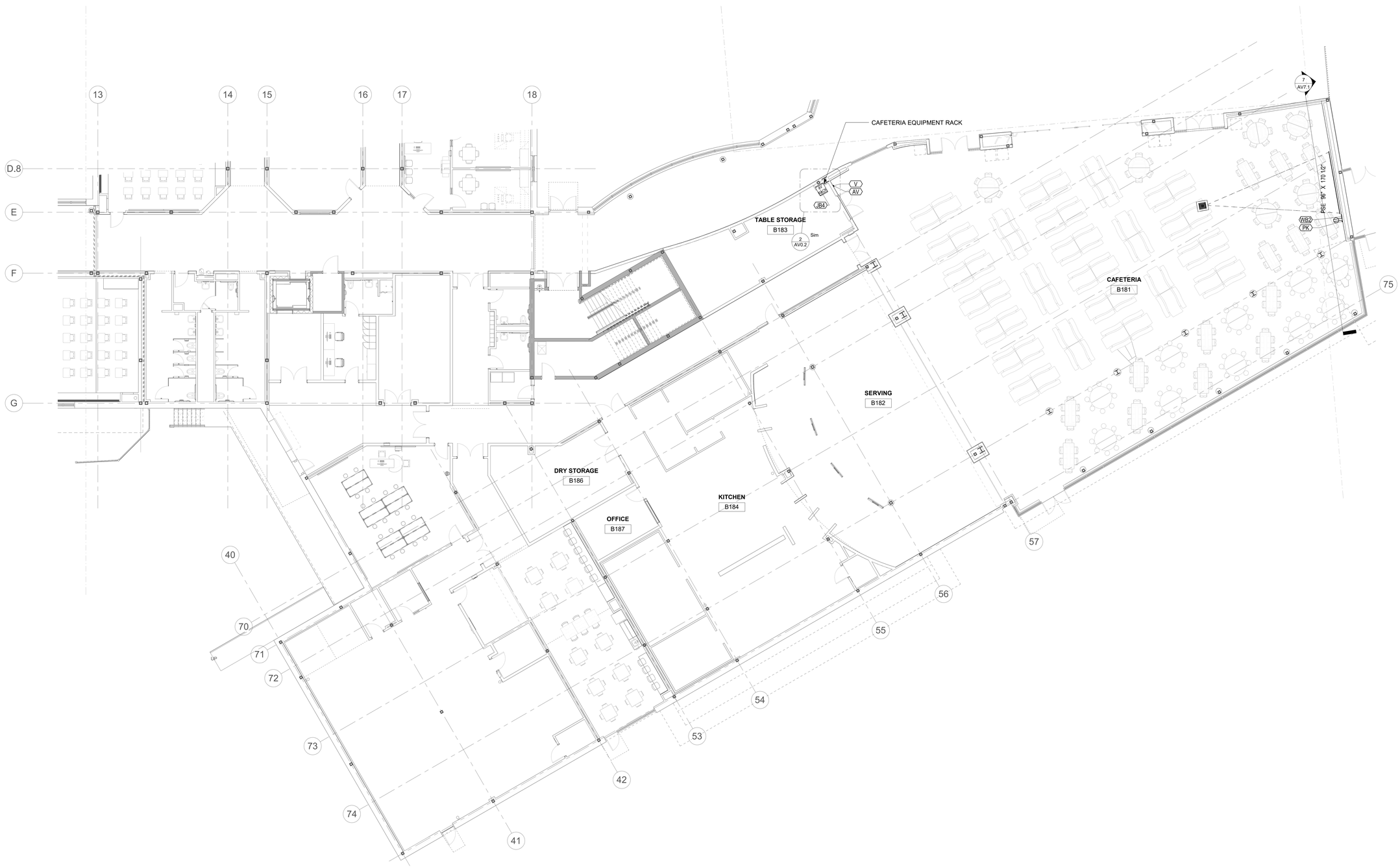
No.	Description	Date

FILE:

DWN. BY: AGB	JOB NO: #1611
CKD. BY: AGB	SCALE: As indicated

DATE: January 31, 2019

AV0.2



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PROJECT

Final Bid Package

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

AUDIOVISUAL DEVICE PLAN - FIRST FLOOR SECTION AB

Key Plan

BUILDING A
BUILDING B
A
B1
B2
AB

REVISIONS		
No.	Description	Date

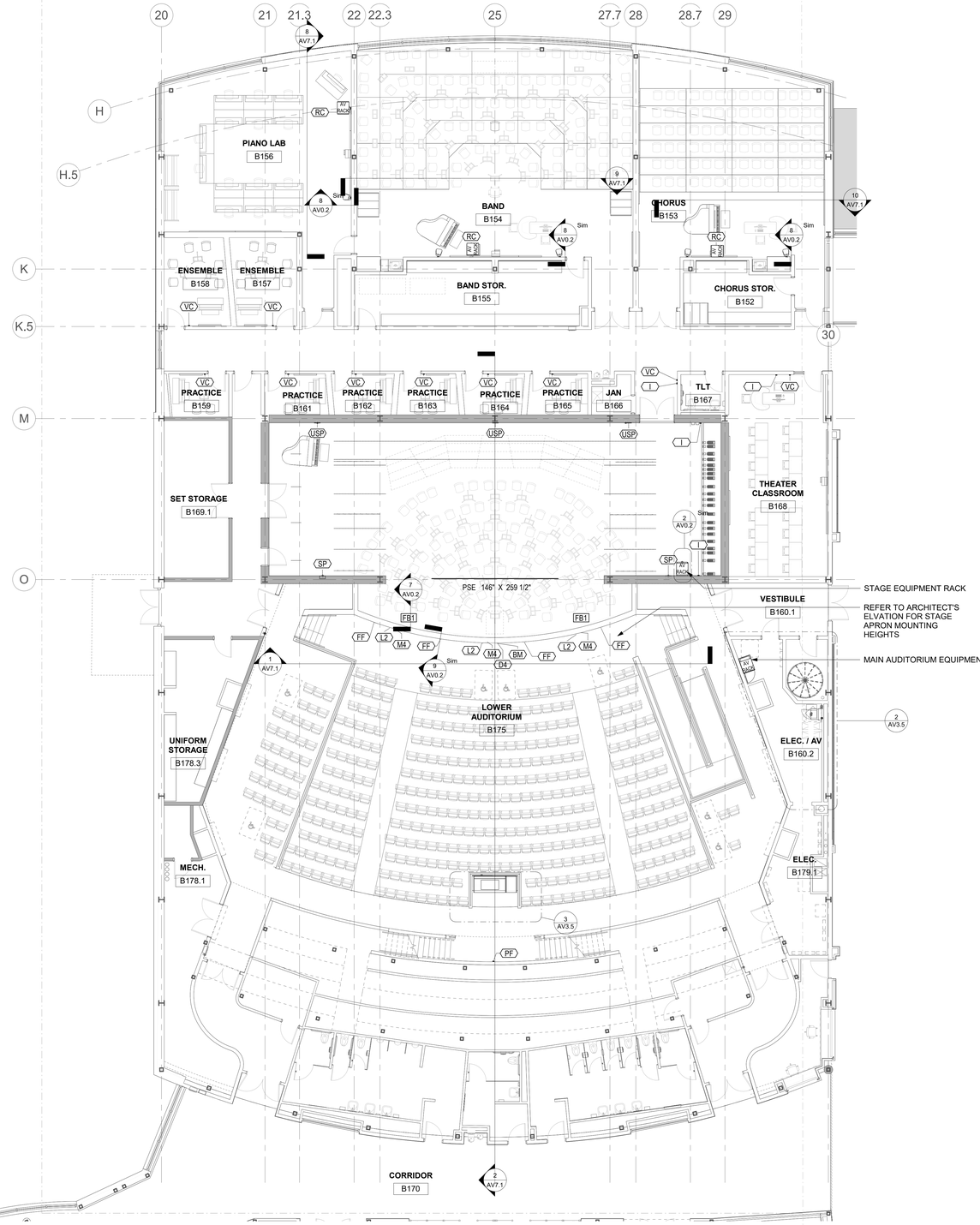
FILE:

DWN. BY: AGB|MM | JOB NO: #1611

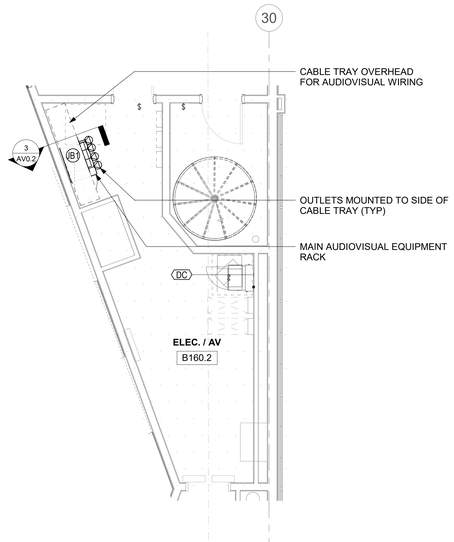
CKD. BY: AGB | SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

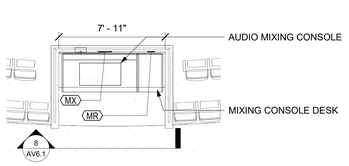
AV3.4



1 FIRST FLOOR PLAN - SECTION B1
1/8" = 1'-0"



2 AUDITORIUM EQUIPMENT ROOM DETAIL PLAN
1/4" = 1'-0"



3 MIX POSITION DETAIL PLAN
1/4" = 1'-0"

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Final Bid Package

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

AUDIOVISUAL DEVICE PLAN - FIRST FLOOR SECTION B1

Key Plan

BUILDING A
BUILDING B
A
B1
B2
AB

REVISIONS

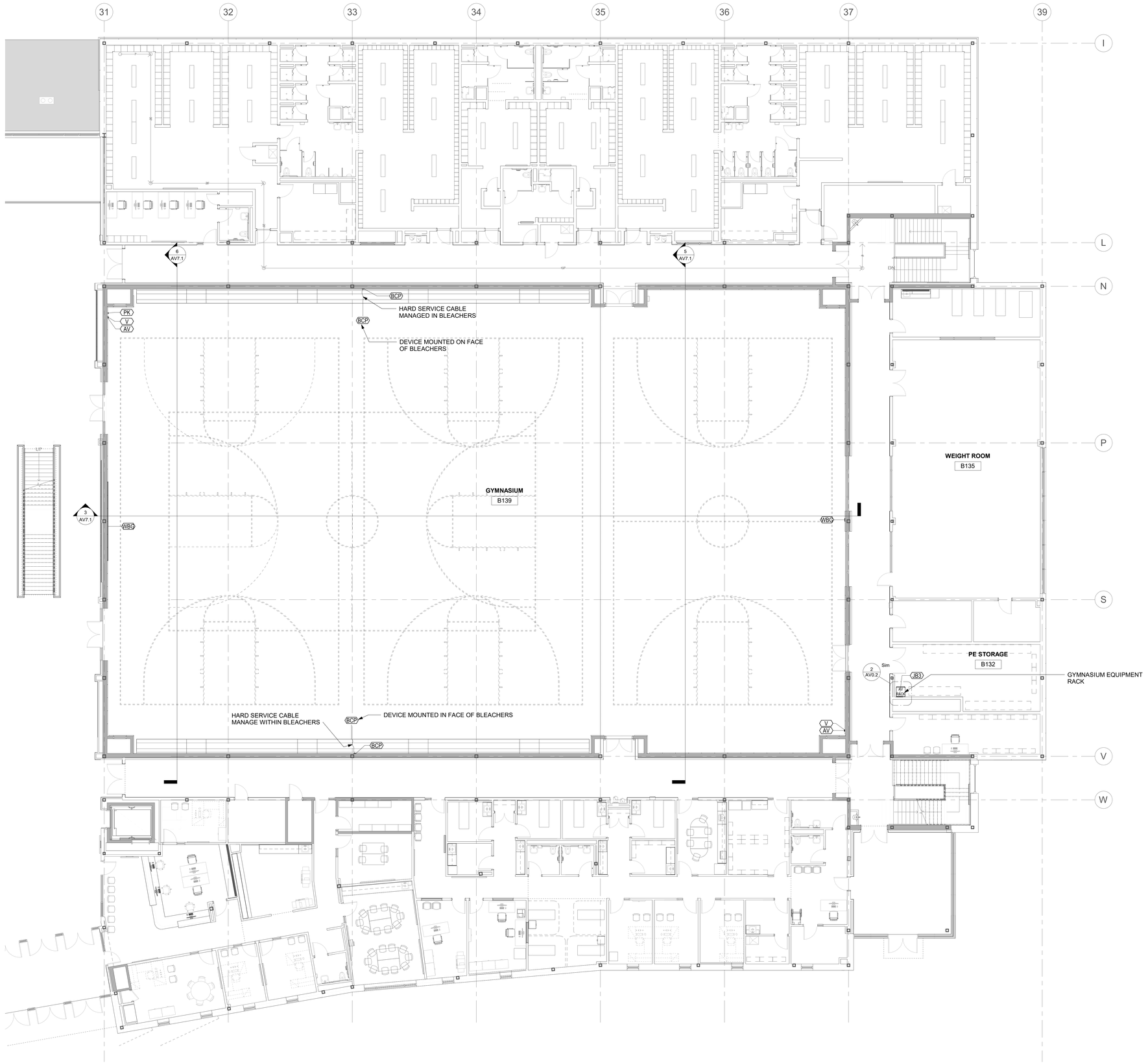
No.	Description	Date

FILE:

DWN. BY: AGB\MM	JOB NO: #1611
CKD. BY: AGB	SCALE: As indicated

DATE: January 31, 2019

AV3.5



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South High Community School

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TITLE

AUDIOVISUAL DEVICE PLAN - FIRST FLOOR SECTION B2

Key Plan

REVISIONS

No.	Description	Date

FILE:

DWN. BY: AGB|MM	JOB NO: #1611
CKD. BY: AGB	SCALE: 1/8" = 1'-0"
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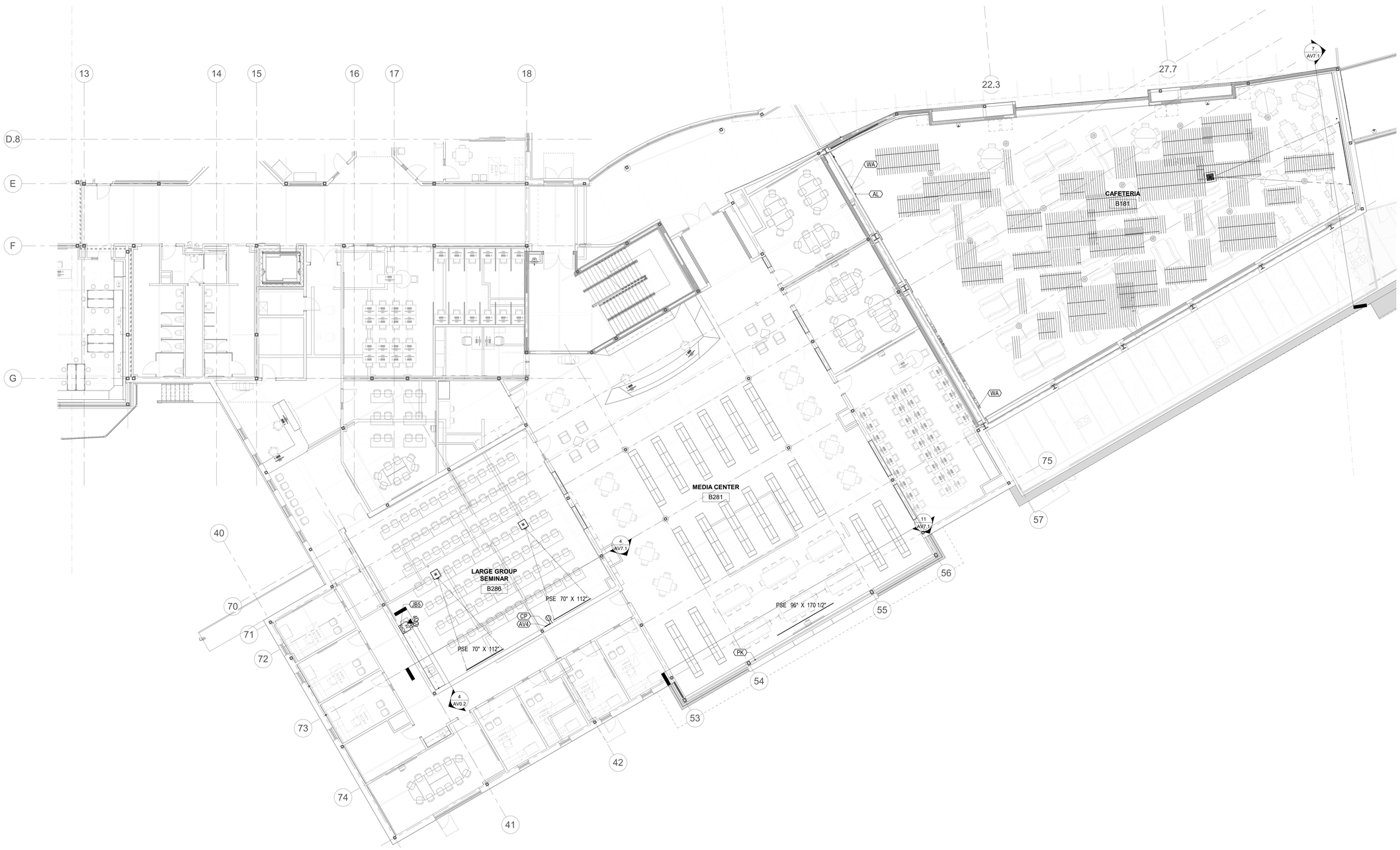
AV3.6



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South High Community School

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TITLE

AUDIOVISUAL DEVICE PLAN - SECOND FLOOR SECTION AB

Key Plan

BUILDING A
BUILDING B
A
B1
B2
AB

REVISIONS

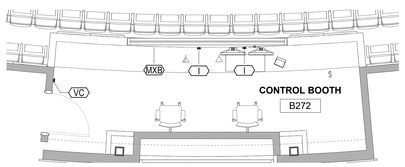
No.	Description	Date

FILE:

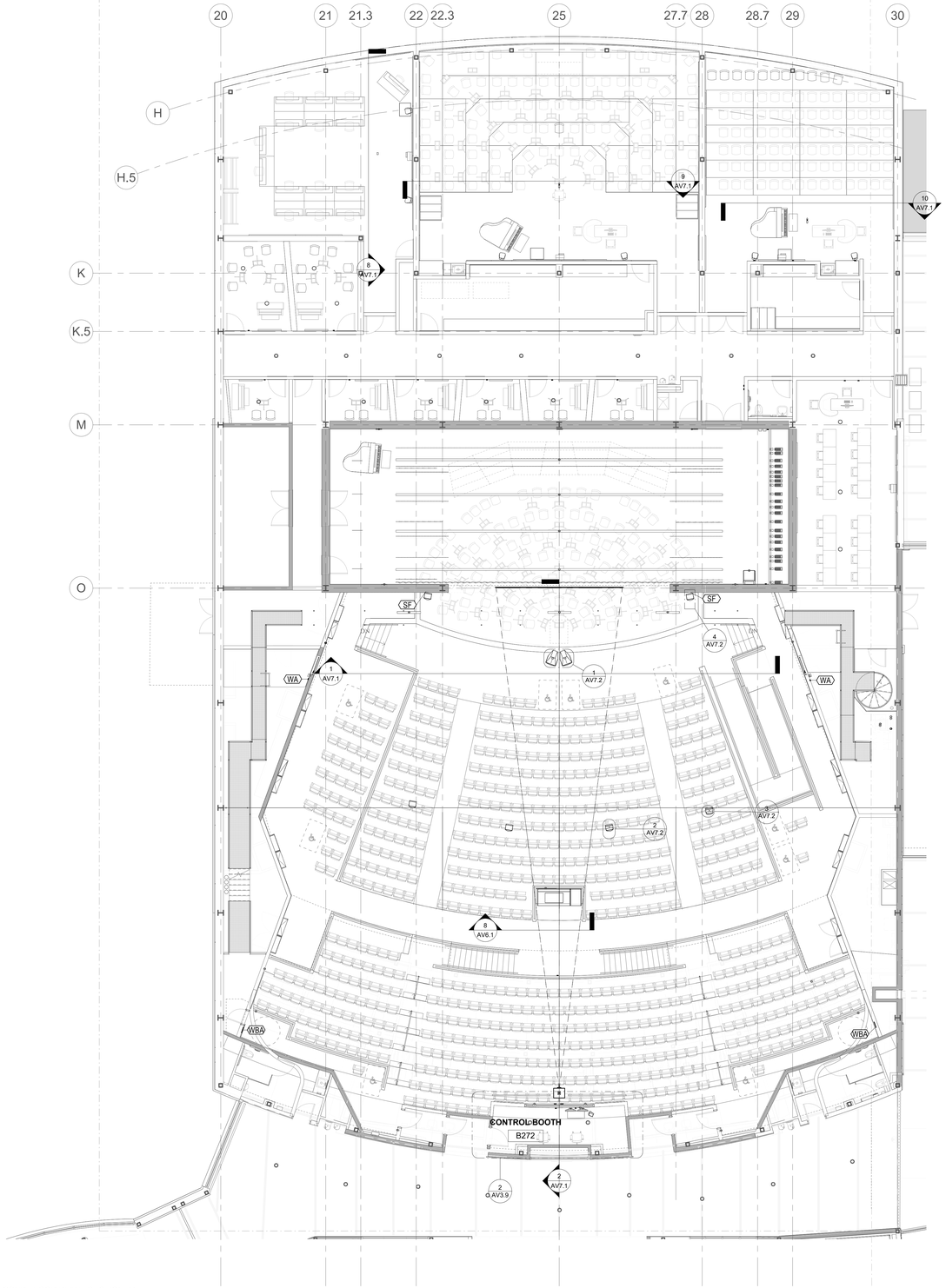
DWN. BY: AGB/MM	JOB NO: #1611
CKD. BY: AGB	SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

AV3.8



2 CONTROL BOOTH DETAIL PLAN
1/4" = 1'-0"



1 SECOND FLOOR PLAN - SECTION B1
1/8" = 1'-0"

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South High Community School

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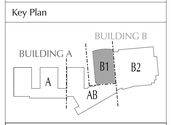
TITLE

AUDIOVISUAL DEVICE PLAN - SECOND FLOOR SECTION B1

Key Plan



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No.	Description	Date

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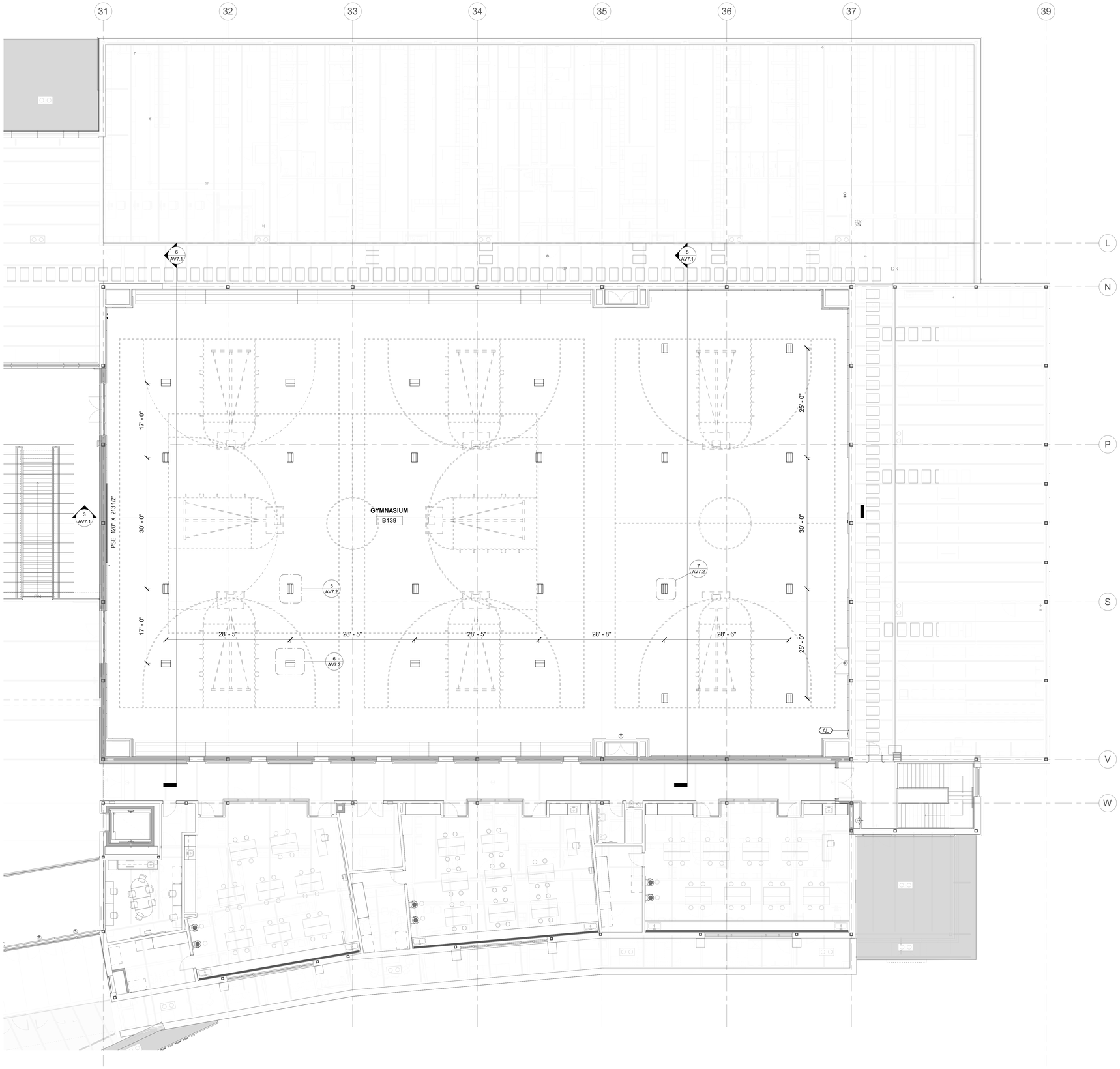

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

AUDIOVISUAL DEVICE PLAN - SECOND FLOOR SECTION B2

Key Plan

BUILDING A
BUILDING B
A
AB
B1
B2

REVISIONS		
No.	Description	Date

FILE:

DWN. BY: AGB/JMM	JOB NO: #1613
CKD. BY: AGB	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

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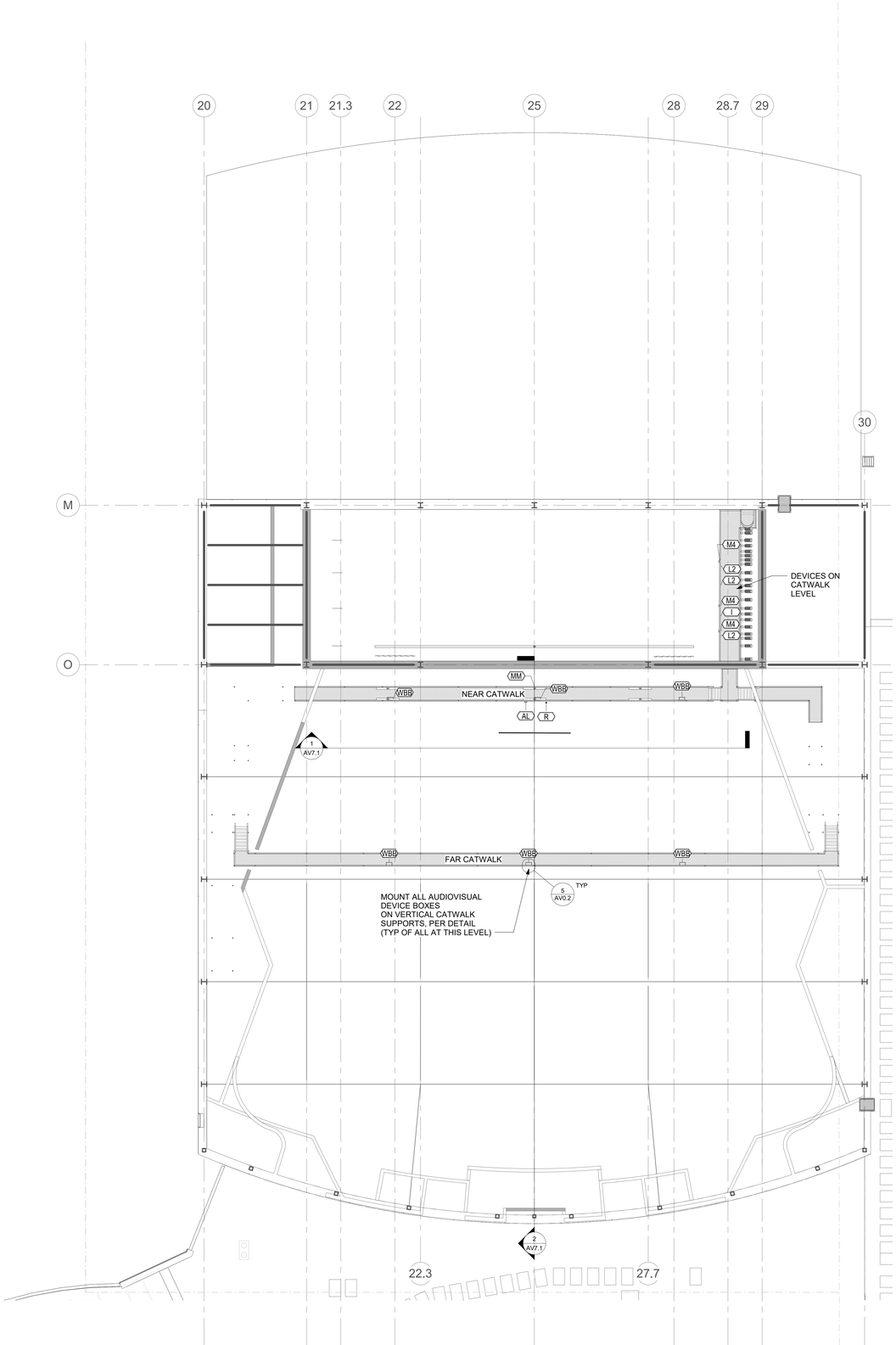

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South High Community School

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TITLE

AUDIOVISUAL DEVICE PLAN - THIRD FLOOR SECTION B1

Key Plan

BUILDING A
BUILDING B
A
B1
B2
AB

REVISIONS

No.	Description	Date

FILE:

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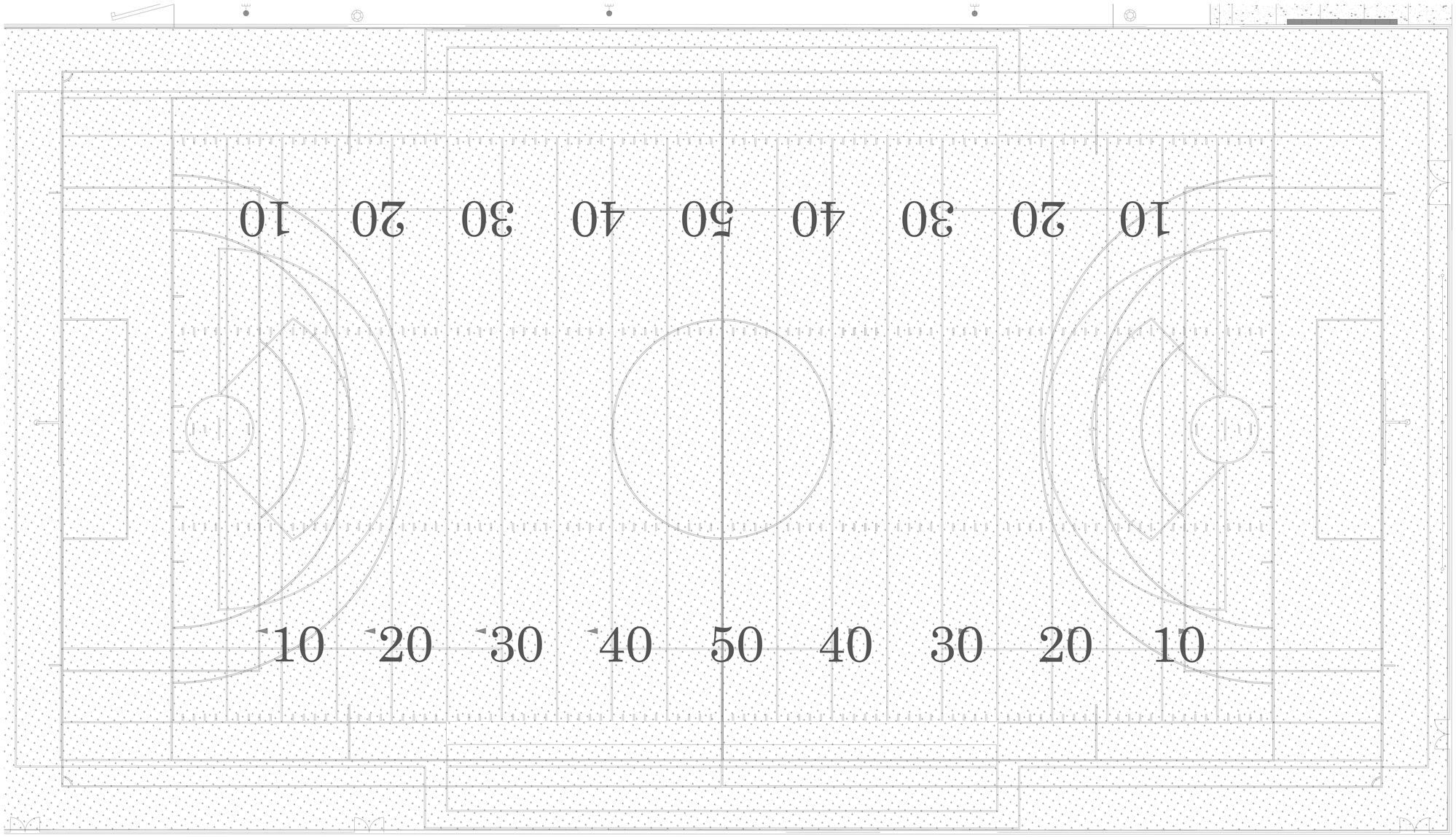
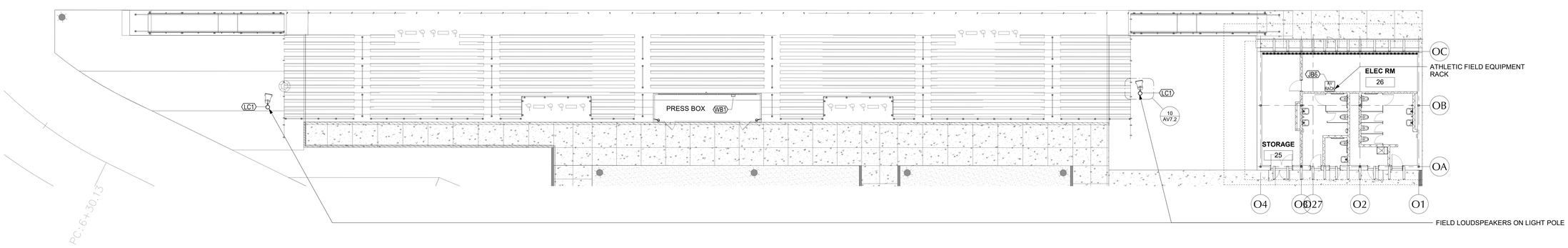
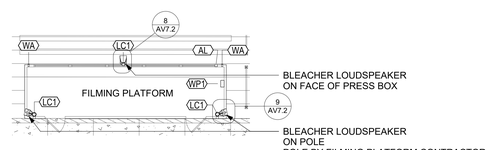
CKD. BY: AGB	SCALE: 1/8" = 1'-0"
DATE: January 31, 2019	

AV3.12





1 ATHLETIC FIELD PLAN
3/32" = 1'-0"



2 FILMING PLATFORM PLAN
1/8" = 1'-0"

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South High Community School

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TITLE

ATHLETIC FIELD PLAN

Key Plan

BUILDING A
BUILDING B
A
AB
B1
B2

REVISIONS		
No.	Description	Date

FILE:

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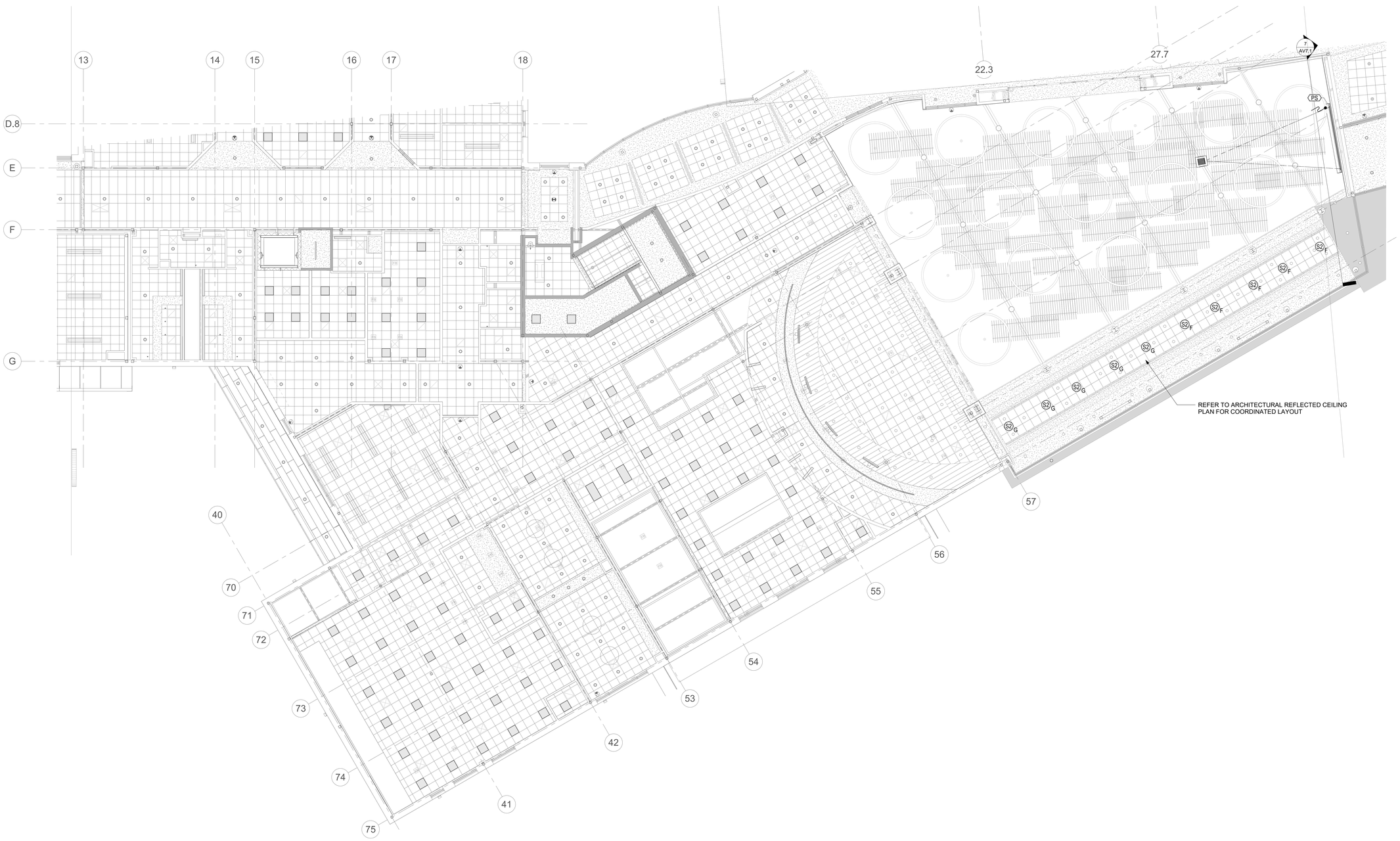
CKD. BY: AGB	SCALE: As indicated
DATE: January 31, 2019	

AV3.18



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170 Apricot Street, Worcester, MA 01603

TITLE

AUDIOVISUAL RCP - FIRST FLOOR SECTION AB

Key Plan

REVISIONS

No.	Description	Date

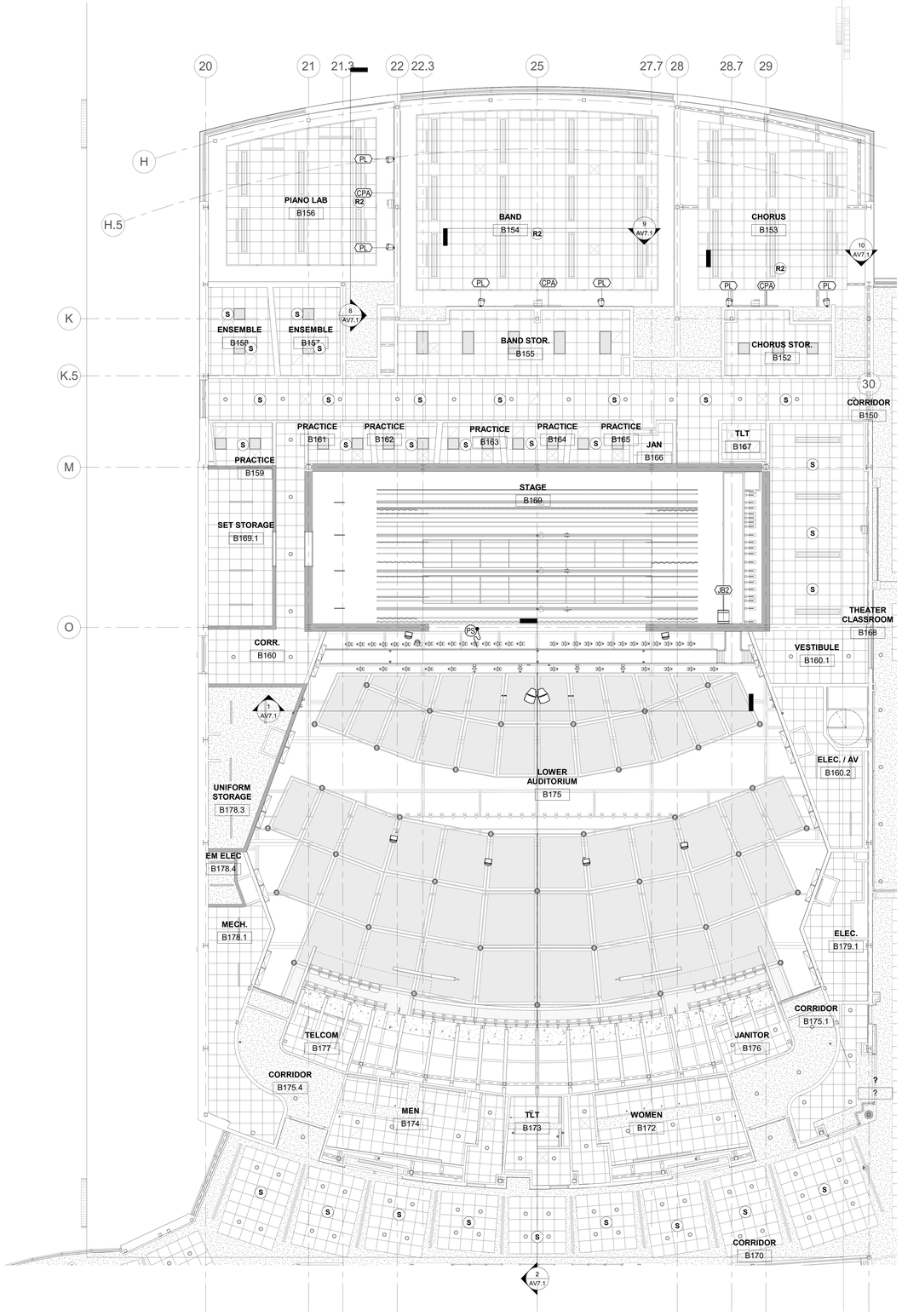
FILE:

DWN. BY: AGB/JMM | JOB NO: #1611

CKD. BY: AGB | SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

AV4.4



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South High Community School

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TITLE

AUDIOVISUAL RCP - FIRST FLOOR SECTION B1

Key Plan

BUILDING A
A
AB
BUILDING B
B1
B2

REVISIONS		
No.	Description	Date

FILE:

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JOB NO: #1611
CKD. BY: AGB
SCALE: 1/8" = 1'-0"
DATE: January 31, 2019

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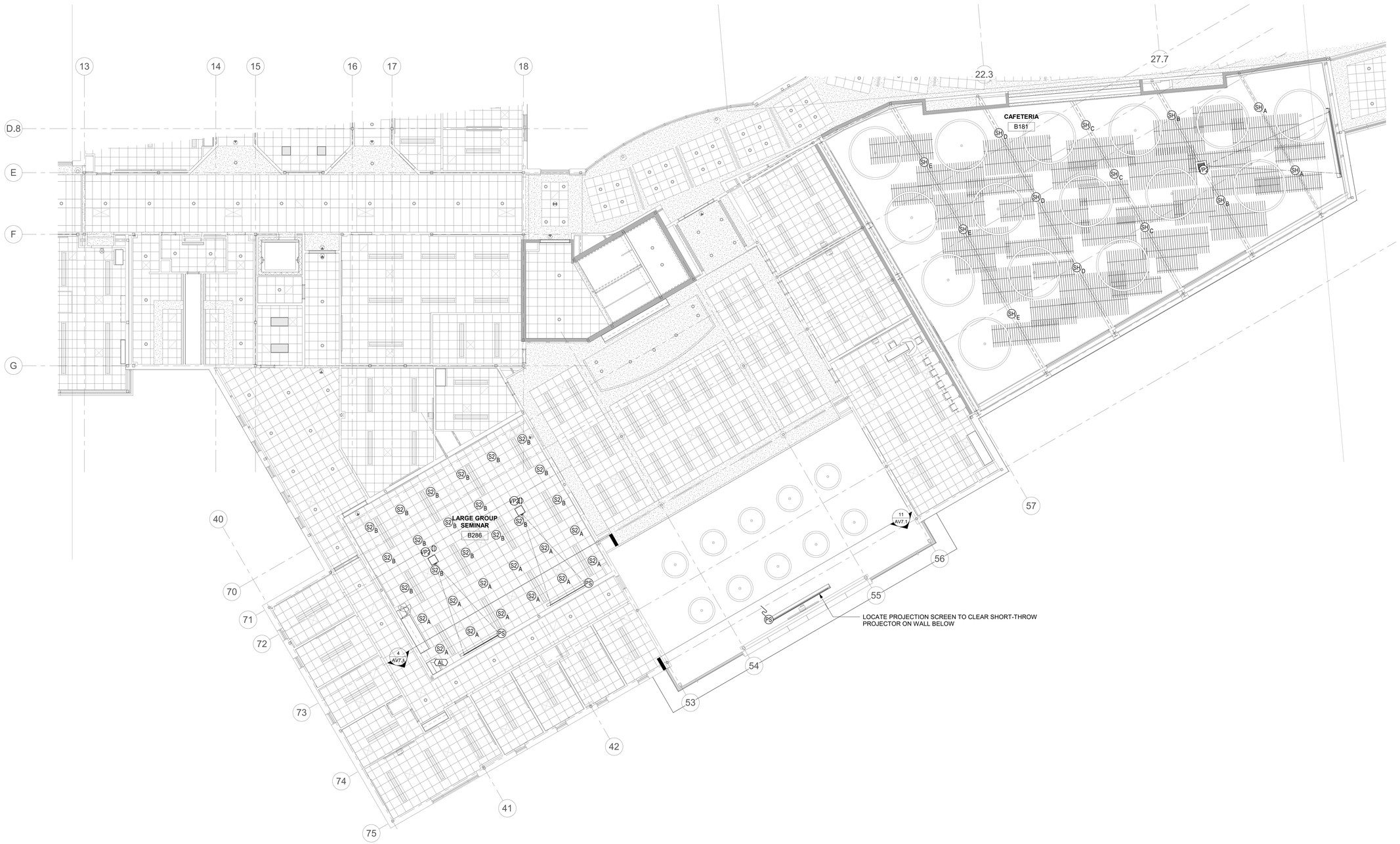

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Final Bid Package

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

AUDIOVISUAL RCP - SECOND FLOOR SECTION AB

Key Plan

REVISIONS

No.	Description	Date

FILE:

DWN. BY:	AGB/JMM	JOB NO:	#1611
CKD. BY:	AGB	SCALE:	1/8" = 1'-0"
DATE:	January 31, 2019		

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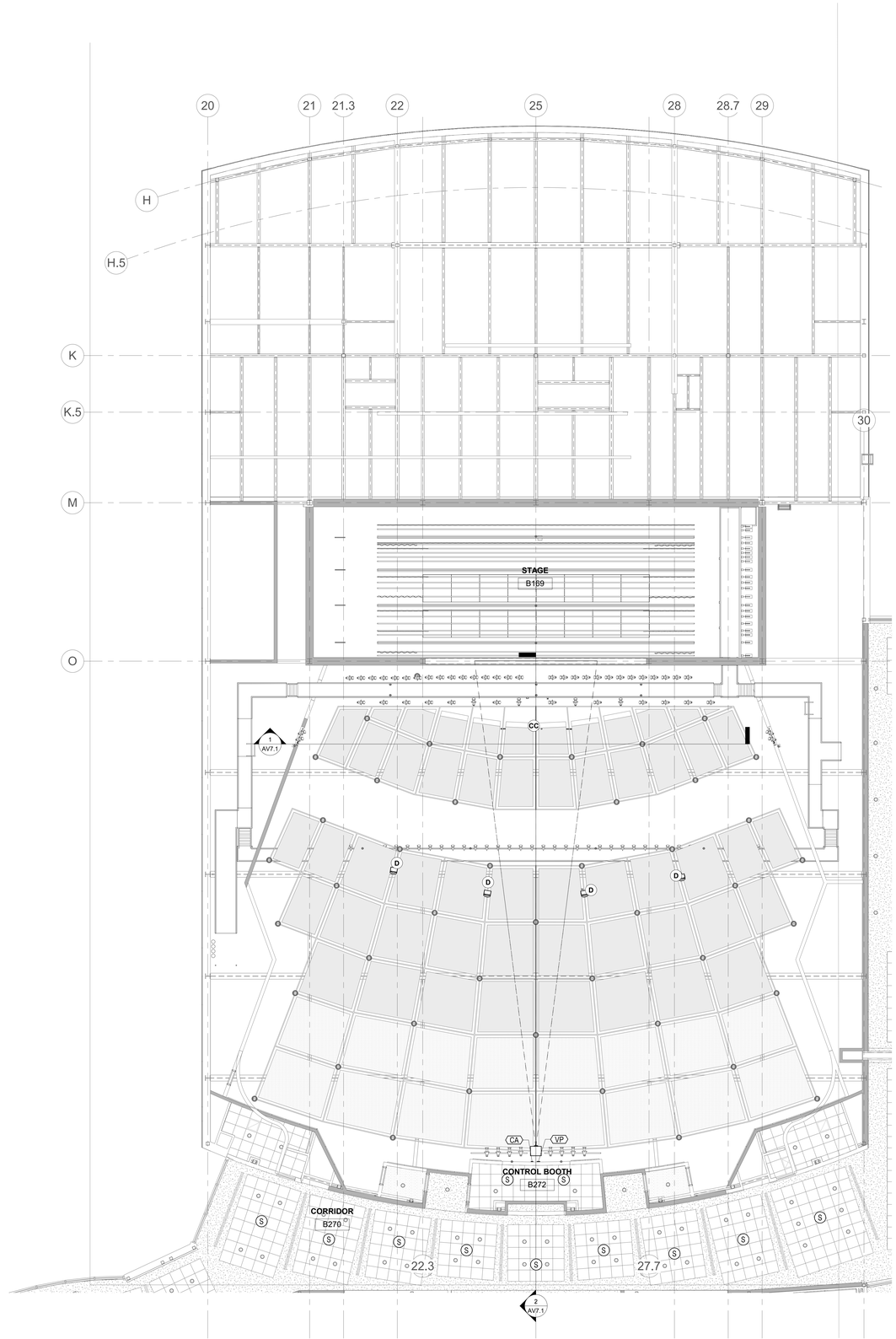

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South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

AUDIOVISUAL DEVICE RCP - SECTION FLOOR SECTION B1

Key Plan

BUILDING A
BUILDING B
A
B1
B2
AB

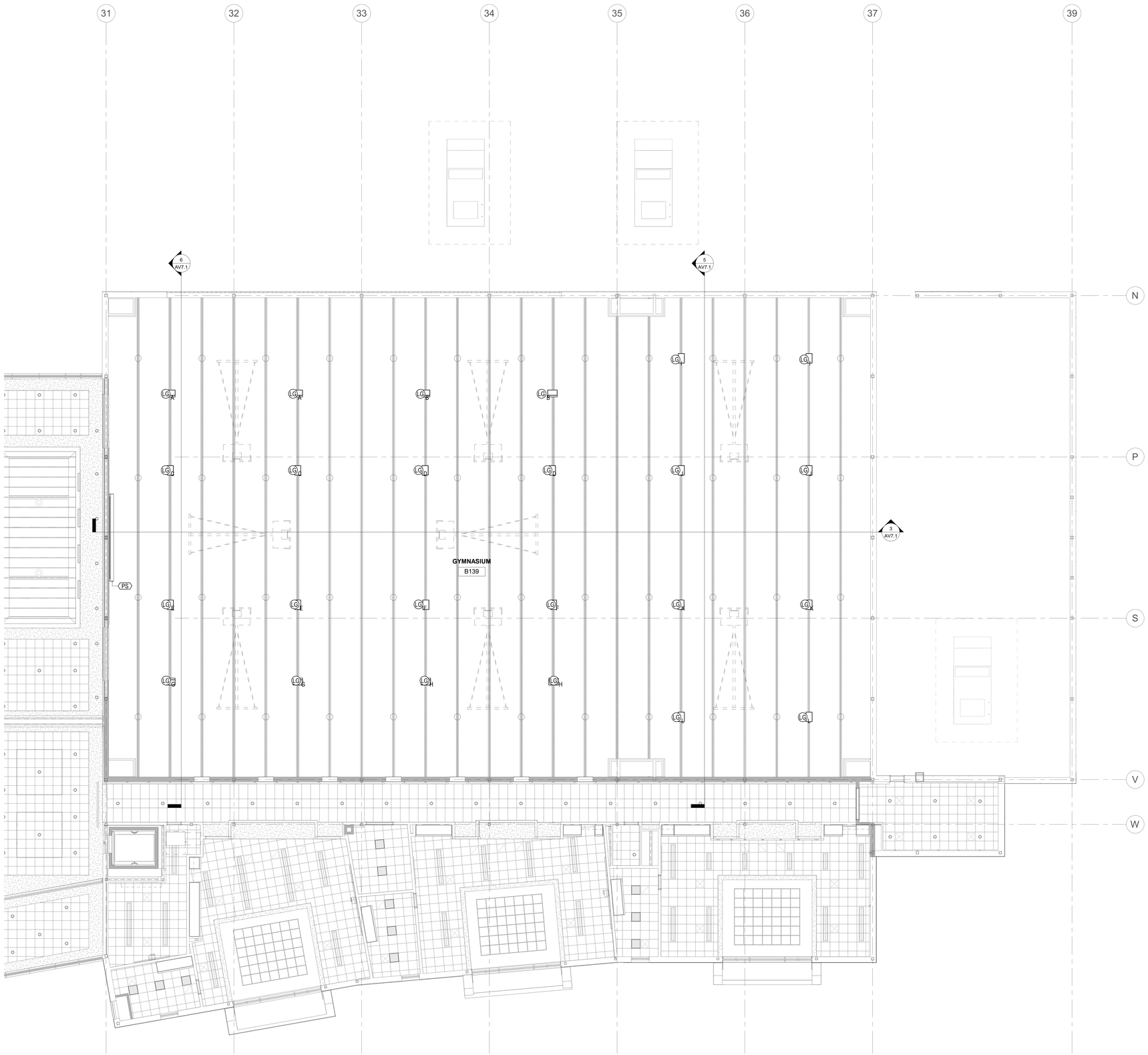
REVISIONS

No.	Description	Date

FILE:

DWN. BY: AGB/JMM
JOB NO: #1611
CKD. BY: AGB
SCALE: 1/8" = 1'-0"
DATE: January 31, 2019

AV4.9



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PROJECT

Final Bid Package

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

AUDIOVISUAL RCP - SECOND FLOOR SECTION B2

Key Plan

BUILDING A
BUILDING B
A
B1
B2
AB

REVISIONS		
No.	Description	Date

FILE:

DWN. BY:	AGB/JMM	JOB NO:	#1611
CKD. BY:	AGB	SCALE:	1/8" = 1'-0"
DATE:	January 31, 2019		

AV4.10

PANEL CONNECTOR KEY

- MULTI-PIN, 58 PAIR
- MULTI-PIN, 40 PAIR
- MULTI-PIN, 28 PAIR
- MULTI-PIN, 16 PAIR
- MULTI-PIN, 20 PAIR
- MULTI-PIN, 12 PAIR
- D-PUNCH BLANK
- NEUTRIK NL4
- XLR 3-PIN FEMALE LATCHING
- XLR 3-PIN FEMALE NON-LATCHING
- XLR 3-PIN MALE
- XLR 4-PIN FEMALE
- XLR 4-PIN MALE
- XLR 5-PIN FEMALE
- XLR 5-PIN MALE
- XLR 6-PIN FEMALE
- XLR 6-PIN MALE
- XLR 7-PIN FEMALE LATCHING
- XLR 7-PIN MALE
- RCA JACK D-PUNCH
- 1/4" T.R.S. JACK
- 1/8" STEREO JACK
- ETHERCON RJ-45
- FIBERCON LC
- 75 OHM BNC
- F CONNECTOR D-PUNCH
- 5-15 FLANGED MALE INLET
- CIRCUIT BREAKER
- COMBO JACK
- COLOR-CODING RING
- USB
- FIREWIRE/1394A
- S-VIDEO
- DB-9
- DB-15 VGA
- RCA JACK
- STRAIGHT TIP FIBER OPTIC
- DVI

CONNECTOR KEY

- RCA JACK, FEMALE
- 1/4" T.R.S. JACK, FEMALE
- 1/8" STEREO JACK, FEMALE
- XLR 3-PIN, FEMALE
- XLR 3-PIN, MALE
- XLR 4-PIN, FEMALE
- XLR 4-PIN, MALE
- XLR 5-PIN, FEMALE
- XLR 5-PIN, MALE
- XLR 6-PIN, FEMALE
- XLR 6-PIN, MALE
- XLR 7-PIN, FEMALE
- XLR 7-PIN, MALE
- COMBO JACK, FEMALE
- NL4 — NEUTRIK NL4
- 1/4" T.R.S. JACK, CABLE MOUNT
- 1/8" STEREO JACK, CABLE MOUNT
- XXP — MULTI-PIN (PAIRS INDICATED)
- F CONNECTOR
- 75 OHM BNC
- ST — STRAIGHT TIP FIBER OPTIC
- DI — DVI-I
- HD — HDMI
- VG — DB-15 VGA
- SV — S-VIDEO
- LC — FIBERCON LC CONNECTOR
- U — USB
- FW — FIREWIRE
- E — ETHERCON RJ-45
- D9 — DB-9

DEVICE KEY

- NON-NORMALLED OUTPUT JACK
- NON-NORMALLED INPUT JACK
- FULL-NORMALLED PATCH JACK PAIR
- HALF/MONITOR-NORMALLED PATCH JACK PAIR
- HALF/MONITOR PATCH JACK
- TERMINAL STRIP
- TWO POSITION TOGGLE SWITCH
- MOMENTARY SWITCH, NORMALLY OPEN
- DUAL BINDING POST TEST JACK
- RESISTOR
- 10k POTENTIOMETER
- LOUDSPEAKER ATTENUATOR
- FLEXIBLE CABLE
- ANTENNA
- TRANSFORMER
- 2-WAY MICROPHONE SPLITTER
- 3-WAY MICROPHONE SPLITTER
- ROCKER SWITCH
- INDICATES REVERSE DIRECTION OF SIGNAL FLOW
- MICROPHONE
- AMPLIFIER / DISTRIBUTION AMPLIFIER

REFERENCE KEY

- SIGNAL REF / DWG REF — SIGNAL LINK FROM OFF SHEET
- SIGNAL REF / DWG REF — SIGNAL LINK TO OFF SHEET
- A — SIGNAL LINK WITHIN SHEET
- A — SIGNAL CONTENT - REFERENCE TABLE

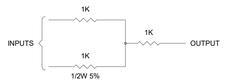
SIGNAL TYPE KEY

- MIC/LINE LEVEL AUDIO
- DIGITAL AUDIO
- LOUDSPEAKER LEVEL CONTROL / DATA
- LOW VOLTAGE POWER
- FIBER OPTIC
- MATV/RF
- LINE LEVEL VIDEO
- DIGITAL VIDEO
- EXISTING MIC/LINE LEVEL AUDIO

LOUDSPEAKER KEY

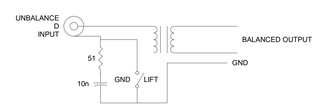
- 3-WAY FULL RANGE LOUDSPEAKER
- SUBWOOFER
- 2-WAY FULL RANGE LOUDSPEAKER WITH HORN-LOADED HF DRIVER
- FRONT-FILL LOUDSPEAKER
- FRONT-FILL LOUDSPEAKER R
- FLUSH-MOUNTED CEILING 70V LOUDSPEAKER
- FLUSH-MOUNTED LONG-THROW CEILING 70V LOUDSPEAKER
- PARTIALLY FLUSH CEILING-MOUNTED 70V LOUDSPEAKER WITH ADJUSTABLE HORN
- PENDANT-MOUNTED CEILING 70V LOUDSPEAKER
- 2-WAY FULL RANGE LOUDSPEAKER WITH DOME TWEETER
- 2-WAY FULL RANGE LOUDSPEAKER WITH HORN-LOADED HF DRIVER
- POWERED MONITOR LOUDSPEAKER

RESISTIVE SUMMER DETAIL

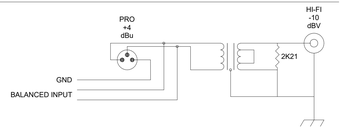


1. FOR BALANCED AUDIO LINES, SUM BOTH SIDES OF INPUTS WITHOUT INVERTING POLARITY.
2. RDL COMBINING NETWORK IS AN ACCEPTABLE SUBSTITUTE.

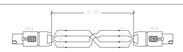
AUDIOVISUAL INPUT DETAIL



PRESS FEED OUTPUT DETAIL

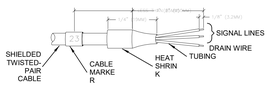


LOUDSPEAKER PATCH CABLE DETAIL

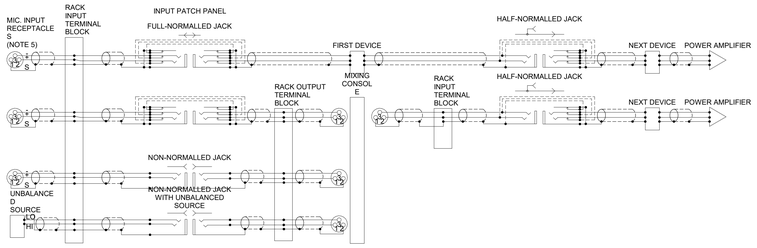


3" RED SHRINK TUBE AT EACH CONNECTOR "PATCH" PRINTED ON SHRINK TUBE

BALANCED AUDIO CABLE TERMINATION DETAIL



SIGNAL GROUNDING DETAIL



1. ALL LINES ARE BALANCED CIRCUITS, EXCEPT AS NOTED.
2. DASHED LINE INDICATE NORMALLED CONNECTIONS.
3. AUDIO SHIELDS SHALL BE CONNECTED AT DEVICE INPUTS AND OUTPUTS. SHIELDS MAY BE LIFTED AT DEVICE INPUTS TO BREAK GROUND LOOPS.
4. DO NOT BUS SHIELDS, EXCEPT AS SHOWN.
5. DO NOT CONNECT SHIELDS TO DEVICE CHASSIS IF SHIELDS ARE GROUNDED ELSEWHERE AS SHOWN.
6. MAINTAIN ELECTRICAL ISOLATION OF SHIELD FROM CONDUIT, ELECTRICAL BOXES AND PANELS.
7. TYPICAL EQUIPMENT ARRANGEMENT SHOWN. REFERENCE SYSTEM SCHEMATIC DRAWINGS FOR ACTUAL ARRANGEMENT.

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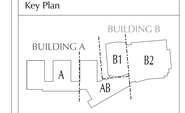
TITLE

AUDIOVISUAL DIAGRAM KEY AND DETAILS

Key Plan



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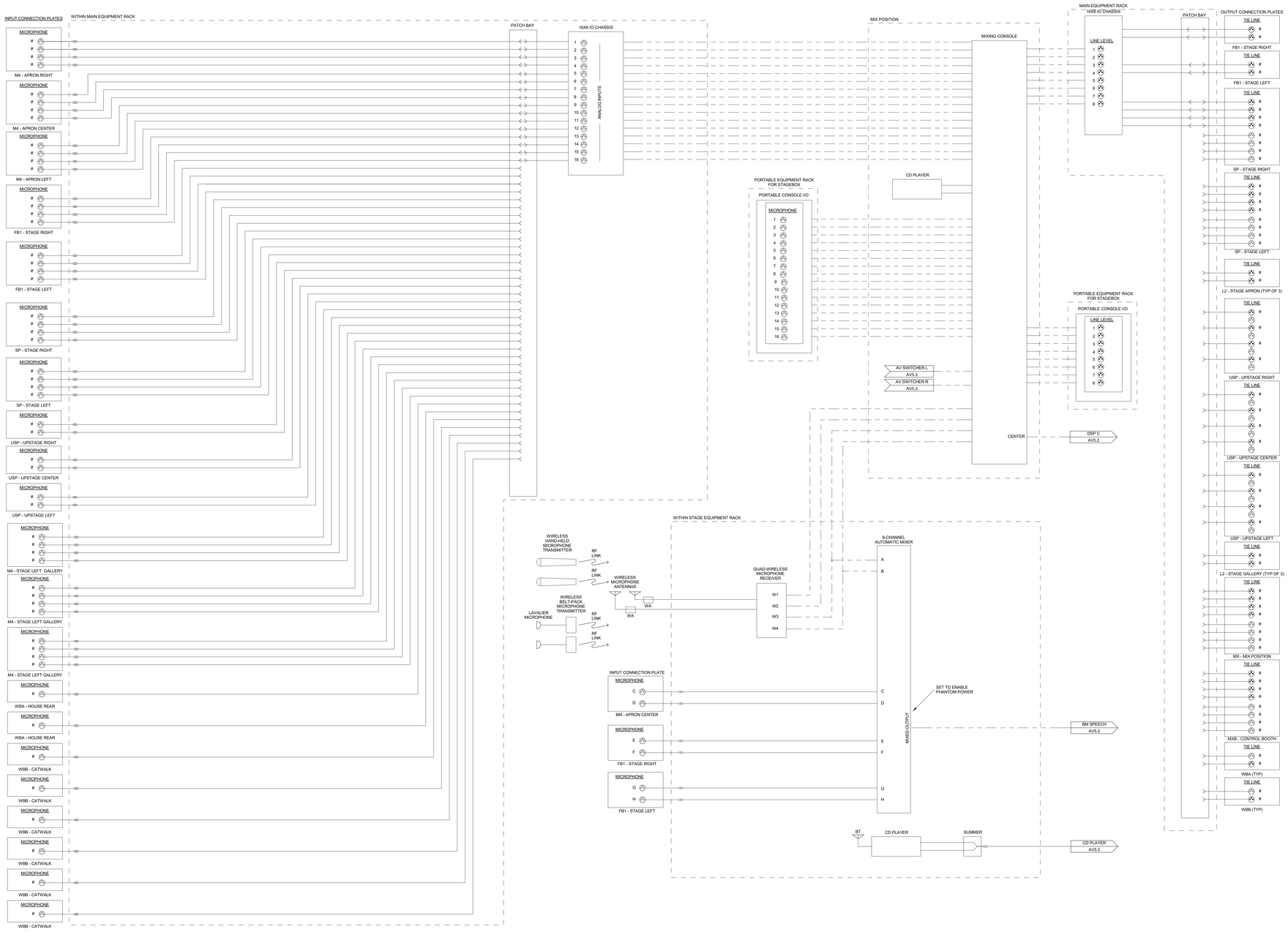
AV5.0



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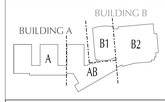
TITLE

AUDIOVISUAL FUNCTIONAL DIAGRAM - AUDITORIUM

Key Plan



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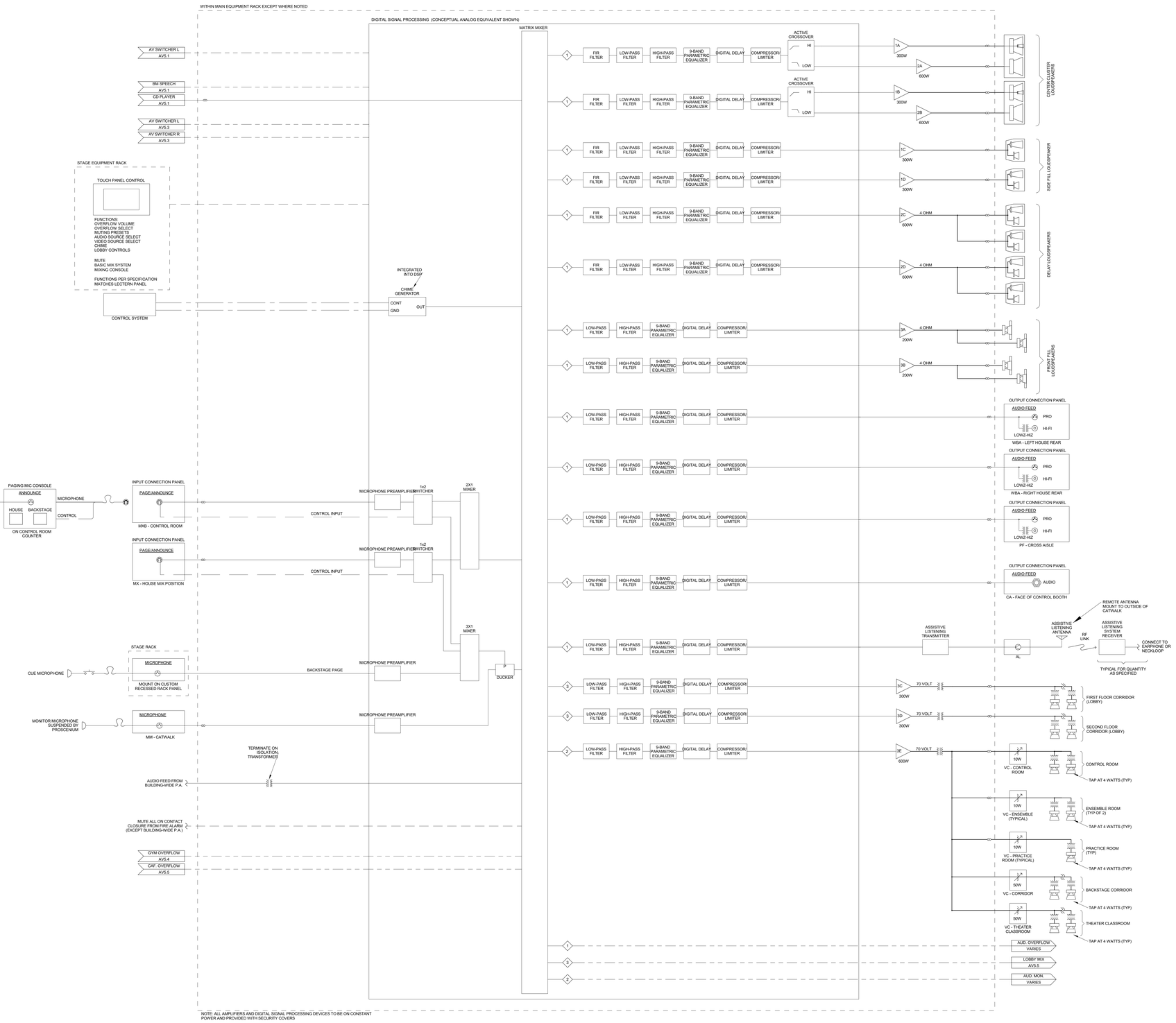

NOTE: ALL AMPLIFIERS AND DIGITAL SIGNAL PROCESSING DEVICES TO BE ON CONSTANT POWER AND PROVIDED WITH SECURITY COVERS

SYMBOL	SIGNAL CONTENT
1	STANDARD OPERATION: CONSOLE MONO; HOUSE ANNOUNCE AUTOMATIC OPERATION: BASIC MIX PROGRAM & SPEECH; AV SWITCHER (SLM L&R); HOUSE ANNOUNCE SELECTED OVERFLOW FEED
2	STANDARD: BACKSTAGE ANNOUNCE; MONITOR MICROPHONE, PROGRAM
3	STANDARD: CHIME; TOUCH PANEL CONFIGURABLE OPTION FOR AUDITORIUM MONITOR MICROPHONE, PROGRAM, LOBBY MIX

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TITLE

AUDIOVISUAL FUNCTIONAL DIAGRAM - AUDITORIUM

Key Plan

BUILDING A
BUILDING B
A
B1
B2
AB

REVISIONS

No.	Description	Date

FILE:

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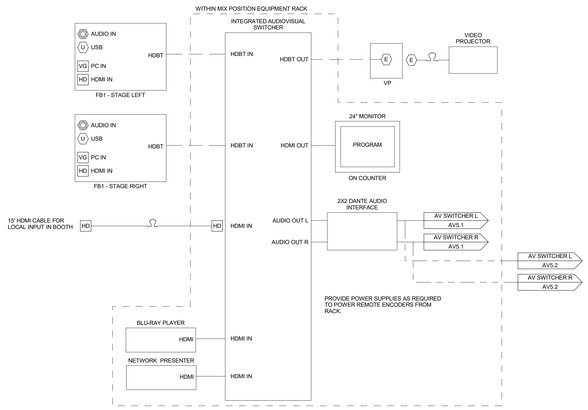
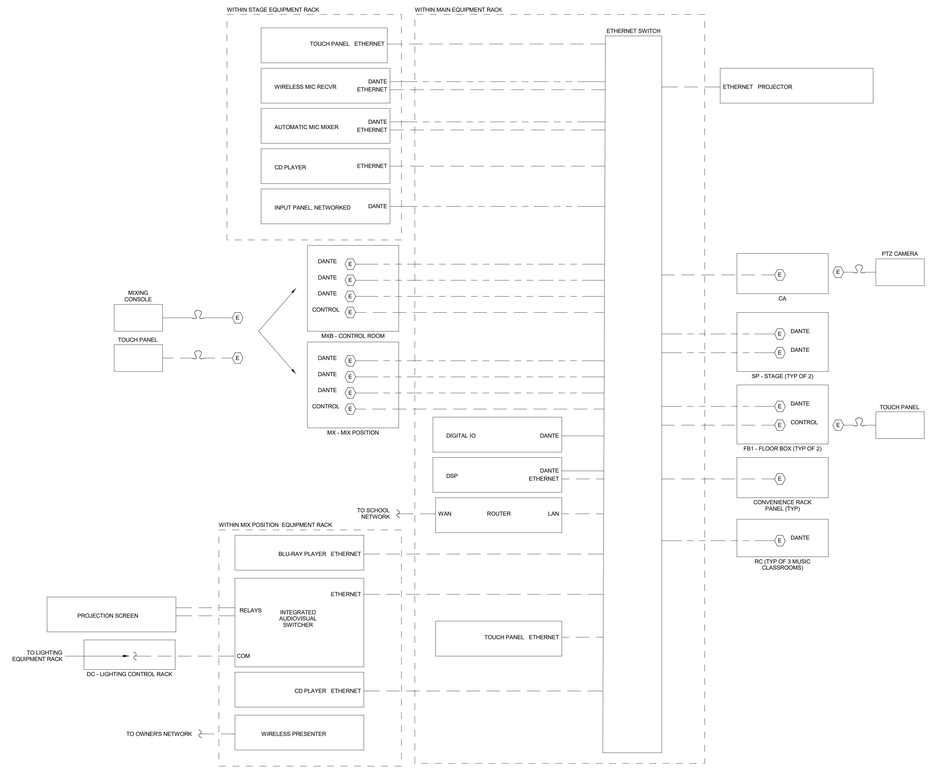
AV5.2



1 AUDITORIUM VIDEO PRESENTATION
NTS



2 AUDITORIUM NETWORK AND CONTROL
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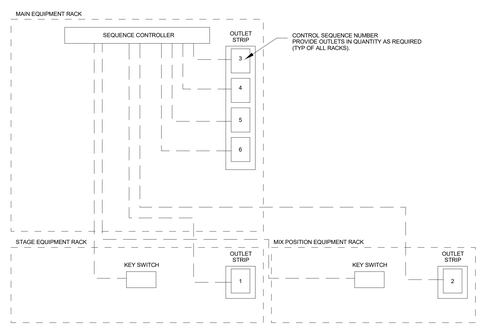
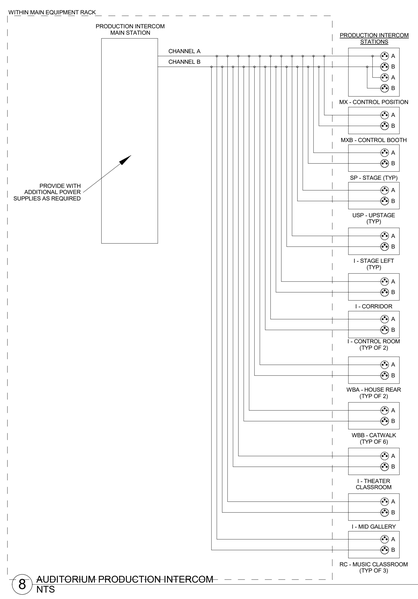
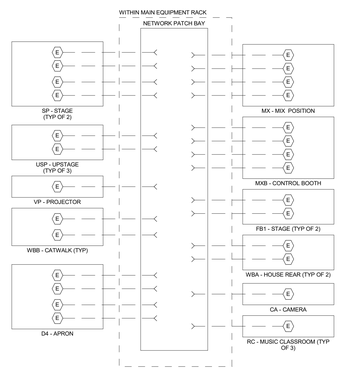


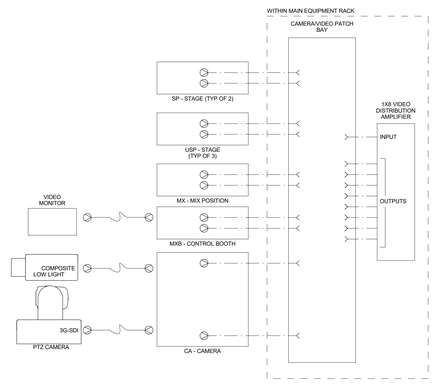
3 AUDITORIUM POWER SEQUENCING
NTS



8 AUDITORIUM PRODUCTION INTERCOM
NTS



5 AUDITORIUM CATEGORY TIE LINES
NTS



6 AUDITORIUM VIDEO TIELINES
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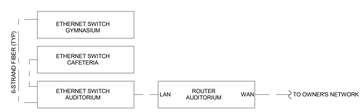
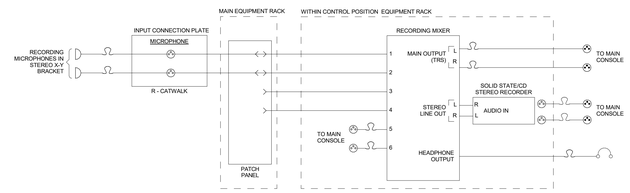


7 BUILDING-WIDE AUDIOVISUAL NETWORK
NTS



4 AUDITORIUM AUDIO RECORDING
NTS

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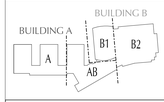
AUDIOVISUAL FUNCTIONAL DIAGRAMS - AUDITORIUM

Key Plan



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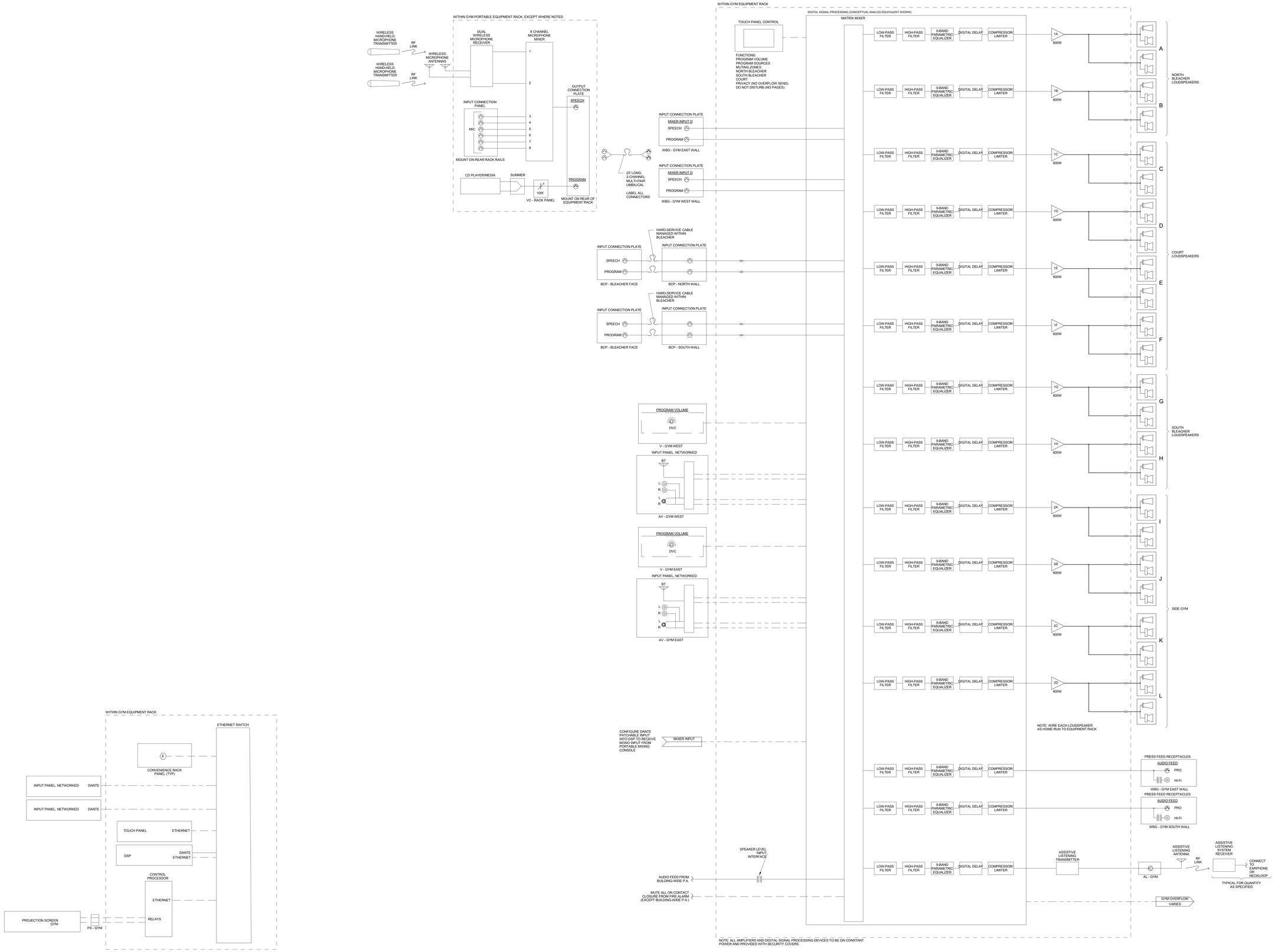

2 GYMNASIUM NETWORK
NTS

1 GYMNASIUM
NTS

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AUDIOVISUAL FUNCTIONAL DIAGRAM - GYMNASIUM

Key Plan

BUILDING A
BUILDING B
A
AB
B1
B2

REVISIONS

No.	Description	Date

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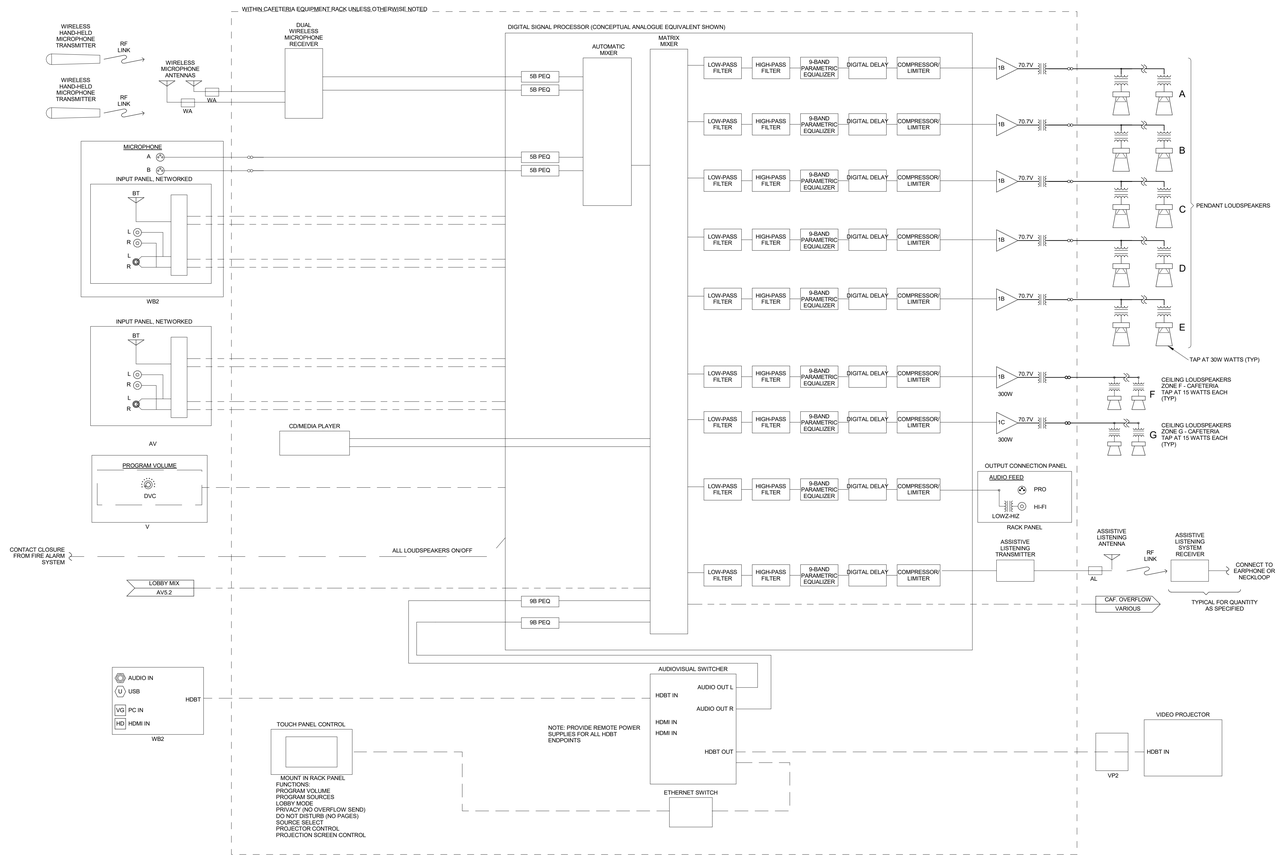
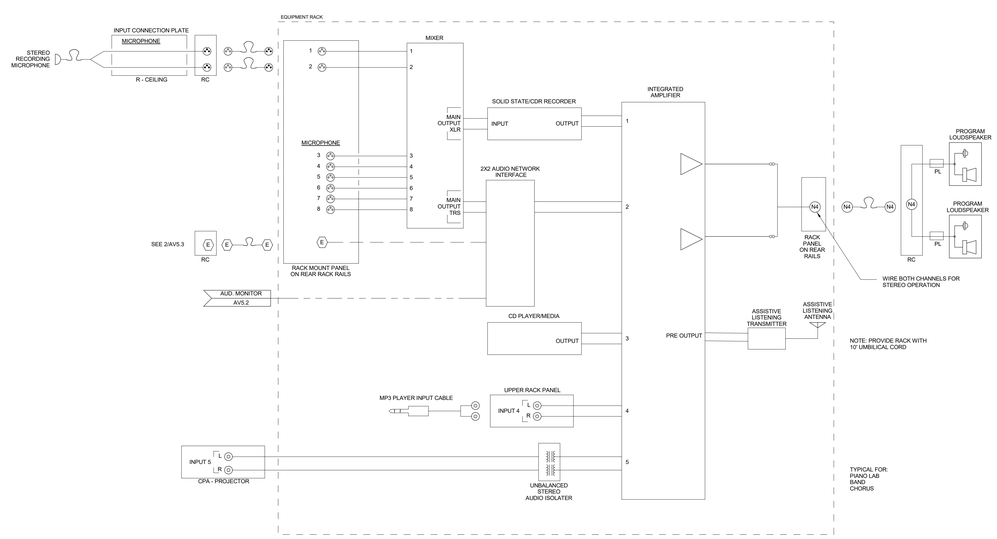


1 CAFETERIA
NTS



2 MUSIC CLASSROOM
NTS

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AUDIOVISUAL FUN. DIAG. - CAFETERIA AND CLASSROOMS

Key Plan

BUILDING A
BUILDING B
A
B1
B2
AB

REVISIONS

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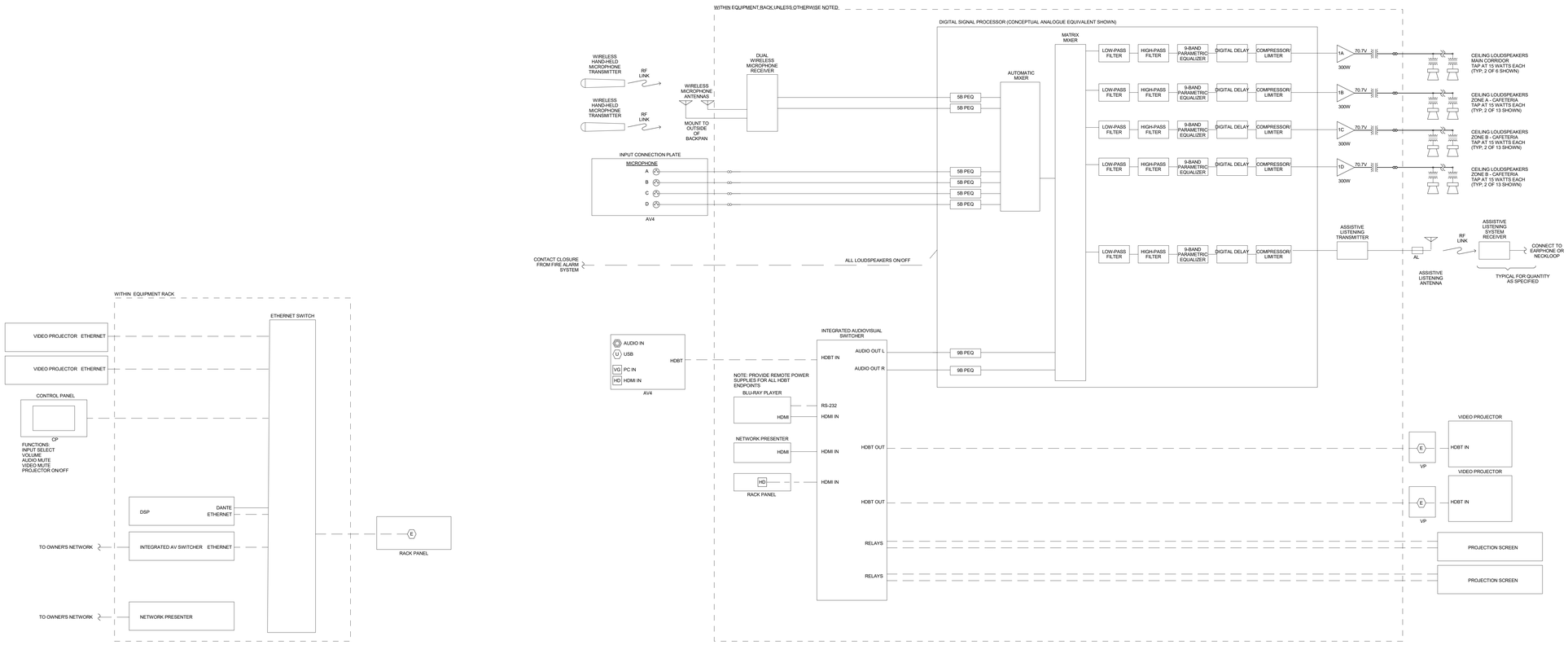

1 LARGE GROUP SEMINAR
NTS

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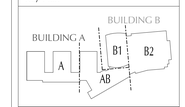
AUDIOVISUAL FUNCTIONAL DIAG. - LARGE GROUP SEMINAR

Key Plan



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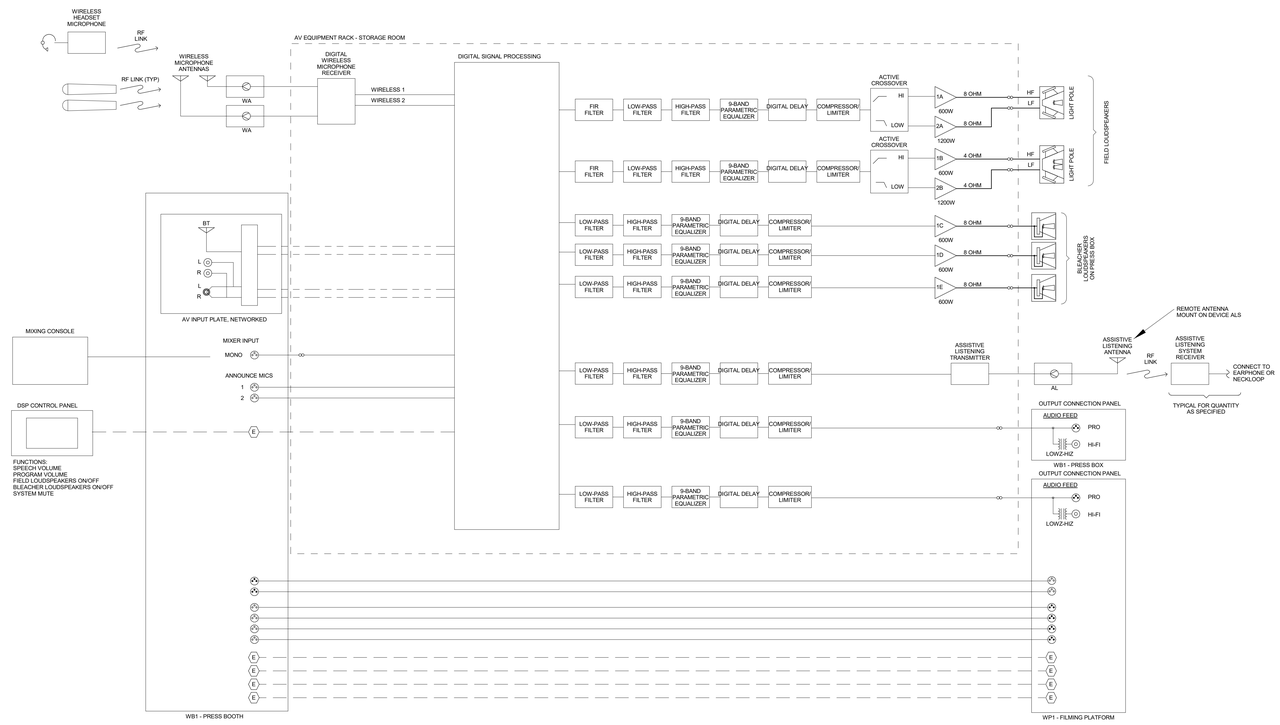

1 ATHLETIC FIELD
NTS

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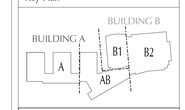
AUDIOVIDUAL FUNCTION DIAGRAM - ATHLETIC FIELD

Key Plan



REVISIONS

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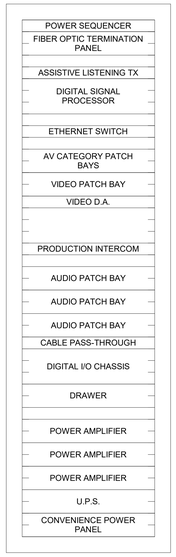
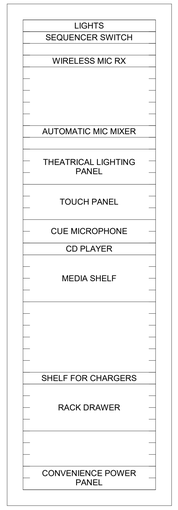
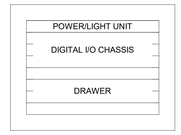
AV5.7



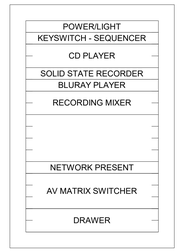
1 ELEVATION - AUDITORIUM MAIN EQUIPMENT RACK
NTS



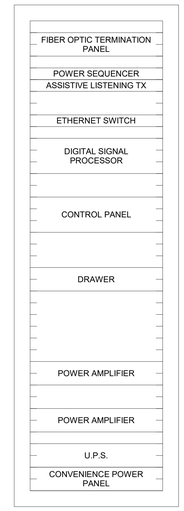
2 ELEVATION - AUDITORIUM STAGE EQUIPMENT RACK
NTS



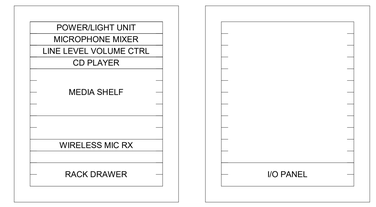
9 ELEVATION - AUDITORIUM PORTABLE I/O EQUIPMENT RACK
NTS



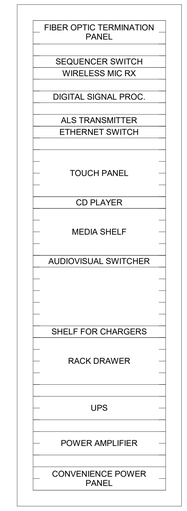
3 ELEVATION - MIX POSITION EQUIPMENT RACK
NTS



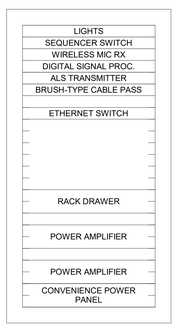
4 ELEVATION - GYM EQUIPMENT RACK
NTS



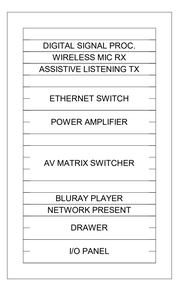
5 ELEVATION - GYM ROLLING EQUIPMENT RACK
NTS



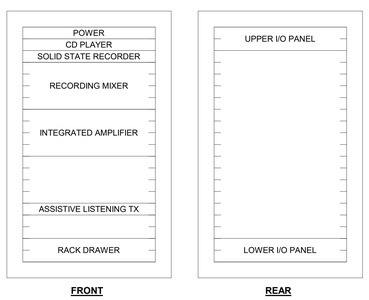
6 ELEVATION - CAFETERIA EQUIPMENT RACK
NTS



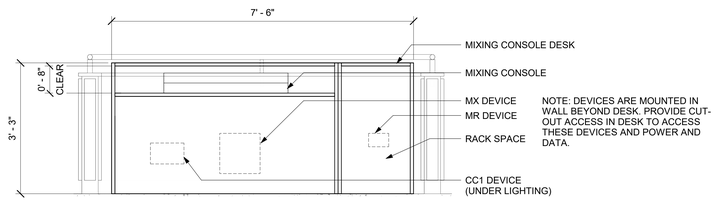
7 ELEVATION - ATHLETIC FIELD EQUIPMENT RACK
NTS



10 ELEVATION - LARGE GROUP ROOM RACK
NTS



11 ELEVATION - CLASSROOM EQUIPMENT RACK (TYP)
NTS



8 AUDITORIUM MIXING POSITION ELEVATION
3/4" = 1'-0"

LAMOUREUX PAGANO ASSOCIATES, ARCHITECTS
108 GROVE STREET, SUITE 300
WORCESTER, MASSACHUSETTS 01605

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CONSULTANT

CAVANAUGH TOCCI
327 F BOSTON POST ROAD, SUDBURY, MA 09776-3027
978.443.7871 www.cavtocci.com

OWNER

Worcester Public Schools

Worcester, MA

Project North

PROJECT

Final Bid Package

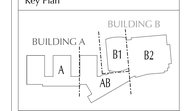
South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

AUDIOVISUAL RACK ELEVATIONS

Key Plan



REVISIONS

No.	Description	Date

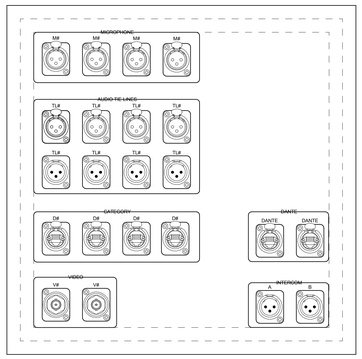
FILE:

DWN. BY: AGB/EEL | JOB NO: #1611

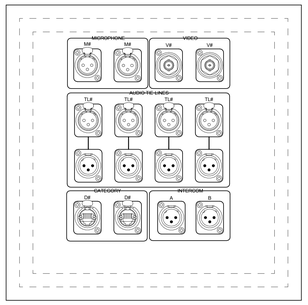
CKD. BY: AGB | SCALE: As indicated

DATE: January 31, 2019

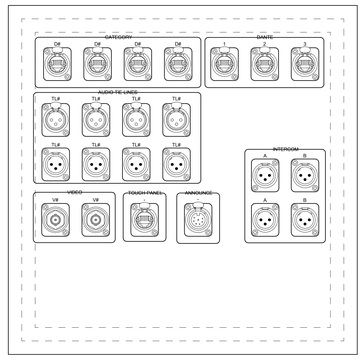
AV6.1



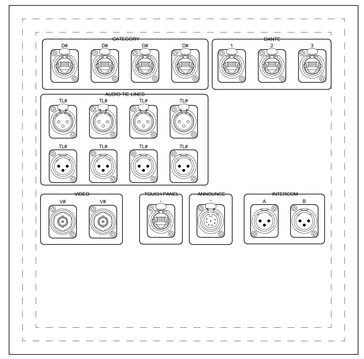
1 DEVICE DETAIL - SP
6" = 1'-0"



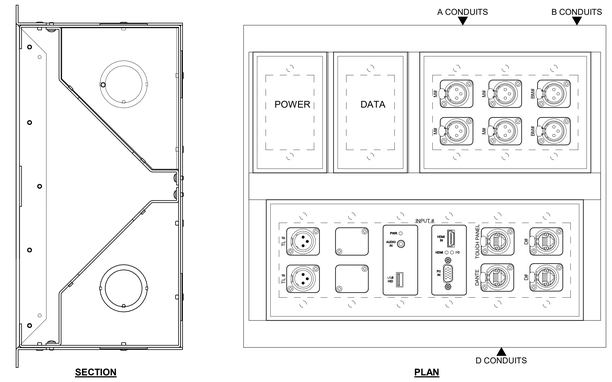
2 DEVICE DETAIL - USP
6" = 1'-0"



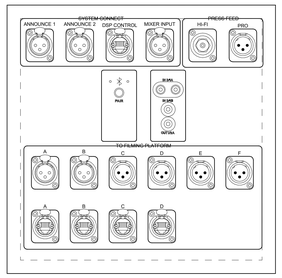
3 DEVICE DETAIL - MX
6" = 1'-0"



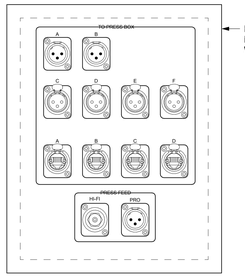
4 DEVICE DETAIL - MXB
6" = 1'-0"



5 Device Detail - FB1
6" = 1'-0"

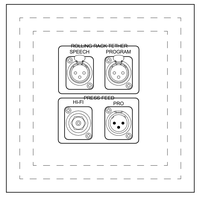


6 DEVICE DETAIL - WB1
6" = 1'-0"

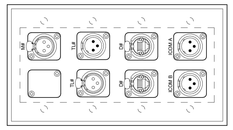


FACEPLATE MOUNTED WITHIN
NEMA TYPE 4X WEATHERPROOF ENCLOSURE
WITH PADLOCKABLE LATCH

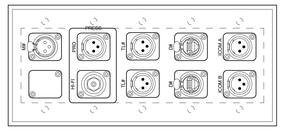
7 DEVICE DETAIL - WP1
6" = 1'-0"



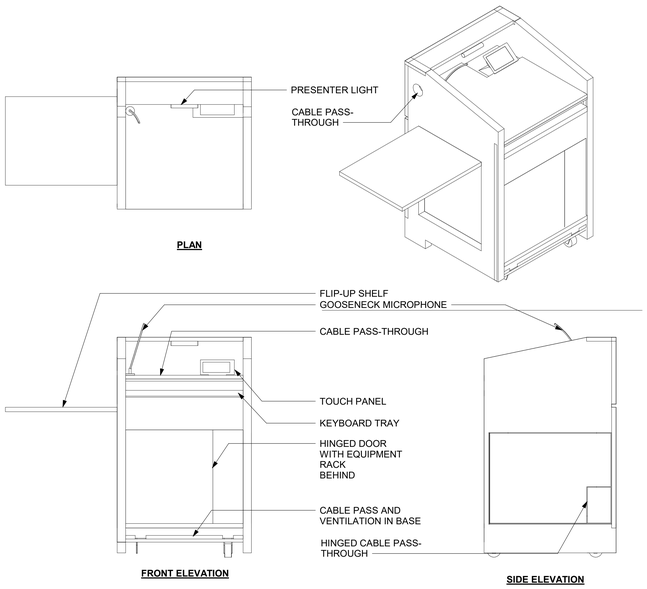
8 Device Detail - WBG
6" = 1'-0"



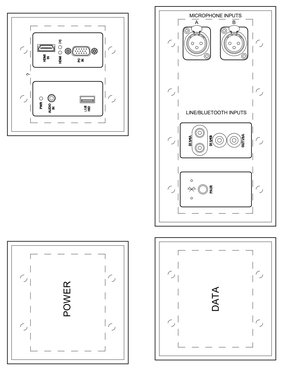
9 DEVICE DETAIL - WBB
6" = 1'-0"



10 DEVICE DETAIL - WBA
6" = 1'-0"



11 DEVICE DETAIL - LECTERN
1" = 1'-0"



FLAT PLATES CUSTOM FITTED FOR WALL BOX

12 DEVICE DETAIL - WB2
6" = 1'-0"

LAMOUREUX PAGANO ASSOCIATES, ARCHITECTS
108 GROVE STREET, SUITE 300
WORCESTER, MASSACHUSETTS 01605

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327 F BOSTON POST ROAD, SUDBURY, MA 01776-3027
978.443.7871 www.cavtocci.com

OWNER

Worcester Public Schools

Worcester, MA

Project North

PROJECT

Final Bid Package

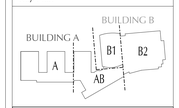
South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

AUDIOVISUAL PLATE AND PANEL DETAILS

Key Plan



REVISIONS

No.	Description	Date

FILE:

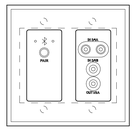
DWN. BY: AGB/EEL | JOB NO: #1611

CKD. BY: AGB | SCALE: As indicated

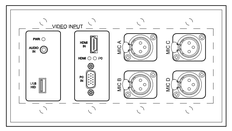
DATE: January 31, 2019

AV6.2

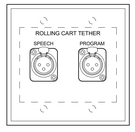
1 DEVICE DETAIL - AL
6" = 1'-0"



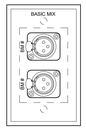
2 DEVICE DETAIL - AV
6" = 1'-0"



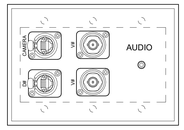
4 DEVICE DETAIL - AV4
6" = 1'-0"



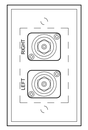
5 DEVICE DETAIL - BCP
6" = 1'-0"



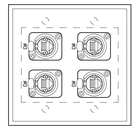
6 DEVICE DETAIL - BM
6" = 1'-0"



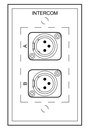
7 DEVICE DETAIL - CA
6" = 1'-0"



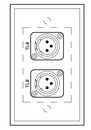
8 DEVICE DETAIL - CPA
6" = 1'-0"



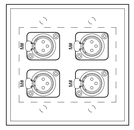
9 DEVICE DETAIL - D4
6" = 1'-0"



10 DEVICE DETAIL - I
6" = 1'-0"



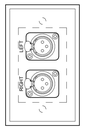
11 DEVICE DETAIL - L2
6" = 1'-0"



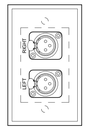
13 DEVICE DETAIL - M4
6" = 1'-0"

14 DEVICE DETAIL - MM
6" = 1'-0"

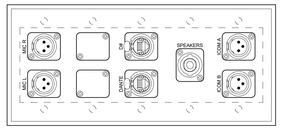
15 DEVICE DETAIL - PF
6" = 1'-0"



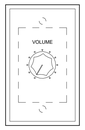
16 DEVICE DETAIL - R
6" = 1'-0"



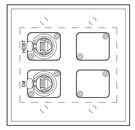
17 DEVICE DETAIL - R2
6" = 1'-0"



18 DEVICE DETAIL - RC
6" = 1'-0"



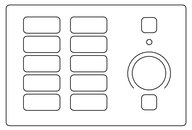
19 DEVICE DETAIL - VC
6" = 1'-0"



20 DEVICE DETAIL - VP
6" = 1'-0"

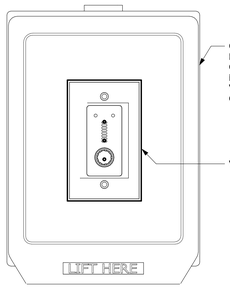
34 DEVICE DETAIL - VP2
6" = 1'-0"

21 DEVICE DETAIL - WA
6" = 1'-0"



PROVIDE WITH CUSTOM BUTTON LABELS

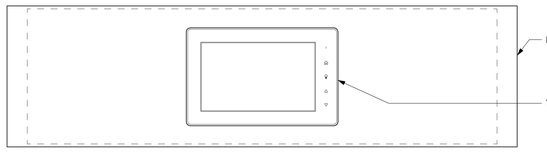
24 DEVICE DETAIL - CP
6" = 1'-0"



CLEAR, HINGED FACEPLATE PROTECTION
CUSTOM LABEL: VOLUME
NOTE: HOLD BACK PADDING ABOVE VOLUME CONTROL TO ALLOW COVER TO OPEN FULLY.

VOLUME CONTROL

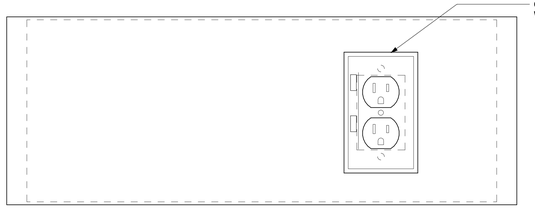
22 DEVICE DETAIL - V
6" = 1'-0"



RACK PANEL

TOUCH PANEL

23 DEVICE DETAIL - STAGE RACK PANEL
6" = 1'-0"



POWER AND AV INPUT PLATES FLUSH WITH BACK FACE OF SHELF

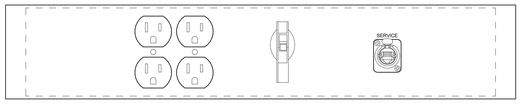
CONVENIENCE POWER OUTLET WITH USB PORTS

MEDIA DOCK SHELF

BACK BOX FOR ELECTRICAL OUTLET

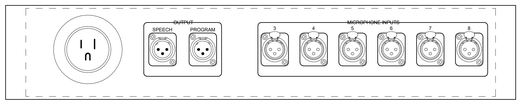
ELEVATION **SECTION**

25 DEVICE DETAIL - MEDIA SHELF
6" = 1'-0"

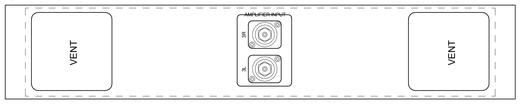


26 DEVICE DETAIL - CONVENIENCE OUTLET
6" = 1'-0"

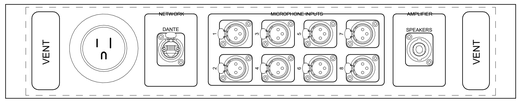
28 RACK PANEL DETAIL - GYM ROLLING RACK VOLUME CONTROL PANEL
6" = 1'-0"



29 DEVICE DETAIL - GYM ROLLING RACK I/O PANEL
6" = 1'-0"

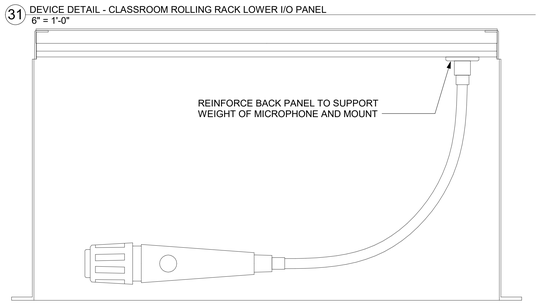


30 DEVICE DETAIL - CLASSROOM ROLLING RACK UPPER I/O PANEL
6" = 1'-0"



NOTE: MAY REQUIRE TABS FOR RACK REAR PANEL.

31 DEVICE DETAIL - CLASSROOM ROLLING RACK LOWER I/O PANEL
6" = 1'-0"



REINFORCE BACK PANEL TO SUPPORT WEIGHT OF MICROPHONE AND MOUNT

32 DEVICE DETAIL - CUE MICROPHONE
6" = 1'-0"

33 LARGE GROUP SEMINAR I/O PANEL
6" = 1'-0"

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PROJECT

Final Bid Package

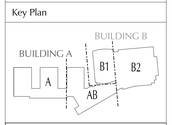
South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

AUDIOVISUAL PLATE AND PANEL DETAILS

Key Plan



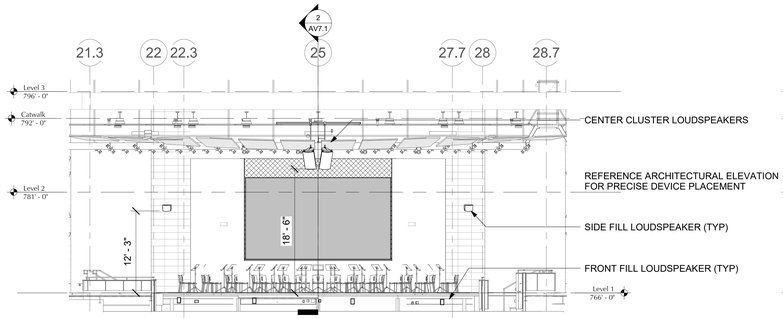
REVISIONS

No.	Description	Date

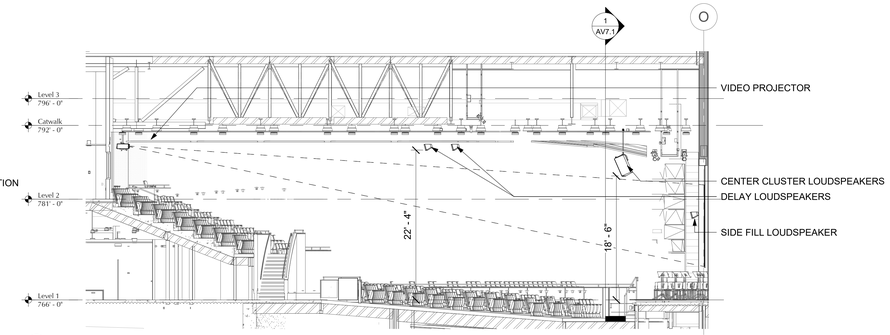
FILE:

DWN. BY: AGB/ELL	JOB NO: #1613
CKD. BY: AGB	SCALE: 6" = 1'-0"
DATE: January 31, 2019	

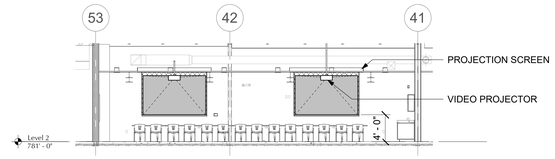
AV6.3



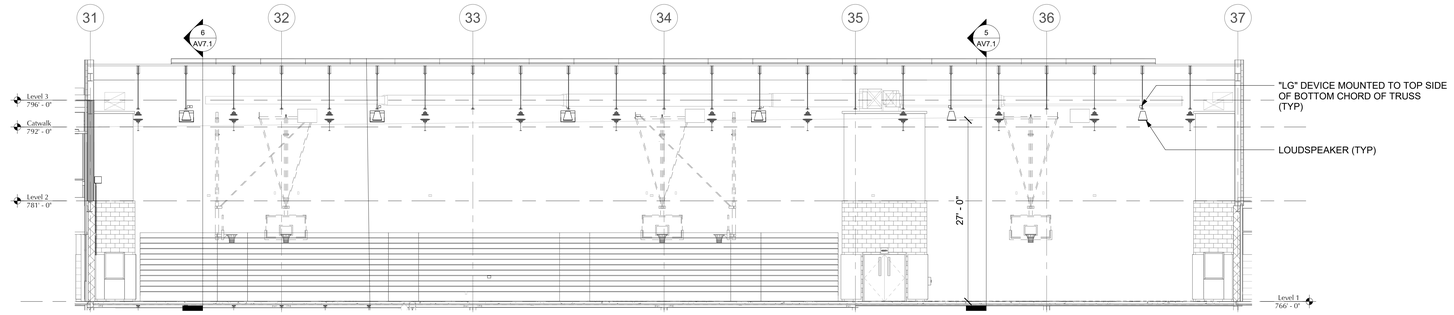
1 TRANSVERSE SECTION LOOKING AT PROSCENIUM
1/8" = 1'-0"



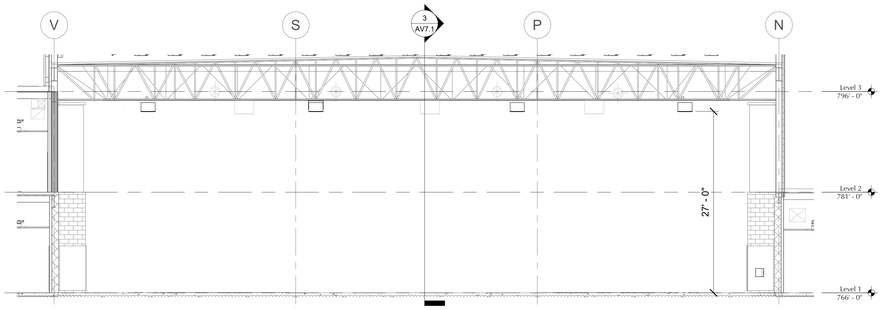
2 AUDITORIUM CENTERLINE SECTION
1/8" = 1'-0"



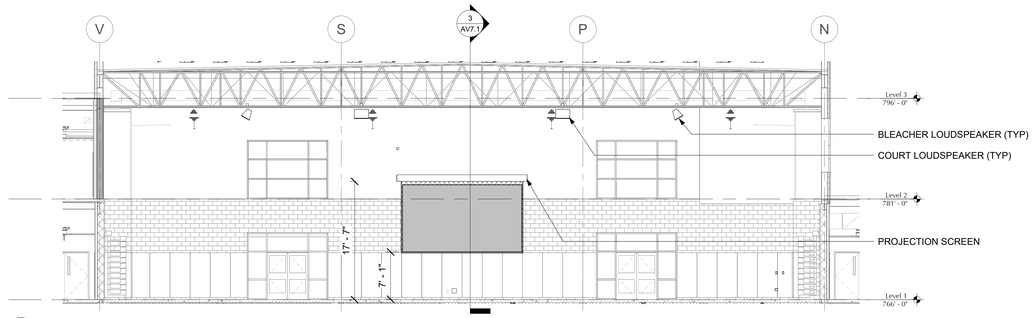
4 LARGE GROUP SEMINAR DISPLAY WALL
1/8" = 1'-0"



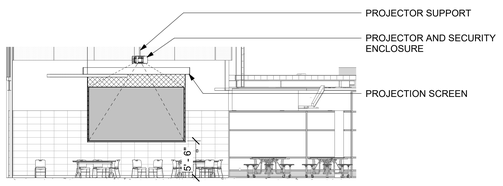
3 LONG SECTION - GYM
1/8" = 1'-0"



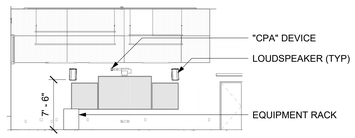
5 TRANSVERSE SECTION - GYM
1/8" = 1'-0"



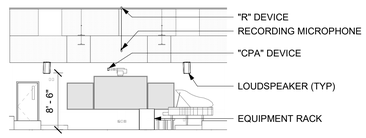
6 TRANSVERSE SECTION - GYM
1/8" = 1'-0"



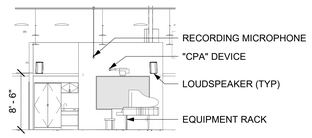
7 CAFETERIA PROJECTION SCREEN WALL
1/8" = 1'-0"



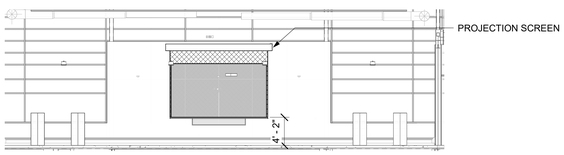
8 PIANO LAB TEACH WALL ELEVATION
1/8" = 1'-0"



9 BAND ROOM TEACH WALL ELEVATION
1/8" = 1'-0"



10 CHORUS ROOM TEACH WALL ELEVATION
1/8" = 1'-0"



11 MEDIA CENTER PROJECTION SCREEN WALL
1/8" = 1'-0"

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PROJECT

Final Bid Package

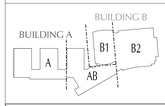
South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

AUDIOVISUAL SECTIONS

Key Plan



REVISIONS

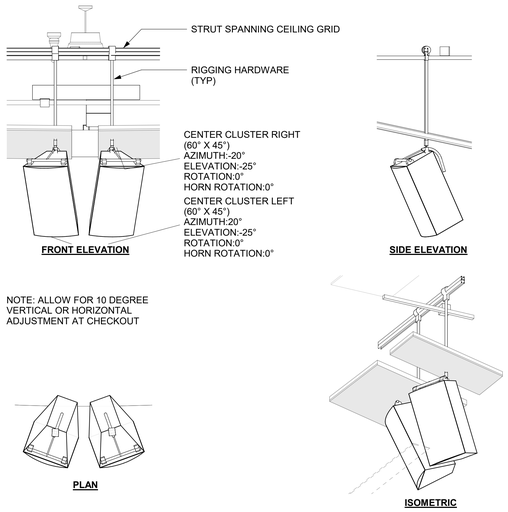
No.	Description	Date

FILE:

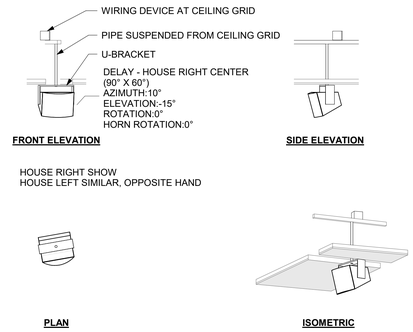
DWN. BY: AGB	JOB NO: #1611
CKD. BY: AGB	SCALE: 1/8" = 1'-0"

DATE: January 31, 2019

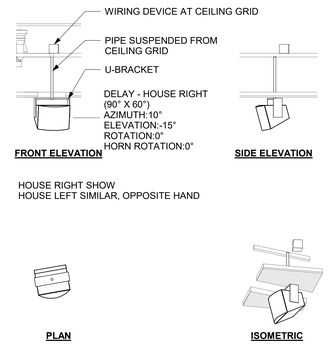
AV7.1



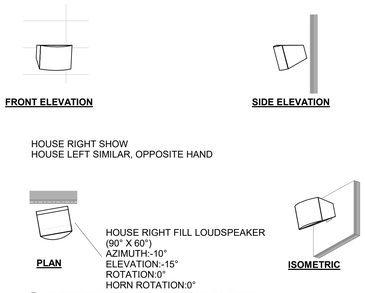
1 AUDITORIUM CENTER CLUSTER LOUDSPEAKER DETAIL
1/2" = 1'-0"



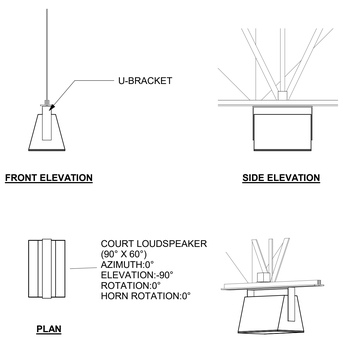
2 AUDITORIUM DELAY LOUDSPEAKER - HOUSE RIGHT OF CENTER DETAIL
1/2" = 1'-0"



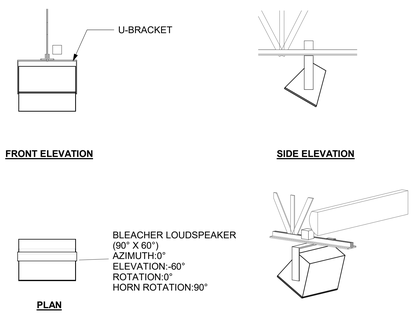
3 AUDITORIUM DETAIL LOUDSPEAKER HOUSE RIGHT DETAIL
1/2" = 1'-0"



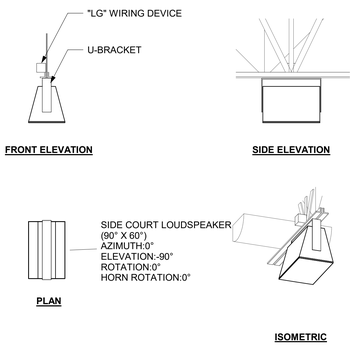
4 AUDITORIUM SIDE FILL LOUDSPEAKER DETAIL
1/2" = 1'-0"



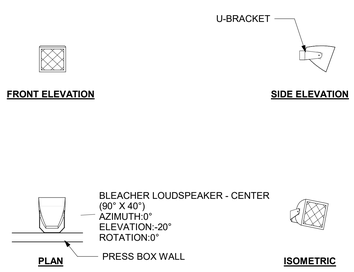
5 GYM - COURT LS PLAN
1/2" = 1'-0"



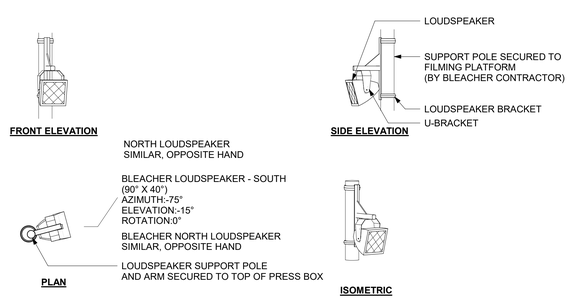
6 GYM - BLEACHER LS PLAN
1/2" = 1'-0"



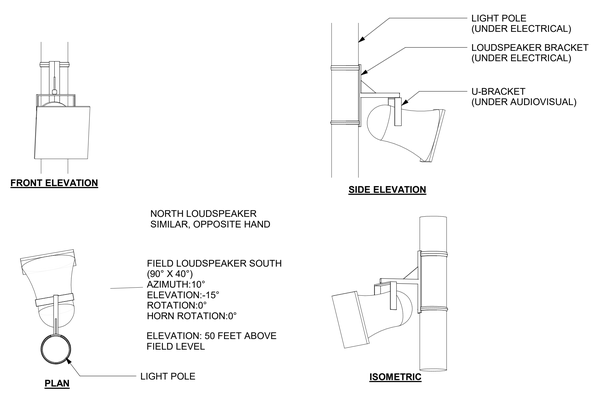
7 GYM - SIDE COURT PLAN
1/2" = 1'-0"



8 BLEACHER LOUDSPEAKER - CENTER
1/2" = 1'-0"



9 BLEACHER LOUDSPEAKER - SOUTH
1/2" = 1'-0"



10 ATHLETIC FIELD LOUDSPEAKER DETAIL
1/2" = 1'-0"

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TITLE

LOUDSPEAKER DETAILS

Key Plan

BUILDING A
BUILDING B
A
B1
B2
AB

REVISIONS

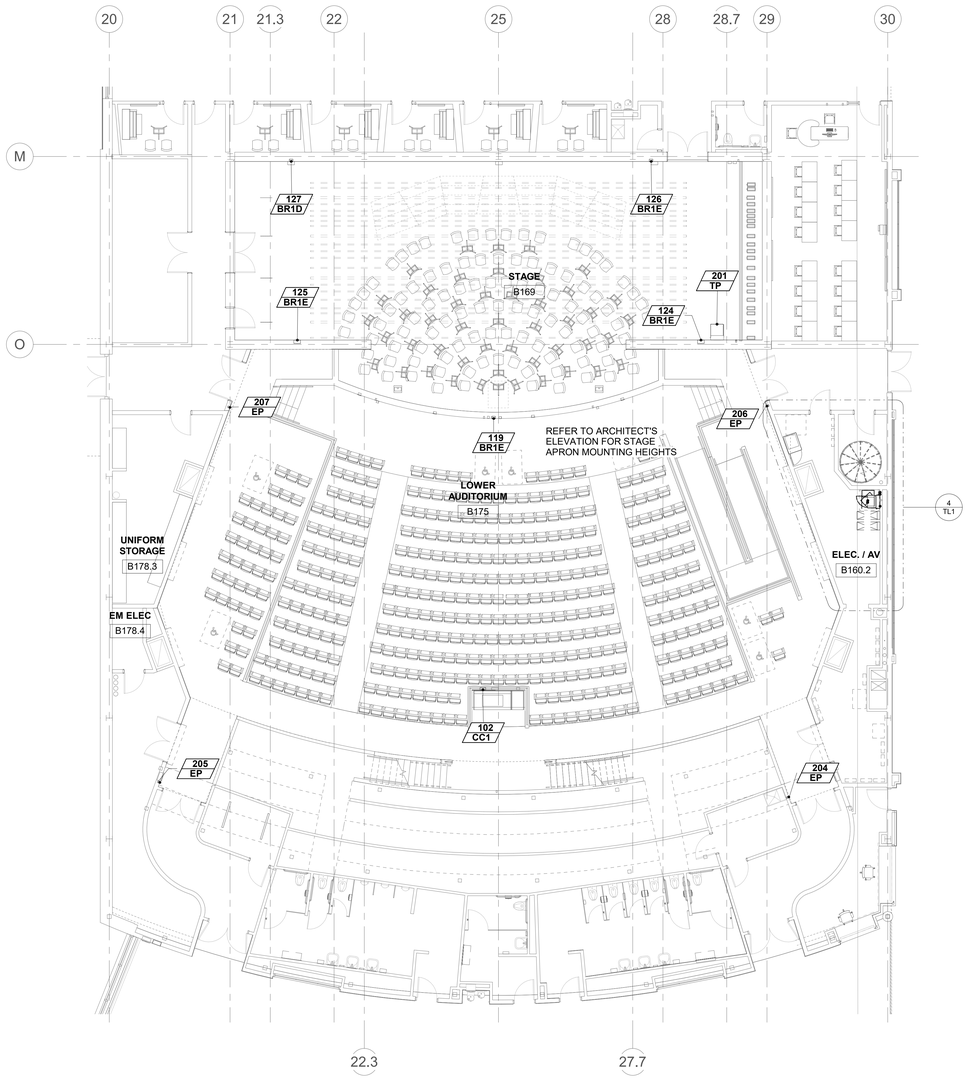
No.	Description	Date

FILE:

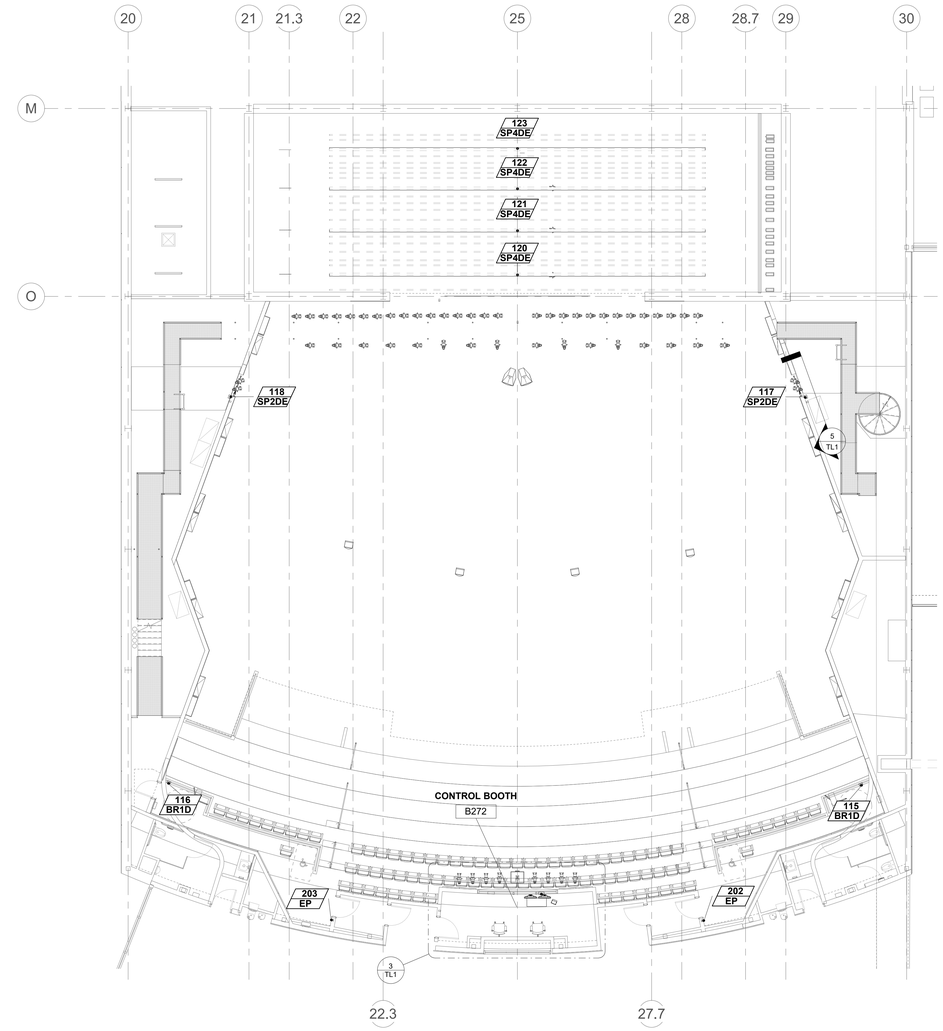
DWN. BY: AGB	JOB NO: #1611
CKD. BY: AGB	SCALE: 1/2" = 1'-0"

DATE: January 31, 2019

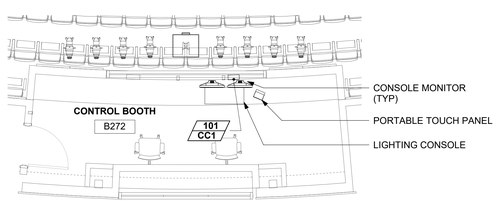
AV7.2



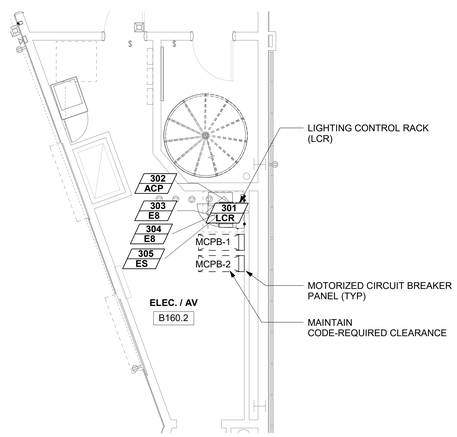
1 THEATRICAL LIGHTING DEVICE PLAN - FIRST FLOOR
1/8" = 1'-0"



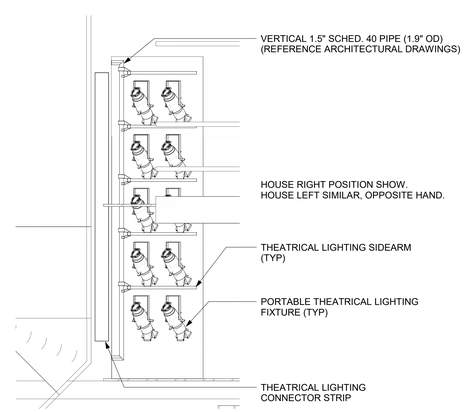
2 THEATRICAL LIGHTING PLAN - SECOND FLOOR
1/8" = 1'-0"



3 CONTROL BOOTH DETAIL PLAN
1/4" = 1'-0"



4 ELECTRICAL ROOM DETAIL PLAN
1/4" = 1'-0"



5 HOUSE LEFT AND RIGHT WALL LIGHTING POSITION
1/2" = 1'-0"

DEVICE KEY

/ XXX — DEVICE NUMBER / DEVICE TYPE

COMPANY SWITCH AMPERAGE INDICATED

RISER DIAGRAM WIRING KEY

POWER

CONTROL

CONTROL WIRING LEGEND

TYPE	WIRE TYPE(S)	SIGNAL
A	(1) BELDEN 8471 (1) #14 AWG. STRANDED WIRE (2) #16 AWG	ARCH. CTRL.
B	(1) BELDEN 1583A	NETWORK
C	(1) BELDEN 9729	DMX

NOTES

1. ALL EXPOSED SURFACES ON STAGE DEVICES FINISHED MATTE BLACK UNLESS OTHERWISE NOTED.
2. PROVIDE BRACKETS AND HARDWARE FOR MOUNTING CONTRL AND DISTRIBUTION DEVICES AS REQUIRED.
3. ALL LOW-VOLTAGE CONTROL WIRING INSTALLED IN METAL CONDUIT.
4. FINAL CONTROL WIRING TYPES TO BE CONFIRMED BY LIGHTING SYSTEM MANUFACTURER.
5. P.S.H.: PROJECT SWITCH HEIGHT
6. P.R.H.: PROJECT RECEPTACLE HEIGHT

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PROJECT

Final Bid Package

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170 Apricot Street, Worcester, MA 01603

TITLE

THEATRICAL LIGHTING DEVICE PLANS

Key Plan

BUILDING A — A
BUILDING B — B1, B2, AB

REVISIONS

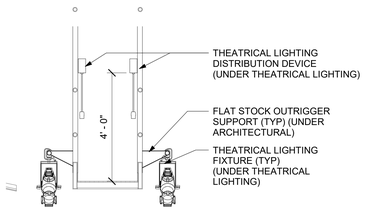
No.	Description	Date

FILE:

DWN. BY: AGB	JOB NO: #1611
CKD. BY: AGB	SCALE: As indicated

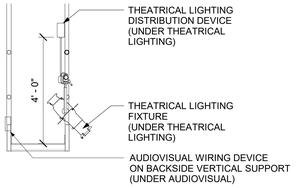
DATE: January 31, 2019

TL1



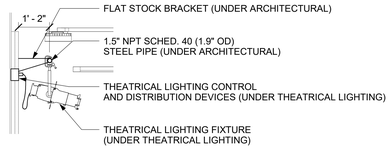
ALL HORIZONTAL PIPE TO BE 1.5" NPT
SCHEDULE 40 PIPE (1.9" O.D.)

2 NEAR CATWALK SECTION DETAIL
1/2" = 1'-0"

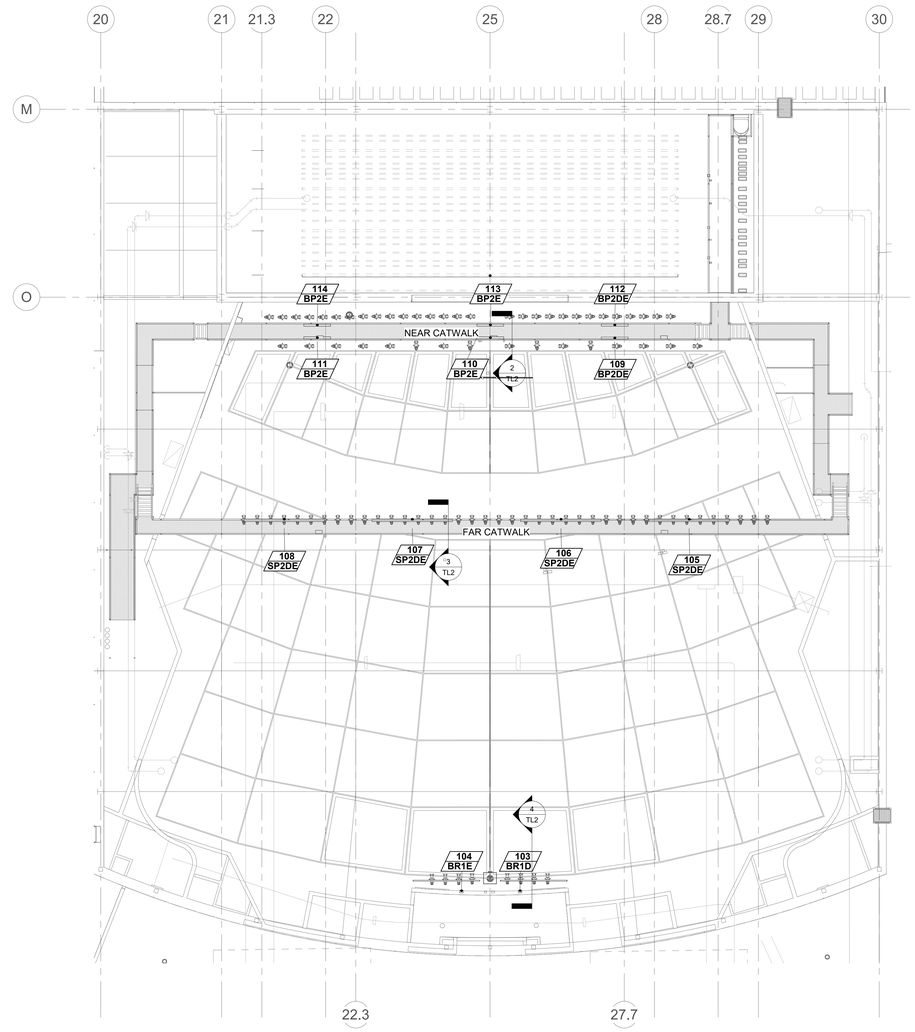


ALL HORIZONTAL PIPE TO BE 1.5" NPT
SCHEDULE 40 PIPE (1.9" O.D.)

3 FAR CATWALK SECTION DETAIL
1/2" = 1'-0"



4 SECTION DETAIL - BOOTH PIPE
1/2" = 1'-0"



1 THEATRICAL LIGHTING DEVICE PLAN - THIRD FLOOR
1/8" = 1'-0"

DEVICE KEY

XXX — DEVICE NUMBER / DEVICE TYPE

COMPANY SWITCH AMPERAGE INDICATED

RISER DIAGRAM WIRING KEY

POWER

CONTROL

CONTROL WIRING LEGEND

TYPE	WIRE TYPE(S)	SIGNAL
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B	(1) BELDEN 1583A	NETWORK
C	(1) BELDEN 9729	DMX

NOTES

1. ALL EXPOSED SURFACES ON STAGE DEVICES FINISHED MATTE BLACK UNLESS OTHERWISE NOTED.
2. PROVIDE BRACKETS AND HARDWARE FOR MOUNTING CONTRL AND DISTRIBUTION DEVICES AS REQUIRED.
3. ALL LOW-VOLTAGE CONTROL WIRING INSTALLED IN METAL CONDUIT.
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5. P.S.H.: PROJECT SWITCH HEIGHT
6. P.R.H.: PROJECT RECEPTACLE HEIGHT

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TITLE

THEATRICAL LIGHTING DEVICE PLANS

Key Plan

BUILDING A
BUILDING B
A
B1
B2
AB

REVISIONS

No.	Description	Date

FILE:

DWN. BY: AGB	JOB NO: #1611
CKD. BY: AGB	SCALE: As indicated

DATE: January 31, 2019

TL2

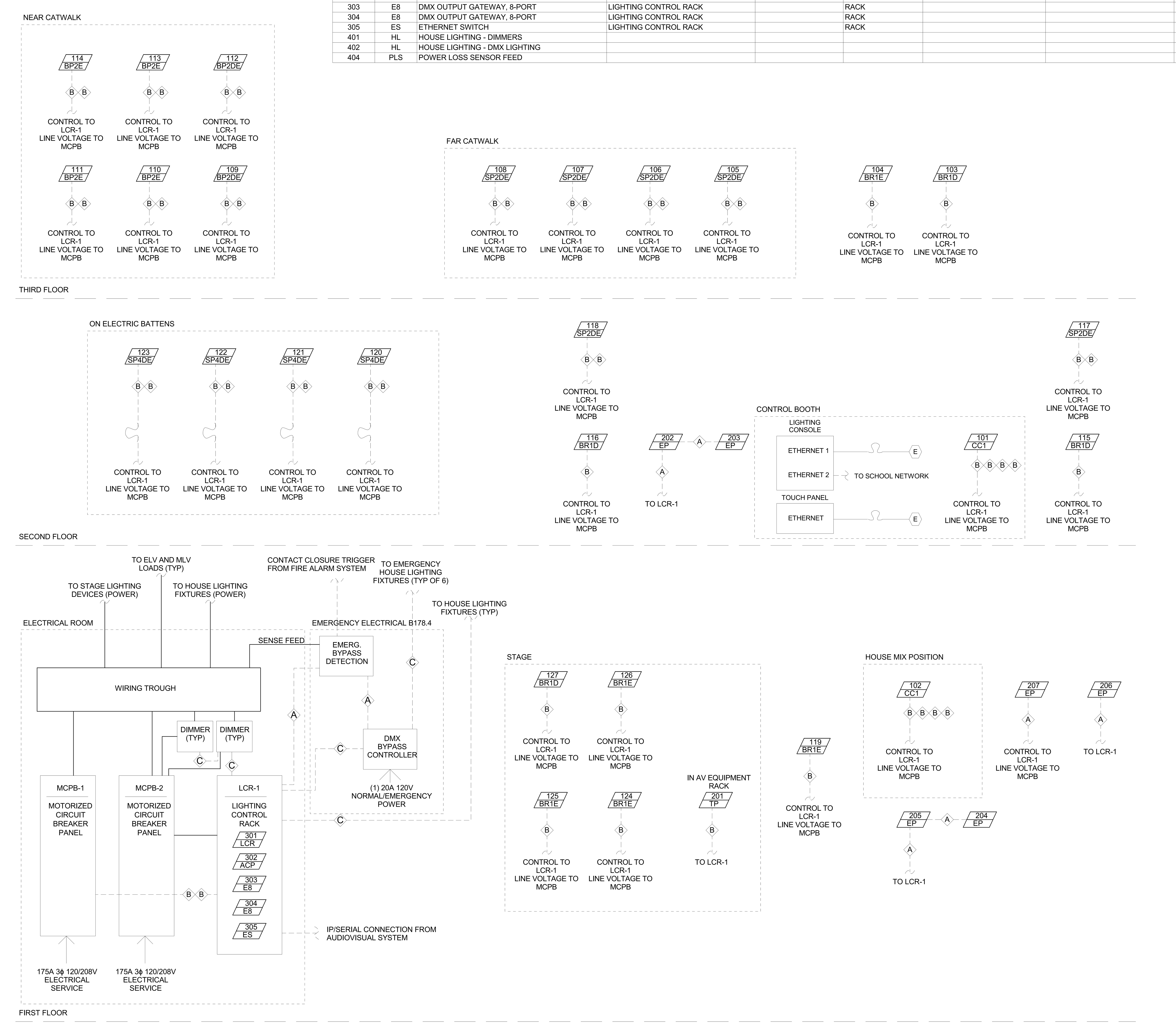
AUDITORIUM HOUSE LIGHTING CONTROL SCHEDULE

CONTROL CIRC. #	DMX ADDRESS	MCPB-2 CIRC #	DIM #	LOCATION	FIXTURE TYPE	DIMMING TYPE	APPROX. LOAD (VA)	
1	513	N/A		OVERHEAD	AP	DMX		ROW CLOSEST TO STAGE, POWERED FROM 277V EMERG...
2	514	N/A		OVERHEAD	AP	DMX		POWERED FROM 277V EMERGENCY PANEL
3	515	N/A		OVERHEAD	AP	DMX		POWERED FROM 277V EMERGENCY PANEL
4	516	N/A		OVERHEAD	AP	DMX		POWERED FROM 277V EMERGENCY PANEL
5	517	N/A		OVERHEAD	AP	DMX		POWERED FROM 277V EMERGENCY PANEL
6	518	52	1	SEAT STANDARD	N1	MLV	130	COORDINATE WITH SEATING MANUFACTURER
7	519	52	2	SEAT STANDARD	N1	MLV	150	COORDINATE WITH SEATING MANUFACTURER
8	520	53	3	AISLE LIGHT	N2	ELV	150	STAGE APRON ZONE
9	521	53	4	AISLE LIGHT	N2	ELV	140	
10	522	54	5	AISLE LIGHT	N2	ELV	170	
11	523	55		WALL PANEL	N3	DMX	970	
12	524	56		WALL PANEL	N3	DMX	970	
13	525	57		WALL PANEL	N3	DMX	650	
14	526	58		WALL PANEL	N3	DMX	650	
15	527	59		STAGE APRON	N4	DMX	120	

CONFIRM LOADS ON ELECTRICAL DRAWINGS.

THEATRICAL LIGHTING DEVICE SCHEDULE

DEVICE #	TYPE	DESCRIPTION	LOCATION	FINISH	MOUNT TYPE	BACK BOX	MOUNTING HEIGHT	# OF CIRCUITS	START #	END #	DMX INPUTS	DMX OUTPUTS	ETHERNET JACKS
101	CC1	CONTROL CONSOLE CONNECTION	CONTROL BOOTH	BRUSHED ALUMINUM	FLUSH	FIVE GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	1	1	1	1	0	3
102	CC1	CONTROL CONSOLE CONNECTION	HOUSE MIX POSITION	BRUSHED ALUMINUM	FLUSH	FIVE GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	1	1	1	1	0	3
103	BR1D	BOX WITH RECEPTACLE, DMX OUTPUT	ABOVE BOOTH WINDOW	BRUSHED ALUMINUM	FLUSH	TWO GANG ELECTRICAL BOX	PER ARCHITECTURAL ELEVATION	1	2	2	0	1	0
104	BR1E	BOX WITH RECEPTACLE, ETHERNET	ABOVE BOOTH WINDOW	BRUSHED ALUMINUM	FLUSH	TWO GANG ELECTRICAL BOX	PER ARCHITECTURAL ELEVATION	1	3	3	0	0	1
105	SP2DE	STRIP WITH PIGTAILS, DMX, ETHERNET	FAR CATWALK	BLACK	SURFACE	CONNECTOR STRIP	PER DETAIL	2	4	5	0	1	1
106	SP2DE	STRIP WITH PIGTAILS, DMX, ETHERNET	FAR CATWALK	BLACK	SURFACE	CONNECTOR STRIP	PER DETAIL	2	6	7	0	1	1
107	SP2DE	STRIP WITH PIGTAILS, DMX, ETHERNET	FAR CATWALK	BLACK	SURFACE	CONNECTOR STRIP	PER DETAIL	2	8	9	0	1	1
108	SP2DE	STRIP WITH PIGTAILS, DMX, ETHERNET	FAR CATWALK	BLACK	SURFACE	CONNECTOR STRIP	PER DETAIL	2	10	11	0	1	1
109	BP2DE	BOX WITH PIGTAILS, DMX OUTPUT, ETHERNET	NEAR CATWALK	BLACK	SURFACE	CONNECTOR STRIP	PER DETAIL	2	12	13	0	1	1
110	BP2E	BOX WITH PIGTAILS, ETHERNET	NEAR CATWALK	BLACK	SURFACE	CONNECTOR STRIP	PER DETAIL	2	14	15	0	0	1
111	BP2E	BOX WITH PIGTAILS, ETHERNET	NEAR CATWALK	BLACK	SURFACE	CONNECTOR STRIP	PER DETAIL	2	16	17	0	0	1
112	BP2DE	BOX WITH PIGTAILS, DMX OUTPUT, ETHERNET	NEAR CATWALK	BLACK	SURFACE	CONNECTOR STRIP	PER DETAIL	2	18	19	0	1	1
113	BP2E	BOX WITH PIGTAILS, ETHERNET	NEAR CATWALK	BLACK	SURFACE	CONNECTOR STRIP	PER DETAIL	2	20	21	0	0	1
114	BP2E	BOX WITH PIGTAILS, ETHERNET	NEAR CATWALK	BLACK	SURFACE	CONNECTOR STRIP	PER DETAIL	2	22	23	0	0	1
115	BR1D	BOX WITH RECEPTACLE, DMX OUTPUT	HOUSE RIGHT FOLLOW SPOT	BRUSHED ALUMINUM	FLUSH	TWO GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	1	24	24	0	1	0
116	BR1D	BOX WITH RECEPTACLE, DMX OUTPUT	HOUSE LEFT FOLLOW SPOT	BRUSHED ALUMINUM	FLUSH	TWO GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	1	25	25	0	1	0
117	SP2DE	VERTICAL STRIP WITH PIGTAILS, DMX, ETHERNET	HOUSE RIGHT WALL NICHE	BLACK	SURFACE	CONNECTOR STRIP	PER DETAIL	2	26	27	0	1	1
118	SP2DE	VERTICAL STRIP WITH PIGTAILS, DMX, ETHERNET	HOUSE LEFT WALL NICHE	BLACK	SURFACE	CONNECTOR STRIP	PER DETAIL	2	28	29	0	1	1
119	BR1E	BOX WITH RECEPTACLE, ETHERNET	STAGE APRON	BRUSHED ALUMINUM	FLUSH	TWO GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	1	30	30	0	0	1
120	SP4DE	STRIP WITH PIGTAILS, DMX OUTPUT, ETHERNET	1 ELECTRIC	BLACK	PIPE	CONNECTOR STRIP		4	31	34	0	1	1
121	SP4DE	STRIP WITH PIGTAILS, DMX OUTPUT, ETHERNET	2 ELECTRIC	BLACK	PIPE	CONNECTOR STRIP		4	35	38	0	1	1
122	SP4DE	STRIP WITH PIGTAILS, DMX OUTPUT, ETHERNET	3 ELECTRIC	BLACK	PIPE	CONNECTOR STRIP		4	39	42	0	1	1
123	SP4DE	STRIP WITH PIGTAILS, DMX OUTPUT, ETHERNET	4 ELECTRIC	BLACK	PIPE	CONNECTOR STRIP		4	43	46	0	1	1
124	BR1E	BOX WITH RECEPTACLE, ETHERNET	DOWNSTAGE LEFT	BLACK	FLUSH	TWO GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	1	47	47	0	0	1
125	BR1E	BOX WITH RECEPTACLE, ETHERNET	DOWNSTAGE RIGHT	BLACK	FLUSH	TWO GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	1	48	48	0	0	1
126	BR1E	BOX WITH RECEPTACLE, ETHERNET	UPSTAGE LEFT	BLACK	FLUSH	TWO GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	1	49	49	0	0	1
127	BR1D	BOX WITH RECEPTACLE, DMX OUTPUT	UPSTAGE RIGHT	BLACK	FLUSH	TWO GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	1	50	50	0	1	0
201	TP	TOUCH PANEL	STAGE LEFT AV EQUIPMENT RACK	BLACK	RACK PANEL						0	0	0
202	EP	ENTRY PANEL	HOUSE RIGHT UPPER REAR ENTRY	BRUSHED ALUMINUM	FLUSH	ONE GANG ELECTRICAL BOX	PROJECT SWITCH HEIGHT				0	0	0
203	EP	ENTRY PANEL	HOUSE LEFT UPPER REAR ENTRY	BRUSHED ALUMINUM	FLUSH	ONE GANG ELECTRICAL BOX	PROJECT SWITCH HEIGHT				0	0	0
204	EP	ENTRY PANEL	HOUSE RIGHT REAR ENTRY	BRUSHED ALUMINUM	FLUSH	ONE GANG ELECTRICAL BOX	PROJECT SWITCH HEIGHT				0	0	0
205	EP	ENTRY PANEL	HOUSE LEFT REAR ENTRY	BRUSHED ALUMINUM	FLUSH	ONE GANG ELECTRICAL BOX	PROJECT SWITCH HEIGHT				0	0	0
206	EP	ENTRY PANEL	HOUSE RIGHT FRONT ENTRY	BRUSHED ALUMINUM	FLUSH	ONE GANG ELECTRICAL BOX	PROJECT SWITCH HEIGHT				0	0	0
207	EP	ENTRY PANEL	HOUSE LEFT FRONT ENTRY	BRUSHED ALUMINUM	FLUSH	ONE GANG ELECTRICAL BOX	PROJECT SWITCH HEIGHT				0	0	0
301	LCR	LIGHTING CONTROL RACK	ELECTRICAL ROOM					1	51	51			
302	ACP	ARCHITECTURAL CONTROL PROCESSOR	LIGHTING CONTROL RACK		RACK						0	0	1
303	E8	DMX OUTPUT GATEWAY, 8-PORT	LIGHTING CONTROL RACK		RACK						0	0	1
304	E8	DMX OUTPUT GATEWAY, 8-PORT	LIGHTING CONTROL RACK		RACK						0	0	1
305	ES	ETHERNET SWITCH	LIGHTING CONTROL RACK		RACK						0	0	0
401	HL	HOUSE LIGHTING - DIMMERS						2	52	53	0	1	0
402	HL	HOUSE LIGHTING - DMX LIGHTING						6	54	59	0	4	0
404	PLS	POWER LOSS SENSOR FEED						3	60	62	0	0	0



1 AUDITORIUM CONTROL RISER DIAGRAM
NTS

DEVICE KEY

— DEVICE NUMBER
XXX — DEVICE TYPE
COMPANY SWITCH AMPERAGE INDICATED

RISER DIAGRAM WIRING KEY

POWER
CONTROL

CONTROL WIRING LEGEND

TYPE	WIRE TYPE(S)	SIGNAL
A	(1) BELDEN 8471 (1) #14 AWG. STRANDED WIRE (2) #16 AWG	ARCH. CTRL.
B	(1) BELDEN 1583A	NETWORK
C	(1) BELDEN 9729	DMX

NOTES

1. ALL EXPOSED SURFACES ON STAGE DEVICES FINISHED MATTE BLACK UNLESS OTHERWISE NOTED.
2. PROVIDE BRACKETS AND HARDWARE FOR MOUNTING CONTRL AND DISTRIBUTION DEVICES AS REQUIRED.
3. ALL LOW-VOLTAGE CONTROL WIRING INSTALLED IN METAL CONDUIT.
4. FINAL CONTROL WIRING TYPES TO BE CONFIRMED BY LIGHTING SYSTEM MANUFACTURER.
5. P.S.H.: PROJECT SWITCH HEIGHT
6. P.R.H.: PROJECT RECEPTACLE HEIGHT

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Project North

PROJECT

Final Bid Package

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

THEATRICAL LIGHTING RISER AND SCHEDULES

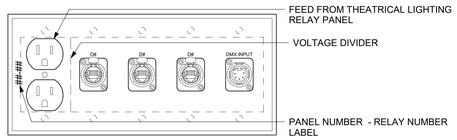
Key Plan

BUILDING A
BUILDING B
A
B1
B2
AB

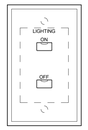
REVISIONS		
No.	Description	Date

FILE:
DWN. BY: AGB JOB NO: #1611
CKD. BY: AGB SCALE: 12" = 1'-0"
DATE: January 31, 2019

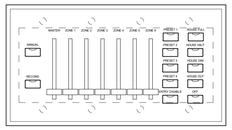
TL3



1 DEVICE DETAIL - CC1
6" = 1'-0"



2 DEVICE DETAIL - EP
6" = 1'-0"



3 DEVICE DETAIL - FP
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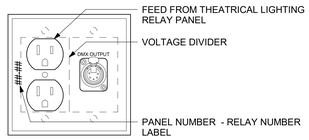
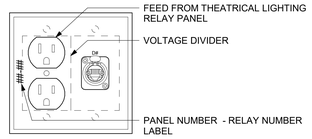
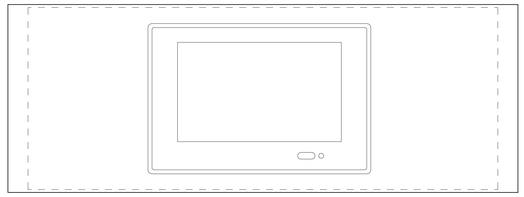


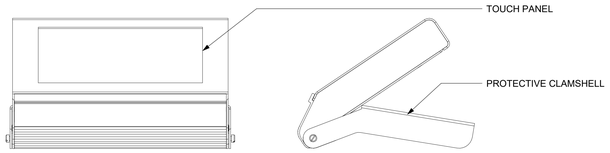
4 DEVICE DETAIL - BR1D
6" = 1'-0"



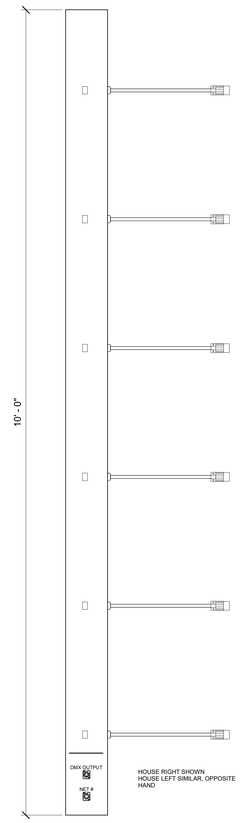
5 DEVICE DETAIL - BR1E
6" = 1'-0"



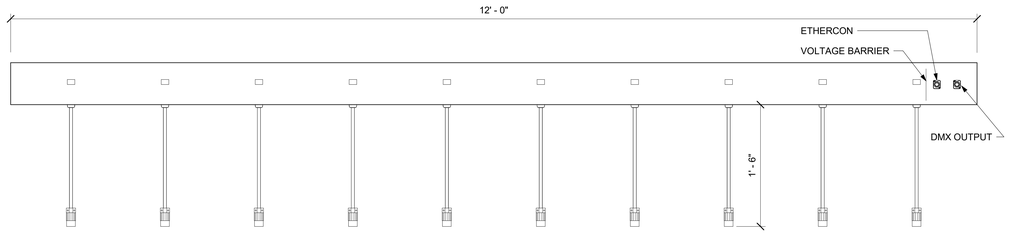
6 DEVICE DETAIL - STAGE RACK PANEL
6" = 1'-0"



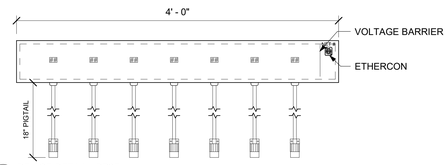
7 DEVICE DETAIL - PORTABLE TOUCH PANEL
6" = 1'-0"



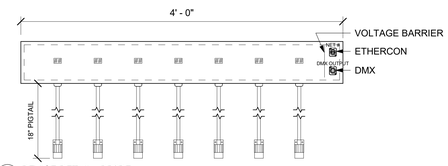
8 DEVICE DETAIL - SP2DE - VERTICAL
1 1/2" = 1'-0"



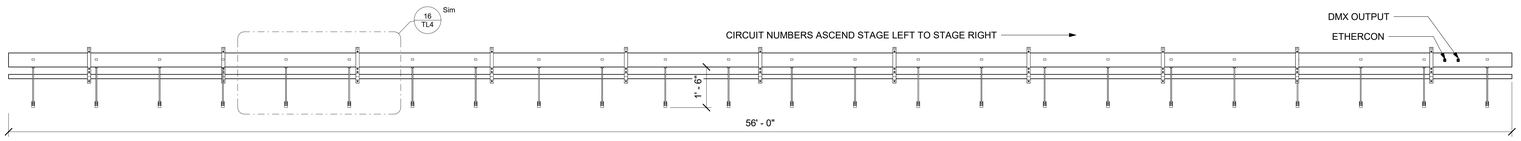
9 DEVICE DETAIL - SP2DE - CATWALK
1 1/2" = 1'-0"



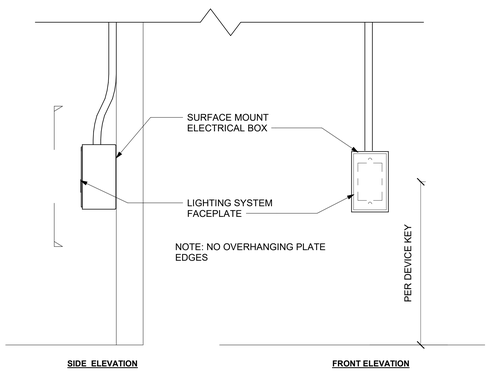
10 DEVICE DETAIL - BP2E
1 1/2" = 1'-0"



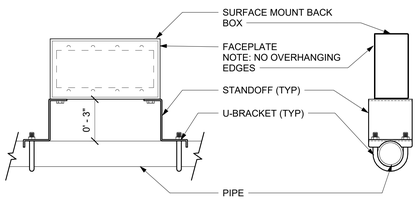
11 DEVICE DETAIL - BP2DE
1 1/2" = 1'-0"



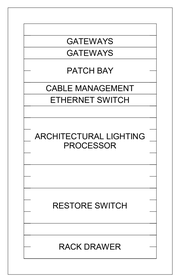
12 DEVICE DETAIL - SP4DE
1/2" = 1'-0"



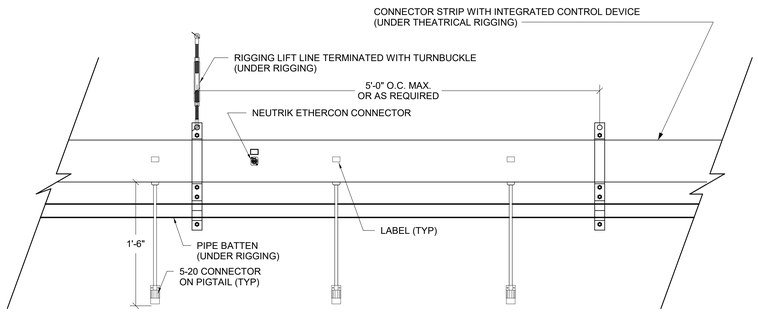
13 MOUNTING DETAIL - SURFACE MOUNT DEVICE
3" = 1'-0"



14 MOUNTING DETAIL - PIPE MOUNTED DEVICES (TYP)
3" = 1'-0"



15 ELEVATION - LIGHTING CONTROL RACK
NTS



16 DETAIL - CONNECTOR STRIP WITH PIGTAILS
1 1/2" = 1'-0"

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PROJECT

Final Bid Package

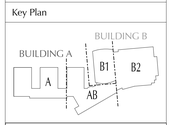
South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

THEATRICAL LIGHTING PLATE AND PANEL DETAILS

Key Plan



REVISIONS

No.	Description	Date

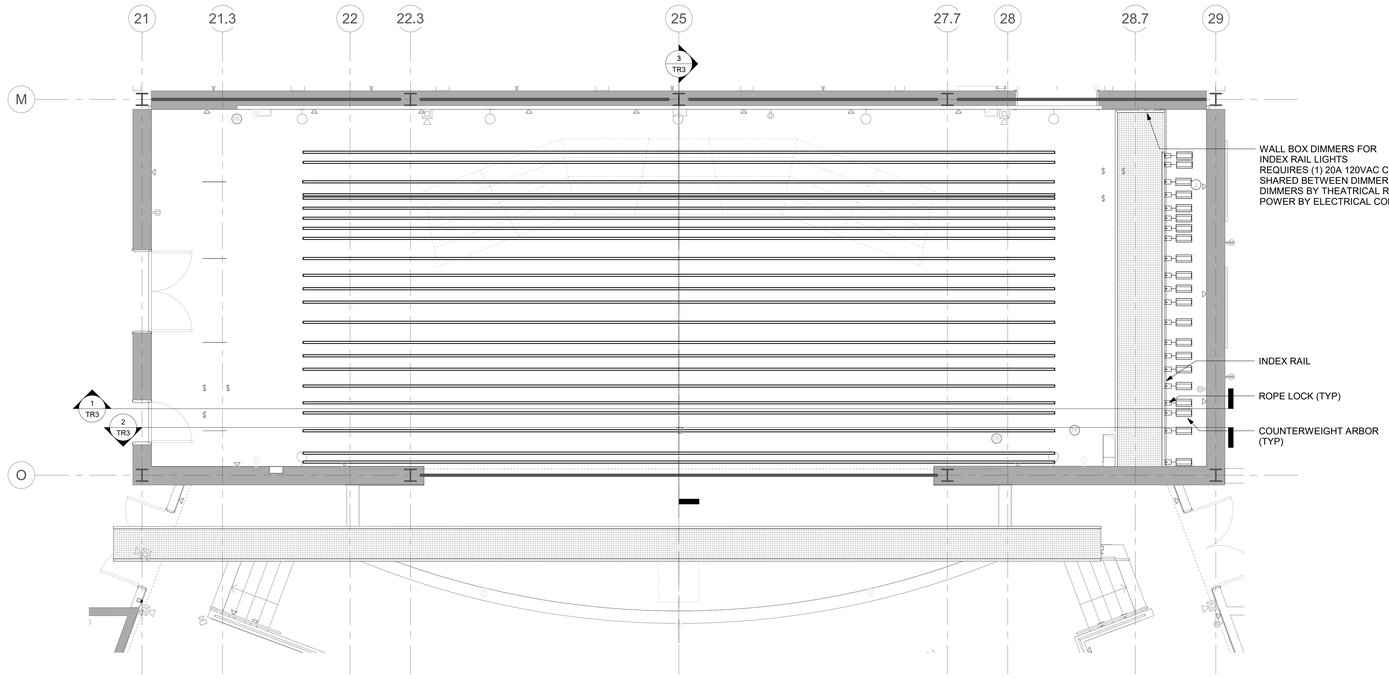
FILE:

DWN. BY: AGB	JOB NO: #1611
CKD. BY: AGB	SCALE: As indicated
DATE: January 31, 2019	

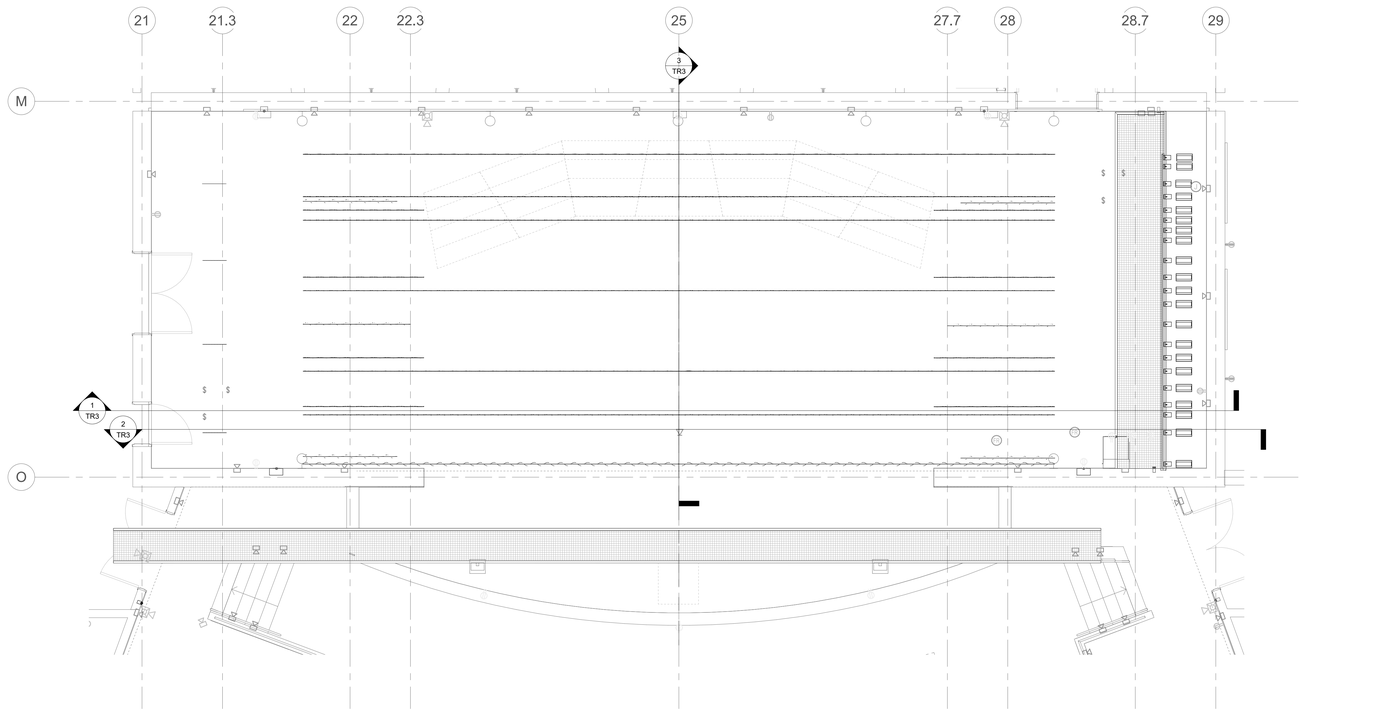
TL4

LINESET SCHEDULE

SET NUMBER	DISTANCE FROM PLASTER	USAGE	WEIGHT (DEAD)	CAPACITY (LIVE)	Arbor Height	PIPE LENGTH	COMMENTS
1	0' - 4"	MAIN VALANCE	250.00 lbf	1450.00 lb	8' - 0"	56' - 0"	
2	1' - 0"	MAIN CURTAIN	900.00 lbf	0.00 lb		56' - 0"	DEAD HUNG
3	2' - 8"	1 ELECTRIC	700.00 lbf	1000.00 lb	8' - 0"	56' - 0"	
4	4' - 0"	BORDER	250.00 lbf	1450.00 lb	8' - 0"	56' - 0"	
5	4' - 9"	LEG	250.00 lbf	1450.00 lb	8' - 0"	56' - 0"	
6	6' - 0"	ACOUSTIC CEILING PANEL	250.00 lbf	1450.00 lb	8' - 0"	56' - 0"	
7	7' - 3"	BORDER	250.00 lbf	1450.00 lb	8' - 0"	56' - 0"	
8	8' - 3"	LEG	250.00 lbf	1450.00 lb	8' - 0"	56' - 0"	
9	9' - 3"	2 ELETRIC	700.00 lbf	1000.00 lb	8' - 0"	56' - 0"	
10	10' - 9"	MID-STAGE TRAVELER	800.00 lbf	900.00 lb	8' - 0"	56' - 0"	
11	12' - 3"	ACOUSTIC CEILING PANEL	250.00 lbf	1450.00 lb	8' - 0"	56' - 0"	
12	13' - 3"	BORDER	250.00 lbf	1450.00 lb	8' - 0"	56' - 0"	
13	14' - 3"	LEGS	250.00 lbf	1450.00 lb	8' - 0"	56' - 0"	
14	15' - 6"	3 ELECTRIC	700.00 lbf	1000.00 lb	8' - 0"	56' - 0"	
15	17' - 0"	GENERAL PURPOSE	250.00 lbf	1450.00 lb	8' - 0"	56' - 0"	
16	17' - 9"	GENERAL PURPOSE	250.00 lbf	1450.00 lb	8' - 0"	56' - 0"	
17	18' - 6"	BORDER	250.00 lbf	1450.00 lb	8' - 0"	56' - 0"	
18	19' - 3"	LEGS	250.00 lbf	1450.00 lb	8' - 0"	56' - 0"	
19	20' - 0"	UPSTAGE TRAVELER	800.00 lbf	0.00 lb		56' - 0"	DEAD HUNG
20	20' - 3"	SCRIM	250.00 lbf	1450.00 lb	8' - 0"	56' - 0"	
21	21' - 0"	4 ELECTRIC	700.00 lbf	1000.00 lb	8' - 0"	56' - 0"	
22	22' - 8"	GENERAL PURPOSE	250.00 lbf	1450.00 lb	8' - 0"	56' - 0"	
23	23' - 5"	CYCLORAMA	250.00 lbf	1450.00 lb	8' - 0"	56' - 0"	



1 THEATRICAL RIGGING PLAN - PIPE PLAN
1/4" = 1'-0"



2 THEATRICAL RIGGING PLAN - FIRST FLOOR DRAPERY PLAN
1/4" = 1'-0"

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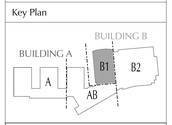
South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

THEATRICAL RIGGING PLANS

Key Plan



REVISIONS

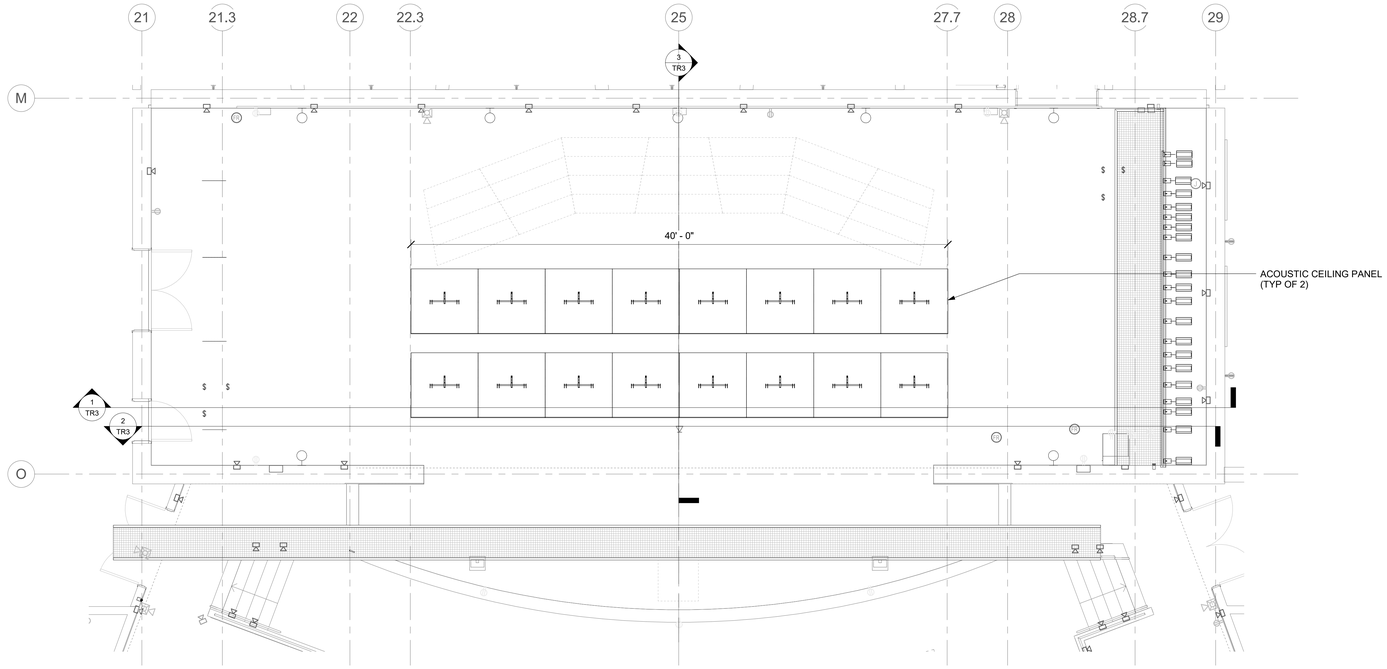
No.	Description	Date

FILE:

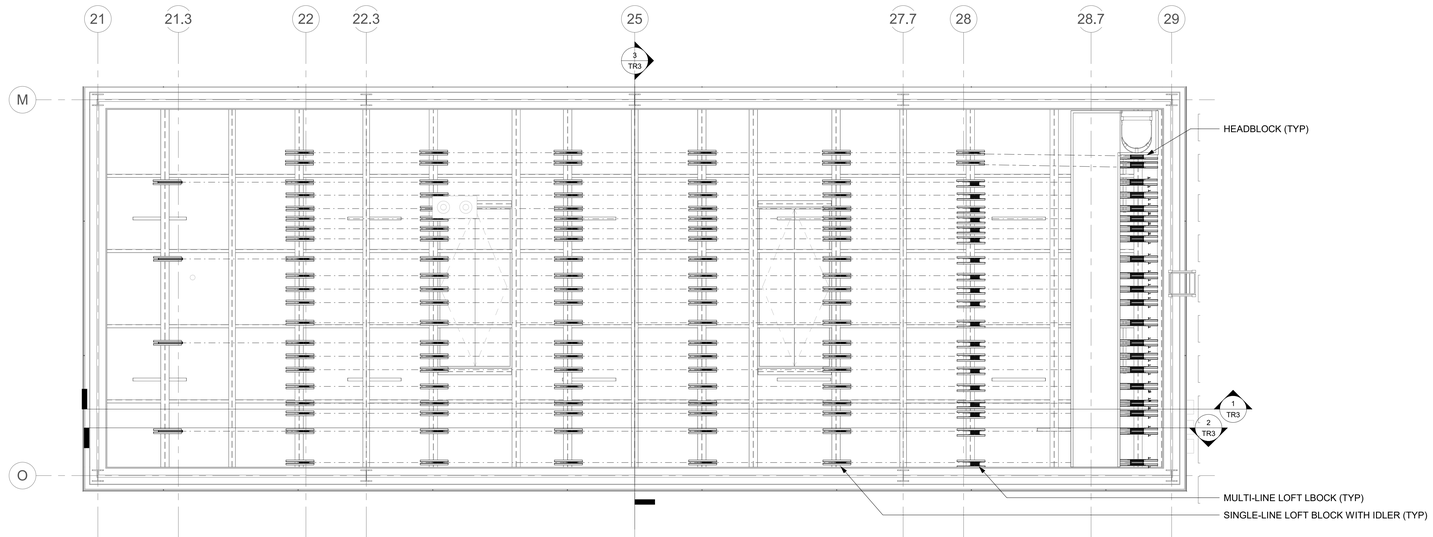
DWN. BY: AGB	JOB NO: #1611
CKD. BY: AGB	SCALE: 1/4" = 1'-0"

DATE: January 31, 2019

TR1



1 THEATRICAL RIGGING PLAN - ACOUSTIC CEILING PANELS
1/4" = 1'-0"



2 THEATRICAL RIGGING - BLOCK PLAN
1/4" = 1'-0"

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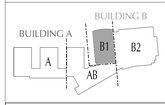
TITLE

THEATRICAL RIGGING PLANS

Key Plan



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No.	Description	Date

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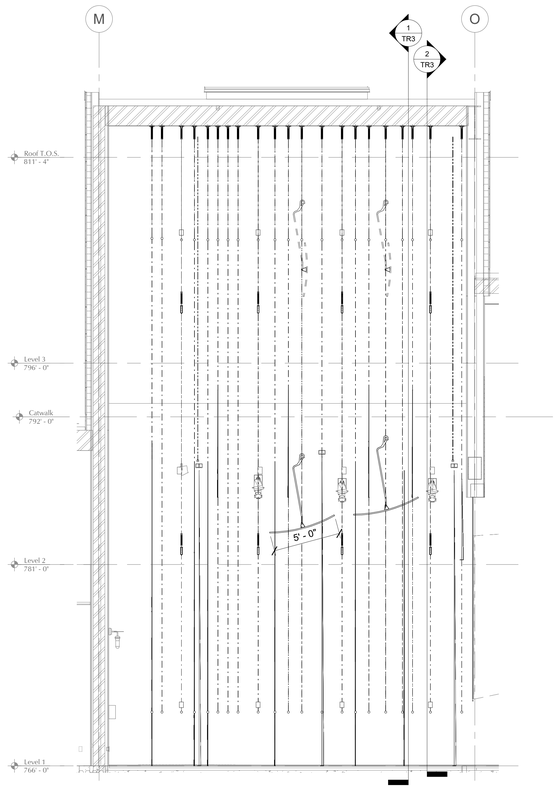
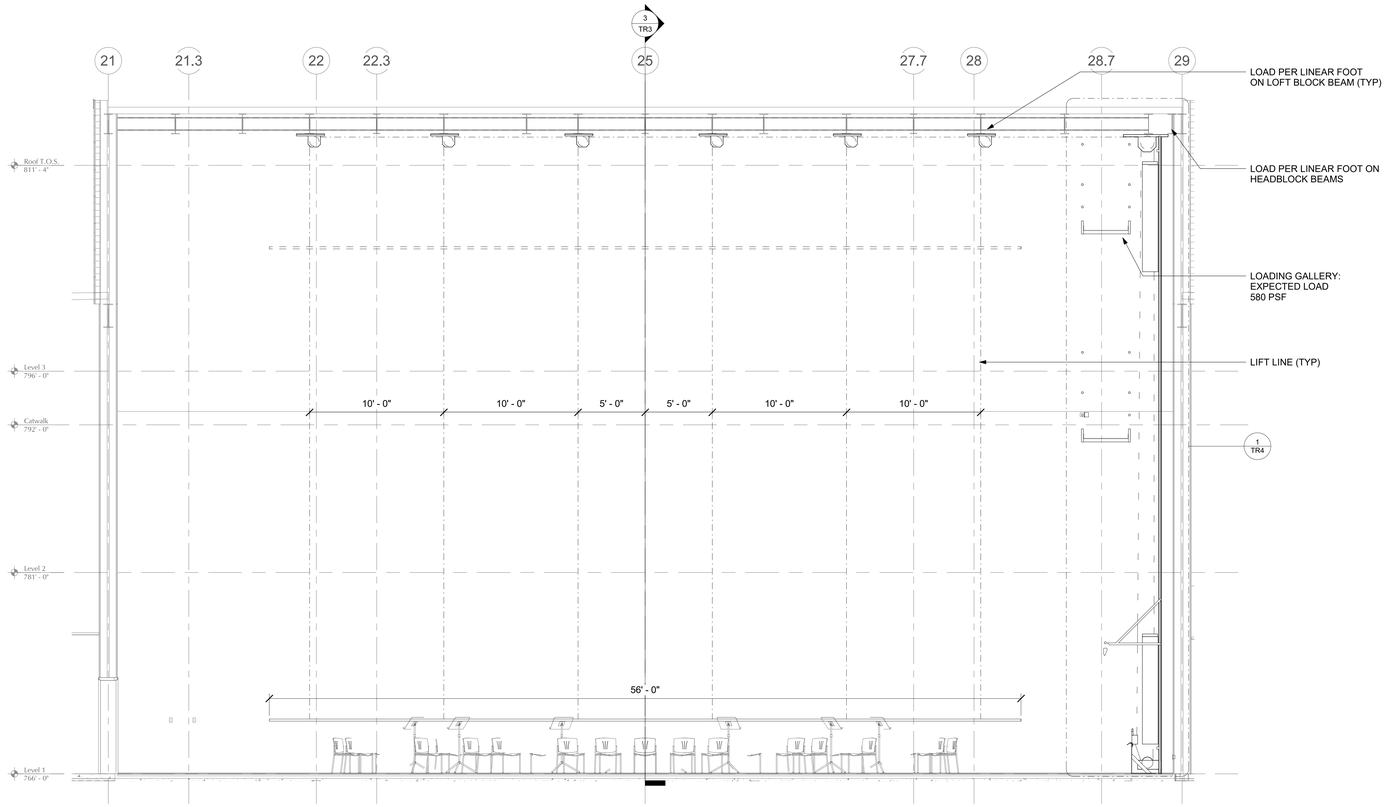
DATE: January 31, 2019

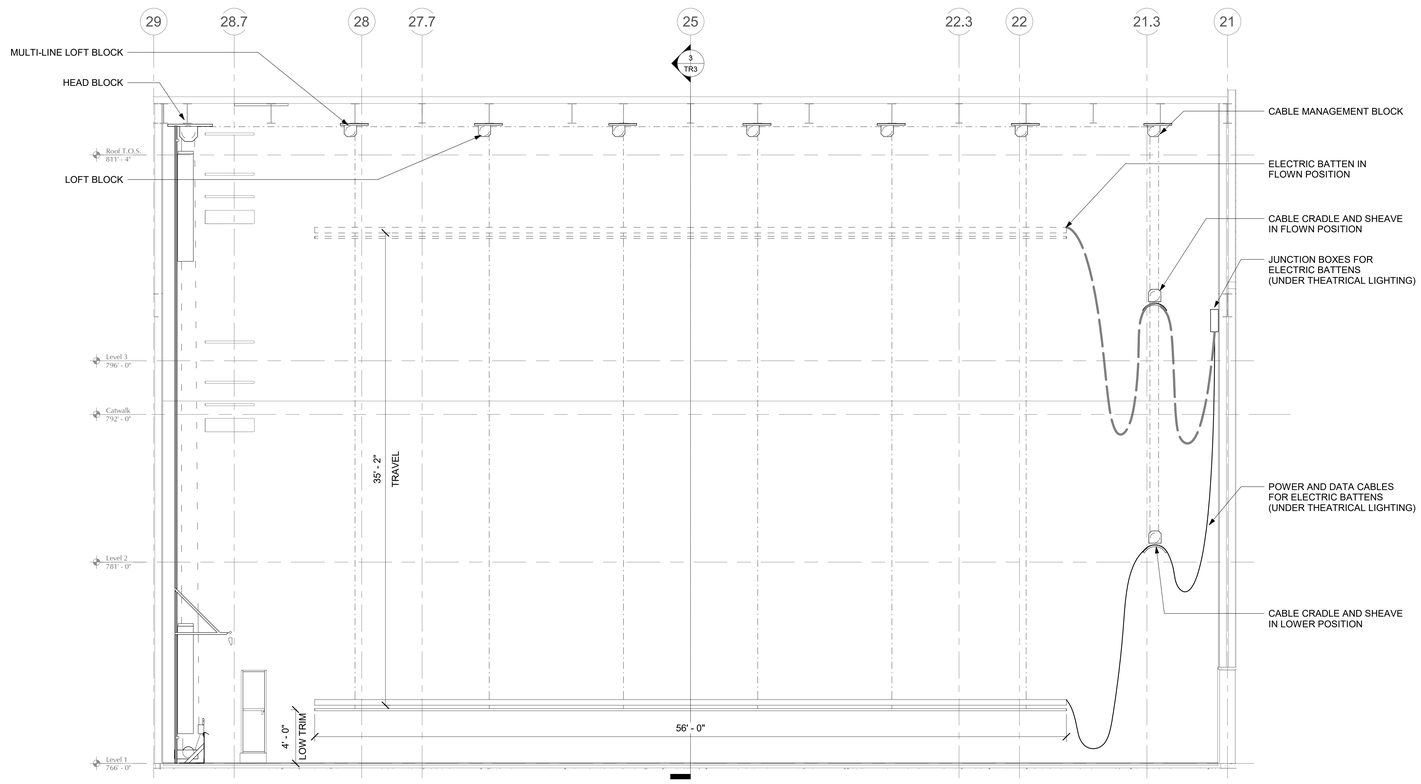
TR2



3 CENTERLINE SECTION
1/4" = 1'-0"



1 TRANSVERSE SECTION LOOKING UPSTAGE
1/4" = 1'-0"



2 TRANSVERSE SECTION LOOKING DOWNSTAGE AT ELECTRIC BATTEN
1/4" = 1'-0"

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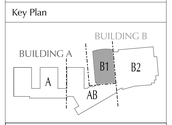
THEATRICAL RIGGING SECTIONS

Key Plan



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No.	Description	Date

FILE:

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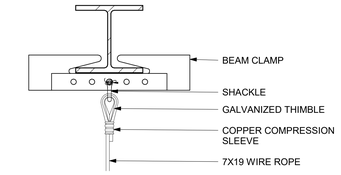
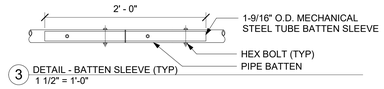
DATE: January 31, 2019

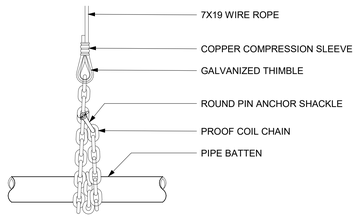
TR3



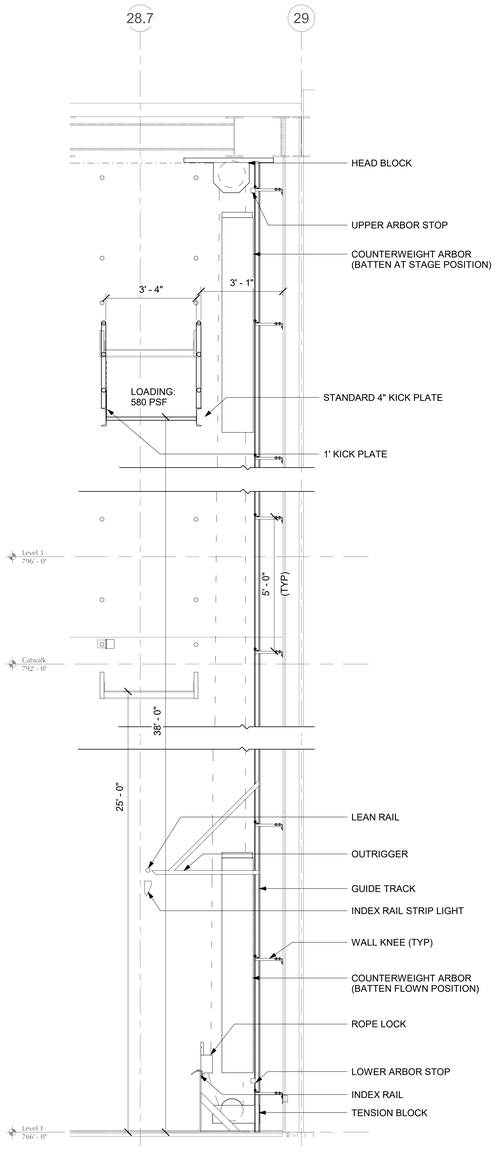
5 DETAIL - DEAD HUNG BATTEN BEAM SUPPORT TERMINATION
3" = 1'-0"



3 DETAIL - BATTEN SLEEVE (TYP)
1 1/2" = 1'-0"



2 Battern Termination Detail
3" = 1'-0"



1 RIGGING WALL DETAIL
1/2" = 1'-0"

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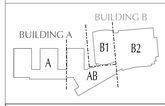
THEATRICAL RIGGING DETAILS

Key Plan



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No.	Description	Date

FILE:

DWN. BY: AGB	JOB NO: #1611
CKD. BY: AGB	SCALE: As indicated

DATE: January 31, 2019

TR4