GRIER MIDDLE SCHOOL REPLACEMENT

01.12.2023 - BID SET

1622 GARRISON BLVD, GASTONIA, NC 28054

9201-218240

VOL 2 OF 2

LIST OF THE BID ALTERNATES:

SITE ALTERNATES:

ALT #1 - BB/SF FIELD LIGHTS
ALT #2 - FOOTBALL FIELD LIGHTS
ALT #3 - CHAIN LINK FENCE WITH BLACK VINYL ALONG THE STREET PERIMETER
ALT #4 - FOOTBALL STADIUM WITH 8 LANES RUNNING TRACK

OWNER PREFERRED VENDORS ALTERNATES:
ALT #5 - SCHNEIDER FOR BAS CONTROLS (MECHANICAL SYSTEM)
ALT #6 - SQUARE D (ELECTRICAL SYSTEM)
ALT #7 - BOILERS BY WEIL MCLAIN
ALT #8 - CHILLERS, AIR HANDLING UNITS, AND ROOFTOP UNITS BY TRANE, AND DDC CONTROLS PROVIDED BY SCHNEIDER

CIVIL / LANDSCAPE

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COST ESTIMATING

MBP
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RALEIGH, NC 27609
tel: 919-875-0124

1 FS-001 ROOF PLAN - CONDENSING UNITS
1/4" = 1'-0"

2 FS-001 FOOD SERVICE EQUIPMENT PLAN
1/4" = 1'-0"

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11/11/22

PROJECT: 9201-218240
DATE: 01-12-2023

FOOD SERVICE EQUIPMENT PLAN

FS-001

01.12.2023 - BID SET

FOODSERVICE EQUIPMENT SCHEDULE

QTY	ITEM	DESCRIPTION	MANUFACTURER	MODEL	ITEM	ELECTRICAL							PLUMBING								GAS			REMARKS
						ELECTRICAL A.F.F.	KW	HP	AMPS	VOLTS	PHASE	NEMA	HW SIZE	HW/A.F.F.	CW SIZE	CW/A.F.F.	IW	DRAIN TYPE	DW	DW A.F.F.	GAS SIZE	GAS/A.F.F.	BTU/HR.	
1	01	COLD STORAGE ASSEMBLY	BALLY	CUSTOM	01													F.D.						SEE REFRIGERATION CONNECTION SCHEDULE
2	02A	PLASTIC W/METAL FRAME SHELVING	METRO	MQ1848G	02A																			74" HIGH POSTS, POLYMER, CASTERS
25	02B	PLASTIC W/METAL FRAME SHELVING	METRO	MQ1860G	02B																			
6	02C	PLASTIC W/METAL FRAME SHELVING	METRO	MQ1836G	02C																			74" HIGH POSTS, POLYMER, CASTERS
3	03A	DUNNAGE RACK	METRO	HP2248PD	03A																			BOW-TIE
2	03B	DUNNAGE RACK	METRO	HP2260PD	03B																			BOW-TIE
1	06	WALL MOUNTED SHELF	EAGLE GROUP	WS1296-16/3	06																			MOUNT 4'-6" A.F.F.
2	07	CART, UTILITY	EAGLE GROUP	EU3-2436S	07																			3 TIER, CASTERS
1	08	AIR CURTAIN INSECT FAN	MARS AIR SYSTEMS	STD248-1UA-OB	08	ABOVE		1/2	5.1	120	1	DIRECT CONNECTION												MICRO SWITCH @ DOOR
1	09	ONE-COMPARTMENT SINK	EAGLE GROUP	FN2424-1-24-14/3	09								1/2"	14"	1/2"	14"	2"	F.S.						LEVER WASTE
2	09.1	FAUCET	T&S BRASS	B-0231	09.1								1/2"	14"	1/2"	14"								
1	10	WORKTABLE	EAGLE GROUP	T3060SEM	10																			UNDERSHELF, (2) DRAWERS, CASTERS
2	11	WORKTABLE	EAGLE GROUP	T3060SE-BS	11																			UNDERSHELF, (2) DRAWERS, CASTERS
1	12	TWO-COMPARTMENT SINK	EAGLE GROUP	FN2448-2-24-14/3	12								1/2"	14"	1/2"	14"	2"	F.S.						T&S BRASS B-0231 FAUCET, (2) LEVER WASTE
1	13	ICE MAKER, CUBE STYLE	ICE-O-MATIC	CIM0330A	13	64"			11.0	120	1	DIRECT CONNECTION			3/8"	64"	1"	F.S.						WATER FILTER, BACKFLOW PREVENTION DEVICE
1	13.1	ICE BIN	ICE-O-MATIC	B40PS	13.1												1"							
5	14	WORKTABLE	EAGLE GROUP	T3048SE-BS	14																			UNDERSHELF, (5) DRAWERS
1	15	WALL MOUNTED SHELF	EAGLE GROUP	SWS1260-16/3	15																			MOUNT 4'-6" A.F.F.
1	16	TEA BREWER	BY VENDOR	N.I.K.C.	16	48"			14.0	120	1	NEMA 5-15P			1/4"	24"	1"	F.S.						WATER FILTER, CORD AND PLUG
1	17	MICROWAVE OVEN	ACP	HDC12A2	17	48"			16.8	120	1	NEMA 5-20P												
5	19	PAN RACK, BUN	EAGLE GROUP	4330	19																			73"H, CASTERS
2	20	REACH-IN HEATED CABINET	DELFIELD	CSH1-S	20	24"			9.0	208	1	NEMA 6-20P												CASTERS, EXTRA RACK SLIDES
1	22	EXHAUST HOOD	BY MECH.	N.I.K.C.	22																			
1	23	UTILITY DISTRIBUTION SYSTEM	BY MECH.	N.I.K.C.	23																			
1	24	FIRE SUPPRESSION SYSTEM	BY MECH.	N.I.K.C.	24																			WET CHEMICAL
2	25	COMBI STEAMER, ELECTRIC	CONVOTHERM	C4eT 6.20 ES RA	25	U.C.			44.1	208	3	DIRECT CONNECTION			(2) 1/2"	U.C.	2"	F.S.						STACKING KIT, WATER FILTER
1	26	CONVECTION STEAMER, GAS	VULCAN	C24GA10	26	U.C.			2.0	120	1	CORD AND PLUG			3/4"	U.C.	2"	F.S.			3/4"	U.C.	125,000	QUICK GAS DISCONNECT, WATER FILTER
2	27	CONVECTION OVEN, GAS	VULCAN	VC44GC	27	U.C.		(2) 1/2	9.0	120	1	(2) NEMA 5-15P									3/4"	U.C.	100,000	QUICK GAS DISCONNECT, CASTERS
1	29	18" RANGE - 2 BURNER	VULCAN	V2B18B	29																1 1/4"	U.C.	70,000	QUICK GAS DISCONNECT, CABINET BASE, CASTERS
1	30	PASS-THRU HEATED CABINET	DELFIELD	CSHPT2-S	30	90"			9.0	208	1	NEMA 6-20P												CASTERS
1	31	PASS-THRU REFRIGERATOR	DELFIELD	CSRPT2P-S	31	90"			6.5	120	1	NEMA 5-20P												CASTERS
2	33	WORKTABLE	EAGLE GROUP	T3048SE	33																			UNDERSHELF, CASTERS
3	34	PLASTIC W/METAL FRAME SHELVING	METRO	5Q557G3	34																			74" HIGH POSTS, POLYMER, CASTERS
1	37	THREE-COMPARTMENT SINK	EAGLE GROUP	FN2860-3-30-14/3	37								(2) 1/2"	14"	(2) 1/2"	14"	2"	F.S.						(2) T&S BRASS B-0231 FAUCET, (3) LEVER WASTE
2	38	WALL MOUNTED SHELF W/POT RACK	EAGLE GROUP	WSP1248	38																			MOUNT 4'-6" A.F.F.
1	39	SOILED DISHTABLE	EAGLE GROUP	CUSTOM	39								1/2"	14"	1/2"	14"	2"	F.S.						T&S BRASS B-0133 PRE-RINSE UNIT, SCRAP BASKET
1	40	DISHWASHER, CONVEYOR TYPE	HOBART	CI44EN-BAS1	40	64"	30		80.0	208	3	DIRECT CONNECTION	1/2"	14"	1/2"	14"	2"	F.S.						INTEGRAL 30.0 KW BOOSTER, DRAIN WATER TEMPER KIT
1	41	CLEAN DISHTABLE	EAGLE GROUP	CUSTOM	41																			
1	42	VENT DUCT	BY DIVISION 23	N.I.K.C.	42																			
1	43	TRAY DRYER	SAN-AIRE	PD-100-M	43				4.3	120	1													
3	44	TRAY STAND	DELFIELD	KCTS-28	44																			CASTERS
2	45	MILK COOLER	TRUE	TMC-49-S-SS-HC	45	STUB			5.0	120	1	NEMA 5-15P												CASTERS
3	46	COLD FOOD COUNTER	DELFIELD	SCSC-50-B	46	STUB			7.0	120	1	NEMA 5-15P					1"	F.S.						TRAY SLIDE, SNEEZE GUARD, CASTERS
3	47	HOT FOOD COUNTER	DELFIELD	SH-5-NU	47	STUB			28.0	208	1	NEMA 14-50P					1"	F.S.						TRAY SLIDE, SNEEZE GUARD, CASTERS
2	48	SERVING COUNTER, UTILITY	DELFIELD	SC-36	48																			CASTERS, OPEN UNDERSHELF
2	49	ALL PURPOSE SERVING COUNTER	DELFIELD	SC-50	49																			CASTERS
3	50	DROP IN REFRIGERATOR	STRUCTURAL CONCEPTS	DOS3623R	50	STUB			16.0	120	1	NEMA 5-15P					1"	F.D.						UNDERCOUNTER COMPRESSOR
1	51	ALL PURPOSE SERVING COUNTER	DELFIELD	SC-74	51																			CASTERS
3	52	CASHIER'S COUNTER	DELFIELD	SCS-50	52						1	NEMA 5-20P												TRAY SLIDE, CASTERS
1	53	ALL PURPOSE SERVING COUNTER	DELFIELD	DCBU-120	53						1	NEMA 5-15P												TRAY SLIDE, CASTERS
1	54	HEATED DISPLAY MERCHANDISER	HATCO	GRSDS/H-36D	54	STUB			14.9	120	1	NEMA 5-20P												CONNECT TO 53
3	55	TRAFFIC GUIDE RAIL	UNTDSC	WRD200	55																			
3	56	CASH REGISTER	BY OWNER	N.I.K.C.	56	STUB/24"			10.0	120	1	CORD AND PLUG												(2) * CONNECTION AT CASHIER COUNTER- ITEM #52
1	57	ICE DISPENSER	FOLLETT CORPORATION	110CM-NI-S	57	48"			4.0	120	1	NEMA 5-15P			3/8"	50"	1"	F.S.	1"					WATER DISPENSER, WATER FILTER
1	57.1	ICE MAKER, CUBE STYLE	MAXXIMUM	MIM360NH	57.1	64"			10.5	120	1	NEMA 5-15P			3/8"	64"	1"	F.S.						WATER FILTER
1	58	COMMERCIAL MICROWAVE OVEN	ACP	RMS10TSA	58	48"			13.4	120	1	NEMA 5-15P												
3	59	HOSE REEL	T&S BRASS	B-1454	59								1/2"	42"	1/2"	14"		F.D.						

***GAS NOTE:
KITCHEN EQUIPMENT WILL BE PROVIDED WITH GAS PRESSURE REGULATORS DESIGNED TO OPERATE WITH 14" W.C. INCOMING GAS PRESSURE OR LESS. PLUMBER TO PROVIDE INTERMEDIATE REGULATORS, AS REQUIRED TO REDUCE INCOMING BUILDING PRESSURE TO LEVEL SUITABLE FOR EQUIPMENT.

ELECTRICAL LOADS ARE BASED ON MANUFACTURER'S INFORMATION. MINIMUM CIRCUIT AMPACITY AND OVERCURRENT PROTECTION TO BE DETERMINED BY CODE REQUIREMENTS AND/OR MANUFACTURER'S DIRECTIONS.

140° F. HOT WATER REQUIREMENTS		GPH
POT SINKS	5 @ 30	150
HOSE STATION	3 @ 45	135
CAN WASH	-	10
CLEANING	-	10
	TOTAL	305

110° F. HOT WATER REQUIREMENTS		GPH
MOP SINK	-	5
HAND SINK	5 @ 5	25
	TOTAL	30

REFRIGERATION CONNECTION SCHEDULE

CONN.	EQUIPMENT	LOAD	V/PH	REMARKS
01A	LIGHTS, COOLER	500 W	120/1	4 EXTRA LIGHTS
01B	EVAP. COIL, COOLER	2.0 AMP	120/1	-
01C	COND. UNIT, COOLER	6.9 MCA	208/3	-
01D	LIGHTS & DOOR HEAT	800 W	120/1	4 EXTRA LIGHTS
01E	HEAT TAPE, FREEZER	15.0 AMP	120/1	DRAINLINE HEAT TAPE
01F	EVAP. COIL, FREEZER	1.8 AMP	208/1	FEED DEFROST THRU TIMER @ COND. UNIT
01G	COND. UNIT, FREEZER	19.4 MCA	208/3	

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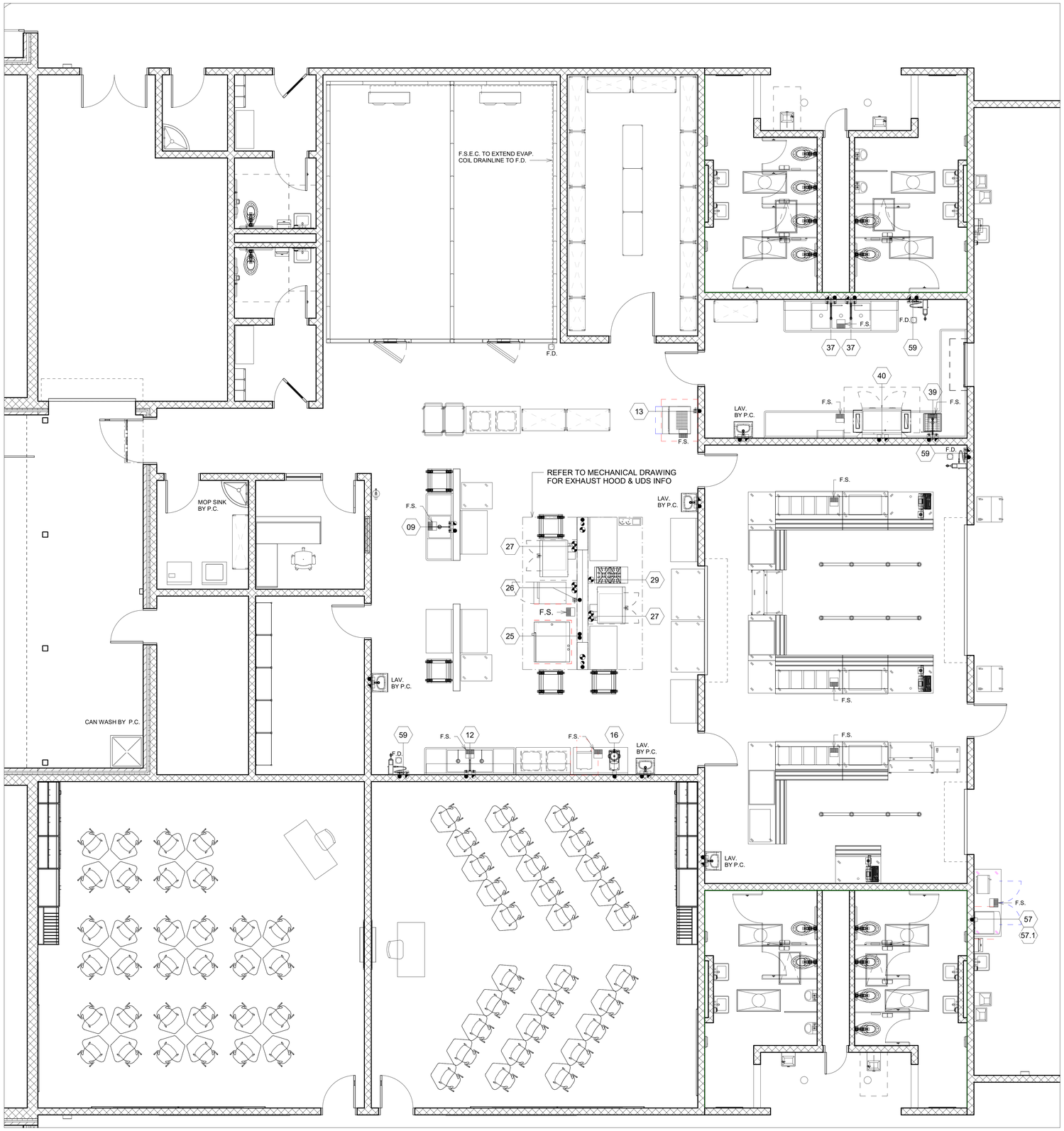
No.	Description	Date
1	AGENCY REVIEW	11/11/22

PROJECT: 9201-218240
DATE: 01-12-2023

FOOD SERVICE EQUIPMENT SCHEDULE

FS-002

01.12.2023 - BID SET



1 FS-003 FOOD SERVICE PLUMBING PLAN
1/4" = 1'-0"

MECHANICAL SYMBOLS

	HOT WATER (HW)
	COLD WATER (CW)
	WASTE (W)
FD	FLOOR DRAIN
	GAS
FS	FLOOR SINK - OPEN
FS	FLOOR SINK W/HALF GRATE

***GAS NOTE:
KITCHEN EQUIPMENT WILL BE PROVIDED WITH GAS PRESSURE REGULATORS DESIGNED TO OPERATE WITH 14" W.C. INCOMING GAS PRESSURE OR LESS. PLUMBER TO PROVIDE INTERMEDIATE REGULATORS, AS REQUIRED TO REDUCE INCOMING BUILDING PRESSURE TO LEVEL SUITABLE FOR EQUIPMENT.

PLUMBING ROUGHING IN NOTES

THIS PLAN IS INTENDED TO SHOW UTILITY REQUIREMENTS AND APPROXIMATE ROUGHING-IN LOCATIONS ONLY. DO NOT USE FOR ACTUAL ROUGHING-IN. FOR FINAL ROUGH-IN LOCATIONS SEE DIMENSIONED PLANS PROVIDED BY FOOD SERVICE EQUIPMENT CONTRACTOR.

WHERE EXPOSED PIPES AND CONDUITS ARE NECESSARY, THEY SHOULD BE MOUNTED 1 TO 2 INCHES OFF THE WALL AND 6 INCHES OFF THE FLOOR TO ALLOW FOR CLEANING.

PLUMBING NOTES

PLUMBING TRIM SUCH AS FAUCETS AND SINK WASTES SHALL BE FURNISHED WITH EQUIPMENT BY FOOD SERVICE EQUIPMENT CONTRACTOR. PLUMBER TO PROVIDE SERVICE, STOP VALVES, P-TRAPS, ETC., AND MAKE FINAL CONNECTIONS.

COLD STORAGE ASSEMBLY: EVAP. COIL DRAINLINES SHALL BE PROVIDED AND INSTALLED BY FOOD SERVICE EQUIPMENT CONTRACTOR.

BOOSTER HEATER SHALL BE FURNISHED BY FOOD SERVICE EQUIPMENT CONTRACTOR WITH/PRESS. REDUCING VALVE TEMP/PRESSURE GAUGE AND SHOCK ABSORBER LOOSE FOR FINAL CONNECTION BY PLUMBER.

HOSE REELS FURNISHED BY FOOD SERVICE EQUIPMENT CONTRACTOR WITH VACUUM BREAKER, MIXING VALVE, SHUT-OFF VALVE, CHECK VALVES, TEMPERED WATER PIPING AND FLANGES. PLUMBER TO PROVIDE SUPPLY LINES AND MAKE FINAL CONN.S. (SEE HOSE REEL DETAIL)

FIRE CONTROL SYSTEM FURNISHED BY DIV. 15

UTILITY RACEWAY FURNISHED BY DIV. 15

GAS COOKING EQUIPMENT SHALL BE AGA APPROVED, FURNISHED WITH PRESSURE REGULATOR REQUIRED BY FOOD SERVICE EQUIPMENT CONTRACTOR. PLUMBER TO PROVIDE GAS PIPING WITH INDIVIDUAL SHUT-OFF VALVES FOR EACH EQUIPMENT CONNECTION AND MAKE FINAL CONNECTIONS.

MECHANICAL NOTES

EXHAUST HOOD SHALL BE FURNISHED BY DIV. 15

DISHMACHINE SHALL BE FURNISHED BY FOOD SERVICE EQUIPMENT CONTRACTOR WITH VENT COWLS AND STAINLESS STEEL DUCTS TO CEILING, READY FOR FINAL CONNECTIONS BY H.V.A.C. CONTRACTOR.

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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FOOD SERVICE PLUMBING PLAN

FS-003

01.12.2023 - BID SET

1 FS-004 FOOD SERVICE ELECTRICAL PLAN
1/4" = 1'-0"

ELECTRICAL SYMBOLS

	J-BOX, FLUSH IN WALL
	J-BOX FROM ABOVE
	WATERPROOF CONDUIT STUB
	DUPLEX OUTLET
	CONVENIENCE OUTLET, UNASSIGNED
F	FLOOR MOUNTED OUTLET BY E.C.
	SPECIAL OUTLET TO MATCH EQUIPMENT
U.C.	UTILITY CHASE MOUNTED OUTLET
D	OUTLET WITH DROP CORD FROM ABOVE
D	OUTLET WITH DROP CORD FROM ABOVE

ELECTRICAL LOADS ARE BASED ON MANUFACTURER'S INFORMATION. MINIMUM CIRCUIT AMPACITY AND OVERCURRENT PROTECTION TO BE DETERMINED BY CODE REQUIREMENTS AND/OR MANUFACTURER'S DIRECTIONS.

ELECTRICAL ROUGHING IN NOTES

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WHERE EXPOSED PIPES AND CONDUITS ARE NECESSARY, THEY SHOULD BE MOUNTED 1 TO 2 INCHES OFF THE WALL AND 6 INCHES OFF THE FLOOR TO ALLOW FOR CLEANING.

ELECTRICAL NOTES

EXHAUST HOODS FURNISHED BY DIV. 15

FIRE CONTROL SYSTEM FURNISHED BY DIV. 15

DISHMACHINE SHALL BE FURNISHED BY FOOD SERVICE EQUIPMENT CONTRACTOR, PRE-WIRED TO INTEGRAL CONTROL PANEL READY FOR FINAL CONNECTION BY ELECTRICAL CONTRACTOR.

COLD STORAGE ROOMS SHALL BE FURNISHED BY FOOD SERVICE EQUIPMENT CONTRACTOR WITH PRE-WIRED LIGHT AND SWITCH AT DOOR PANEL. ELECTRICAL CONTRACTOR TO PROVIDE INTERCONNECTING WIRING TO EXTRA LIGHT FIXTURES AND MAKE FINAL CONNECTIONS.

REFRIGERATION SYSTEMS SHALL BE FURNISHED AND INSTALLED BY FOOD SERVICE EQUIPMENT CONTRACTOR, INCLUDING DEFROST WIRING BETWEEN COND. UNIT AND EVAP. COIL. FINAL POWER DROPS AND DISCONNECTS FOR COND. UNITS AND EVAP. COILS SHALL BE BY ELECTRICAL CONTRACTOR.

UTILITY RACEWAY SHALL BE FURNISHED BY DIV. 15

AIR CURTAIN FAN TO BE FURNISHED BY F.S.E.C. WITH DOOR SWITCH. E.C. TO PROVIDE MASTER SWITCH & MAKE FINAL CONNECTIONS.

GASTON COUNTY SCHOOLS

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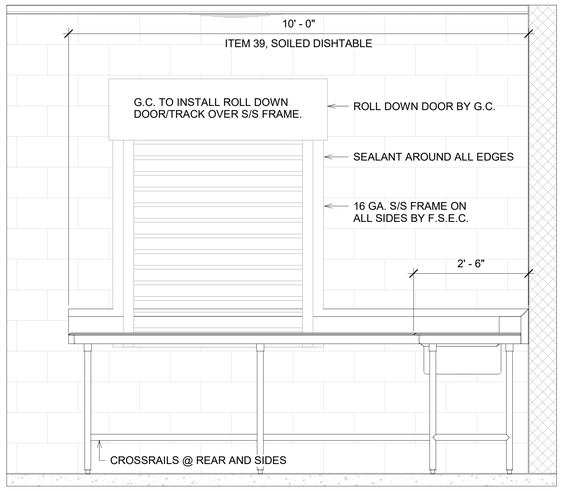
PROJECT: 9201-218240
DATE: 01-12-2023

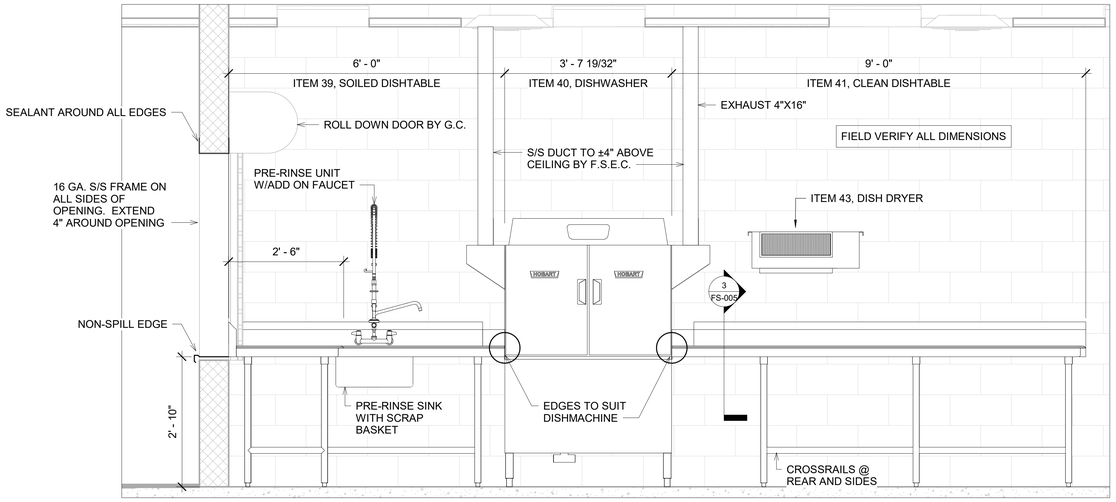
FOOD SERVICE ELECTRICAL PLAN

FS-004

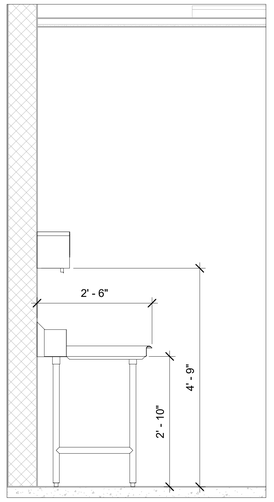
01.12.2023 - BID SET



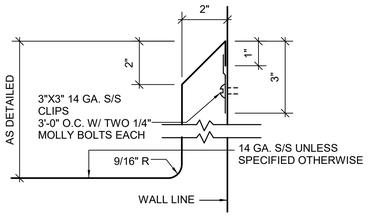
1 FS-005 SOILED DISHTABLE SECTION VIEW
3/4" = 1'-0"



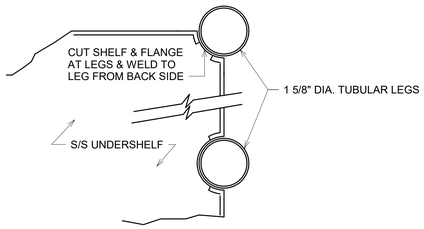
2 FS-005 DISHTABLE ASSEMBLY ELEVATION VIEW
3/4" = 1'-0"



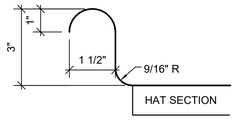
3 FS-005 CLEAN DISHTABLE SECTION VIEW
3/4" = 1'-0"



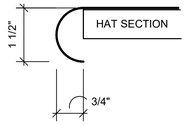
4 FS-005 BACKSPLASH DETAIL
NO SCALE



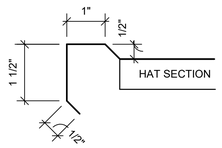
5 FS-005 PIPE LEG UNDERSHELF
NO SCALE



6 FS-005 ROLLED RIM
NO SCALE



7 FS-005 PLAIN EDGE
NO SCALE



8 FS-005 NON-SPILL
NO SCALE

GASTON COUNTY SCHOOLS

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11/11/22

PROJECT: 9201-218240
DATE: 01-12-2023

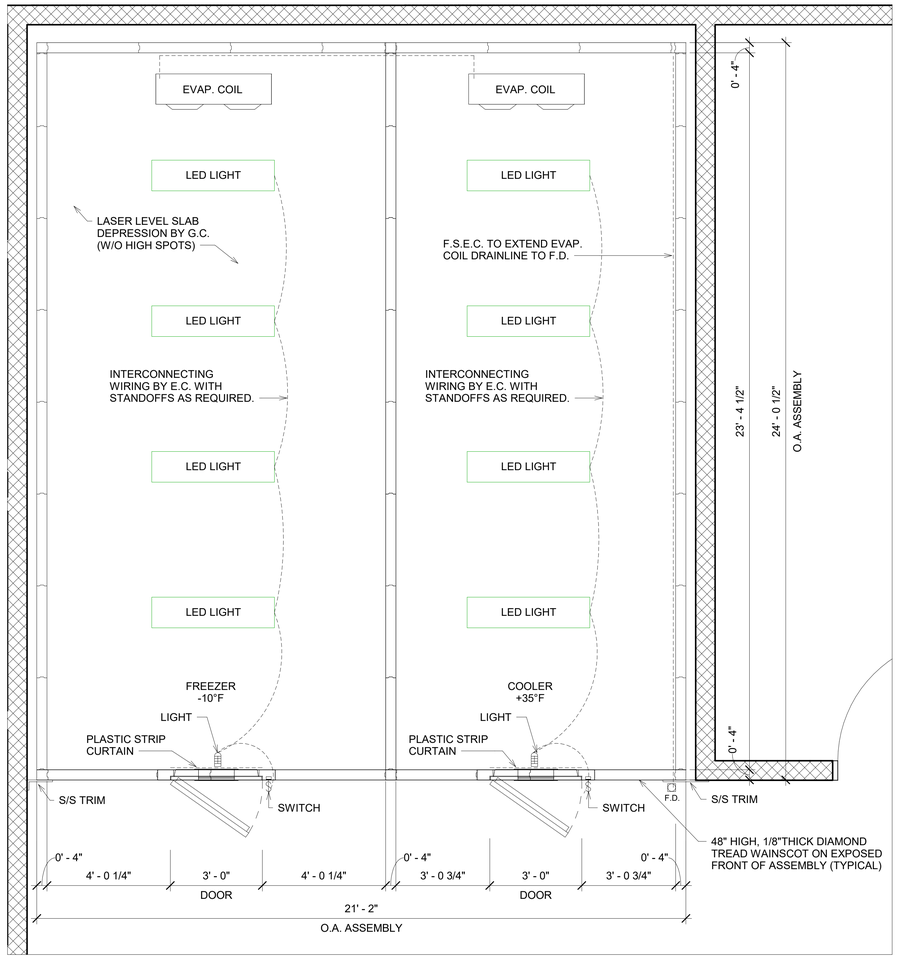
FOOD SERVICE DETAILS

FS-005

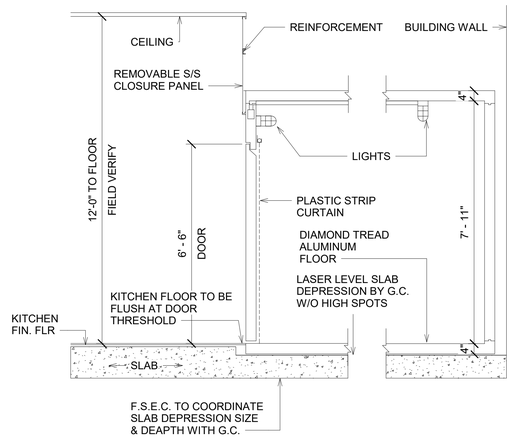
01.12.2023 - BID SET

COLD STORAGE ASSEMBLY DATA						
COMPARTMENT	TEMP RANGE	DAILY BTU LOAD	LIGHTS WATTS	DOOR HEAT	VOLT	PHASE
COOLER	+35° F	10,040	500 W		120	1
FREEZER	-10° F	14,080	500 W	300 W	120	1

REFRIGERATION SYSTEMS										
AMBIENT TEMP.	RUN TIME	COND. UNIT			SUCTION TEMP	EVAP. COIL			
		MCA	VOLT	PHASE		AMP	VOLT	PHASE	DEFROST
100° F	16 HOURS	6.9	208	3	24.8° F	2.0	120	1	OFF-CYCLE
100° F	18 HOURS	19.4	208	3	-19.2° F	1.8	208	1	ELECTRIC



1 FS-006 COLD STORAGE ASSEMBLY PLAN
1/2" = 1'-0"



2 FS-006 COLD STORAGE ASSEMBLY SECTION
1/2" = 1'-0"

WALK-IN NOTES

EXTERIOR SURFACES
.040 PATTERNED ALUMINUM WITH 48" HIGH WAINSCOT ON EXPOSED SURFACES.

INTERIOR WALLS
.040 PATTERNED ALUMINUM WITH WHITE FINISH.

INTERIOR CEILING
.040 PATTERNED ALUMINUM WITH WHITE ENAMEL.

INTERIOR FLOOR
RECESSED INSULATED FLOOR BY F.S.E.C. WITH .100 DIAMOND TREAD ALUMINUM, 1200 LB/SQ FT. UNDER STRUCTURE

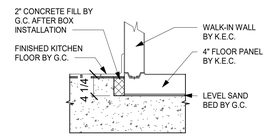
DOORS
NOMINAL 36"x78" FINISHED TO MATCH EXTERIOR. CHROME PLATED HARDWARE; 1/8" DIAMOND TREAD KICK PLATE, 48" HIGH, BOTH SIDES.

REFRIGERATION
AIR COOLED REMOTE CONDENSING UNITS WITH ALL WEATHER HOUSING, AND CONTROLS FOR OUTDOOR OPERATION.

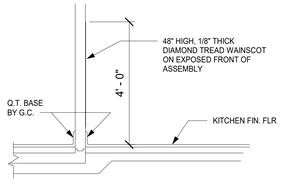
MISCELLANEOUS
TRIM STRIPS, EVAPORATOR DRAIN LINES, DIAL THERMOMETERS, TOP CLOSURE PANELS, PLASTIC STRIP CURTAINS AND 1/8" DIAMOND TREAD WAINSCOT ACROSS FRONT OF ASSEMBLY.

LIGHTS
MANUFACTURER TO FURNISH EXTRA LIGHT FIXTURES AS REQUIRED TO PROVIDE 50 FT. CANDLES 30" ABOVE FLOOR MINIMUM. F.S.E.C. TO INSTALL AND E.C. TO CONNECT.

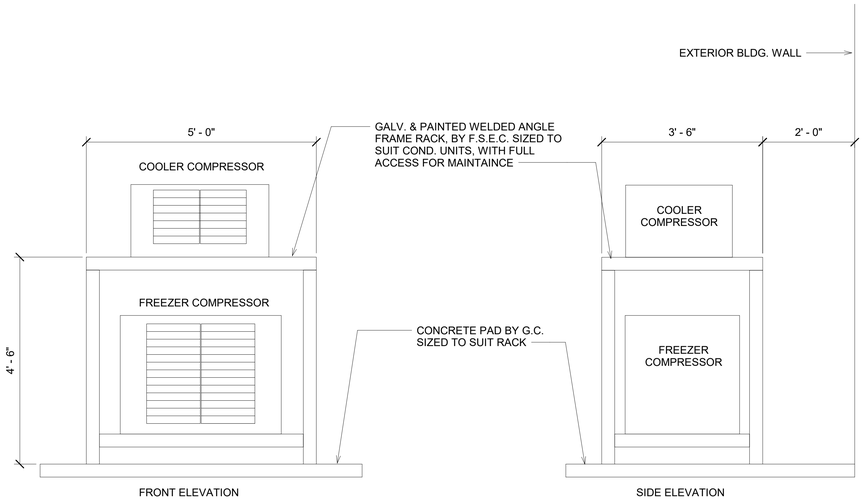
NOTES:
- WALK-IN FLOOR PANELS MUST SIT ON A LEVEL SURFACE. G.C. TO PROVIDE LASER-LEVEL SURFACE WITHOUT HIGH SPOTS FOR WALK-IN FLOOR PANELS.
- MANUFACTURER MUST KNOW PRIOR TO FABRICATION: DEPTH OF PIT; THICKNESS OF SAND; TILE THICKNESS & GROUT THICKNESS TO SIZE DOOR HEIGHT CORRECTLY.



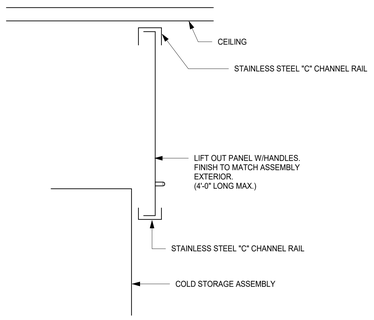
3 FS-006 RECESSED WALK-IN FLOOR
NO SCALE



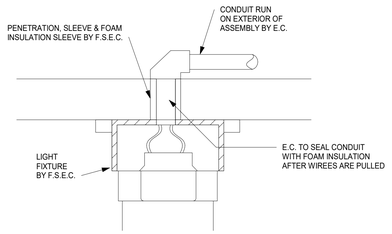
4 FS-006 WAINSCOT DETAIL
NO SCALE

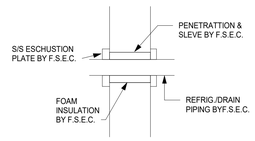


5 FS-006 CONDENSING UNIT DETAIL
NO SCALE



6 FS-006 REMOVABLE S/S PANEL DETAIL
NO SCALE





7 FS-006 PANEL PENETRATION DETAIL
NO SCALE

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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PROJECT: 9201-218240
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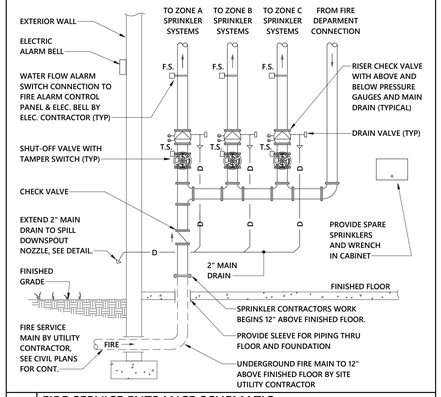
FOOD SERVICE COLD STORAGE DETAILS

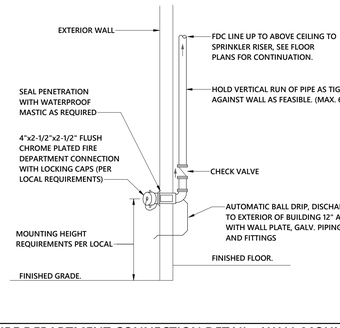
FS-006

01.12.2023 - BID SET



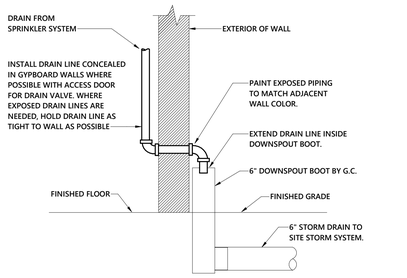
1 FIRE SERVICE ENTRANCE SCHEMATIC

NOT TO SCALE



2 FIRE DEPARTMENT CONNECTION DETAIL - WALL MOUNTED

NOT TO SCALE



NOTE: DO NOT SPILL SPRINKLER DRAIN ONTO PAVING OR LANDSCAPING OF ANY TYPE. DISCHARGE SPRINKLER DRAINS INTO DOWNSPOUT BOOTS AT THE LOCATIONS DESIGNATED ON THE PLANS. IF ADDITIONAL AUXILIARY DRAINS ARE NEEDED, THE SPRINKLER CONTRACTOR SHALL PROVIDE A DOWNSPOUT BOOT AND EXTEND A 6" STORM DRAIN LINE UNDERGROUND TO THE NEAREST SITE STORM DRAIN INLET FOR EACH AUXILIARY DRAIN. OBTAIN DESIGN TEAM APPROVAL FOR ANY ADDITIONAL AUXILIARY DRAIN LOCATIONS PRIOR TO INSTALLATION. DOWNSPOUT BOOTS SHALL MATCH THE OTHER DOWNSPOUT BOOTS UTILIZED ON THE BUILDING. COORDINATE SPRINKLER DRAIN LOCATIONS WITH G.C. AND SITE GRADING PLANS.

3 TYPICAL DRAIN TO DOWNSPOUT BOOT

NOT TO SCALE

FIRE PROTECTION GENERAL NOTES

1. THE INTENT OF THESE PLANS IS TO PROVIDE INFORMATION TO THE REVIEWING AUTHORITIES THAT THE BUILDING WILL BE PROTECTED BY A SPRINKLER SYSTEM.

2. GENERAL AND SPECIAL CONDITIONS OF THE CONTRACT APPLY TO THE FIRE PROTECTION SCOPE OF WORK. THE FIRE PROTECTION DRAWINGS AND SPECIFICATIONS SHALL NOT BE INTERPRETED AS WAIVING OR OVERRULING ANY REQUIREMENTS EXPRESSED IN GENERAL CONDITIONS.

3. SCOPE: PROVIDE DESIGN, FABRICATION AND INSTALLATION OF A HYDRAULICALLY CALCULATED AUTOMATIC SPRINKLER SYSTEM INCLUDING ALL SERVICES, MATERIALS, LABOR AND EQUIPMENT REQUIRED FOR A COMPLETE WORKING SPRINKLER SYSTEM IN FULL COMPLIANCE WITH THE REQUIREMENTS OF THE 2013 EDITION OF NFPA 13, THE OWNER'S INSURANCE UNDERWRITER, THE 2018 NORTH CAROLINA STATE FIRE CODE AND THE LOCAL AUTHORITY HAVING JURISDICTION.

4. PERMITS: APPLY AND PAY FOR ALL NECESSARY PERMITS, FEES AND INSPECTIONS REQUIRED BY ANY PUBLIC AUTHORITY HAVING JURISDICTION. ACREAGE CHARGES, FACILITIES CHARGES AND BOND PROPERTY ASSESSMENTS ARE NOT TO BE CONSTRUED TO BE A PART OF THIS CONTRACT.

5. WARRANTY: PROVIDE A ONE YEAR WARRANTY, FROM THE DATE OF ACCEPTANCE OF WORK BY THE OWNER, FOR ALL SPRINKLER SYSTEM MATERIALS AND EQUIPMENT.

6. COORDINATE ALL SPRINKLER PIPING LOCATIONS, SPRINKLER LOCATIONS AND EQUIPMENT LOCATIONS WITH OTHER TRADES TO AVOID CONFLICTS AND INTERFERENCES. FINAL PIPING AND EQUIPMENT LOCATIONS SHALL BE A CODE COMPLIANT INSTALLATION FOR ALL TRADES.

7. WHERE DISCREPANCIES ARE FOUND IN THE DRAWINGS AND SPECIFICATIONS THE MORE STRINGENT SHALL APPLY. CONTACT ENGINEER FOR CLARIFICATION.

8. OBTAIN A NEW FLOW TEST, LESS THAN 1 MONTH OLD, PRIOR TO STARTING THE DESIGN OF THE SPRINKLER SYSTEM. THE FLOW TEST CRITERIA SHALL INCLUDE THE STATIC PRESSURE, RESIDUAL PRESSURE, FLOW IN GPM, HORIZONTAL AND VERTICAL DISTANCE OF TEST FROM BASE OF FIRE RISER, THE NAME OF THE PERSON AND COMPANY WHOM PERFORMED THE FLOW TEST, THE TESTING COMPANY'S PHONE NUMBER, AND THE DATE AND TIME THE TEST WAS PERFORMED.

9. DESIGN AND HYDRAULICALLY CALCULATE THE SPRINKLER SYSTEM UTILIZING THE CURRENT FLOW TEST DATA, BASED ON THE 48-HOUR LOW PRESSURE. MEET ALL NFPA 13 REQUIREMENTS WHETHER OR NOT SPECIFICALLY INDICATED WITHIN THESE DOCUMENTS. TERMINATE THE HYDRAULIC CALCULATIONS AT THE CITY CONNECTION MINIMUM. INDICATE ON DRAWINGS ALL UNDERGROUND PIPE AND FITTINGS BOTH NEW AND EXISTING.

10. THE CONTRACTOR SHALL HAVE A DESIGNER ON STAFF WITH A CURRENT NICET LEVEL III CERTIFICATION OR HIGHER TO PREPARE THE WORKING PLANS AND HYDRAULIC CALCULATIONS IN ACCORDANCE WITH NFPA 13 CHAPTER 23 "PLANS AND CALCULATIONS". THE NICET DESIGNERS NAME, SIGNATURE AND CERTIFICATE NUMBER SHALL APPEAR ON THE WORKING DRAWINGS AND HYDRAULIC CALCULATIONS.

11. PROVIDE DESIGN AND INSTALLATION OF SEISMIC RESTRAINT ELEMENTS FOR THE FIRE PROTECTION SYSTEM(S) IN COMPLIANCE WITH THE 2013 EDITION OF NFPA 13. REFER TO THE APPENDIX B ON THE ARCHITECTURAL DRAWINGS FOR THE SITE'S SEISMIC DESIGN CATEGORY.

12. SUBMIT WORKING PLANS, HYDRAULIC CALCULATIONS AND MATERIALS DATA AND ACCESSORIES IN ELECTRONIC FORMAT (PDF) TO THE ARCHITECT / ENGINEER FOR REVIEW AND OBTAIN APPROVAL BEFORE STARTING THE INSTALLATION OF THE SPRINKLER SYSTEM.

13. THE CONTRACTOR SHALL SUBMIT WORKING PLANS AND HYDRAULIC CALCULATIONS EXPEDIENTLY TO THE AUTHORITIES HAVING JURISDICTION. APPROVAL FROM ALL AUTHORITIES HAVING JURISDICTION SHALL BE OBTAINED BEFORE STARTING THE INSTALLATION OF THE SPRINKLER SYSTEM.

14. AT THE COMPLETION OF THE PROJECT, PROVIDE TWO SETS OF RECORD DRAWINGS TO THE OWNER, CLEARLY SHOWING ANY CHANGES AND/OR MODIFICATIONS, ADDITIONS OR DELETIONS TO AND FROM THE CONSTRUCTION DOCUMENTS. THESE SETS SHALL BE REVIEWED BY THE ARCHITECT / ENGINEER BEFORE BEING TURNING OVER TO THE OWNER.

INSTALLATION REQUIREMENTS:

1. PROVIDE ALL NECESSARY OFFSETS, RISES OR DROPS IN THE PIPING AND AUXILIARY DRAINS AS REQUIRED BY ALL APPLICABLE CODES WHETHER OR NOT SHOWN ON THE PLANS.

2. CONNECT ALL SPRINKLER ALARM, TAMPER AND DETECTION SYSTEMS TO THE BUILDINGS CENTRAL FIRE ALARM SYSTEM, COORDINATE LOCATIONS AND REQUIREMENTS WITH THE ELECTRICAL CONTRACTOR.

3. PIPE PENETRATIONS THRU WALLS, PARTITIONS AND FLOORS SHALL BE SLEEVED. CORE DRILLING THRU WALLS AND PARTITIONS IS PERMITTED IF PERFORMED IN A NEAT CRAFTSMAN LIKE MANNER. PIPES PENETRATING THRU EXTERIOR WALLS SHALL BE SEALED WATER TIGHT. INSTALL ESCUTCHEONS IN ALL EXPOSED AREAS.

4. CONCEAL PIPING ABOVE CEILINGS OR TIGHT TO UNDERSIDE OF STRUCTURE IN EXPOSED AREAS.

5. PAINT ALL EXPOSED FIRE PROTECTION SYSTEM PIPING (IN CLOSETS, STAIRWELLS, MECHANICAL ROOMS, ETC.). COLOR TO BE SELECTED BY THE ARCHITECT.

6. SPRINKLER LOCATIONS ARE TO BE IN THE CENTER OF THE CEILING TILE USING THE REFLECTED CEILING PLANS AND AS COORDINATED WITH THE CEILING CONTRACTOR.

7. WARRANT THE SYSTEM LABOR, MATERIALS AND EQUIPMENT FOR THE AMOUNT OF TIME SPECIFIED IN THE PROJECT MANUAL. IF NO WARRANTY SECTION IS PROVIDED, THEN WARRANT THE SYSTEM LABOR, MATERIAL AND EQUIPMENT FOR A MINIMUM OF ONE YEAR AFTER COMPLETION AND ACCEPTANCE. PRIOR TO TURNING THE COMPLETED SYSTEM OVER TO THE OWNER, REVIEW THE INSTALLATION WITH THE ARCHITECT / ENGINEER AND REPLACE OR REPAIR ANY DEFECTIVE WORKMANSHIP, EQUIPMENT AND MATERIALS AT NO ADDITIONAL COST TO THE OWNER.

TESTING AND FLUSHING:

1. OVERHEAD SPRINKLER PIPING: TESTED FOR A PERIOD OF TWO HOURS AT A HYDROSTATIC PRESSURE OF 200 LBS. AND ALL PIPING, VALVES, HEADS,ETC. SHALL BE WATERTIGHT.

2. UNDERGROUND PIPING: TESTED FOR A PERIOD OF TWO HOURS AT A HYDROSTATIC PRESSURE OF 200 LBS. IN ACCORDANCE WITH NFPA PAMPHLET #13. LEAKAGE SHALL NOT EXCEED QUANTITIES INDICATED.

FIRE PROTECTION MATERIALS

1. ALL PIPING SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA.

2. UNDERGROUND PIPE AND FITTINGS CLASS 50 DUCTILE IRON CONFORMING TO ANSI/AWWA C110/A21.10 AND ANSI/AWWA C111/A21.11 OR CLASS 315 PVC PIPE FOR SIZES 6" AND SMALLER CONFORMING TO ASTM-2241.

3. ABOVE GRADE PIPING: BLACK STEEL PIPING (ASTM A53, ASTM A135, OR ASTM A795) SHALL BE LISTED FOR FIRE SPRINKLER PIPING USE AND INCLUDE FM APPROVED MIC INHIBITING COATING. PIPING 1-1/4" AND SMALLER SHALL BE SCHEDULE 40 BLACK STEEL PIPE THREADED, WELDED OR ROLL GROOVED FOR MECHANICAL FITTINGS. PIPING 1-1/2" AND LARGER SHALL BE SCHEDULE 10 BLACK STEEL PIPE WELDED, OR ROLL GROOVED FOR MECHANICAL FITTINGS.

4. THREADED FITTINGS: UL-LISTED, STANDARD WEIGHT SUITABLE FOR PRESSURE UP TO 175 PSIG, CAST IRON MEETING ASTM A126 OR MALLEABLE IRON MEETING ASTM A197. THREADED CAST IRON FITTINGS SHALL MEET ANSI B16.4; FLANGED CAST IRON FITTINGS SHALL MEET ANSI B16.1. THREADED MALLEABLE IRON FITTINGS SHALL MEET ANSI B16.3.

5. GROOVED FITTINGS AND COUPLINGS: UL-LISTED, DUCTILE IRON MEETING ASTM A536, UTILIZING AN EDPM GASKET. PLAIN-END FITTINGS AND COUPLINGS, OR WELDED-SEGMENTED FITTINGS SHALL NOT BE USED. CHANGES IN PIPE DIAMETER SHALL BE MADE USING TAPERED REDUCING FITTINGS. BUSHINGS OR GROOVED-END REDUCING COUPLINGS SHALL NOT BE USED UNLESS STANDARD REDUCING FITTINGS ARE NOT REGULARLY AVAILABLE.

6. USE HOT-DIPPED GALVANIZED PIPING AND FITTINGS FOR COMPRESSED AIR PIPING, WATER MOTOR ALARM PIPING, BALL DRIP DISCHARGES AND TEST / DRAIN PIPING SUBJECT TO ALTERNATE WETTING AND DRYING.

7. PIPE HANGERS: UL-LISTED SWIVEL LOOP TYPE WITH PRE-GALVANIZED CARBON STEEL BAND, HANGER RODS SIZED PER NFPA 13, UL-LISTED STEEL OR MALLEABLE IRON BEAM CLAMPS, UL-LISTED ANCHORS. POWER DRIVEN ANCHORS SHALL NOT BE USED. REFER TO THE STRUCTURAL PLANS AND DETAILS FOR ACCEPTABLE LOCATIONS TO ATTACH HANGERS AND SUPPORTS TO THE BUILDING STRUCTURE. HANGERS SHALL NOT ATTACH TO THE ROOF DECK.

8. VALVES: OS&Y TYPE, IRON BODY BRONZE MOUNTED, DOUBLE DISC WITH PARALLEL SEATS, OR; BUTTERFLY, LUG TYPE, DUCTILE IRON BODY, STAINLESS STEEL STEM, ALUMINUM BRONZE DISC, PHENOLIC RING AND BUNA N SEAT. VALVES SHALL BE FM/UL LISTED AND APPROVED FOR FIRE PROTECTION SERVICE.

9. ESCUTCHEON PLATES: PROVIDE CHROME PLATED ESCUTCHEON PLATES WHERE PIPES PASS THROUGH FINISHED WALLS, FLOORS, OR CEILING. PROVIDE PRIME COAT PAINTED ESCUTCHEON PLATES WHERE PIPES PASS THROUGH WALLS, CEILINGS, ETC. IN UNFINISHED EXPOSED AREAS.

10. SPRINKLERS: LISTED IN U.L.'S FIRE PROTECTION EQUIPMENT DIRECTORY OR FM GLOBAL'S APPROVAL GUIDE. 175-PSI MINIMUM, AUTOMATIC SPRINKLERS WITH HEAT RESPONSIVE ELEMENT. SEE SPRINKLER SCHEDULE FOR ADDITIONAL INFORMATION.

FIRE PROTECTION SHEET INDEX

SHEET NUMBER	SHEET NAME
FP-001	FIRE PROTECTION INDEX, LEGEND, NOTES AND DETAILS
FP-101	FIRST FLOOR AND BASEMENT FIRE PROTECTION PLANS
FP-102	SECOND FLOOR FIRE PROTECTION PLAN

FIRE PROTECTION LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
F	F	FIRE MAIN PIPING
WP	WP	WET PIPE SPRINKLER
D	D	DRAIN PIPING
	-	PIPING ELBOW DOWN
	-	PIPING ELBOW UP
	-	PIPING CONTINUES
	-	SHUT-OFF VALVE
	CV	CHECK VALVE
	FDC	FIRE DEPARTMENT CONNECTION

ADDITIONAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	KW	KILOWATT
AFG	ABOVE FINISHED GRADE	MFG	MANUFACTURER
BFF	BELOW FINISHED FLOOR	PSI	POUNDS PER SQUARE INCH
CLG	CEILING	TS	TAMPER SWITCH
CONT	CONTINUATION	TYP	TYPICAL
DN	DOWN		
FHV	FIRE HOSE VALVE	EC	ELECTRICAL CONTRACTOR
FS	FLOW SWITCH	GC	GENERAL CONTRACTOR
GPM	GALLONS PER MINUTE	MC	MECHANICAL CONTRACTOR
HP	HORSE POWER	PC	PLUMBING CONTRACTOR

FLOW TEST DATA

DATE	LOCATION	PRESSURE STATIC (PSI)	PRESSURE RESIDUAL (PSI)	FLOW (GPM)	FLOW AT 20 PSI (GPM)
04-28-2022	HYDRANT #1736 1555 EAST GARRISON BLV, GASTONIA, NC	90	74	1278	2835

MINIMUM SAFETY MARGIN = 10 PSI

FLOW TEST PERFORMED BY: CAPT. MICHAEL ST. THOMAS, CITY OF GASTONIA FIRE DEPT.

FLOW TEST NOTES:

1. THE CONTRACTOR SHALL OBTAIN A NEW FIRE FLOW TEST LESS THAN 6 MONTHS OLD. THE FLOW TEST SHALL BE PERFORMED PER NFPA 291 WHICH USES TWO HYDRANTS; A PRESSURE HYDRANT AND A FLOW HYDRANT LOCATED AS CLOSE TO THE POINT OF CONNECTION AS POSSIBLE. THE PRESSURE TEST SHALL RECORD THE 48-HOUR STATIC LOW PRESSURE AND 48 HOUR STATIC HIGH PRESSURE.

2. THE CONTRACTOR SHALL INCLUDE THE MINIMUM SAFETY FACTOR LISTED ABOVE IN THEIR CALCULATIONS ON THE STATIC & RESIDUAL WATER PRESSURE AS WELL AS THE WATER FLOW.

3. PROVIDE THE FLOW TEST DATA AND HYDRANT LOCATIONS WITH THE SUBMITTED SPRINKLER SHOP DRAWING PACKAGE, INCLUDING STATIC PRESSURE, RESIDUAL PRESSURE, FLOW IN GPM, HORIZONTAL AND VERTICAL DISTANCE OF TEST FROM BASE OF FIRE RISER, ORGANIZATION NAME PERFORMING FLOW AND PRESSURE TESTS, AND THE DATE AND TIME THE TEST WAS PERFORMED.

FIRE PROTECTION DESIGN CRITERIA

OCCUPANCY	TYPE	DESIGN DENSITY GPM/S.F.	HYDRAULIC REMOTE AREA S.F.	AREAS OF COVERAGE
LIGHT HAZARD	WET	0.10	1500	ENTIRE FACILITY, EXCEPT AS NOTED OTHERWISE
ORDINARY HAZARD GROUP I	WET	0.15	1500	MECH. ROOMS, STORAGE ROOMS, ELEC. ROOMS, JANITORS ROOMS, ETC.
ORDINARY HAZARD GROUP II	WET	0.20	1500	STORAGE ROOMS WITH SHELVES OVER 8'-0" TALL

APPLICABLE PUBLICATIONS: THE FOLLOWING PUBLICATIONS SHALL BE USED AS A REFERENCE FOR THE DESIGN OF THE FIRE PROTECTION SYSTEM ON THIS PROJECT:

1. NORTH CAROLINA STATE BUILDING CODE: FIRE PREVENTION CODE - 2018 EDITION
2. NFPA 13 - STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS - 2013 EDITION

NOTES:

1. DURING DESIGN CALCULATIONS, AN ALLOWANCE SHALL BE MADE FOR A 250 GPM HOSE STREAM.

SPRINKLER SCHEDULE

1. PROVIDE ADJUSTABLE CONCEALED PENDENT SPRINKLERS ALL LAY-IN ACOUSTICAL TILE AND GYPBOARD CEILINGS. COORDINATE COLOR OF CONCEALED SPRINKLER HEAD COVER-PLATE WITH ARCHITECT.

2. LOCATE SPRINKLERS SO NOT OBSTRUCTED BY CEILING MOUNTED DEVICES. WHERE CEILING DEVICES OBSTRUCT SPRINKLER DISCHARGE, ADD ADDITIONAL SPRINKLERS SPACED AROUND THE OBSTRUCTION.

3. PROVIDE BRASS UPRIGHT SPRINKLERS IN EXPOSED AREAS WITH NO FINISH CEILING.

4. PROVIDE BRASS PENDENT SPRINKLERS WITH SHIELDS IN MECHANICAL ROOMS, ELECTRIC ROOMS, GYMNASIUMS, STORAGE ROOMS AND OTHER AREAS WHERE EXPOSED SPRINKLERS ARE SUBJECT TO DAMAGE.

5. PROVIDE RECESSED DRY STEM PENDENT SPRINKLER WITH WHITE PLATE IN AREAS SUBJECT TO FREEZING.

6. PROVIDE RECESSED SIDEWALL SPRINKLERS AS REQUIRED OR INDICATED.

7. PROVIDE INTERMEDIATE TEMPERATURE SPRINKLERS (175° F - 225°F ACTIVATION TEMPERATURE) IN ELEC. ROOMS, BOILER ROOMS, DATA CLOSETS AND WHEN SPRINKLER IS LOCATED WITHIN 18" OF HVAC DIFFUSER.

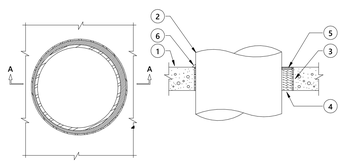
8. PROVIDE HIGH TEMPERATURE SPRINKLERS (250° F - 300°F ACTIVATION TEMPERATURE) IN KILN ROOMS OR OTHER AREAS SUBJECT TO HIGH TEMPERATURES.

* INSTALL SPRINKLERS IN ACCORDANCE WITH NFPA 13 AND THE MANUFACTURERS APPROVAL LISTING.
* PROVIDE QUICK RESPONSE SPRINKLERS.

U.L. SYSTEM NO. CAJ1155

METAL PIPE THROUGH A SLEEVE IN CONCRETE WALL OR FLOOR

F RATING = 3-HR.
T RATING = 0-HR.
L RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.
L RATING AT 400°F = 4 CFM/SQ. FT.



1. FLOOR OR WALL ASSEMBLY: B. U.L. CLASSIFIED CONCRETE BLOCK WALL (MINIMUM 8" BLOCK). A. MINIMUM 4-1/2" THICK LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR.

2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
   A. MAXIMUM 20" DIAMETER STEEL PIPE.
   B. MAXIMUM 6" DIAMETER COPPER PIPE.
   C. MAXIMUM 6" DIAMETER STEEL CONDUIT.
   D. MAXIMUM 4" DIAMETER EMT.

3. OPTIONAL: MAXIMUM 22" DIAMETER STEEL PIPE SLEEVE (SCHEDULE 10 OR HEAVIER).

4. MINIMUM 4" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) RECESSED 1/2" FROM TOP OF SLEEVE.

5. MINIMUM 1/2" DEPTH HILTI FS-ONE FIRESTOP SEALANT.

6. A GENEROUS BEAD OF HILTI FS-ONE FIRESTOP SEALANT AROUND OUTER PERIMETER OF STEEL SLEEVE.

NOTES:
1. MAXIMUM DIAMETER OF OPENING = 22".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1-1/2".

INSTALLATION INSTRUCTIONS FOR UL NO.CAJ1155

STEP 1 - PREPARATION: to application of firestopping materials. All surfaces must be clean, sound, dry and frost free prior

STEP 2 - BACKING MATERIAL: Firmly pack mineral wool around the penetrating item recessing it 1/2" below surface of the sleeve (or both ends of sleeve in wall)

STEP 3 - FIRESTOP SEALANT: Apply the Firestop Sealant over the backing material to a min. depth of 1/2" flush with the end(s) of the sleeve. Wall penetrations require Firestop Sealant installed on both sides. Leave completed seal undisturbed for 48 hours.

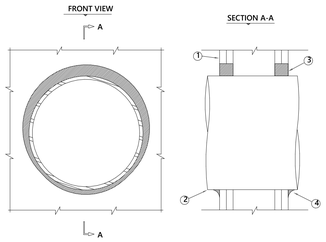
4 U.L. SYSTEM NO CAJ-1155 DETAIL

NOT TO SCALE

U.L. SYSTEM NO. WL1054

METAL PIPE THROUGH GYPSUM WALL ASSEMBLY

F RATING = 1-HR OR 2-HR
T RATING = 0-HR
L RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.
L RATING AT 400°F = 4 CFM/SQ. FT.



1. GYPSUM-WALL ASSEMBLY (1-HR. AND 2-HR. FIRE RATING)(2-HR. SHOWN).

2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
   A. MAXIMUM 20" DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
   B. MAXIMUM 6" DIAMETER COPPER PIPE.
   C. MAXIMUM 6" DIAMETER STEEL CONDUIT.
   D. MAXIMUM 4" DIAMETER STEEL EMT.

1. MINIMUM DEPTH
   A. MINIMUM 5/8" DEPTH HILTI FS-ONE FIRESTOP SEALANT = 1-HR. FIRE-RATING. B. MINIMUM 1-1/4" DEPTH HILTI FS-ONE FIRESTOP SEALANT = 2-HR. FIRE-RATING.

2. MINIMUM 1/2" BEAD HILTI FS-ONE FIRESTOP SEALANT FOR POINT OF CONTACT.

NOTES: 1. MAXIMUM DIAMETER OF OPENING = 22-1/4".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 2-1/4".

INSTALLATION INSTRUCTIONS FOR UL NO.WL1054

STEP 1 - PREPARATION: All surfaces must be clean, sound, dry and frost free prior to application of firestopping materials.

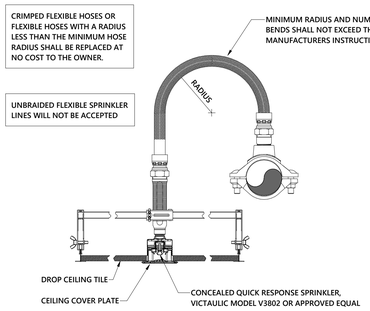
STEP 2 - FIRESTOP SEALANT: Apply a minimum 5/8" or 1-1/4" depth of FS-ONE in the annular space around the penetrating item. Tool excess sealant beyond perimeter of the opening 1/2" onto wall surface. Leave completed seal undisturbed for for 48 hours.

5 U.L. SYSTEM NO WL1054 DETAIL

NOT TO SCALE

CRIMPED FLEXIBLE HOSES OR FLEXIBLE HOSES WITH A RADIUS LESS THAN THE MINIMUM HOSE RADIUS SHALL BE REPLACED AT NO COST TO THE OWNER.

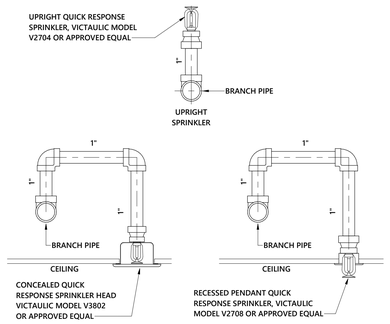
UNBRAIDED FLEXIBLE SPRINKLER LINES WILL NOT BE ACCEPTED



BRAIDED FLEXIBLE HOSE SPRINKLER ASSEMBLIES FOR CONCEALED PENDENT SPRINKLERS

6 TYPICAL RETURN BEND SCHEMATIC - FLEXIBLE HOSE

NOT TO SCALE



REFER TO ARCHITECTURAL PLANS FOR CEILING TYPE, REFER TO SPRINKLER LEGEND FOR TYPE.

7 TYPICAL RETURN BEND SCHEMATIC

NOT TO SCALE

GASTON COUNTY SCHOOLS

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER DANIEL A. PLOTZ

01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

FIRE PROTECTION INDEX, LEGEND, NOTES AND DETAILS

FP-001

Optima # 22-0082

01.12.2023 - BID SET

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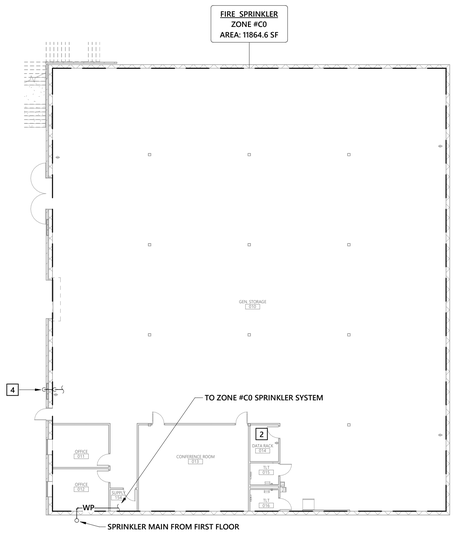
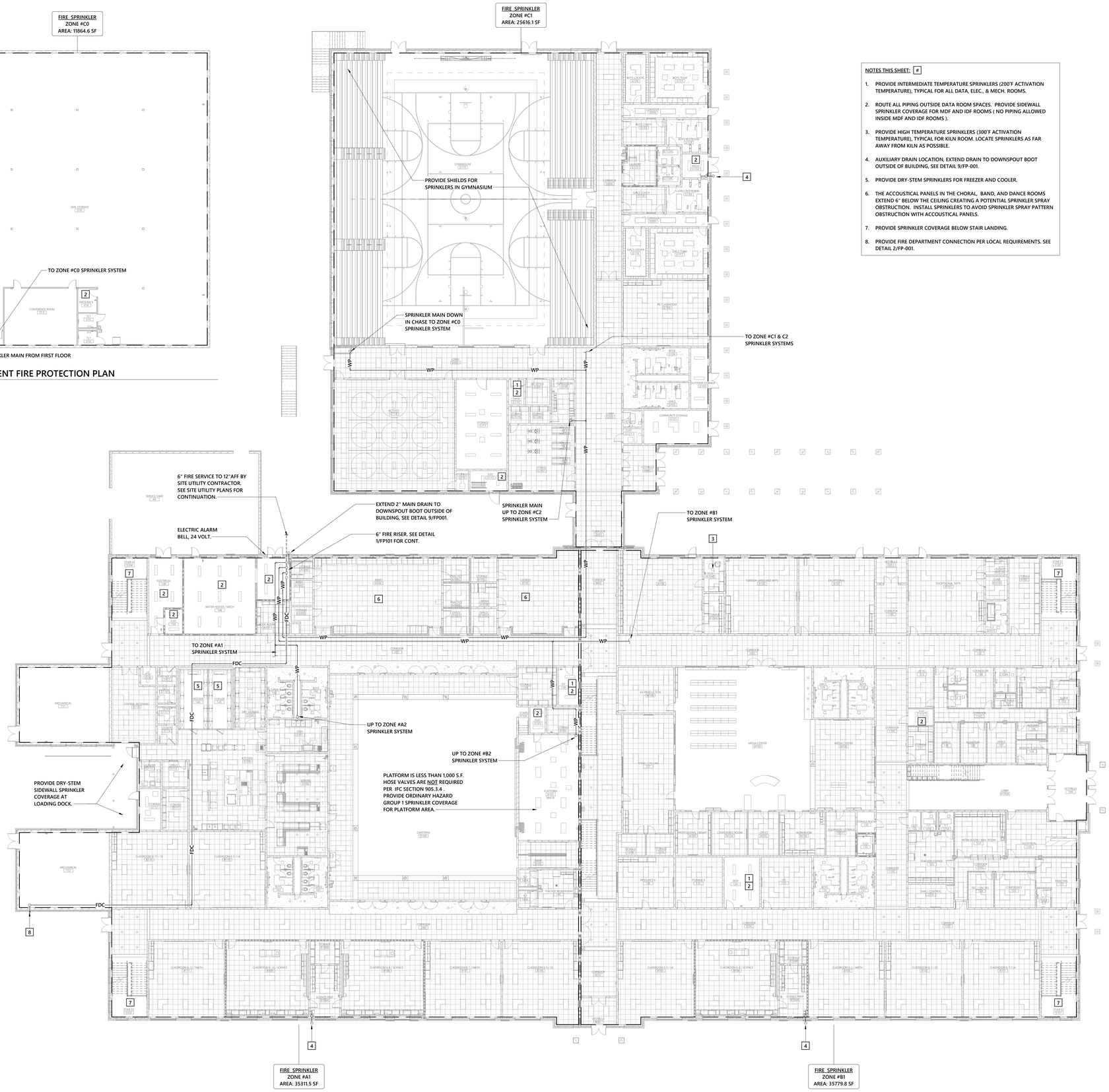


2 BASEMENT FIRE PROTECTION PLAN

1/16" = 1'-0"



1 FIRST FLOOR FIRE PROTECTION PLAN

1/16" = 1'-0"

NOTES THIS SHEET: #

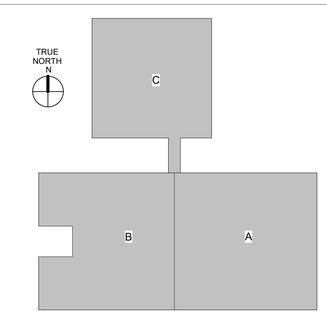
1. PROVIDE INTERMEDIATE TEMPERATURE SPRINKLERS (200°F ACTIVATION TEMPERATURE), TYPICAL FOR ALL DATA, ELEC., & MECH. ROOMS.
2. ROUTE ALL PIPING OUTSIDE DATA ROOM SPACES. PROVIDE SIDEWALL SPRINKLER COVERAGE FOR MDF AND IDF ROOMS (NO PIPING ALLOWED INSIDE MDF AND IDF ROOMS).
3. PROVIDE HIGH TEMPERATURE SPRINKLERS (300°F ACTIVATION TEMPERATURE), TYPICAL FOR KILN ROOM. LOCATE SPRINKLERS AS FAR AWAY FROM KILN AS POSSIBLE.
4. AUXILIARY DRAIN LOCATION, EXTEND DRAIN TO DOWNSPOUT BOOT OUTSIDE OF BUILDING, SEE DETAIL 9/FP-001.
5. PROVIDE DRY-STEM SPRINKLERS FOR FREEZER AND COOLER.
6. THE ACCOUSTICAL PANELS IN THE CHORAL, BAND, AND DANCE ROOMS EXTEND 6" BELOW THE CEILING CREATING A POTENTIAL SPRINKLER SPRAY OBSTRUCTION. INSTALL SPRINKLERS TO AVOID SPRINKLER SPRAY PATTERN OBSTRUCTION WITH ACCOUSTICAL PANELS.
7. PROVIDE SPRINKLER COVERAGE BELOW STAIR LANDING.
8. PROVIDE FIRE DEPARTMENT CONNECTION PER LOCAL REQUIREMENTS. SEE DETAIL 2/FP-001.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

FIRST FLOOR AND BASEMENT FIRE PROTECTION PLANS

FP-101

Optima # 22-0082

[redacted]

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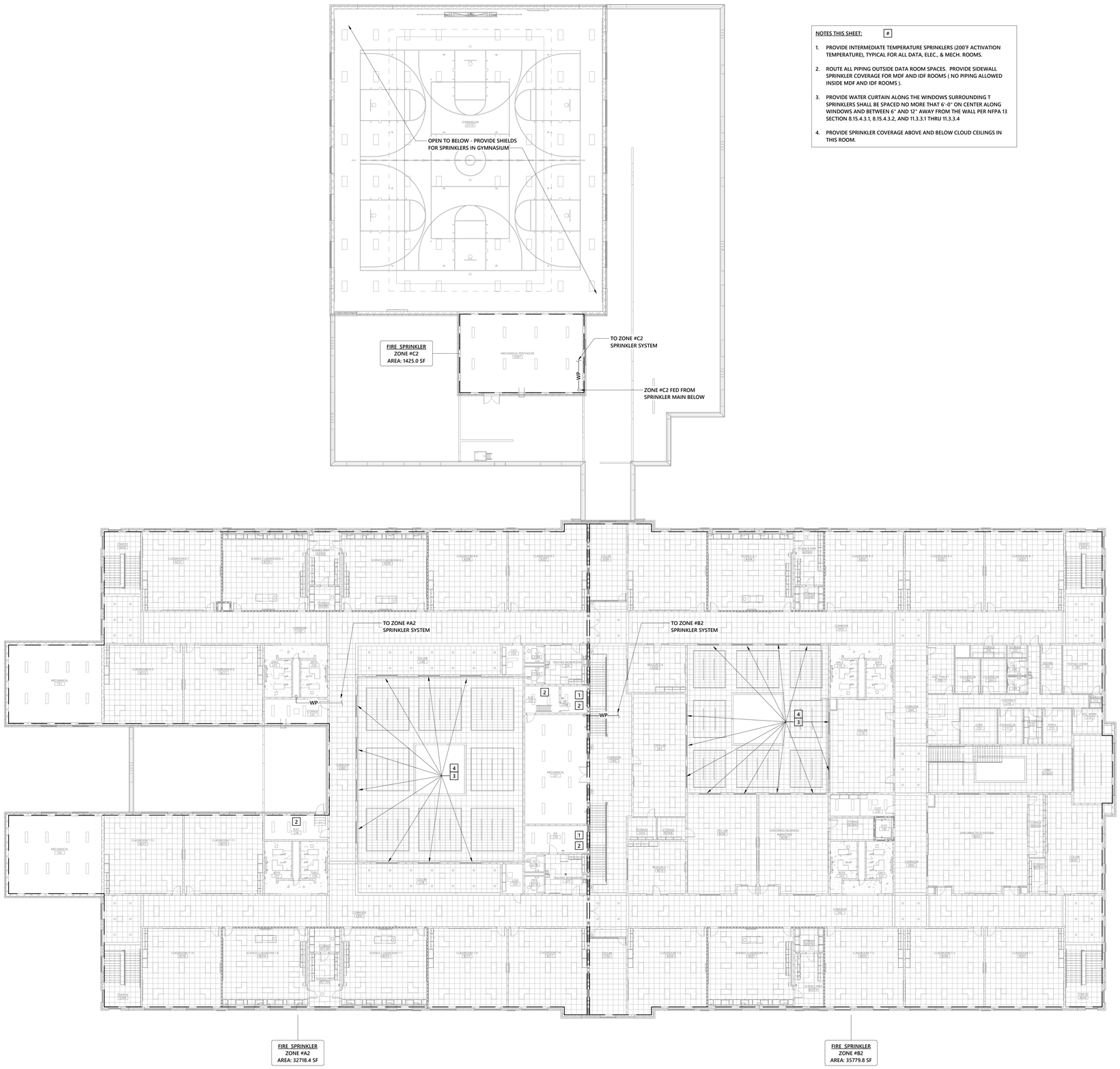


1 SECOND FLOOR FIRE PROTECTION PLAN
1/16" = 1'-0"

NOTES THIS SHEET: #

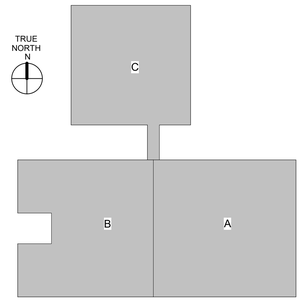
1. PROVIDE INTERMEDIATE TEMPERATURE SPRINKLERS (200°F ACTIVATION TEMPERATURE), TYPICAL FOR ALL DATA, ELEC., & MECH. ROOMS.
2. ROUTE ALL PIPING OUTSIDE DATA ROOM SPACES. PROVIDE SIDEWALL SPRINKLER COVERAGE FOR MDF AND IDF ROOMS (NO PIPING ALLOWED INSIDE MDF AND IDF ROOMS).
3. PROVIDE WATER CURTAIN ALONG THE WINDOWS SURROUNDING T SPRINKLERS SHALL BE SPACED NO MORE THAT 6'-0" ON CENTER ALONG WINDOWS AND BETWEEN 6" AND 12" AWAY FROM THE WALL PER NFPA 13 SECTION 8.15.4.3.1, 8.15.4.3.2, AND 11.3.3.1 THRU 11.3.3.4
4. PROVIDE SPRINKLER COVERAGE ABOVE AND BELOW CLOUD CEILINGS IN THIS ROOM.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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No.	Description	Date
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PROJECT: 9201-218240
DATE: 01-12-2023

SECOND FLOOR FIRE PROTECTION PLAN

FP-102

Optima # 22-0082
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SANITARY WASTE, VENT & STORM DRAIN PIPING

1. BELOW GRADE PIPING AND JOINTS: PROVIDE SERVICE WEIGHT CAST IRON HUB AND SPIGOT PIPE (ASTM A 74) WITH COMPRESSION JOINTS (CISPI HSN) AND NEOPRENE GASKETS (ASTM C 564) OR NO-HUB PIPE AND FITTINGS (CISPI 301) WITH NEOPRENE GASKET / STAINLESS STEEL CLAMP JOINTS (CISPI 310) WITH NEOPRENE GASKET / STAINLESS STEEL CLAMP JOINTS (ASTM C1540-15)

2. ABOVE GRADE PIPING AND JOINTS: PROVIDE SERVICE WEIGHT CAST IRON NO-HUB PIPE AND FITTINGS (CISPI 301) WITH NEOPRENE GASKET AND STAINLESS STEEL CLAMP JOINTS (CISPI 310) WITH NEOPRENE GASKET / STAINLESS STEEL CLAMP JOINTS (ASTM C1540-15)

3. SLOPE ALL WASTE AND STORM DRAIN PIPING AT 1/4" PER FOOT MINIMUM UNLESS NOTED OTHERWISE.

4. PROVIDE CLEAN-OUTS AT THE BASE OF WASTE STACKS, STORM RISERS, AND AT EVERY TURN IN PIPING IN EXCESS OF 45° AND SPACED WITH-IN 100'-0" APART IN A LOCATION THAT PERMITS ACCESS FOR SERVICE WITHOUT DAMAGE TO THE BUILDING OR FINISHED MATERIALS.

5. PROVIDE FLOOR CLEANOUTS (FCO) WITH TOPS DESIGNED TO MATCH SPECIFIC FLOOR FINISHES SUCH AS CARPET, TILE, ETC. PROVIDE YARD CLEANOUTS (YCO) ENCASED IN AN 18"x18"x6" CONCRETE PAD.

6. WHERE WASTE PIPING IS EXPOSED IN REST ROOM AREAS, PROVIDE CHROME PLATED BRASS PIPING, REMOVABLE P-TRAPS, MATCHING STOPS AND ESCUTCHEONS FOR ALL LAVATORIES.

7. WASTE AND VENT SYSTEMS SHALL BE TESTED AND PROVED WATER TIGHT UNDER A HEAD PRESSURE OF NO LESS THAN 10 FT. THIS PRESSURE SHALL BE HELD FOR A PERIOD OF NO LESS THAN 15 MINUTES.

8. WHERE MECHANICAL ROOM FLOOR DRAINS ARE INSTALLED ABOVE GRADE, PROVIDE 1" THICK CLOSED CELL ELASTOMERIC INSULATION WITH VAPOR BARRIER AND JACKET ON THE FLOOR DRAIN BODY, THE P-TRAP AND THE ASSOCIATED DRAIN PIPING ABOVE GRADE.

9. INSULATE ROOF DRAIN BODIES AND HORIZONTAL DRAIN PIPING ABOVE GRADE WITH 1" THICK CLOSED CELL ELASTOMERIC INSULATION WITH VAPOR BARRIER AND JACKET.

10. PIPING INSULATION, JACKETS, COVERINGS, SEALERS, MASTICS AND ADHESIVES SHALL MEET A FLAME-SPREAD RATING OF 25 OR LESS AND A SMOKE-DEVELOPED RATING OF 50 OR LESS AS TESTED BY ASTM E84 (NFPA 255) METHOD. INSTALL INSULATION CONTINUOUSLY THRU FIRE RATED WALLS AND PIPE HANGERS. PROVIDE GALVANIZED STEEL SHIELD BETWEEN PIPE HANGER AND INSULATION.

SUMP PUMP DRAIN PIPING

1. SUMP PUMP DISCHARGE PIPING: PROVIDE TYPE 'L' HARD DRAWN SEAMLESS COPPER TUBING (ASTM B 88) AND CAST COPPER ALLOY FITTINGS (ASME B16.18). JOINTS 2" AND SMALLER SHALL BE LEAD FREE 95-5 TIN/SILVER SOLDER JOINTS (ASTM B 32), JOINTS 2-1/2" AND LARGER SHALL BE BCUP SILVER / PHOSPHORUS / COPPER BRAZED JOINTS (AWS A5.8).

UNDERSLAB DRAINAGE VIDEO RECORDING

THE CONTRACTOR SHALL PERFORM TWO SEPARATE DIAGNOSTIC VIDEOS OF UNDER-SLAB DRAINAGE LINES. THE FIRST VIDEO SHALL BE PERFORMED AFTER THE GROUND LEVEL FLOOR SLAB HAS BEEN POURED AND SHALL BE WITNESSED BY THE DESIGN ENGINEER AND THE OWNERS REPRESENTATIVE. THE SECOND VIDEO SHALL BE RECORDED AFTER VISUAL VERIFICATION BY THE DESIGN ENGINEER THAT ALL DEFICIENCIES FROM THE FIRST DIAGNOSTIC VIDEO HAVE BEEN CORRECTED AND PRIOR TO THE REQUEST FOR SUBSTANTIAL COMPLETION OF THE PROJECT. THE CONTRACTOR SHALL SUBMIT THE SECOND VIDEO RECORDING TO THE OWNER AND DESIGN ENGINEER IN MP4 FILE FORMAT FOR FINAL REVIEW. THE DIAGNOSTIC VIDEO SHALL CONTAIN THE PIPE SEGMENT DESIGNATION MATCHING THE SUBMITTED REFERENCE PLAN AT THE BEGINNING OF THE RECORDING FOR EACH PIPE SEGMENT. THE DIAGNOSTIC VIDEOS APPLY TO ALL UNDERGROUND SANITARY WASTE, GREASE WASTE AND STORM DRAIN PIPING 3" AND LARGER.

PRIOR TO EACH DIAGNOSTIC VIDEO THE CONTRACTOR SHALL;

- SUBMIT A DIAGNOSTIC VIDEO REFERENCE PLAN OF ALL UNDERGROUND DRAINAGE PIPING CONTAINING DESIGNATIONS FOR EACH PIPING SEGMENT (i.e. PIPE SEGMENT A-B, B-C, C-D, etc.) TO THE ENGINEER.
- PROVIDE AT LEAST TWO WEEKS NOTICE TO THE DESIGN ENGINEER AND THE OWNERS REPRESENTATIVE.
- CLEAN ALL DRAINAGE LINES TO BE FREE OF ALL DEBRIS.
- PROVIDE A LIGHT STREAM OF CLEAR WATER FLOWING THROUGH THE PIPE SEGMENT DURING THE VIDEO.

2018 NORTH CAROLINA ENERGY CONSERVATION CODE

COMMERCIAL ENERGY EFFICIENCY - PLUMBING SUMMARY

C401 METHOD OF COMPLIANCE

- [x] 2018 NCECC CHAPTER 4
- [ ] COMCHECK PROVIDED (2018 NCECC)
- [ ] ASHRAE 90.1-2013 PRESCRIPTIVE
- [ ] COMCHECK PROVIDED (90.1-2013)
- [ ] ASHRAE 90.1-2013 PERFORMANCE
- [ ] ENERGY MODELING DATA PROVIDED
- [ ] N/A (EXISTING LIGHTING, HVAC, AND DOM. WATER HEATING SYSTEMS TO REMAIN)

C406 ADDITIONAL EFFICIENCY PACKAGE OPTIONS

- [ ] C406.2 EFFICIENT MECH EQUIPMENT
- [ ] C406.5 ON-SITE RENEWABLE ENERGY
- [x] C406.3 REDUCED LTG DENSITY
- [ ] C406.6 DEDICATED OA SYSTEM
- [ ] C406.4 ENHANCED LTG CONTROLS
- [ ] C406.7 SERVICE WATER HEATING

TABLE C404.2 - MINIMUM PERFORMANCE OF WATER HEATING EQUIPMENT

EQUIPMENT TYPE	SIZE CATEGORY (INPUT)	SUB CATEGORY OR RATING CONDITION	PERFORMANCE REQUIRED a,b	REQ'D EFFICIENCY	*96%*
INSTANTANEOUS WATER HEATERS, GAS	> 155,000 BTU/H	≧4000 BTU/H/GAL ≧10 GAL	80% E_t (Q/800+110 √ V)SL, BTU/H	*80%*	SPECIFIED EQPM

a. ENERGY FACTOR (EF) AND THERMAL EFFICIENCY (E_t) ARE MINIMUM REQUIREMENTS. IN THE EF EQUATION V IS THE VOLUME IN GALLONS.
b. STANDBY LOSS (SL) IS THE MAXIMUM BTU/H BASED ON A NOMINAL 70° TEMPERATURE DIFFERENCE BETWEEN STORED WATER AND AMBIENT REQUIREMENTS. IN THE SL EQUATION Q IS THE NAMEPLATE INPUT RATE IN BTU/H. IN THE EQUATIONS FOR ELECTRIC WATER HEATERS, V IS THE RATED VOLUME IN GALLONS AND V_m IS THE MEASURED VOLUME IN GALLONS. IN THE SL EQUATION FOR GAS WATER HEATERS AND BOILERS, V IS THE RATED VOLUME IN GALLONS.
c. REFER TO WATER HEATER SCHEDULES FOR SPECIFIED WATER HEATING EQUIPMENT TYPES, CAPACITIES (STORAGE VOLUME) AND ENERGY INPUTS (ELECTRIC AND/OR GAS)

C408 - SYSTEM COMMISSIONING

- [ ] BUILDING IS LESS THAN 10,000 SQUARE FEET AND IS EXEMPT FROM THE SYSTEM COMMISSIONING REQUIREMENTS OF SECTION C408.
- [x] BUILDING IS GREATER THAN 10,000 SQUARE FEET AND REQUIRES SYSTEM COMMISSIONING PER SECTION C408.

COMMISSIONING NOTE

THIS PROJECT INCLUDES A THIRD PARTY COMMISSIONING AGENT CONTRACTED BY THE OWNER. THE PLUMBING CONTRACTOR SHALL COORDINATE WITH OWNER'S COMMISSIONING AGENT AND PROVIDE ALL NECESSARY TIME, MATERIALS, AND PROCEDURES REQUIRED FOR A FULLY COMMISSIONED PROJECT. SEE COMMISSIONING REQUIREMENTS IN THE PROJECT MANUAL FOR FURTHER INFORMATION.

DOMESTIC WATER PIPING

1. BELOW GRADE PIPING AND JOINTS: PROVIDE TYPE 'K' SOFT ANNEALED SEAMLESS COPPER TUBING (ASTM B 88) WITH NO JOINTS FOR PIPING 3" AND SMALLER. PROVIDE DUCTILE IRON PIPE AND FITTINGS (AWWA C151, AWWA C110) WITH RUBBER GASKET JOINTS AND RODS (AWWA C111) FOR PIPING 4" AND LARGER.

2. ABOVE GRADE PIPING AND JOINTS: PROVIDE TYPE 'L' HARD DRAWN SEAMLESS COPPER TUBING (ASTM B 88) AND CAST COPPER ALLOY FITTINGS (ASME B16.18). JOINTS 2" AND SMALLER SHALL BE LEAD FREE 95-5 TIN/SILVER SOLDER JOINTS (ASTM B 32), JOINTS 2-1/2" AND LARGER SHALL BE BCUP SILVER / PHOSPHORUS / COPPER BRAZED JOINTS (AWS A5.8).

3. INSULATE PIPING ABOVE GRADE (EXCEPT EXPOSED CONNECTIONS TO PLUMBING FIXTURES). PROVIDE GLASS FIBER INSULATION HAVING A VAPOR BARRIER AND JACKET FOR HOT WATER PIPING AND PROVIDE CLOSED CELL ELASTOMERIC INSULATION WITH JACKET FOR COLD WATER PIPING. PIPE INSULATION SHALL HAVE A CONDUCTIVITY NOT EXCEEDING 0.27 BTUH x SQ. FT., SEE LIST BELOW FOR INSULATION THICKNESS:

   - PROVIDE 1" THICK INSULATION FOR HOT WATER & CIRCULATION PIPING SIZES 1/2" THRU 1-1/4".
   - PROVIDE 1-1/2" THICK INSULATION FOR HOT WATER & CIRCULATION PIPING SIZES 1-1/2" THRU 4".
   - PROVIDE 1/2" THICK INSULATION FOR COLD WATER PIPING SIZES 1/2" THRU 1-1/4".
   - PROVIDE 1" THICK INSULATION FOR COLD WATER PIPING SIZES 1-1/2" THRU 4".

4. PIPING INSULATION, JACKETS, COVERINGS, SEALERS, MASTICS AND ADHESIVES SHALL MEET A FLAME-SPREAD RATING OF 25 OR LESS AND A SMOKE-DEVELOPED RATING OF 50 OR LESS AS TESTED BY ASTM E84 (NFPA 255) METHOD AND SHALL BE PLENUM RATED. PROVIDE PVC INSULATION JACKET FOR EXPOSED PIPING IN MECHANICAL ROOMS. INSTALL INSULATION CONTINUOUSLY THRU FIRE RATED WALLS AND PIPE HANGERS. PROVIDE GALVANIZED STEEL SHIELD BETWEEN PIPE HANGER AND INSULATION.

5. PROVIDE A CHROME FINISH ON EXPOSED PIPING IN REST ROOMS AND OTHER FINISHED AREAS.

6. PROTECT COPPER PIPING AGAINST CONTACT WITH DISSIMILAR METALS. ALL HANGERS, SUPPORTS, ANCHORS AND CLIPS SHALL BE COPPER OR COPPER PLATED. WHERE COPPER PIPING IS CARRIED ON TRAPEZE HANGERS WITH OTHER PIPING, PROVIDE A PERMANENT ELECTROLYTIC ISOLATION MATERIAL TO PREVENT CONTACT WITH DISSIMILAR OTHER METALS.

7. PROTECT COPPER PIPING AGAINST CONTACT WITH MASONRY. WHERE COPPER IS SLEEVED THROUGH MASONRY, PROVIDE COPPER OR RED BRASS SLEEVES. WHERE COPPER MUST BE CONCEALED IN OR AGAINST MASONRY PARTITIONS, PROVIDE A HEAVY COATING OF ASPHALTIC ENAMEL ON THE COPPER PIPING AND 15# ASPHALT SATURATED FELT BETWEEN THE PIPING AND THE MASONRY PARTITION.

8. PERFORM A PRESSURE TEST ON ALL WATER PIPING. FILL PIPING WITH POTABLE WATER, CAP AND SUBJECT PIPING TO A STATIC WATER PRESSURE OF 50 PSIG ABOVE OPERATING PRESSURE, WITHOUT EXCEEDING PRESSURE RATING OF PIPING SYSTEM MATERIALS OR PRESSURIZE PIPING WITH AIR TO AT LEAST ONE-HUNDRED (100) PSI. ISOLATE TEST SOURCE AND ALLOW TO STAND FOR FOUR HOURS. LEAKS AND LOSS IN TEST PRESSURE CONSTITUTE DEFECTS THAT MUST BE REPAIRED. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST PIPING OR PORTION THEREOF UNTIL SATISFACTORY RESULTS ARE OBTAINED

9. STERILIZE THE DOMESTIC WATER SYSTEM IN PER THE AMERICAN WATER WORKS ASSOCIATION'S INSTRUCTIONS SPECIFICATIONS AND LOCAL HEALTH DEPARTMENT REGULATIONS.

10. SLOPE WATER PIPING FOR DRAINAGE WITH DRAIN VALVES INSTALLED AT LOW POINTS.

NATURAL GAS PIPING

1. BELOW GRADE PIPING AND FITTINGS (OUTSIDE): PROVIDE SCHEDULE 40 BLACK STEEL, TYPE S, SEAMLESS, GRADE B (ASTM A 53) AND FORGED STEEL WELDING TYPE FITTINGS (ASTM A234) WITH (AWWA C105) POLYETHYLENE JACKET OR DOUBLE LAYER, HALF LAPPED 10 MIL POLYETHYLENE TAPE. PROVIDE WELDED JOINTS (ASME B31.9) FOR ALL UNDERGROUND PIPE. PROVIDE METALIZED WARNING TAPE BETWEEN GRADE AND ALL UNDERGROUND GAS PIPING.

2. ABOVE GRADE PIPING AND FITTINGS : PROVIDE SCHEDULE 40 BLACK STEEL PIPING, TYPE S, SEAMLESS, GRADE B (ASTM A 53) AND 150 PSI MALLEABLE BLACK IRON FITTINGS, GRADE 32510, (ASTM B 16.3) OR FORGED STEEL WELDING TYPE FITTINGS (ASTM A234). PROVIDE THREADED JOINTS FOR PIPE 2" AND SMALLER. PROVIDE WELDED JOINTS (ASME B31.9) FOR PIPE 2-1/2" AND LARGER.

3. SPACE GAS PIPING HANGER RODS 7'-0" ON CENTER MAXIMUM AND SPACE TRANSVERSE BRACING 20'-0" ON CENTER MAXIMUM. TRANSVERSE BRACING FOR ONE SECTION MAY ACT AS LONGITUDINAL BRACING FOR THE PIPE SECTION CONNECTED TO IT IF THE BRACING IS INSTALLED WITHIN 24" OF THE ELBOW OR TEE. COORDINATE HANGER LOCATIONS WITH STRUCTURAL DRAWING DETAILS.

4. PROVIDE A.G.A. CERTIFIED SHUT-OFF VALVES MINIMUM, 125 PSI RATED, NON- LUBRICATED PLUG TYPE WITH BRONZE BODY AND BRONZE PLUG, STRAINERS AND REGULATORS (AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER) FOR ALL EQUIPMENT CONNECTED TO THE NATURAL GAS SYSTEM.

5. GAS PRESSURE REGULATORS SHALL COMPLY WITH ANSI Z21.80. REGULATORS SHALL BE CAST IRON OR DIE-CAST ALUMINUM CONSTRUCTION WITH INTERCHANGEABLE ZINC-PLATED STEEL SPRINGS, ZINC-PLATED STEEL DIAPHRAGM PLATE, NITRILE RUBBER SEAT DISC, INTERCHANGEABLE ALUMINUM ORIFICE, AND ULTRAVIOLET-STABILIZED MINERAL FILLED NYLON SEAL PLUG. REGULATOR SHALL BE SINGLE-PORT SELF-CONTAINED WITH ORIFICE NO LARGER THAN REQUIRED AT MAXIMUM PRESSURE INLET AND NO PRESSURE SENSING PIPING EXTERNAL TO THE REGULATOR. PRESSURE REGULATOR SHALL MAINTAIN DISCHARGE PRESSURE SETTING DOWNSTREAM AND NOT EXCEED 150 PERCENT OF DESIGN DISCHARGE PRESSURE AT SHUTOFF. OVERPRESSURE PROTECTION DEVICE SHALL BE FACTORY MOUNTED ON REGULATOR. WHEN USING VENTLESS REGULATORS, MOUNT REGULATOR IN A HORIZONTAL UPRIGHT POSITION. IF VENTED TYPE REGULATORS ARE USED, INSTALL VENT PIPING (FULL SIZE OPENING) FROM GAS PRESSURE REGULATORS TO OUTDOORS AND TERMINATE IN WEATHERPROOF HOOD.

6. PAINT ALL GAS PIPING WITH 2 COATS OF YELLOW ENAMEL PAINT APPLIED WITH A BRUSH (2 MIL THICKNESS MINIMUM). LABEL ALL GAS PIPING ON 5'-0" CENTERS INDICATING THE GAS PRESSURE.
   5 PSI GAS PIPING SHALL BE LABELED "5-PSI GAS".
   2 PSI GAS PIPING SHALL BE LABELED "2-PSI GAS"
   LOW PRESSURE GAS PIPING SHALL BE LABELED "GAS"

7. CONTACT LOCAL GAS UTILITY TO PROVIDE GAS SERVICE AND GAS METER WITH A PULSE OUTPUT COMPATIBLE WITH THE BUILDING AUTOMATION SYSTEM. COORDINATE REQUIREMENTS WITH MECHANICAL CONTRACTOR AND LOCAL GAS UTILITY.

ACID WASTE & VENT PIPING

1. ABOVE GRADE PIPE AND FITTINGS (BETWEEN LAB SINK OUTLET AND NEUTRALIZATION TRAP): PROVIDE FIRE RETARDANT SCHEDULE 40 POLYPROPYLENE PIPE (ASTM D4101, ASTM F1412), NSF LISTED, CSA CERTIFIED. FITTINGS: POLYPROPYLENE (ASTM D4101, ASTM F1412). JOINTS: ELECTROFUSION JOINTS CONFORMING TO ASTM F1290 OR MECHANICAL JOINTS (MOLDED UNION CONNECTION TYPE OR NO-HUB STYLE WITH STEEL OUTER COUPLING).

2

LAB CONNECTION NOTES

1. PLUMBING CONTRACTOR IS RESPONSIBLE FOR ALL INTER-CONNECTING WATER, WASTE, INDIRECT DRAIN PIPING AND FINAL CONNECTIONS TO LAB EQUIPMENT. COORDINATE WITH LAB EQUIP. SUPPLIER. SEE LAB EQUIPMENT DRAWINGS AND LAB EQUIPMENT SPECIFICATIONS FOR ADDITIONAL PLUMBING REQUIREMENTS.

2. PLUMBING CONTRACTOR IS RESPONSIBLE FOR ALL LAB PIPING INCLUDING BUT NOT LIMITED TO LAB AIR, LAB VACUUM, ACID WASTE/VENT, COMPRESSED AIR 100 PSI, DI-WATER, NITROGEN GAS, HELIUM, HYDROGEN, ARGON, LIQUID NITROGEN AND METHANE GAS. SEE LAB EQUIPMENT DRAWINGS AND LAB EQUIPMENT SPECIFICATIONS FOR ADDITIONAL PLUMBING REQUIREMENTS.

PLUMBING GENERAL NOTES

1. GENERAL AND SPECIAL CONDITIONS OF THE CONTRACT APPLY TO THE PLUMBING SCOPE OF WORK. THE PLUMBING DRAWINGS AND SPECIFICATIONS SHALL NOT BE INTERPRETED AS WAIVING OR OVERRULING ANY REQUIREMENTS EXPRESSED IN GENERAL CONDITIONS.

2. PLUMBING WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE 2018 NORTH CAROLINA STATE PLUMBING CODE AND WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION.

3. SCOPE: PROVIDE ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED FOR THE COMPLETION AND OPERATION OF ALL PLUMBING SYSTEMS IN ACCORDANCE WITH ALL APPLICABLE CODES.

4. PERMITS: APPLY AND PAY FOR ALL NECESSARY PERMITS, FEES AND INSPECTIONS REQUIRED BY ANY PUBLIC AUTHORITY HAVING JURISDICTION. ACREAGE CHARGES, FACILITIES CHARGES AND BOND PROPERTY ASSESSMENTS ARE NOT TO BE CONSTRUED TO BE A PART OF THIS CONTRACT.

5. WARRANT THE SYSTEM LABOR, MATERIALS AND EQUIPMENT FOR THE TIME PERIOD SPECIFIED IN THE PROJECT MANUAL. IF NO WARRANTY SECTION IS PROVIDED, THEN WARRANT THE SYSTEM LABOR, MATERIAL AND EQUIPMENT FOR A MINIMUM OF ONE YEAR AFTER COMPLETION AND ACCEPTANCE. PRIOR TO TURNING THE COMPLETED SYSTEM OVER TO THE OWNER, REVIEW THE INSTALLATION WITH THE ARCHITECT / ENGINEER AND REPLACE OR REPAIR ANY DEFECTIVE WORKMANSHIP, EQUIPMENT AND MATERIALS AT NO ADDITIONAL COST TO THE OWNER.

6. COORDINATE ALL PLUMBING PIPING LOCATIONS, ROUGH-IN LOCATIONS AND EQUIPMENT LOCATIONS WITH OTHER TRADES TO AVOID CONFLICTS AND INTERFERENCES. FINAL PIPING AND EQUIPMENT LOCATIONS SHALL BE A CODE COMPLIANT INSTALLATION FOR ALL TRADES.

7. FIELD VERIFY PROPER OPERATION OF EXISTING SYSTEMS BEFORE STARTING CONSTRUCTION. NOTIFY THE ARCHITECT / ENGINEER OF RECORD OF ANY PROBLEMS OR DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND EXISTING CONDITIONS AND/OR ANY POTENTIAL PROBLEMS OBSERVED BEFORE CONTINUING WORK IN THE EFFECTED AREAS.

8. PLUMBING PLANS SHALL NOT BE SCALED. REFERENCE THE ARCHITECTURAL PLANS FOR DIMENSIONS OF ALL LOCATIONS OF PLUMBING FIXTURES, FLOOR DRAINS, COLUMNS, WALLS, DOORS, ETC.

9. WHERE DISCREPANCIES ARE FOUND IN THE DRAWINGS AND SPECIFICATIONS THE MORE STRINGENT SHALL APPLY. CONTACT ENGINEER FOR CLARIFICATION.

10. ALL PIPING SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA.

11. ALL VALVES, BACKFLOW PREVENTERS, BOOSTER PUMPS, ETC. SERVING THE DOMESTIC WATER SYSTEM SHALL MEET LEAD FREE STANDARDS PER ANSI/NSF 372 AND NSF 61, ANNEX G.

12. PROVIDE COMPLETE PLUMBING FIXTURES AND EQUIPMENT. INCLUDE SUPPLIES, STOPS, VALVES, FAUCETS, DRAINS, TRAPS, TAIL PIECES, ESCUTCHEONS, ETC. AND INSTALL PER THE MANUFACTURER'S INSTRUCTIONS.

13. CUT WALLS, FLOORS AND CEILINGS AS REQUIRED FOR INSTALLATION OF PLUMBING WORK. ALL CUTTING SHALL BE HELD TO A MINIMUM. PATCH AND FINISH SURFACES TO MATCH ADJOINING SURFACES.

14. PIPE PENETRATIONS THRU WALLS, PARTITIONS AND FLOORS SHALL BE SLEEVED. CORE DRILLING THRU WALLS AND PARTITIONS IS PERMITTED IF PERFORMED IN A NEAT CRAFTSMAN LIKE MANNER. OPENINGS THRU WALLS, PARTITIONS, AND FLOORS SHALL BE LARGE ENOUGH FOR PIPE INSULATION TO REMAIN CONTINUOUS. PIPES PENETRATING THRU EXTERIOR WALLS SHALL BE SEALED WATER TIGHT. INSTALL ESCUTCHEONS IN ALL EXPOSED AREAS.

15. PIPING AND SPECIALTIES SHALL BE LOCATED CONCEALED IN WALLS, PARTITIONS OR ABOVE CEILINGS UNLESS NOTED OTHERWISE. PIPING IN EXPOSED AREAS SHALL BE RUN TIGHT TO UNDERSIDE OF STRUCTURE.

16. PROVIDE ACCESS DOORS FOR ALL SPECIALTIES, VALVES, WATER HAMMER ARRESTORS, TRAP PRIMERS, ETC., CONCEALED BEHIND WALLS OR CEILINGS THAT REQUIRE MAINTENANCE ACCESS.

17. DO NOT INSTALL PIPING IN AREAS SUBJECT TO FREEZING TEMPERATURES. INSTALL PIPING SHOWN IN EXTERIOR WALLS ON THE CONDITIONED SIDE OF THE WALL INSULATION.

18. PIPING, VENTS, ETC. EXTENDING THROUGH EXTERIOR WALLS AND/OR THE ROOF SHALL BE FLASHED AND COUNTER FLASHED IN A WATERPROOF MANNER. COORDINATE FLASHING WITH THE GENERAL CONTRACTOR.

19. PROVIDE A CHROME FINISH FOR ALL EXPOSED PIPING IN REST ROOMS AND OTHER FINISHED AREAS.

20. PROVIDE NON-CONDUCTING DIELECTRIC UNIONS WHENEVER CONNECTING DISSIMILAR METALS.

21. REFER TO THE STRUCTURAL PLANS AND DETAILS FOR ACCEPTABLE LOCATIONS TO ATTACH HANGERS AND SUPPORTS TO THE BUILDING STRUCTURE. HANGERS SHALL NOT ATTACH TO THE ROOF DECK.

22. PROVIDE MANUFACTURERS RECOMMENDED CLEARANCES AROUND ALL EQUIPMENT FOR MAINTENANCE.

23. VALVES AND OTHER PIPING ACCESSORIES REQUIRING ACCESS SHALL BE INSTALLED IN ACCESSIBLE LOCATION NO MORE THAN 18" ABOVE THE CEILING OR 2" BEHIND THE WALL, PROVIDE OFFSETS IN PIPING AS NEEDED.

24. PLUMBING SYSTEMS INCLUDE, BUT ARE NOT LIMITED TO: PLUMBING FIXTURES AND EQUIPMENT, FIRE STOPPING, SEISMIC BRACING, PIPE IDENTIFICATION, DOMESTIC WATER SYSTEM, SANITARY WASTE AND VENT SYSTEM, STORM DRAIN SYSTEM, NATURAL GAS SYSTEM.

FIRE STOPPING:

1. FIRE STOP ALL PENETRATIONS, BY PIPING OR CONDUITS, OF FIRE RATED WALLS, FLOORS AND PARTITIONS. PROVIDE A DEVICE(S) OR SYSTEM(S) WHICH HAS BEEN TESTED AND LISTED AS COMPLYING WITH ASTM E-814 AND INSTALL IN ACCORDANCE WITH THE CONDITIONS OF THEIR LISTING. PROVIDE A DEVICE(S) OR SYSTEM(S) WITH AN 'F' RATING EQUAL TO THE RATING OF THE ASSEMBLY BEING PENETRATED. REFER TO ARCHITECTURAL PLANS FOR WALL AND FLOOR TYPES.

SEISMIC BRACING:

1. PROVIDE DESIGN AND INSTALLATION OF SEISMIC RESTRAINT ELEMENTS FOR THE PLUMBING SYSTEM(S) IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS OF THE 2018 NORTH CAROLINA BUILDING CODE AND ASCE 7-10, CHAPTER 13. REFER TO THE APPENDIX B ON THE ARCHITECTURAL DRAWINGS FOR THE SITE'S SEISMIC DESIGN CATEGORY CLASSIFICATION.

PIPE IDENTIFICATION:

1. PIPE IDENTIFICATION SHALL MATCH THE FACILITY'S EXISTING STANDARD. IF NO STANDARD EXISTS, THEN THE PIPE IDENTIFICATION SHALL BE IN ACCORDANCE WITH ANSI A13.1.

2. PROVIDE PIPING LABELS FOR ALL PLUMBING PIPING. PIPING LABELS SHALL BE ACRYLIC FACED, WRAP-AROUND TYPE. EACH LABEL SHALL INDICATE THE PIPING CONTENTS, DIRECTION OF FLOW AND SHALL BEAR THE MANUFACTURER'S STANDARD COLOR FOR THE SERVICE INDICATED.

SUBMITTALS:

1. PROVIDE SUBMITTALS BEARING THE CONTRACTORS REVIEW STAMP FOR ALL PLUMBING FIXTURES, PIPING, EQUIPMENT AND ACCESSORIES IN ELECTRONIC FORMAT (PDF).

2. NO PRIVATE LABELED MATERIALS WILL BE ACCEPTED AS EQUALS TO PRODUCTS SPECIFIED HEREIN.

3. THE PLUMBING CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH SUBSTITUTIONS TO SPECIFIED PLUMBING FIXTURES AND EQUIPMENT INCLUDING BUT NOT LIMITED TO; PROVIDING MAINTENANCE ACCESS CLEARANCE, PIPING, ELECTRICAL, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC. AND ANY MODIFICATIONS TO ASSOCIATED MECHANICAL, ELECTRICAL OR PLUMBING SYSTEMS REQUIRED BY THE EQUIPMENTS INSTALLATION INSTRUCTIONS. ALL COSTS ASSOCIATED WITH SUBSTITUTIONS SHALL BE INCLUDED IN THE ORIGINAL BASE BID.

KITCHEN CONNECTION NOTES

1. PLUMBING CONTRACTOR TO BE RESPONSIBLE FOR PROTECTION OF DOMESTIC WATER SYSTEM AGAINST BACKFLOW AND BACK SIPHONING WHEN A 'HARD' CONNECTION IS MADE TO ANY KITCHEN EQUIPMENT OR APPLIANCE. PER NC PLUMBING CODE 608.3, ALL DEVICES, APPURTENANCES,APPLIANCES, AND APPARATUS INTENDED TO SERVE SPECIAL FUNCTIONS SUCH AS PROCESSING, COOKING, HEATING, OR STORAGE OF ICE THAT ARE CONNECTED TO THE WATER SUPPLY SHALL BE PROVIDED WITH PROTECTION AGAINST BACKFLOW CONTAMINATION OF WATER SUPPLY SYSTEM.

2. WATER FILTERS, SOFTENERS, AND HOLDING TANKS OF POTABLE WATER SHALL BE PROTECTED AGAINST CONTAMINATION. THE PC SHALL COOPERATE WITH KITCHEN EQUIPMENT CONTRACTOR AND SHALL VERIFY MOST ADEQUATE PROTECTION REQUIRED. ANY APPROVED DEVICE EITHER EXTERIOR TO OR BUILT-INTO THE APPLIANCE SHALL BE ACCEPTABLE.

PLUMBING LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
— – —— – —	CW	COLD WATER PIPING
—— – – ——	HW	HOT WATER PIPING
——140—	HWR	HOT WATER RETURN PIPING
– – – –140—	140	140°F HOT WATER RETURN PIPING
————	W	SANITARY WASTE PIPING
– – – – – –	V	SANITARY VENT PIPING
——GW——	GW	GREASE WASTE PIPING
——AW——	AW	ACID RESISTANT WASTE PIPING
—— SD ——	SD	STORM DRAIN PIPING
——ESD——	ESD	EMERGENCY STORM DRAIN PIPING
—— PD ——	PD	PUMP DISCHARGE (SUMP PUMP)
—— G ——	G	NATURAL GAS PIPING
—— D ——	D	DRAIN PIPING (INDIRECT)
	-	PIPING ELBOW DOWN
	-	PIPING ELBOW UP
	-	PIPING CONTINUES
	-	SHUT-OFF VALVE
	-	CHECK VALVE
	-	BALANCING VALVE
	PRV	PRESSURE REDUCING VALVE
S	-	SOLENOID VALVE
	RPZ	REDUCED PRESSURE BACKFLOW PREVENTER ASSEMBLY
	-	IN-LINE PUMP
	-	PIPING REDUCER
	FCO	FLOOR CLEANOUT
	YCO	YARD CLEANOUT
	WCO	WALL CLEANOUT
	CO	PLUG CLEANOUT
	FD	FLOOR DRAIN
	RD	ROOF DRAIN
	HB	HOSE BIBB / WALL HYDRANT
	SA-#	SHOCK ARRESTOR - SUFFIX INDICATES PDI SIZE

ADDITIONAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	MFG	MANUFACTURER
AFG	ABOVE FINISHED GRADE	PSI	POUNDS PER SQUARE INCH
AVTR	ACID VENT THRU ROOF	T&P	TEMPERATURE AND PRESSURE
BAS	BUILDING AUTOMATION SYSTEM	TYP	TYPICAL
BFF	BELOW FINISHED FLOOR	UG	UNDERGROUND
CFH	CUBIC FEET PER HOUR	VTR	VENT THRU ROOF
CLG	CEILING	WSV	WASTE STACK VENT
CONT	CONTINUATION	WC	WATER COLUMN
DN	DOWN		
GPF	GALLONS PER FLUSH	EC	ELECTRICAL CONTRACTOR
GPM	GALLONS PER MINUTE	FSC	FOOD SERVICE CONTRACTOR
HP	HORSE POWER	GC	GENERAL CONTRACTOR
INV	INVERT ELEVATION	MC	MECHANICAL CONTRACTOR
KW	KILOWATT	PC	PLUMBING CONTRACTOR
MBH	1,000 BRITISH THERMAL UNIT / HOUR		

PLUMBING SHEET INDEX

SHEET NUMBER	SHEET NAME
P-001	PLUMBING INDEX, LEGEND, NOTES AND MATERIALS
P-002	PLUMBING SCHEDULES
P-010	OVERALL FIRST FLOOR PLUMBING PLAN
P-100	BASEMENT FLOOR DRAINAGE PIPING PLAN
P-101A	FIRST FLOOR DRAINAGE PIPING PLAN AREA A
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P-200	BASEMENT FLOOR SUPPLY PIPING PLAN
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P-301	ENLARGED PLUMBING PLANS
P-302	ENLARGED PLUMBING PLANS
P-303	ENLARGED PLUMBING PLANS
P-601	PLUMBING DETAILS AND SCHEMATICS
P-602	PLUMBING DETAILS AND SCHEMATICS

GASTON COUNTY SCHOOLS

Gaston County Schools

GRIER MIDDLE SCHOOL REPLACEMENT

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022
2	Permit Revisions	01-11-2023

PROJECT: 9201-218240
DATE: 01-12-2023

PLUMBING INDEX, LEGEND, NOTES AND MATERIALS

P-001

Optima # 22-0082

01.12.2023 - BID SET

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TANKLESS WATER HEATER CALC. - KITCHEN

KITCHEN EQUIPMENT	QUANTITY	FLOW (GPM)	TOTAL (GPM)
HAND SINK - (PROVIDE 0.5 GPM AERATOR)	5	0.5	2.5
UTENSIL WASH SINK - (PROVIDE 2 GPM AERATOR)	1	2	2
PREPARATION SINK - (PROVIDE 2 GPM AERATOR)	2	2	4
MOP SINK - (PROVIDE 2 GPM AERATOR)	0	2	0
CAN WASH	1	2	2
KITCHEN HOOD COOKING EQUIPMENT	1	1	1
HOSE REEL STATION	2	3	6
CLOTHES WASHER	0	3	0
DISHMACHINE FINAL RINSE AT 20 PSI - HOBART CL44e	1	2.1	2.1
PRE-RINSE SINK - (PROVIDE 2 GPM AERATOR & SPRAYER)	1	2	2
TOTAL GALLONS PER MINUTE REQUIRED:			21.6

NOTES:
1. WATER HEATER CALCULATIONS BASED ON THE NC DIVISION OF HEALTH TANKLESS WATER HEATER CRITERIA.
2. WATER HEATERS PROVIDED: (7) NAVIEN NPE-240A TANKLESS HEATERS RATED FOR 27.3 GPM AT 100°F RISE.

OUTDOOR GREASE INTERCEPTOR CALC. - GRS1

KITCHEN EQUIPMENT	INDIRECT DRAIN SIZE (SEE NOTE 1)	QUANTITY	FLOW RATE (GPM)	RATING FACTOR	SUB-TOTAL (GPM)
UTENSIL / POT WASH SINK	1-1/2" I.D. TO 3"FS	1	15	1	15.0
MEAT PREP. SINK	1-1/2" I.D. TO 3"FS	1	15	0.75	11.25
VEGETABLE PREP. SINK	1-1/2" I.D. TO 3"FS	2	15	0.25	7.5
PRE-RINSE SINK	1-1/2" I.D. TO 3"FS	1	15	0.5	7.5
CAN WASH	3" P-TRAP	1	93	0.25	23.25
TILTING SKILLET DRAIN	1-1/2" I.D. TO 3"FS	1	15	0.25	3.75
HOOD COOKING EQUIPMENT DRAIN	1" I.D. TO 3"FS	2	5	0.25	2.5
DISHMACHINE (PEAK DRAIN RATE)	2" PUMP I.D. TO 4"FS	1	38	1.0	38
NOTE: FLOW RATE AND RATING VALUES ARE BASED ON THE MANNING FORMULA AND THE NC PLUMBING CODE.			TOTAL GPM		108.75
			RETENTION TIME		30 MIN.
			MIN. STORAGE GALLONS REQUIRED TOTAL GPM x RETENTION TIME		3,263

GREASE INTERCEPTOR - GRS1

ZURN PROCEPTOR GMC-4000 OR APPROVED EQUAL BY XERXES, FLOWTITE, OR TOWN AND COUNTRY PLASITICS. 4,000 GALLON WATER CAPACITY (TWO 2,000 GALLON TANKS), FIBERGLASS CONSTRUCTION, 6" INLETS AND OUTLETS AND 3" VENTS. PROVIDE MANWAYS TO MEET INVERT DEPTH AND H-20 TRAFFIC RATED MANHOLE COVERS ND FRAMES INSTALLED FLUSH WITH FINISHED GRADE. PROVIDE REINFORCED CONCRETE RELIEVING SLAB WHEN EASE INTERCEPTOR IS LOCATED IN AREAS WITH VEHICLE ACCESS. INSTALL PER THE MANUFACTURERS INSTRUCTIONS. COORDINATE EXACT LOCATION WITH SITE UTILITY CONTRACTOR. SEE SCHEMATIC 5/P-601

LINT INTERCEPTOR - LI-1

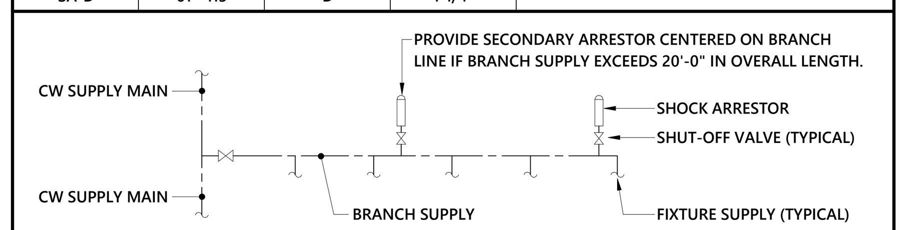
H-M COMPANY DRAIN TROUGH 4'-0"x1'-0"x1'-0" OR APPROVED EQUAL, 1/4" THICK PREFABRICATED POLYPROPYLENE LAUNDRY TRENCH RECESSED IN FLOOR WITH 3/8" THICK POLYPROPYLENE REMOVABLE LID. PROVIDE LINT SCREEN AND OPTIONAL SECOND LINT SCREEN. PROVIDE WITH 4" BOTTOM OUTLET AND 4" P'TRAP. SEE SCHEMATIC 5/P-602.

ACID WASTE NEUTRALIZATION TANK - ANT1

AT EACH LAB SINK, PROVIDE AN ACID NEUTRALIZATION DRUM TRAP EQUAL TO ZURN Z9A-PHIX, INCLUDING A GLASS-FILLED POLYPROPYLENE BODY WITH LOWER SEDIMENT CHAMBER, REMOVABLE NEUTRALIZATION CHAMBER, AND NEUTRALIZATION MEDIA . NEUTRALIZATION MEDIA SHALL CONSIST OF NON-HAZARDOUS SOLID ALKALI NON-RESIN MATERIALS. (Limestone, Marble, or Caustic Soda beads are NOT acceptable). SEE DETAIL 7/P602 .

SHOCK ARRESTOR TABLE

DRAWING SYMBOL	FIXTURE UNITS	P.D.I. WH201 DESIGNATION	ARRESTOR SIZE	REMARKS
SA-A	1 - 11	A	1/2"	INSTALL SHOCK ARRESTORS PER THE PLUMBING DRAINAGE INSTITUTE (P.D.I.) GUIDELINES. ACCEPTED MANUFACTURERS: SIOUX CHIEF, WATTS, PPP INC., ZURN
SA-B	12 - 32	B	3/4"	
SA-C	33 - 60	C	1"	
SA-D	61 - 113	D	1-1/4"	



PLUMBING SPECIALTIES SCHEDULE

SYMBOL	DESCRIPTION	CONNECTION SIZE W	V	CW	HW	SPECIFICATION	REMARKS
WMB1	WASHING MACHINE CONNECTION BOX; 14"x 9"x 3.5", 20 GAUGE STEEL WITH WHITE POWDER COATING, RECESSED IN WALL	3"	2"	1/2"	1/2"	FIXTURE: GUY GRAY T200TPPVCHA WITH WATER HAMMER ARRESTOR STOPS: INTEGRAL 1/4 TURN SUPPLIES: (2) 5/8" BRAIDED S.S. FLEXIBLE HOSES	2" DRAIN OUTLET, 2" STANDPIPE WITH 2" P-TRAP.
IDB1	INDIRECT DRAIN CONNECTION BOX; 14"x 9"x 3.5", 20 GAUGE STEEL WITH WHITE POWDER COATING, RECESSED IN WALL	2"	1-1/2"	-	-	FIXTURE: GUY GRAY T200LV WITH KNOCK-OUTS IN TOP OF BOX 2" DRAIN OUTLET WITH 2" DEEP SEAL P-TRAP	PROVIDE 2" TRAP GUARD EQUAL TO RECTORSEAL "SURE-SEAL". SEE 16/P-601
IMB1	WATER CONNECTION BOX; 7"X 7"X 3.5", 20 GAUGE STEEL WITH WHITE POWDER COATING, RECESSED IN WALL	-	-	1/2"	-	FIXTURE: GUY GRAY MIB1AB STOP: QUARTER TURN WITH SHOCK ARRESTOR SUPPLY: 1/4" FLEXIBLE HOSE	PROVIDE INLINE DOUBLE CHECK VALVE WILIKINS SERIES 700
CS-x	BALANCING VALVE, THERMOSTATIC, AUTOMATIC, SUFFIX INDICATES PIPE SIZE, SEE FLOOR PLANS	-	-	-	**	EQUIPMENT: CIRCUIT SOLVER CS SERIES, SIZES 1/2" THRU 2", NSF 61 CERTIFIED.	PROVIDE 110 MODEL
MV1	THERMOSTATIC MIXING VALVE, ASSE 1070, POINT OF USE, WITH 5"x3" FACTORY WALL MOUNT ENCLOSURE.	-	-	1/2"	1/2"	EQUIPMENT: AMERICAN STANDARD 605XTMV1070, NSF 61 CERTIFIED, WITH INTEGRAL CHECK VALVES AND SCREENS ON INLETS.	SET OUTLET TEMPERATURE TO 105°F MOUNT TIGHT TO UNDERSIDE OF LAV.
SA-x	SHOCK ARRESTOR, SUFFIX INDICATES PDI SIZE	-	-	x	-	EQUIPMENT: SIOUX CHIEF 650 SERIES, SIZES 1/2" THRU 2", NSF 61 CERTIFIED.	SEE SHOCK ARRESTOR TABLE THIS SHEET
HB1	HOSE BIBB, INTERIOR, EXPOSED, STAINLESS STEEL FACE PLATE, ANTI-SIPHON	-	-	3/4"	-	EQUIPMENT: ZURN Z1333-C-34EL, PROVIDE VACUUM BREAKER AND METAL LOOSE KEY FOR EACH HOSE BIBB	MOUNT 18" AFF
HB2	HOSE BIBB, EXTERIOR, EXPOSED, STAINLESS STEEL FACE PLATE, FREEZELESS, ANTI-SIPHON	-	-	3/4"	-	EQUIPMENT: ZURN Z1310-34EL, PROVIDE VACUUM BREAKER AND METAL LOOSE KEY FOR EACH HOSE BIBB	MOUNT 18" AFF
HB3	HOSE BIBB, EXTERIOR, EXPOSED, STAINLESS STEEL FACE PLATE, FREEZELESS, ANTI-SIPHON, DUAL TEMPERATURE, RECESSED	-	-	3/4"	3/4"	EQUIPMENT: WOODFORD HCB67 WITH TEMPERATURE CONTROL MIXING VALVE PROVIDE VACUUM BREAKER AND METAL LOOSE KEY	MOUNT 42" AFF
HB4	HOSE BIBB, EXTERIOR, ROOF MOUNTED, FREEZELESS, AUTOMATIC DRAINING, ANTI-SIPHON.	-	-	3/4"	3/4"	EQUIPMENT: WOODFORD RHY2-MS PROVIDE WITH 3/4" REMOVABLE ASSE 1052 BACKFLOW PREVENTER OUTLET	PROVIDE WITH ROOF MOUNTING BASE, UNDERDECK CLAMP. SEE DETAIL 6/P-602
CO	PLUG CLEANOUT, CAST IRON BODY	**	-	-	-	CLEANOUT: ZURN Z-1440-BP, BRONZE PLUG, CLEANOUT SIZE SHALL MATCH PIPE SIZE	GAS / WATER TIGHT
WCO	WALL CLEANOUT, CAST IRON BODY, STAINLESS STEEL WALL PLATE	**	-	-	-	CLEANOUT: ZURN Z-1446-BP, BRONZE PLUG, CLEANOUT SIZE SHALL MATCH PIPE SIZE	GAS / WATER TIGHT
FCO	FLOOR CLEANOUT, CAST IRON BODY, NICKEL BRONZE TOP, ADJUSTABLE	**	-	-	-	CLEANOUT: ZURN ZN-1400-BP, BRONZE PLUG CLEANOUT SIZE SHALL MATCH PIPE SIZE	GAS / WATER TIGHT, INSTALL TOP FLUSH WITH FINISHED FLOOR
YCO	YARD CLEANOUT, CAST IRON BODY, NICKEL BRONZE TOP, ADJUSTABLE, INSTALLED IN 18"x18"x6" CONCRETE PAD	**	-	-	-	CLEANOUT: ZURN ZN-1400-BP, BRONZE PLUG INSTALL IN 18"x 18"x 6" DEEP CONCRETE PAD	GAS / WATER TIGHT, INSTALL TOP FLUSH WITH FINISHED GRADE
FD1	FLOOR DRAIN, CAST IRON BODY, ROUND NICKEL BRONZE GRATE, ADJUSTABLE	3"	2"	-	-	DRAIN: ZURN ZN-415-B, 6" DIAMETER GRATE P-TRAP: 3" DEEP SEAL.	INSTALL TOP FLUSH WITH FINISHED FLOOR. SEE NOTE 1 BELOW.
FD2	FLOOR DRAIN, CAST IRON BODY, ROUND NICKEL BRONZE GRATE, ADJUSTABLE	3"	2"	-	-	DRAIN: ZURN ZN-415-I, 9" DIAMETER RECESSED GRATE P-TRAP: 3" CAST IRON, DEEP SEAL.	INSTALL TOP OF DRAIN LIP FLUSH WITH FLOOR. SEE NOTE 1 BELOW.
FS1	FLOOR SINK, 12"x 12"x 6" DEEP, STAINLESS STEEL BODY AND GRATE	3"	2"	-	-	DRAIN: ZURN Z1750 P-TRAP: 3" CAST IRON, DEEP SEAL	SEE KITCHEN EQUIP. PLANS FOR GRATE (FULL / QUARTER / HALF)
FS2	FLOOR TROUGH BY FOOD SERVICE EQUIPMENT CONTRACTOR STAINLESS STEEL BODY AND GRATE	4"	2"	-	-	DRAIN: PROVIDED BY F.S.E.C. INSTALLED BY P.C. P-TRAP: 4" CAST IRON, DEEP SEAL	-

NOTES:
1. PROVIDE HOSE BIBB HB1 TO SERVE AS TRAP PRIMER IN EACH ROOM WITH A FLOOR DRAIN. ALSO PROVIDE A BARRIER TYPE TRAP SEAL PROTECTION DEVICE FOR EACH FLOOR DRAIN CONFORMING TO ASSE 1072 AND EQUAL TO RECOTORSEAL"SURE-SEAL" MODEL SS3009V. INSTALL TRAP GUARDS IN THE OUTLET OF THE FLOOR DRAIN BODY (NOT IN THE STRAINER). SEE DETAIL 13/P601

** MATCH PIPE SIZE SHOWN ON PLANS, SEE PLANS.

APPROVED EQUALS:	PRODUCT TYPE:	ACCEPTED MANUFACTURERS:
THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MODEL WHICH MOST CLOSELY MATCHES THE SPECIFIED PRODUCT. PROVIDE PRODUCTS MADE BY THE MANUFACTURER'S LISTED.	SHOCK ARRESTOR HOSE BIBBS DRAINS BACKFLOW PREVENTER	SIOUX CHIEF, PPP INC., ZURN, WATTS ZURN, WOODFORD, ZURN, J.R. SMITH ZURN, J.R. SMITH, WADE WILKINS, WATTS, APOLLO

PLUMBING EQUIPMENT SCHEDULE

SYM.	DESCRIPTION	CONN. SIZE INLET	OUT	SPECIFICATION	REMARKS
WH1 TYP. OF 7	WATER HEATER, COMMERCIAL TANKLESS, GAS FIRED, WALL MOUNTED, KITCHEN	3/4"	3/4"	EQUIPMENT: RINNAI CU199iN GAS INPUT: 199,999 BTUH, RECOVERY: 3.9 GPM AT 100° RISE. ELEC: 120V, 350 WATT	SET OUTLET TEMPERATURE TO 140°F SEE NOTE 1 BELOW, SEE DETAIL 2/P601
WH2 TYP. OF 4	WATER HEATER, COMMERCIAL TANKLESS, GAS FIRED, WALL MOUNTED, CLASSROOMS	3/4"	3/4"	EQUIPMENT: RINNAI CU199iN GAS INPUT: 199,999 BTUH, RECOVERY: 5.6 GPM AT 67° RISE. ELEC: 120V , 350 WATT	SET OUTLET TEMPERATURE TO 110°F SEE NOTE 1 BELOW, SEE DETAIL 3/P601
WH3 TYP. OF 3	WATER HEATER, COMMERCIAL TANKLESS, GAS FIRED, WALL MOUNTED, GYMNASIUM / LOCKER ROOMS	3/4"	3/4"	EQUIPMENT: RINNAI CU199iN GAS INPUT: 199,999 BTUH, RECOVERY: 5.6 GPM AT 67° RISE. ELEC: 120V , 350 WATT	SET OUTLET TEMPERATURE TO 110°F SEE NOTE 1 BELOW, SEE DETAIL 4/P601
WH4 TYP. OF 2	WATER HEATER, COMMERCIAL TANK TYPE ELECTRIC, WALL MOUNTED, CONCESSIONS BUILDINGS	3/4"	3/4"	EQUIPMENT: A.O. SMITH DEL 20 RECOVERY: 5.6 GPM AT 67° RISE. ELEC: 3 KW, 208V, 1 PHASE	SET OUTLET TEMPERATURE TO 110°F SEE NOTE 2, SEE DETAIL 6/P601
ET1, ,2,3,4	THERMAL EXPANSION TANK 4.4 GALLON CAPACITY	3/4"	-	EQUIPMENT: AMTROL ST-12 MAX. ACCEPTANCE = 3.2 GAL.	SUPPORT FROM WALL, DO NOT HANG FROM SUPPLY PIPING.
RCP1	CIRCULATION PUMP STAINLESS STEEL CONSTRUCTION	3/4"	3/4"	PUMP: B&G ECOCIRC 18-20 SS, RATED FOR 9 GPM AT 10' HEAD ELEC: 10-70 WATT, 120V	SEE NOTE 1
RCP2	CIRCULATION PUMP STAINLESS STEEL CONSTRUCTION	1-1/4"	1-1/4"	PUMP: B&G ECOCIRC XL N 45-55, RATED FOR 20 GPM AT 35' HEAD ELEC: 1/2 HP, 208V, SINGLE PHASE	SEE NOTE 1
RCP3	CIRCULATION PUMP STAINLESS STEEL CONSTRUCTION	3/4"	3/4"	PUMP: B&G ECOCIRC 18-20 SS, RATED FOR 9 GPM AT 10' HEAD ELEC: 10-70 WATT, 120V	SEE NOTE 1
RCP4	CIRCULATION PUMP STAINLESS STEEL CONSTRUCTION	3/4"	3/4"	PUMP: B&G ECOCIRC 18-20 SS, RATED FOR 9 GPM AT 10' HEAD ELEC: 10-70 WATT, 120V	SEE NOTE 2
SP1	ELEVATOR SUMP PUMP AND HIGH WATER ALARM WITH AUDIBLE & VISUAL ALARMS, INTERLOCK WITH BUILDING MANAGEMENT SYSTEM.	-	2"	PUMP: LIBERTY 291 HIGH WATER LEVEL ALARM: LIBERTY ALM-2 FLOW: 50 GPM AT 22 FT. HEAD ELECTRICAL: 3/4 H.P, 120V	PROVIDE CHECK VALVE AND SHUT-OFF VALVE ON DISCHARGE LINE. SEE SCHEMATIC 17/P601.

NOTES:
1. COMMERCIAL GAS FIRED WATER HEATER SHALL EXCEED A 96% THERMAL EFFICIENCY RATING, WITH A 5 YEAR WARRANTY, STAINLESS STEEL BURNERS, REDUNDANT GAS VALVES, SEALED COMBUSTION CHAMBER, FAN ASSISTED COMBUSTION, ASME 150 PSI WORKING PRESSURE, INLET AND OUTLET TEMPERATURE GAUGE, TEMP GAUGE, 150 PSI T&P RELIEF VALVE, OPERATING LIMIT AND HIGH LIMIT CONTROLS, U.L. AND FM APPROVED GAS TRAIN, 100% SAFETY SHUTDOWN AND LOW NOX EMISSIONS. PROVIDE FACTORY CONDENSATE NEUTRALIZATION KIT. WATER HEATER SHALL EXCEED ASHRAE 90.1 REQUIREMENTS. INTERLOCK WATER HEATERS AND ASSOCIATED CIRCULATION PUMPS WITH BUILDING AUTOMATION SYSTEM (BAS). WATER HEATERS AND CIRCULATION PUMPS SHALL BE DISABLED THROUGH (BAS) SYSTEM DURING UNOCCUPIED HOURS. PROVIDE WATER HEATER / CIRCULATION PUMP CONTROL PANEL COMPATIBLE WITH THE BAS SYSTEM.

2. COMMERCIAL ELECTRIC WATER HEATER, WITH A 5 YEAR WARRANTY, ASME 150 PSI WORKING PRESSURE, INLET AND OUTLET TEMPERATURE GAUGE, 150 PSI T&P RELIEF VALVE, OPERATING LIMIT AND HIGH LIMIT CONTROLS. WATER HEATER SHALL EXCEED ASHRAE 90.1 REQUIREMENTS. INTERLOCK ASSOCIATED CIRCULATION PUMP WITH AN AQUA-STAT AND AN ON/OFF SWITCH.

** MATCH PIPE SIZE SHOWN ON PLANS, SEE PLANS.

APPROVED EQUALS:	PRODUCT TYPE:	ACCEPTED MANUFACTURERS:
THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MODEL WHICH MOST CLOSELY MATCHES THE SPECIFIED PRODUCT. PROVIDE PRODUCTS MADE BY THE MANUFACTURER'S LISTED.	WATER HEATERS EXPANSION TANKS PUMPS	RINNAI, A.O. SMITH, NAVIEN, STATE AMTROL, A.O. SMITH, WATTS, WESSLES B&G, TACO, ARMSTRONG

PLUMBING FIXTURE SCHEDULE

SYMBOL	DESCRIPTION	CONNECTION SIZE W	V	CW	HW	SPECIFICATION	REMARKS
P1	TOILET ELONGATED, WHITE VITREOUS CHINA, FLOOR MOUNTED (1.28 GPF) MANUAL OPERATED FLUSH VALVE	4"	2"	1-1/4"	-	FIXTURE: AMERICAN STANDARD 2234.001 "MADERA" FLUSH VALVE: SLOAN 111-1.28-DFB "SLOAN" DUAL FILTERED BYPASS CHLORAMINE RESISTANT DIAPHRAGM SEAT: AMERICAN STANDARD 5901.100 ANTI-MICROBIAL (WHITE)	15" RIM HEIGHT.
P1A	TOILET, A.D.A. COMPLIANT ELONGATED, WHITE VITREOUS CHINA, FLOOR MOUNTED (1.28 GPF) MANUAL OPERATED FLUSH VALVE	4"	2"	1-1/4"	-	FIXTURE: FIXTURE: AMERICAN STANDARD 3461.001 "MADERA" FLUSH VALVE: SLOAN 111-1.28-DFB "SLOAN" DUAL FILTERED BYPASS DIAPHRAGM AND CHLORAMINE RESISTANT DIAPHRAGM SEAT: AMERICAN STANDARD 5901.100 ANTI-MICROBIAL (WHITE)	17" RIM HEIGHT
P2	URINAL, A.D.A. COMPLIANT WHITE VITREOUS CHINA, CARRIER MOUNTED, (0.125 GPF) MANUAL OPERATED FLUSH VALVE	2"	2"	3/4"	-	FIXTURE: AMERICAN STANDARD 6590.001 "WASHBROOK" FLUSH VALVE: SLOAN 186-0.125-DBP DUAL BYPASS CHLORAMINE RESISTANT DIAPHRAGM	SEE NOTE 1 BELOW
P2A	URINAL, A.D.A. COMPLIANT WHITE VITREOUS CHINA, CARRIER MOUNTED, (0.125 GPF) MANUAL OPERATED FLUSH VALVE	2"	2"	3/4"	-	FIXTURE: AMERICAN STANDARD 6590.001 "WASHBROOK" FLUSH VALVE: SLOAN 186-0.125-DBP DUAL BYPASS CHLORAMINE RESISTANT DIAPHRAGM	SEE NOTE 1 BELOW
P3	LAVATORY, A.D.A. COMPLIANT, 20"x18" RECTANGULAR BOWL, WHITE ENAMELED CAST IRON, CARRIER MOUNTED, 4" CENTER FAUCET HOLES, METERING FAUCET PUSH LEVER HANDLES (0.5 GPM) VANDAL RESISTANT AERATOR (0.1 GPC)	2"	1-1/2"	1/2"	1/2"	FIXTURE: AMERICAN STANDARD 0356.927 "LUCERNE" FAUCET: DELTA 86T1153 GRID DRAIN: ZURN 8743; P-TRAP: ZURN Z-8701 (1-1/4"x1-1/2", 17 GA.) SUPPLIES/STOPS: ZURN 8806-XL-LR-LK	SEE NOTES 2 & 4 BELOW. PROVIDE ASSE 1070 MIXING VALVE MV1 TIGHT TO UNDERSIDE OF LAVATORY
P3A	LAVATORY, A.D.A. COMPLIANT, 20"x18" RECTANGULAR BOWL, WHITE ENAMELED CAST IRON, CARRIER MOUNTED, 4" CENTER FAUCET HOLES, METERING FAUCET PUSH LEVER HANDLE (0.5 GPM) VANDAL RESISTANT AERATOR (0.1 GPC)	2"	1-1/2"	1/2"	-	FIXTURE: AMERICAN STANDARD 0356.927 "LUCERNE" FAUCET: DELTA 87T104 WITH 4" BASE PLATE GRID DRAIN: ZURN 8743; P-TRAP: ZURN Z-8701 (1-1/4"x1-1/2", 17 GA.) SUPPLY/STOP: ZURN 8806-XL-LR-LK	SEE NOTES 2 & 4 BELOW COLD WATER ONLY
P3H	LAVATORY, A.D.A. COMPLIANT, 20"x18" RECTANGULAR BOWL, WHITE ENAMELED CAST IRON, CARRIER MOUNTED, 4" CENTER FAUCET HOLES, MANUAL FAUCET WITH WRIST BLADE HANDLES (0.5 GPM) VANDAL RESISTANT AERATOR	2"	1-1/2"	1/2"	1/2"	FIXTURE: ELKAY ELVWO22193 FAUCET: DELTA 27C4934-TI GRID DRAIN: ZURN 8743; P-TRAP: ZURN Z-8701 (1-1/4"x1-1/2", 17 GA.) SUPPLIES/STOPS: ZURN 8806-XL-LR-LK	SEE NOTES 2 & 4 BELOW PROVIDE ASSE 1070 MIXING VALVE MV1 TIGHT TO UNDERSIDE OF LAVATORY
P4	WATER COOLER, A.D.A. COMPLIANT, STAINLESS STEEL FINISH, SINGLE BOWL, VANDAL RESISTANT, CARRIER MOUNTED, INTEGRAL WATER FILTER, SENSOR OPERATED BOTTLE FILLER WITH AUTO SHUT-OFF.	2"	1-1/2"	1/2"	-	FIXTURE: MURDOCK A171408F-VR-WF3 ELEC: 260 WATT, 120 VOLT, SINGLE PHASE P-TRAP: McGUIRE 8902C (1-1/4"x1-1/2", 17 GA.) SUPPLY/STOP: ZURN 8806-XL-LR-LK	PROVIDE CANE APRON WHEN WATER COOLER IS LOCATED ON AN EXPOSED WALL. SEE NOTE 3 BELOW
P4A	WATER COOLER & BOTTLE FILLER, A.D.A. COMPLIANT, STAINLESS STEEL FINISH, SINGLE BOWL, VANDAL RESISTANT, CARRIER MOUNTED, INTEGRAL WATER FILTER, SENSOR OPERATED BOTTLE FILLER WITH AUTO SHUT-OFF.	2"	1-1/2"	1/2"	-	FIXTURE: MURDOCK A171408F-VR-WF3-BF12 ELEC: 260 WATT, 120 VOLT, SINGLE PHASE P-TRAP: McGUIRE 8902C (1-1/4"x1-1/2", 17 GA.) SUPPLY/STOP: ZURN 8806-XL-LR-LK	PROVIDE CANE APRON WHEN WATER COOLER IS LOCATED ON AN EXPOSED WALL. SEE NOTE 3 BELOW
P4B	WATER COOLER & BOTTLE FILLER, A.D.A. COMPLIANT, STAINLESS STEEL FINISH, BI-LEVEL DOUBLE BOWL, VANDAL RESISTANT, CARRIER MOUNTED, INTEGRAL WATER FILTER, SENSOR OPERATED BOTTLE FILLER WITH AUTO SHUT-OFF.	2"	1-1/2"	1/2"	-	FIXTURE: MURDOCK A172408F-VR-WF3-BF12 ELEC: 335 WATT, 120 VOLT, SINGLE PHASE P-TRAP: McGUIRE 8902C (1-1/4"x1-1/2", 17 GA.) SUPPLY/STOP: ZURN 8806-XL-LR-LK	PROVIDE CANE APRON WHEN WATER COOLER IS LOCATED ON AN EXPOSED WALL. SEE NOTE 3 BELOW
P4C	DRINKING FOUNTAIN BOTTLE FILLER, A.D.A. COMPLIANT, FREEZE RESISTANT, RECESSED, STAINLESS STEEL FINISH, TWO-LEVEL, DOUBLE BOWL, CARRIER MOUNTED, INTEGRAL WATER FILTER, SENSOR OPERATED BOTTLE FILLER WITH AUTO SHUT-OFF.	2"	1-1/2"	1/2"	-	FIXTURE: MURDOCK M-OBR4-GRD-FRA3-SK7 ELEC: 335 WATT, 120 VOLT, SINGLE PHASE P-TRAP: McGUIRE 8902C (1-1/4"x1-1/2", 17 GA.) SUPPLY/STOP: ZURN 8806-XL-LR-LK	PROVIDE CANE APRON. SEE NOTE 3 BELOW
P5	S.S. SINK, A.D.A. COMPLIANT 25"L x 21"W x 6"D, SINGLE BOWL 18 GAUGE STAINLESS STEEL SELF RIMMING, COUNTER MOUNTED PROVIDE (1.5 GPM) AERATOR	2"	1-1/2"	1/2"	1/2"	FIXTURE: ELKAY LRAD2521 FAUCET: DELTA 26C3933-LS-TI BASKET STRAINER: ZURN Z-8740 P-TRAP: ZURN 8703 (1-1/2"x2", 17 GA.) SUPPLY/STOP: ZURN 8806-XL-LR-LK	PROVIDE SOLIDS TRAP FOR ALL ART ROOM SINKS EQUAL TO ZURN Z-1180 IN LIEU OF A P-TRAP SEE NOTE 4 BELOW
P5A	STAINLESS STEEL SCULLERY SINK 57" x 27-1/2" x 44" (27" x 24" BOWLS) DOUBLE BOWL 16 GAUGE STAINLESS STEEL, SELF RIMMING PROVIDE (1.5 GPM) AERATOR	2"	1-1/2"	1/2"	1/2"	FIXTURE: ELKAY WNSF82542 FAUCET: DELTA 28C4233-AC BASKET STRAINERS: (2) ZURN Z-8740 P-TRAP: ZURN 8703 (1-1/2" x 2", 17 GA.) SUPPLY/STOP: ZURN 8806-XL-LR-LK	PROVIDE OVERFLOW DRILLING CENTERED IN SINK 2" BELOW DRAIN BOARD ELEVATION.
P6	MOP SINK, 24"x 24"x 12" TERRAZZO BASIN, 6" DROP FRONT WITH STAINLESS STEEL THRESHOLD CAP, 36" HIGH STAINLESS STEEL WALL GUARDS, SERVICE FAUCET WITH EMERGENCY EYEWASH/DRENCH HOSE WALL MOUNTED WITH DUAL SPRAY HEADS, SQUEEZE VALVE OPERATED, HOSE, MOP HANGER BRAKET.	3"	2"	1/2"	1/2"	FIXTURE: FIAT TSB3010, 830AA, 832AA, (2) MSG3624 FAUCET: DELTA 28T9, EYE/FACE WASH: BRADELY S1944011BBC THERMOSTATIC MIXING VALVE: BRADLEY S19-2000-EFX8 DRAIN: 3" STAINLESS STEEL SLOTTED, P-TRAP: 3" DEEP SEAL, CAST IRON SUPPLY/STOP: ZURN 8806-XL-LR-LK	PROVIDE CHECK VALVES ON HW AND CW SUPPLIES. PROVIDE BRAIDED STAINLESS STEEL FLEXIBLE HOSE AND WALL BRACKET FOR EYEWASH.
P7	SHOWER, PRESSURE BALANCED SHOWER VALVE WITH 2 GPM WALL MOUNTED SHOWER HEAD.	2"	2"	1/2"	1/2"	FIXTURE: TILED WALLS AND EPOXY FLOORS BY G.C. SHOWER VALVE: BRADLEY S59-1005, SHOWER HEAD: BRADELY AS PROVIDE FLOOR DRAIN 2" FD1	COORDINATE RIGHT OR LEFT HAND CONTROLS WITH ARCHITECTURAL PLANS AND ELEVATIONS
P7A	SHOWER, ADA COMPLIANT, PRESSURE BALANCED SHOWER VALVE WITH 1.5 GPM WALL MOUNTED SHOWER HEAD WITH HAND HELD SHOWER AND SLIDE BAR.	2"	2"	1/2"	1/2"	FIXTURE: TILED WALLS AND EPOXY FLOORS BY G.C. SHOWER VALVE: BRADLEY S59-1005, SHOWER HEAD: BRADELY AS DIVERTER VALVE: BRADLEY DV, HAND HELD SHOWER / SLIDEBAR: BRADLEY B24 PROVIDE FLOOR DRAIN 2" FD1	COORDINATE RIGHT OR LEFT HAND CONTROLS WITH ARCHITECTURAL PLANS AND ELEVATIONS

NOTES:
1. SEE ARCHITECTURAL PLANS FOR MOUNTING HEIGHT. PROVIDE A FLOOR MOUNTED PLATE STYLE CARRIER EQUAL TO ZURN Z1222-EZ (-SL) SERIES. WHEN CARRIER IS LOCATED BEHIND A BLOCK WALL, PROVIDE EXTENDED STUD LENGTHS TO COMPENSATE FOR THE BLOCK WALL THICKNESS.
2. SEE ARCHITECTURAL PLANS FOR MOUNTING HEIGHT. PROVIDE A FLOOR MOUNTED, ADJUSTABLE CONCEALED ARM CARRIER EQUAL TO ZURN Z1231-EZ (-SL) SERIES. WHEN CARRIER IS LOCATED BEHIND BLOCK WALL, PROVIDE EXTENDED CONCEALED ARM SLEEVES TO COMPENSATE FOR THE BLOCK WALL THICKNESS.
3. SEE ARCHITECTURAL PLANS FOR MOUNTING HEIGHT. PROVIDE A FLOOR MOUNTED PLATE STYLE CARRIER EQUAL TO ZURN Z1225-EZ (-SL) SERIES. WHEN CARRIER IS LOCATED BEHIND A BLOCK WALL, PROVIDE EXTENDED STUD LENGTHS TO COMPENSATE FOR THE BLOCK WALL THICKNESS.
4. PROVIDE PRE-MANUFACTURED A.D.A. COMPLIANT INSULATION KIT FOR EXPOSED P'TRAP AND SUPPLY TRIM UNDER SINK.
5. PROVIDE HEAVY DUTY CAST IRON CLOSET FLANGE WITH COMPRESSION SEAL AND TEST CAP EQUAL TO ZURN CF2980-CI4. OFFSET FLANGES ARE NOT ACCEPTABLE.

** MATCH PIPE SIZE SHOWN ON PLANS, SEE PLANS.

APPROVED EQUALS:	PRODUCT TYPE:	ACCEPTED MANUFACTURERS:
THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MODEL WHICH MOST CLOSELY MATCHES THE SPECIFIED PRODUCT. PROVIDE PRODUCTS MADE BY THE MANUFACTURER'S LISTED.	VITREOUS CHINA FLUSH VALVES ENAMELED CAST IRON CARRIERS STAINLESS STEEL SINKS FAUCETS WATER COOLERS SUPPLIES, STOPS HOSE BIBBS UTILITY SINKS SHOWER VALVES	KOHLER, AMERICAN STANDARD, ZURN, SLOAN DELANEY, ZURN, SLOAN KOHLER, AMERICAN STANDARD, ZURN ZURN, J.R. SMITH, WADE ELKAY, JUST, ADVANCE TABCO DELTA, MOEN, AMERICAN STANDARD MURDOCK, ELKAY, HALSEY TAYLOR ZURN, MCGUIRE, BRASSCRAFT ZURN, J.R. SMITH, WOODFORD FIAT, FLORESTONE, STERN WILLIAMS AMERICAN STANDARD, BRADLEY, SYMMONS

PLUMBING FIXTURE SCHEDULE (LAB SPACES)

SYMBOL	DESCRIPTION	CONNECTION SIZE W	V	CW	HW	SPECIFICATION	REMARKS
L1	LAB SINK FAUCET, ADA COMPLIANT 6" FIXED SPOUT, VACUUM BREAKER, 1.5 GPM SERRATED TIP, SINGLE HOLE DRILLING.	2"	1-1/2"	1/2"	1/2"	SINK: SUPPLIED BY LAB EQUIP. SUPPLIER, INSTALLED BY P.C. FAUCET: MOEN 8116 BY P.C. PROVIDE ACID WASTE NEUTRALIZATION DRUM TRAP: ANT1 STRAINER: ZURN Z9A-WA-112-B SUPPLIES/STOPS: ZURN 8806-XL-LR-LK	GRID DRAIN, TAIL PIECE AND WASTE PIPING FROM SINK TO NEUTRALIZATION TANK SHALL BE ACID RESISTANT. SEE DETAIL 7/P-602.
ES1	EMERGENCY EYEWASH & SHOWER, ADA COMPLIANT, WALL MOUNTED EYEWASH, CEILING MOUNTED SHOWER, STAINLESS STEEL FINISH	2"	1-1/2"	1"	1"	EYEWASH: BRADLEY S19-224SC SHOWER: BRADLEY S19-130SSBF THERMOSTATIC MIXING VALVE: BRADLEY S19-2100EFX25 PROVIDE P-TRAP FOR EYEWASH DRAIN, PROVIDE STAINLESS STEEL SUPPLY PIPING FOR EXPOSED PIPING TO EMERGENCY SHOWER HEAD	PROVIDE TEST KIT WITH BUCKET. ANSI Z358.1 COMPLIANT. SEE DETAIL 9/P-602.
EW1	EMERGENCY EYEWASH, ADA COMPLIANT COUNTER MOUNTED, HAND HELD	-	-	1/2"	1/2"	FIXTURE: BRADLEY S19-460EFW THERMOSTATIC MIXING VALVE: BRADLEY S19-2000EFX8	ANSI Z358.1 COMPLIANT. SEE DETAIL 10/P-602.

NOTES:
1. PROVIDE HOSE BIBB TO SERVE AS TRAP PRIMER IN EACH ROOM WITH A FLOOR DRAIN, SEE PLANS.

** MATCH PIPE SIZE SHOWN ON PLANS, SEE PLANS.

APPROVED EQUALS:	PRODUCT TYPE:	ACCEPTED MANUFACTURERS:
THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MODEL WHICH MOST CLOSELY MATCHES THE SPECIFIED PRODUCT. PROVIDE PRODUCTS MADE BY THE MANUFACTURER'S LISTED.	EMERGENCY FIXTURES ACID WASTE SPECIALTY FAUCETS	BRADLEY, GUARDIAN, SPEAKMAN ORION, ZURN, IPEX DELTA, ZURN, BRADLEY

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

PLUMBING SCHEDULES

P-002

Optima # 22-0082

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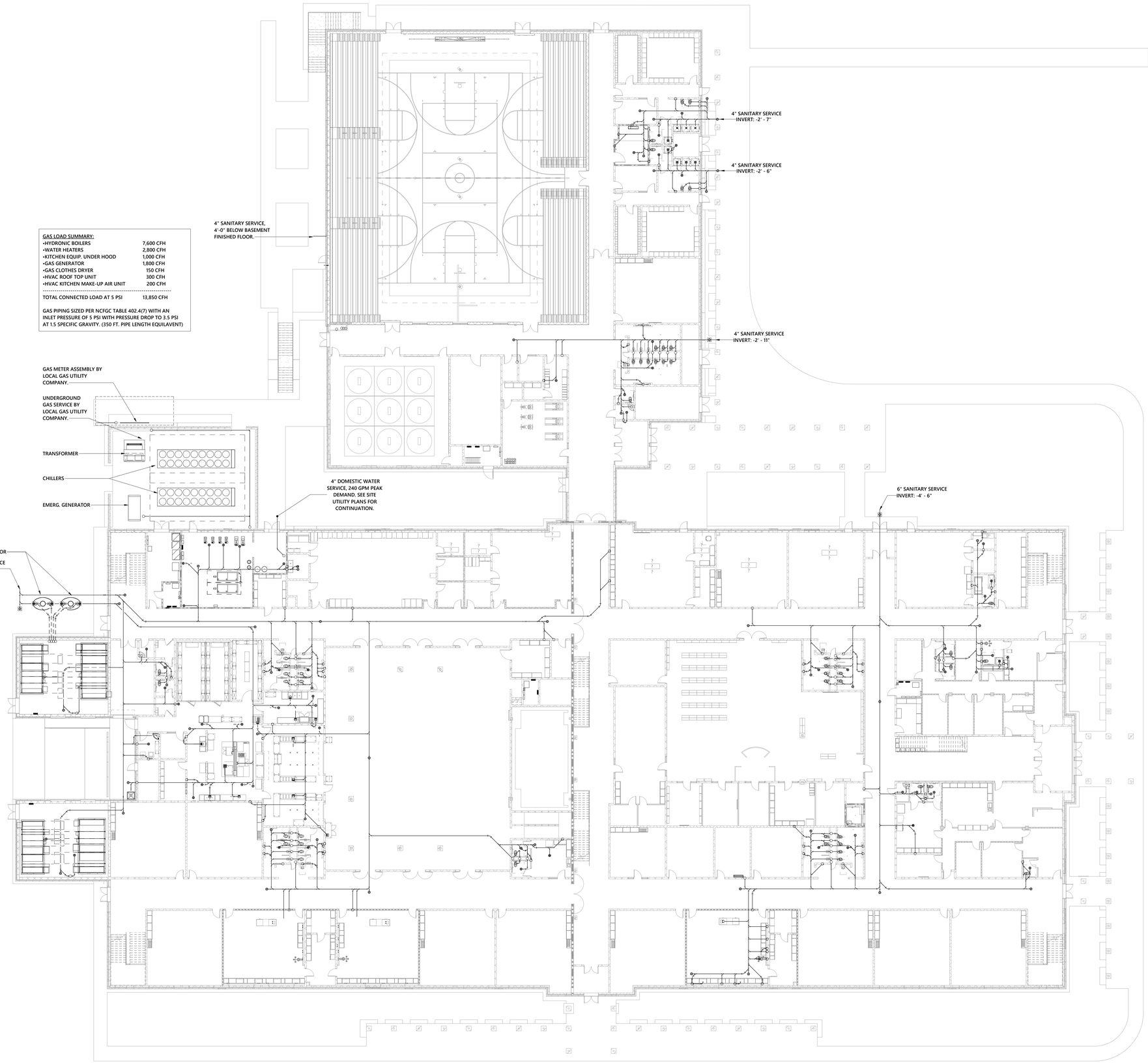

GAS LOAD SUMMARY:

•HYDRONIC BOILERS	7,600 CFH
•WATER HEATERS	2,800 CFH
•KITCHEN EQUIP. UNDER HOOD	1,000 CFH
•GAS GENERATOR	1,800 CFH
•GAS CLOTHES DRYER	150 CFH
•HVAC ROOF TOP UNIT	300 CFH
•HVAC KITCHEN MAKE-UP AIR UNIT	200 CFH
TOTAL CONNECTED LOAD AT 5 PSI	13,850 CFH

GAS PIPING SIZED PER NCFGC TABLE 402.4(7) WITH AN INLET PRESSURE OF 5 PSI WITH PRESSURE DROP TO 3.5 PSI AT 1.5 SPECIFIC GRAVITY. (350 FT. PIPE LENGTH EQUILAVENT)

1 OVERALL FIRST FLOOR PLUMBING PLAN
1/16" = 1'-0"

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1	AGENCY REVIEW	11-11-2022

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OVERALL FIRST FLOOR PLUMBING PLAN

P-010

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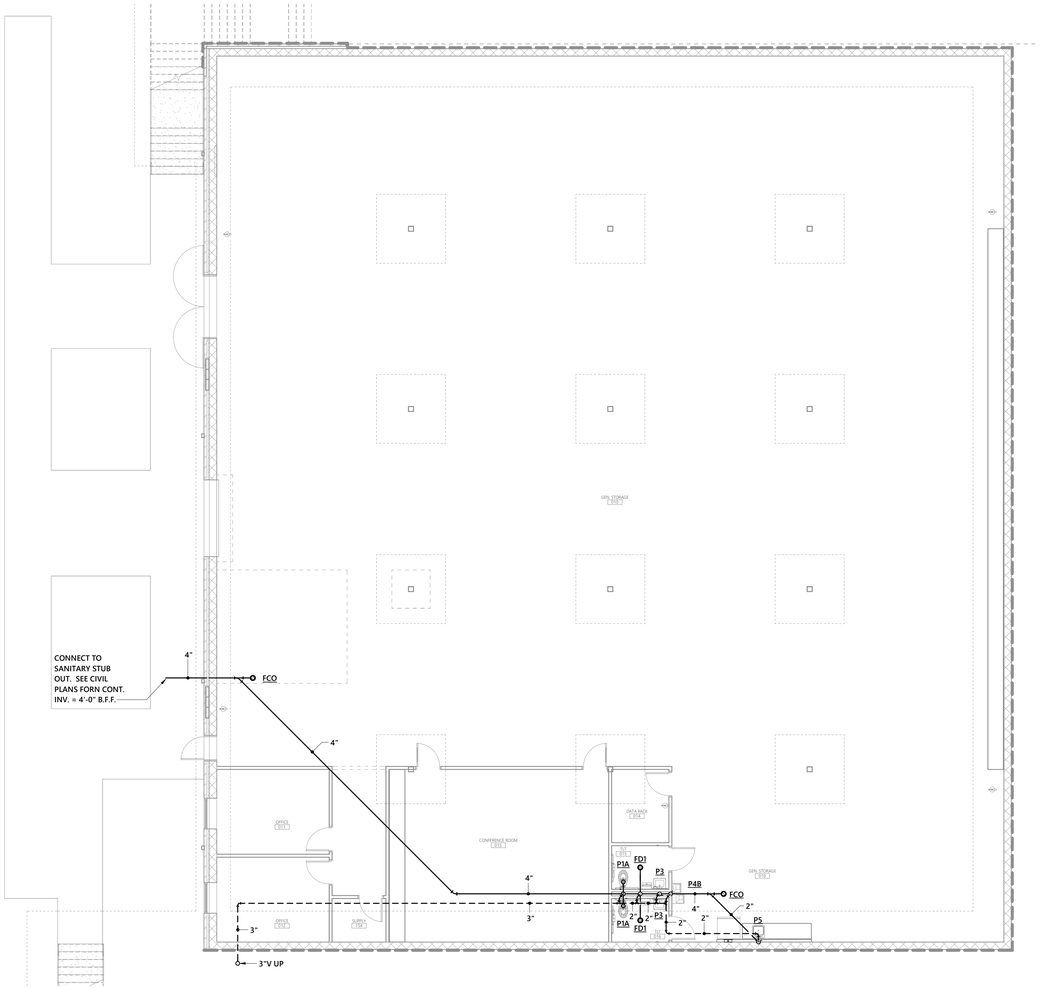


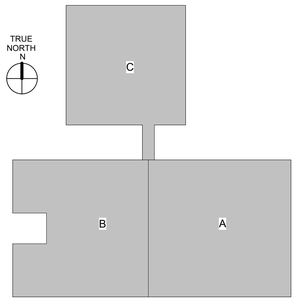
1 BASEMENT DRAINAGE PIPING PLAN
1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

BASEMENT FLOOR DRAINAGE PIPING PLAN

P-100

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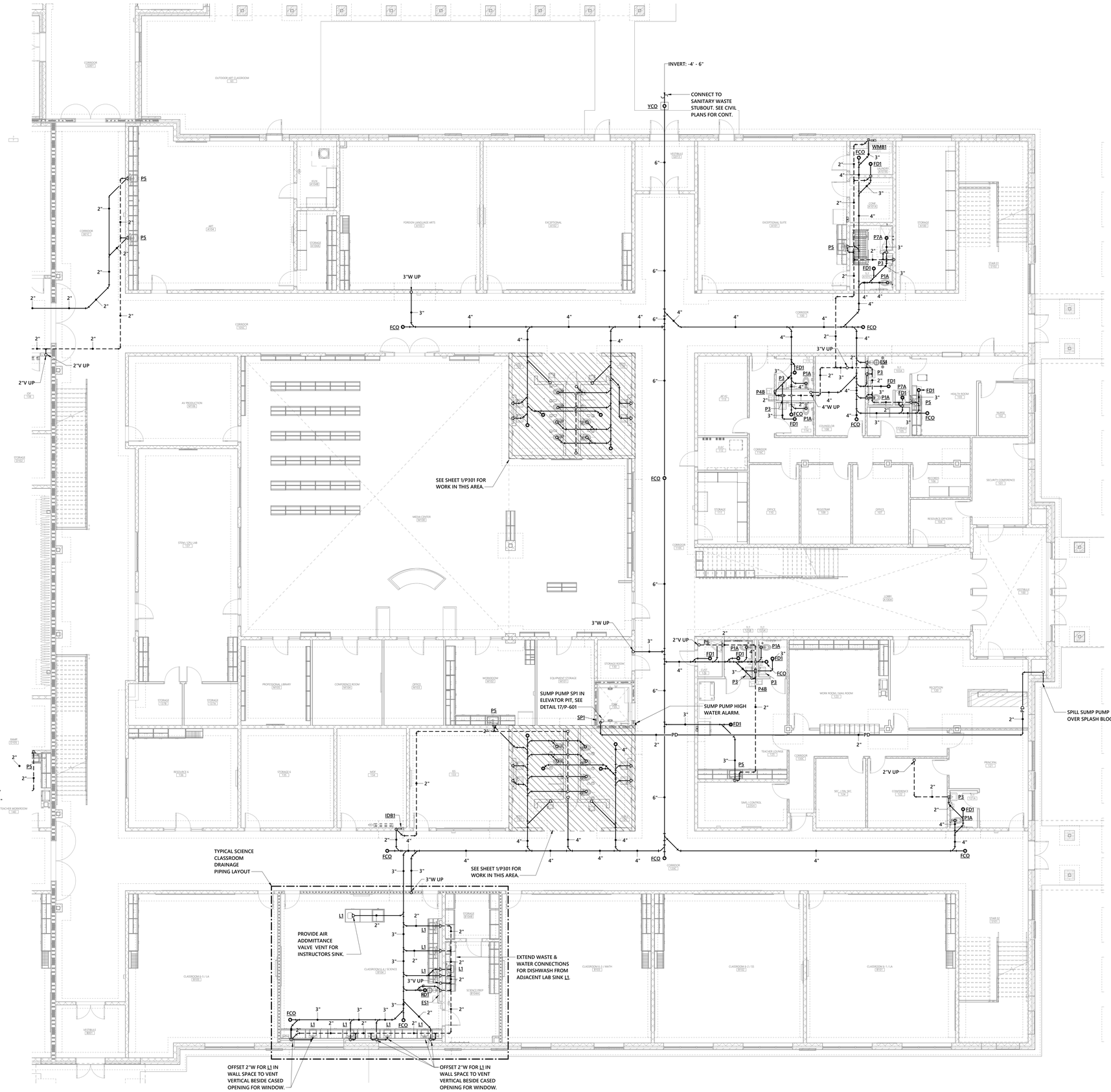

1 FIRST FLOOR DRAINAGE PIPING PLAN - AREA A

1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

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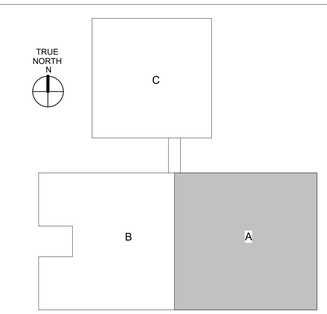
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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FIRST FLOOR DRAINAGE PIPING PLAN AREA A

P-101A

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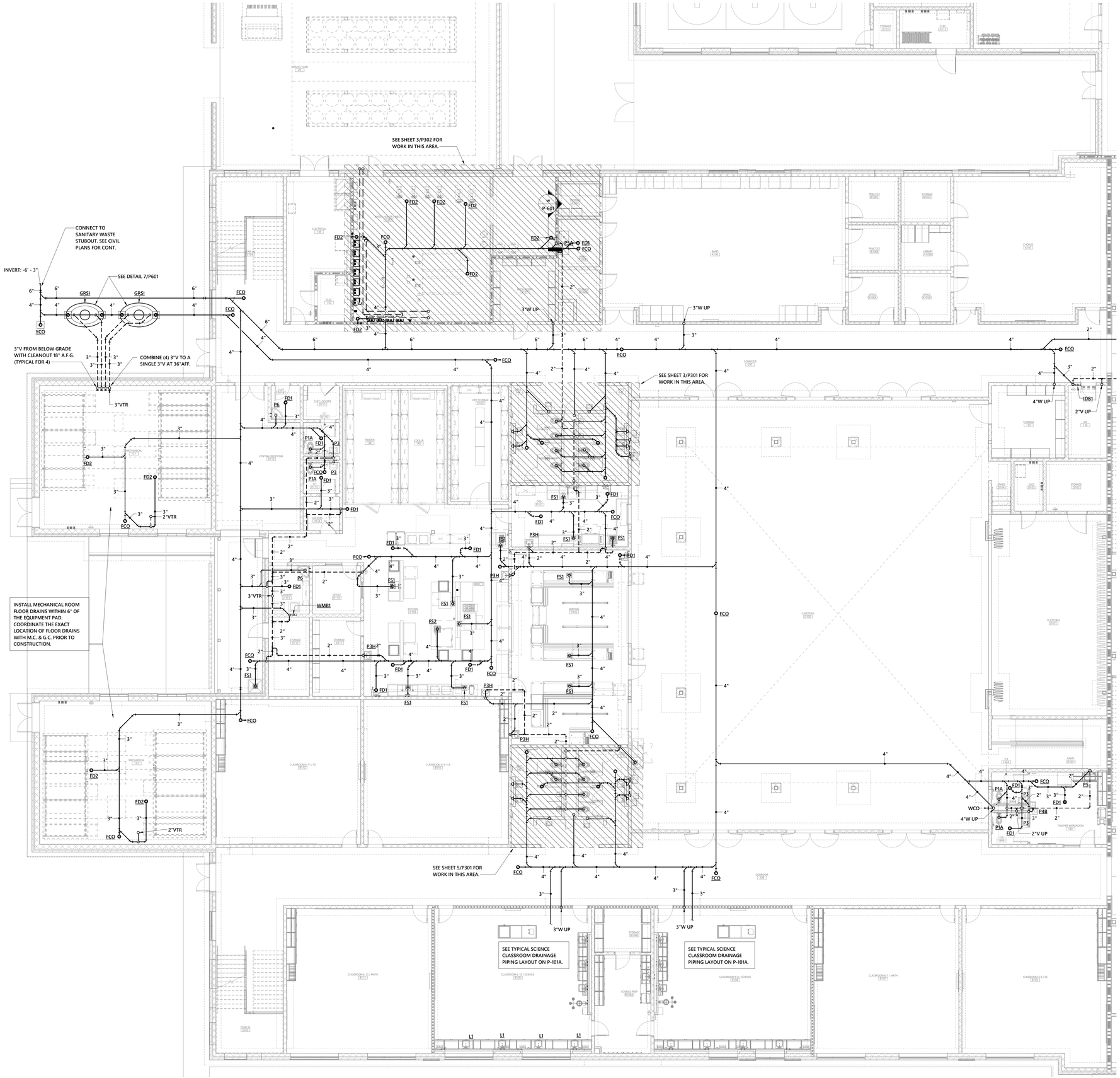

1 FIRST FLOOR DRAINAGE PIPING PLAN - AREA B
1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

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- NON-RATED METAL STUD PARTITION TO DECK
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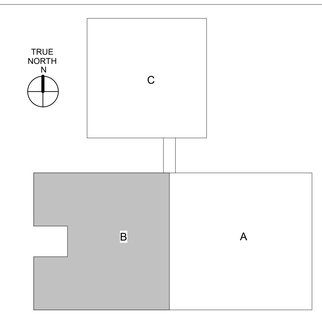

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FIRST FLOOR DRAINAGE PIPING PLAN AREA B

P-101B

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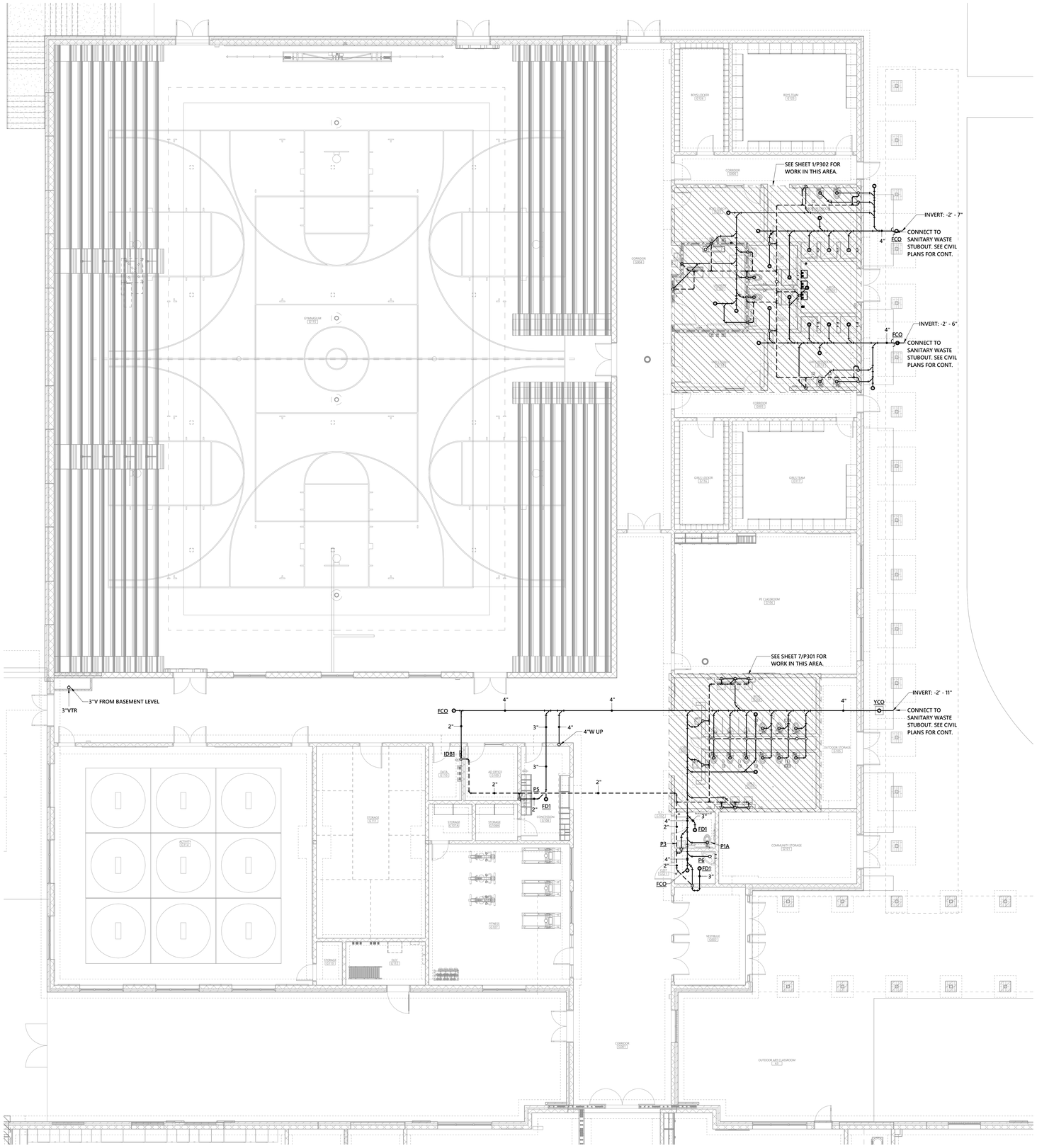

1 FIRST FLOOR DRAINAGE PIPING PLAN - AREA C

1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

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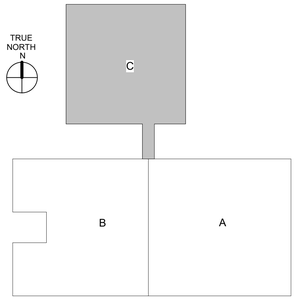
KEY PLAN



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FIRST FLOOR DRAINAGE PIPING PLAN AREA C

P-101C

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1 SECOND FLOOR DRAINAGE PIPING PLAN - AREA A

1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
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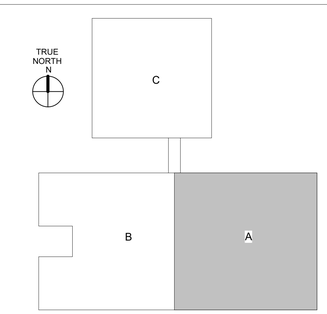

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SECOND FLOOR DRAINAGE PIPING PLAN AREA A

P-102A

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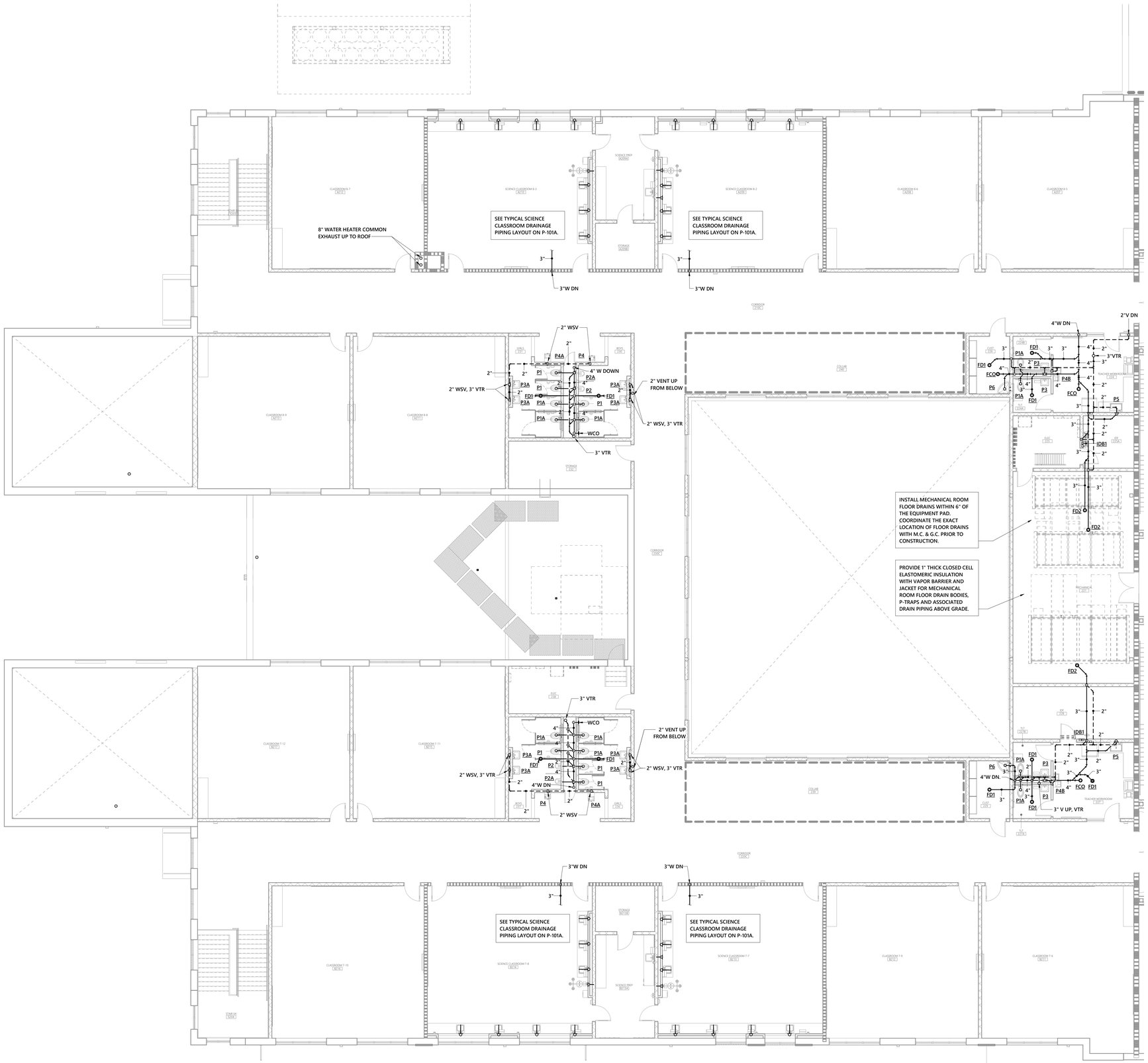

1 SECOND FLOOR DRAINAGE PIPING PLAN - AREA B
1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

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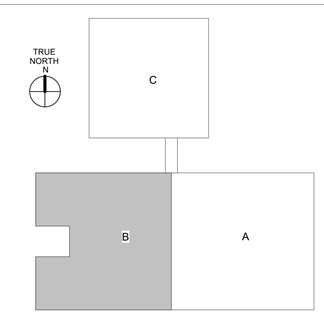

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SECOND FLOOR DRAINAGE PIPING PLAN AREA B

P-102B

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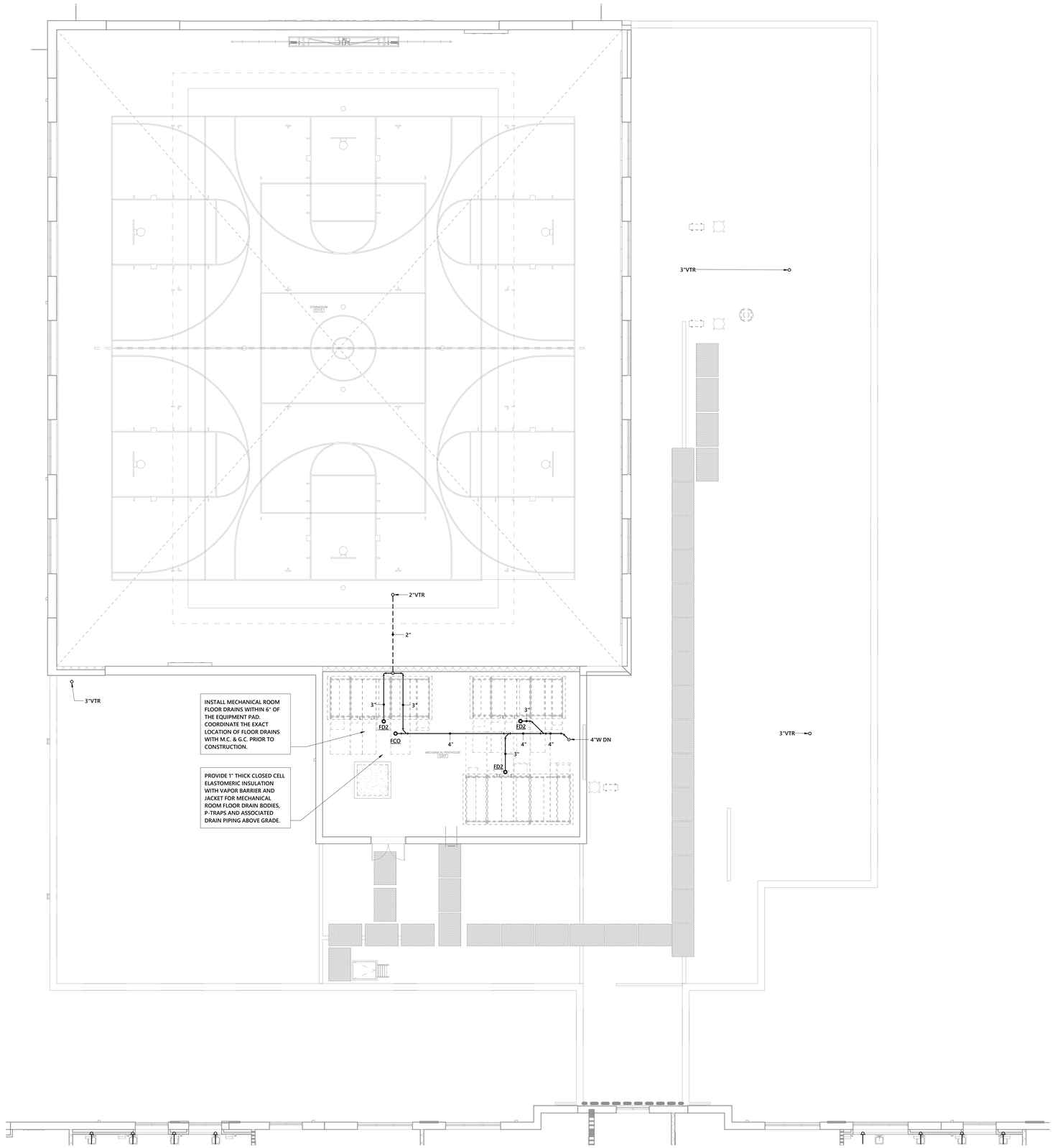

1 SECOND FLOOR DRAINAGE PIPING PLAN - AREA C

1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
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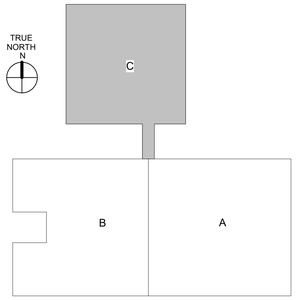

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SECOND FLOOR DRAINAGE PIPING PLAN AREA C

P-102C

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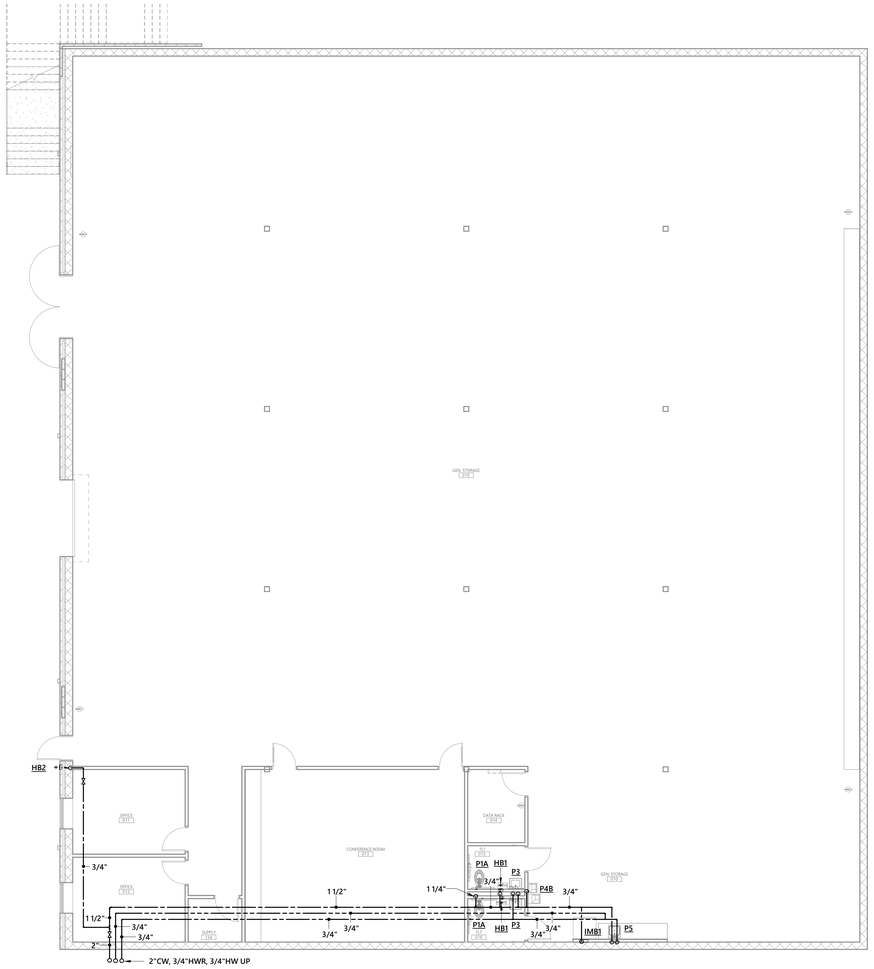

1 BASEMENT SUPPLY PIPING PLAN

1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

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- NON-RATED CMU PARTITION
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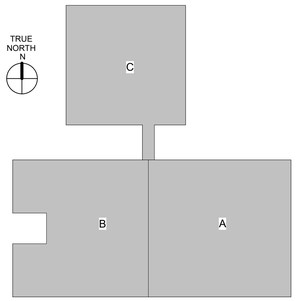
KEY PLAN



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BASEMENT FLOOR SUPPLY PIPING PLAN

P-200

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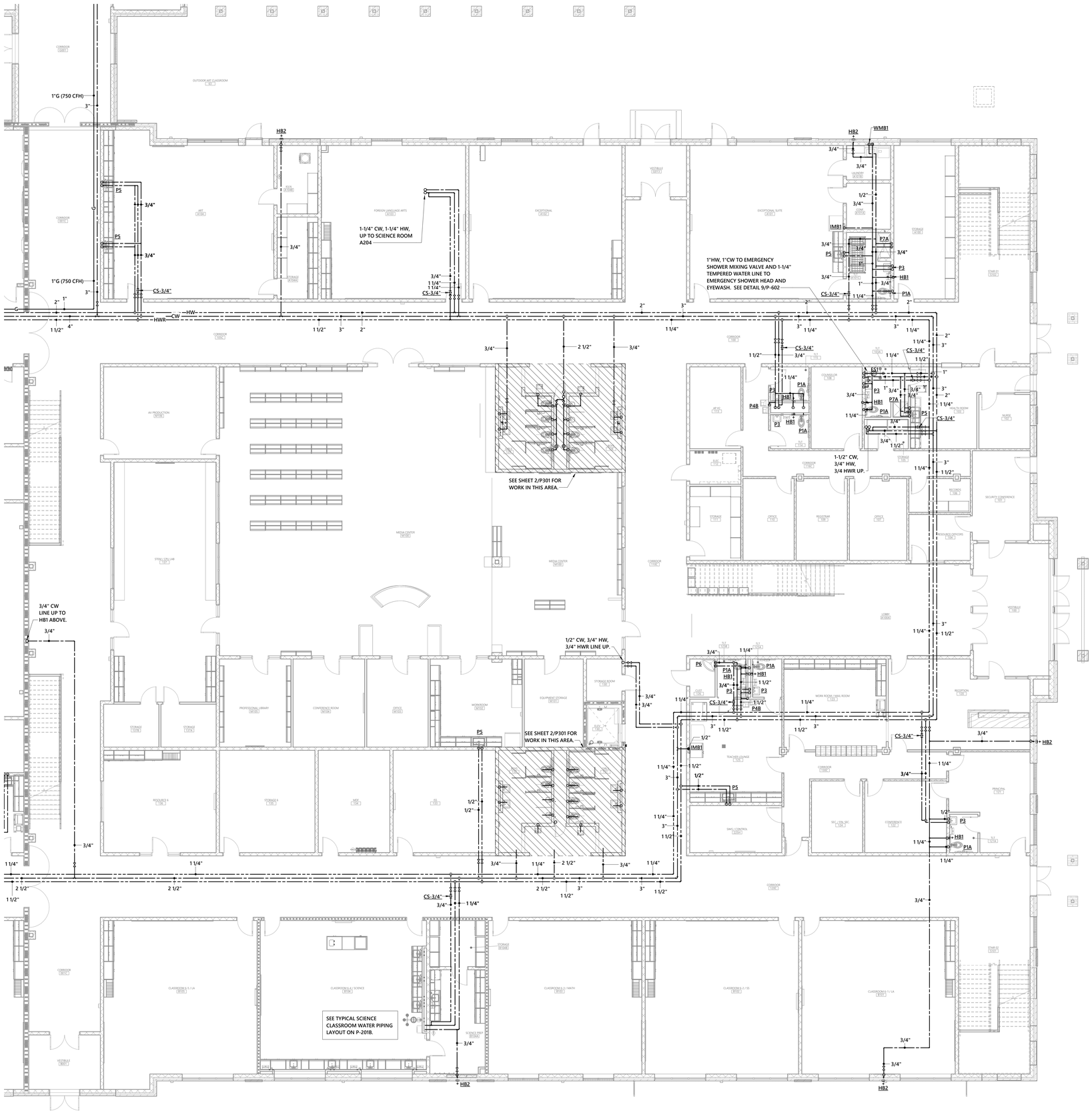


1 FIRST FLOOR SUPPLY PIPING PLAN - AREA A

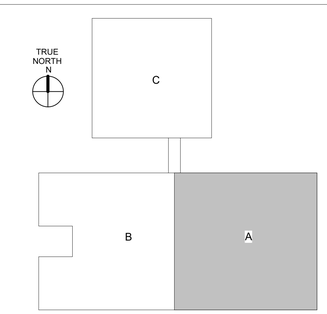
1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

FIRST FLOOR SUPPLY PIPING PLAN AREA A

P-201A

Optima # 22-0082

01.12.2023 - BID SET

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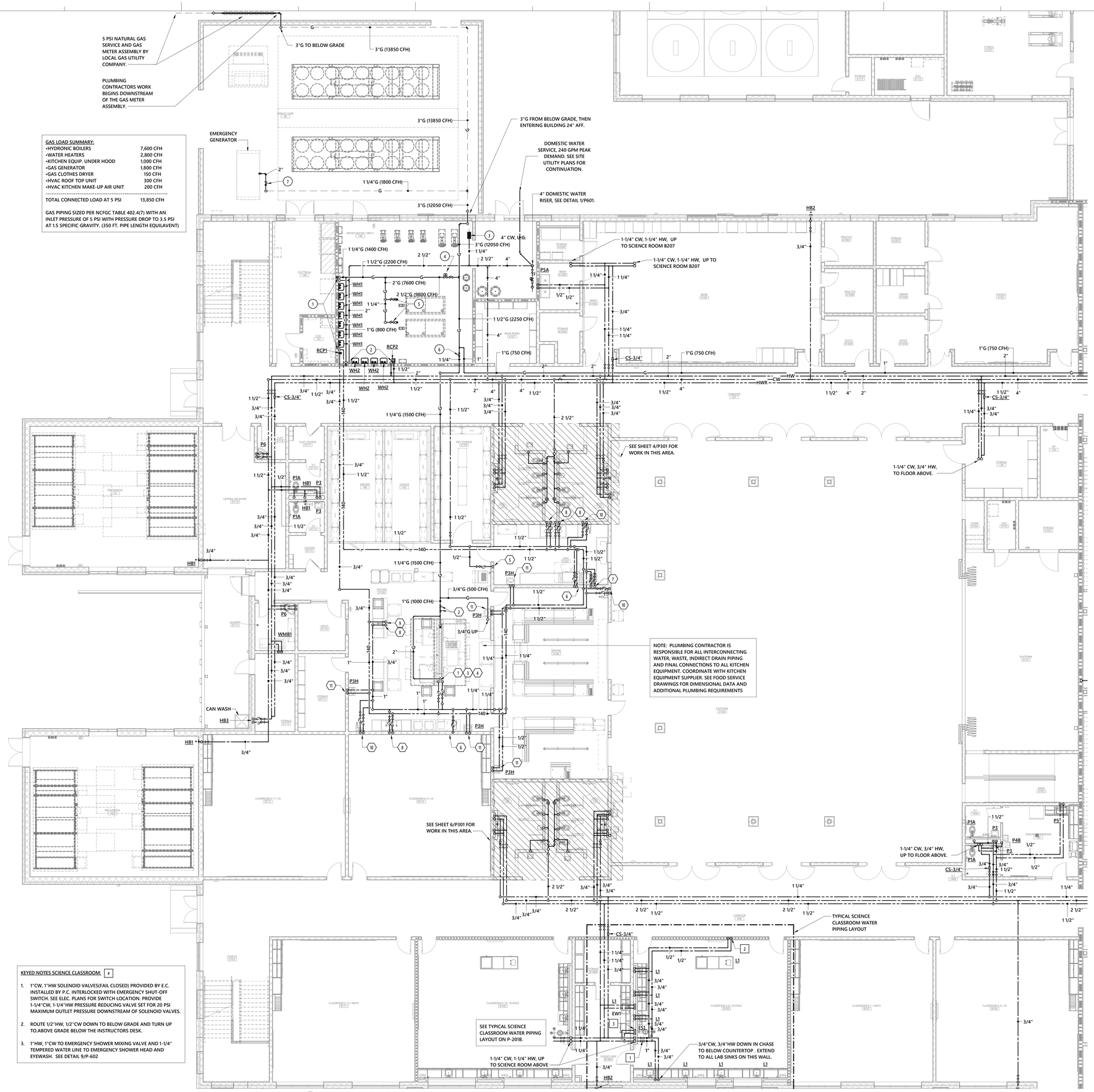

1 FIRST FLOOR SUPPLY PIPING PLAN - AREA B
1/8" = 1'-0"

GAS LOAD SUMMARY:

•HYDRONIC BOILERS	7,600 CFH
•WATER HEATERS	2,800 CFH
•KITCHEN EQUIP. UNDER HOOD	1,000 CFH
•GAS GENERATOR	1,800 CFH
•GAS CLOTHES DRYER	150 CFH
•HVAC ROOF TOP UNIT	300 CFH
•HVAC KITCHEN MAKE-UP AIR UNIT	200 CFH
TOTAL CONNECTED LOAD AT 5 PSI	13,850 CFH

GAS PIPING SIZED PER NCFGC TABLE 402.4(7) WITH AN INLET PRESSURE OF 5 PSI WITH PRESSURE DROP TO 3.5 PSI AT 1.5 SPECIFIC GRAVITY. (350 FT. PIPE LENGTH EQUILAVENT)

KEYED NOTES SCIENCE CLASSROOM: #

1. 1"CW, 1"HW SOLENOID VALVES(FAIL CLOSED) PROVIDED BY E.C. INSTALLED BY P.C. INTERLOCKED WITH EMERGENCY SHUT-OFF SWITCH. SEE ELEC. PLANS FOR SWITCH LOCATION. PROVIDE 1-1/4"CW, 1-1/4"HW PRESSURE REDUCING VALVE SET FOR 20 PSI MAXIMUM OUTLET PRESSURE DOWNSTREAM OF SOLENOID VALVES.
2. ROUTE 1/2"HW, 1/2"CW DOWN TO BELOW GRADE AND TURN UP TO ABOVE GRADE BELOW THE INSTRUCTORS DESK.
3. 1"HW, 1"CW TO EMERGENCY SHOWER MIXING VALVE AND 1-1/4" TEMPERED WATER LINE TO EMERGENCY SHOWER HEAD AND EYEWASH. SEE DETAIL 9/P-602

KEYED NOTES FOR KITCHEN AREA: #

1. KITCHEN HOOD WATER SUPPLY: PROVIDE SHUT-OFF VALVES AND 3/4"CW, 3/4"HW,TO PREFABRICATED KITCHEN HOOD UTILITY DISTRIBUTION SYSTEM SERVING THE COOKING EQUIPMENT UNDER EXHAUST HOOD. SEE FOOD SERVICE EQUIPMENT PLANS FOR FINAL CONNECTION SIZES AND LOCATION.
2. KITCHEN HOOD GAS SUPPLY: PROVIDE GAS SHUT-OFF VALVE, A GAS LINE PRESSURE REGULATING VALVE (2 PSI TO 11"W.C.) RATED FOR 1,000 CFH AT 1 PSIINLET PRESSURE WITH 1-1/2"INLET AND 2" OUTLET, EXTEND GAS REGULATOR VENT PORT TO EXTERIOR OF THE BUILDING AT LEAST 10'-0" AWAY FROM OUTSIDE AIR INTAKES. PROVIDE 2" GAS AT 11" W.C. TO PREFABRICATED KITCHEN HOOD UTILITY DISTRIBUTION SYSTEM. (NOTE TO REVIEWER: U.D.S. HAS INTEGRAL EMERGENCY GAS SOLENOID SHUT-OFF VALVES). SEE FOOD SERVICE EQUIPMENT PLANS FOR FINAL CONNECTION SIZES AND LOCATION.
3. KITCHEN EQUIPMENT (WATER): PROVIDE WATER SUPPLIES FROM U.D.S. TO EACH PIECE OF KITCHEN EQUIPMENT REQUIRING HW / CW SUPPLY. PROVIDE DOMESTIC WATER SHUT-OFF VALVE(S), LEAD FREE (ASSE 1024 LISTED) INLINE DOUBLE CHECK VALVE EQUAL TO WILKINS 700XL AND NSF-CERTIFIED FLEXIBLE WATER CONNECTION KIT(S) EQUAL TO DORMONT SERIES 71-000, 72-000, OR 73-000 INCLUDING, LEAD-FREE STAINLESS STEEL QUICK DISCONNECT(S), RETRACTABLE POLYURETHANE SWIRL HOSE AND FINAL CONNECTION TO EQUIPMENT. PROVIDE VALVES AND WATER CONNECTION KIT PIPE SIZE TO MATCH THE EQUIPMENT CONNECTION SIZE. SEE FOOD SERVICE DRAWINGS FOR EQUIPMENT CONNECTION SIZES AND QUANTITIES.
4. KITCHEN EQUIPMENT (GAS FIRED): PROVIDE GAS LINE FROM 1-1/2"GAS HEADER BEHIND KITCHEN EQUIPMENT, GAS SHUT-OFF VALVE AND GAS CONNECTION KIT EQUAL TO DORMONT SERIES 1600-KIT-2S INCLUDING, SAFETY QUICK DISCONNECT, (2) 360 DEGREE SWIVELS, BRAIDED CSST FLEXIBLE GAS HOSE WITH ANTIMICROBIAL PVC COATING, AND EQUIPMENT RESTRAINING CABLE FOR EACH GAS FIRED APPLIANCE. PROVIDE GAS VALVE AND CONNECTION KIT ONE PIPE SIZE LARGER THAN THE EQUIPMENT CONNECTION SIZE. SEE FOOD SERVICE DRAWINGS FOR EQUIPMENT CONNECTION SIZES AND QUANTITIES.
5. ICE MAKER & WATER FILTER: PROVIDE 1/2"CW SHUT-OFF VALVE, LEAD FREE (ASSE 1024 LISTED) INLINE DOUBLE CHECK VALVE EQUAL TO WILKINS SERIES 700 AND NSF-CERTIFIED FLEXIBLE WATER CONNECTION KIT EQUAL TO DORMONT SERIES 71-000, 72-000, OR 73-000 INCLUDING, NSF-61 STAINLESS STEEL QUICK DISCONNECT(S), AND RETRACTABLE POLYURETHANE SWIRL HOSE. EXTEND DRAIN LINE FROM ICE MAKER TO SPILL OVER FLOOR SINK. SEE DETAIL 9/P601.
6. DISHWASHER AND BOOSTER HEATER: PROVIDE 1"HW-140°F WITH SHUT-OFF VALVE, 20 PSI PRV, SHOCK ARRESTOR SA-A AND FINAL CONNECTIONS TO BOOSTER HEATER AND DISHWASHER. PLUMBING CONTRACTOR IS RESPONSIBLE FOR ALL INTER-CONNECTING PIPING. PROVIDE T&P RELIEF VALVE FOR BOOSTER HEATER PER MANUFACTURERS INSTRUCTIONS. PROVIDE 3/4"CW WITH SHUT-OFF VALVE, SHOCK ARRESTOR SA-A, AND FINAL CONNECTION TO DISHWASHER DRAIN TEMPERING KIT.
7. PRE-RINSE SINK: PROVIDE 1/2"HW-140°F, 1/2"CW WITH SHUT-OFF VALVES AND CHECK VALVES TO PRE-RINSE FAUCET.
8. KITCHEN SINK FAUCETS: PROVIDE 1/2"HW-140°F, 1/2"CW WITH SHUT-OFF VALVES AND CHECK VALVES TO SINK FAUCET.
9. FREE STANDING SINK: PROVIDE 1/2"HW-140°F, 1/2"CW WITH SHUT-OFF VALVES AND CHECK VALVES TO SINK FAUCET. ROUTE PIPING DOWN IN STAINLESS STEEL CHASE WALL (BY OTHERS) TO SINK STOPS.
10. HOSE REEL: PROVIDE 1/2"HW-140°F, 1/2"CW WITH SHUT-OFF VALVES AND CHECK VALVES TO HOSE REEL MIXING VALVE. PROVIDE 1/2"TEMPERED WATER LINE FROM MIXING VALVE TO HOSE REEL.
11. THERMOSTATIC MIXING VALVE: PROVIDE THERMOSTATIC MIXING VALVE MV2 BELOW HAND SINK, MOUNT AS HIGH AS POSSIBLE UNDER SINK.
12. DRAIN BOARD: PROVIDE 1/2"CW WITH SHUT-OFF VALVES AND CHECK VALVES TO DRAIN BOARD SUPPLY.

KEYED NOTES FOR BOILER ROOM AND MECHANICAL YARD AREA: #

1. 3/4"HWR-140, 1-1/2"CW, 1-1/2"HW AND 1-1/4" GAS TO WATER HEATERS WH1 & RCP1. SEE DETAIL 2/P401 FOR CONT. (1400 CFH)
2. 1-1/4"HWR, 2"CW, 2"HW AND 1" GAS TO WATER HEATERS WH2 & RCP2. SEE DETAIL 3/P401 FOR CONT. (1200 CFH)
3. PROVIDE (2) 1-1/4"REDUCED PRESSURE BACKFLOW PREVENTER ASSEMBLIES FOR HVAC MAKE-UPWATER. PIPE DRAIN PORTS FULL SIZE TO ADJACENT FLOOR DRAIN (TYPICAL FOR 2)
4. 3" EMERGENCY GAS SOLENOID SHUT-OFF VALVE RATED FOR 6,000 CFH AT 5 PSI PROVIDED BY E.C. INSTALLED BY P.C.
5. 1-1/4"GAS DROP AND SHUT-OFF VALVE AT 5 PSI FOR HVAC BOILER (TYPICAL FOR 2) (2,383 CFH EACH) FINAL CONNECTION TO BOILER BY M.C. COORDINATE GAS DROP LOCATION WITH M.C.
6. PROVIDE A 1" THERMAL MASS FLOW METER FOR KITCHEN GAS SUPPLY, RATED FOR 1,500 CFH AT 5 PSI, STAINLESS STEEL CONSTRUCTION, WITH PULSE OUTPUT COMPATIBLE THE B.A.S. EQUAL TO ONICON SERIES F-5500.
7. PROVIDE GAS SHUT-OFF VALVE, DRIP LEG, PRESSURE REGULATING VALVE (5 PSI TO 11" WATER COLUMN) AND FINAL GAS CONNECTION TO THE EMERGENCY GENERATOR. COORDINATE GAS CONNECTION LOCATION AND GAS PIPING REQUIREMENTS WITH THE EMERGENCY GENERATOR MANUFACTURERS INSTALLATION INSTRUCTIONS. PRESSURE REDUCING VALVE SHALL HAVE 1" INLET, 2" OUTLET AND BE RATED FOR AT LEAST 1,800 CFH AT 3.5 PSI INLET PRESSURE.

PARTITION LEGEND

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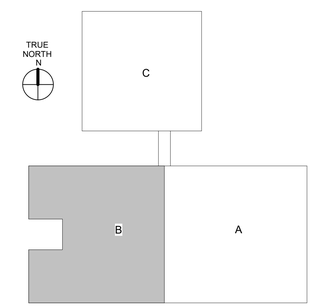
KEY PLAN



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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

FIRST FLOOR SUPPLY PIPING PLAN AREA B

P-201B

Optima # 22-0082

01.12.2023 - BID SET

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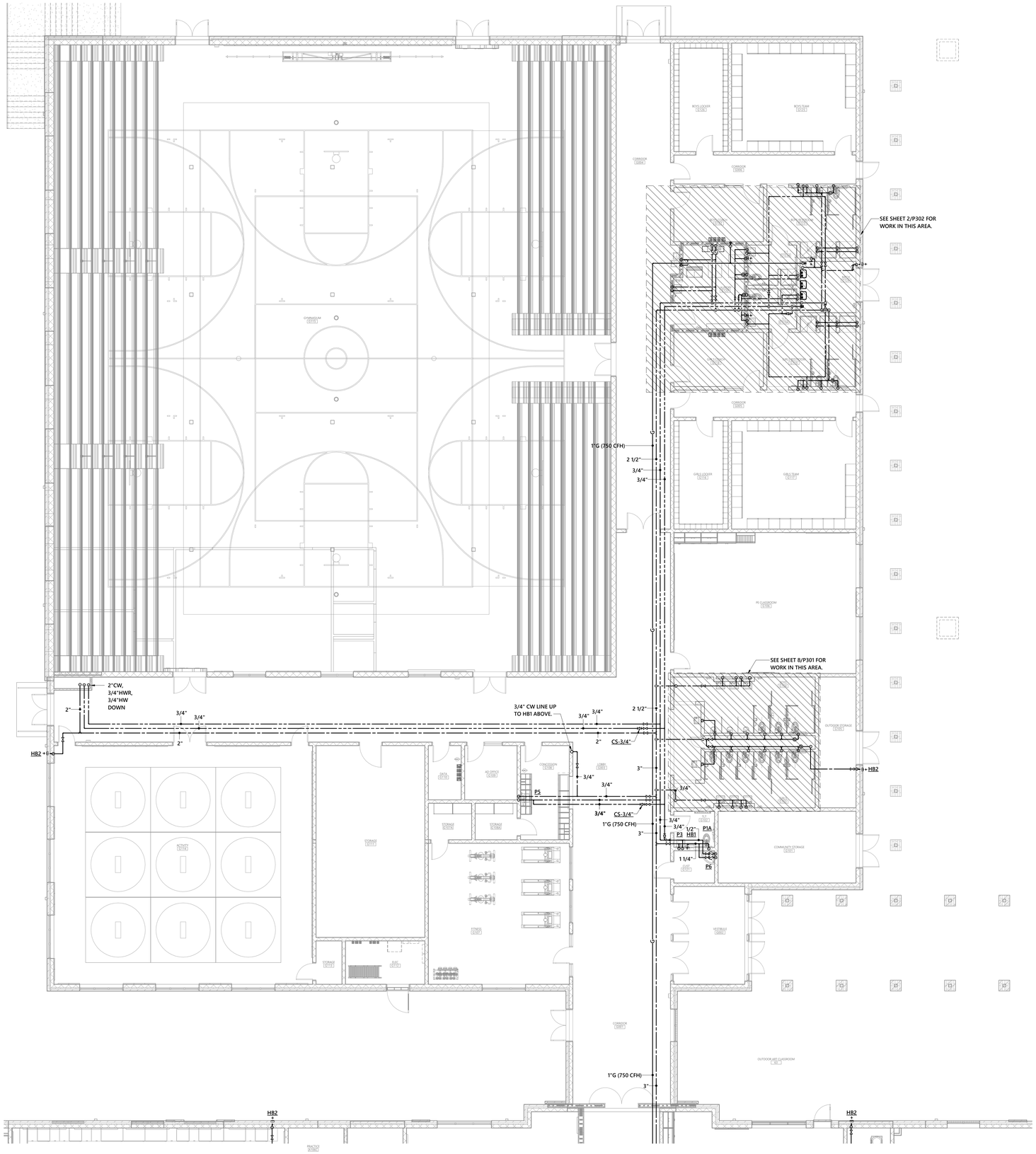

1 FIRST FLOOR SUPPLY PIPING PLAN - AREA C

1/8" = 1'-0"

PARTITION LEGEND

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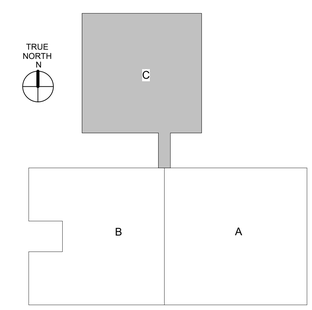

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FIRST FLOOR SUPPLY PIPING PLAN AREA C

P-201C

Optima # 22-0082

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1 SECOND FLOOR SUPPLY PIPING PLAN - AREA A

1/8" = 1'-0"

PARTITION LEGEND

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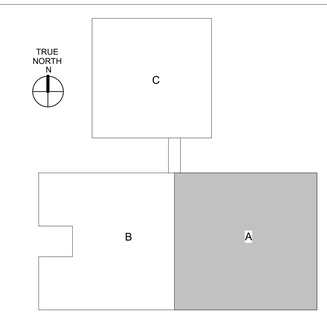

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SECOND FLOOR SUPPLY PIPING PLAN AREA A

P-202A

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1/8" = 1'-0"

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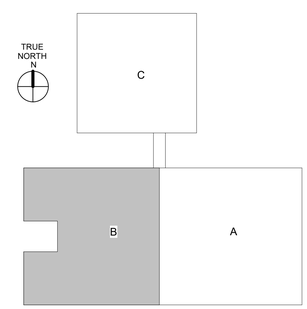

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SECOND FLOOR SUPPLY PIPING PLAN AREA B

P-202B

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[redacted]

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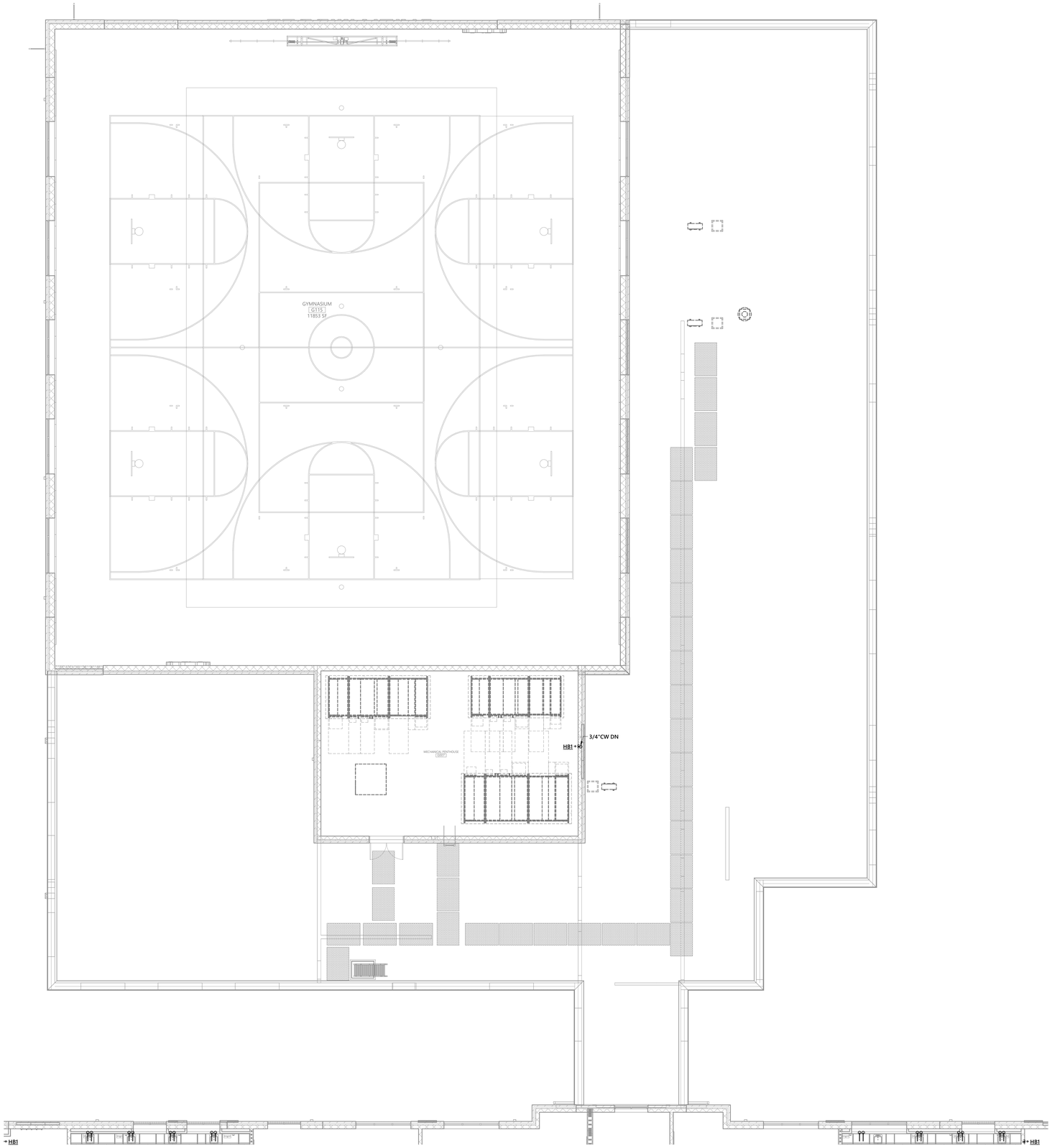

1 SECOND FLOOR SUPPLY PIPING PLAN - AREA C
1/8" = 1'-0"

PARTITION LEGEND

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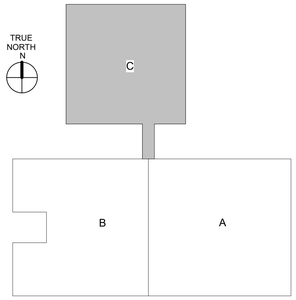

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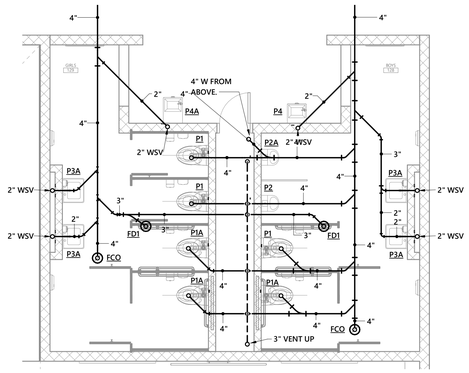
SECOND FLOOR SUPPLY PIPING PLAN AREA C

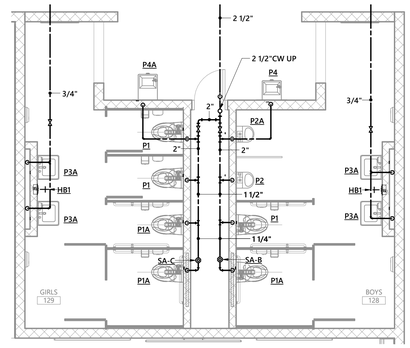
P-202C

Optima # 22-0082

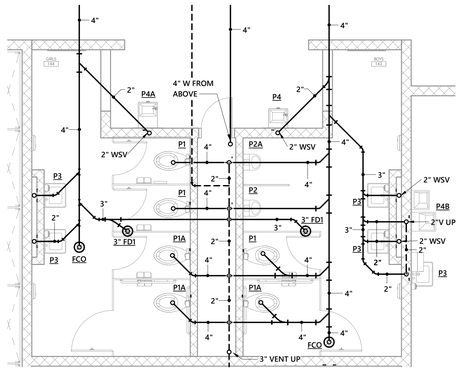
01.12.2023 - BID SET



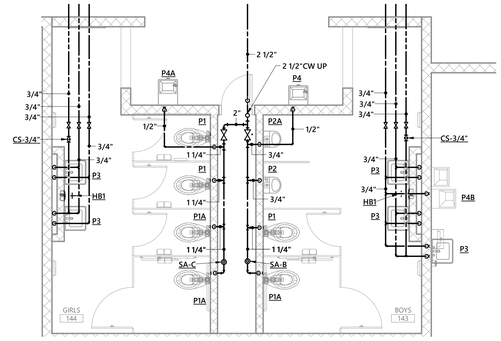
1 ENLARGED FIRST FLOOR RESTROOM PLAN - AREA A - DRAINAGE PIPING
1/4" = 1'-0"



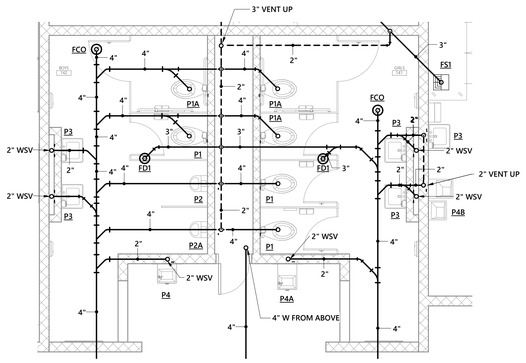
2 ENLARGED FIRST FLOOR RESTROOM PLAN - AREA A - SUPPLY PIPING
1/4" = 1'-0"



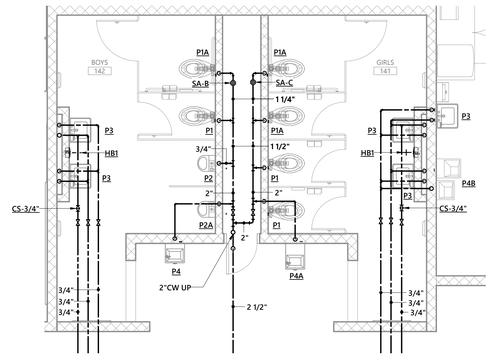
3 ENLARGED FIRST FLOOR RESTROOM PLAN - AREA B (NORTH) - DRAINAGE PIPING
1/4" = 1'-0"



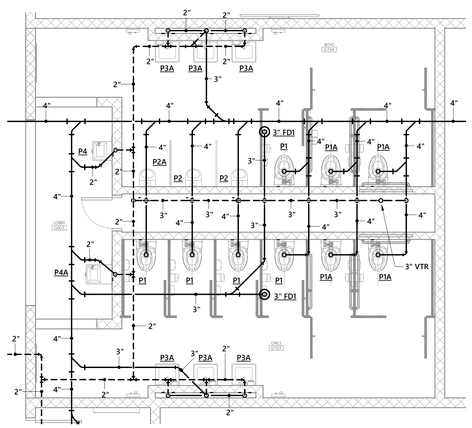
4 ENLARGED FIRST FLOOR RESTROOM PLAN - AREA B (NORTH) - SUPPLY PIPING
1/4" = 1'-0"



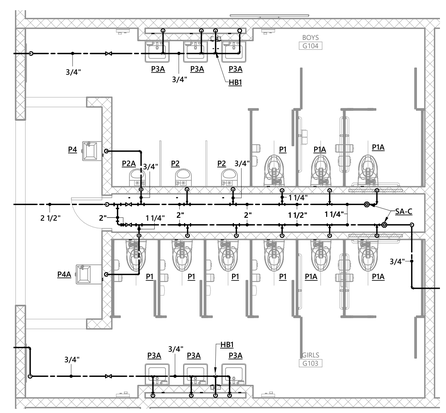
5 ENLARGED FIRST FLOOR RESTROOM PLAN - AREA B (SOUTH) - DRAINAGE PIPING
1/4" = 1'-0"



6 ENLARGED FIRST FLOOR RESTROOM PLAN - AREA B (SOUTH) - SUPPLY PIPING
1/4" = 1'-0"



7 ENLARGED FIRST FLOOR RESTROOM PLAN - AREA C - DRAINAGE PIPING
1/4" = 1'-0"



8 ENLARGED FIRST FLOOR RESTROOM PLAN - AREA C - SUPPLY PIPING
1/4" = 1'-0"

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

ENLARGED PLUMBING PLANS

P-301

Optima # 22-0082

01.12.2023 - BID SET

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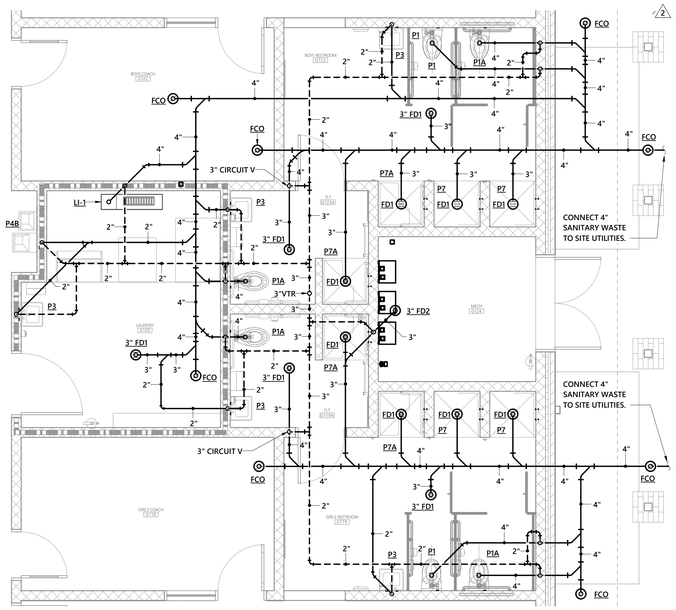
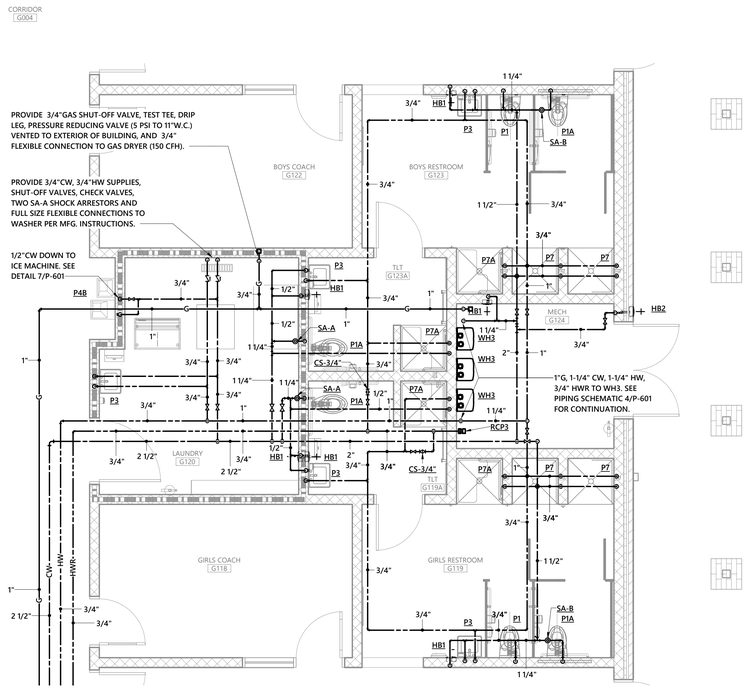
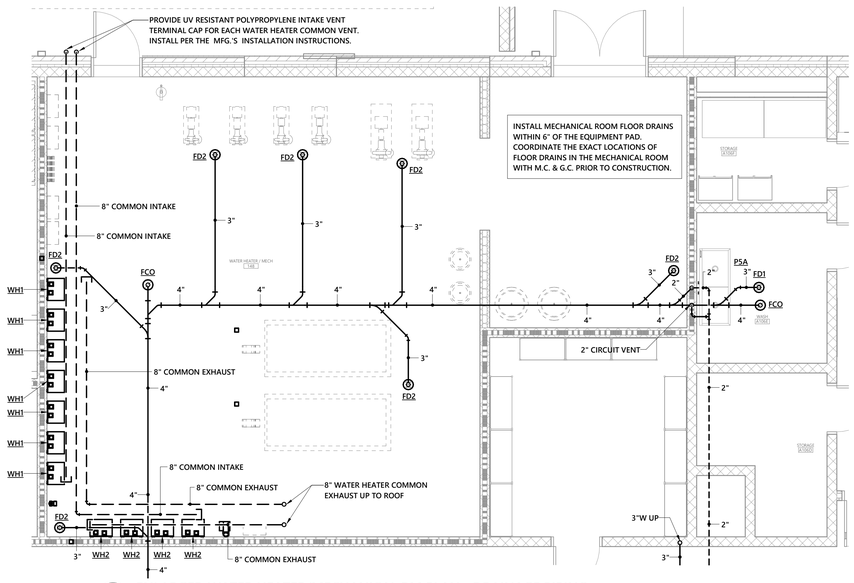


1 ENLARGED FIRST FLOOR RESTROOMS/SHOWERS PLAN - DRAINAGE PIPING
1/4" = 1'-0"



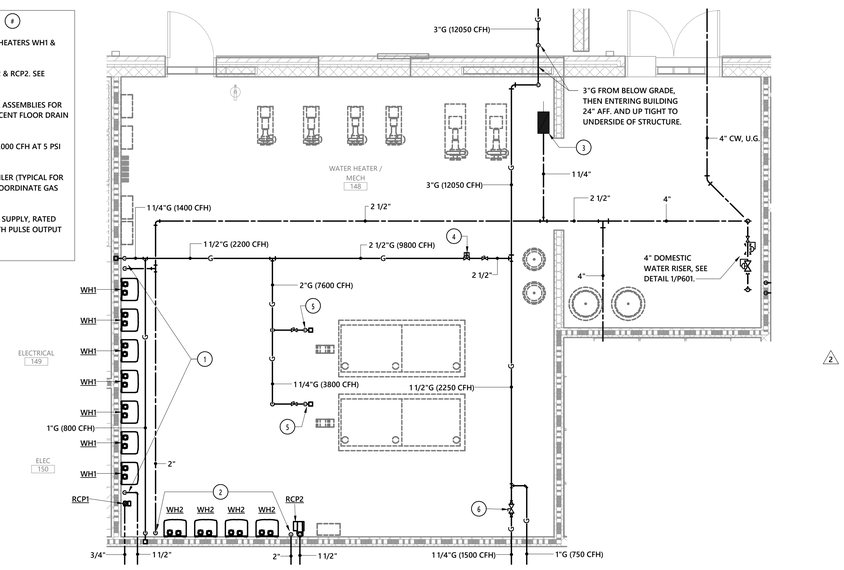
2 ENLARGED FIRST FLOOR RESTROOMS/SHOWERS PLAN - SUPPLY PIPING
1/4" = 1'-0"



3 ENLARGED WATER HEATER/MECHANICAL RM PLAN - DRAINAGE PIPING
1/4" = 1'-0"

KEYED NOTES FOR BOILER ROOM AND MECHANICAL YARD AREA: #

1. 3/4"HWR-140, 1-1/2"CW, 1-1/2"HW AND 1-1/4" GAS TO WATER HEATERS WH1 & RCP1. SEE DETAIL 2/P401 FOR CONT. (1400 CFH)
2. 1-1/4"HWR, 2"CW, 2"HW AND 1" GAS TO WATER HEATERS WH2 & RCP2. SEE DETAIL 3/P401 FOR CONT. (1200 CFH)
3. PROVIDE (2) 1-1/4"REDUCED PRESSURE BACKFLOW PREVENTER ASSEMBLIES FOR HVAC MAKE-UPWATER. PIPE DRAIN PORTS FULL SIZE TO ADJACENT FLOOR DRAIN (TYPICAL FOR 2)
4. 3" EMERGENCY GAS SOLENOID SHUT-OFF VALVE RATED FOR 6,000 CFH AT 5 PSI PROVIDED BY E.C. INSTALLED BY P.C.
5. 1-1/4"GAS DROP AND SHUT-OFF VALVE AT 5 PSI FOR HVAC BOILER (TYPICAL FOR 2) (2,383 CFH EACH) FINAL CONNECTION TO BOILER BY M.C. COORDINATE GAS DROP LOCATION WITH M.C.
6. PROVIDE A 1" THERMAL MASS FLOW METER FOR KITCHEN GAS SUPPLY, RATED FOR 1,500 CFH AT 5 PSI, STAINLESS STEEL CONSTRUCTION, WITH PULSE OUTPUT COMPATIBLE THE B.A.S. EQUAL TO ONICON SERIES F-5500.



4 ENLARGED WATER HEATER/MECHANICAL RM PLAN - SUPPLY PIPING
1/4" = 1'-0"

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022
2	Permit Revisions	01-11-2023

PROJECT: 9201-218240
DATE: 01-12-2023

ENLARGED PLUMBING PLANS

P-302

Optima # 22-0082

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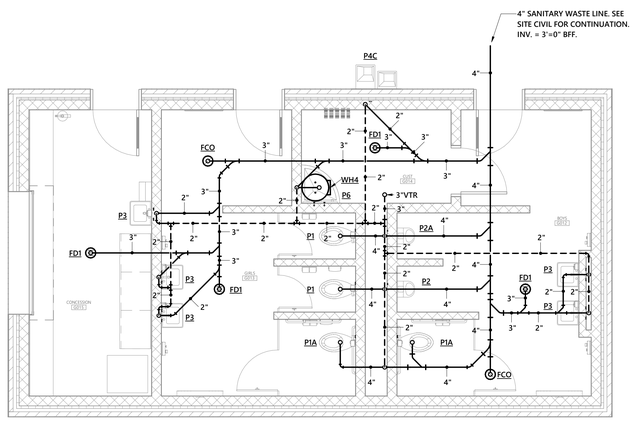
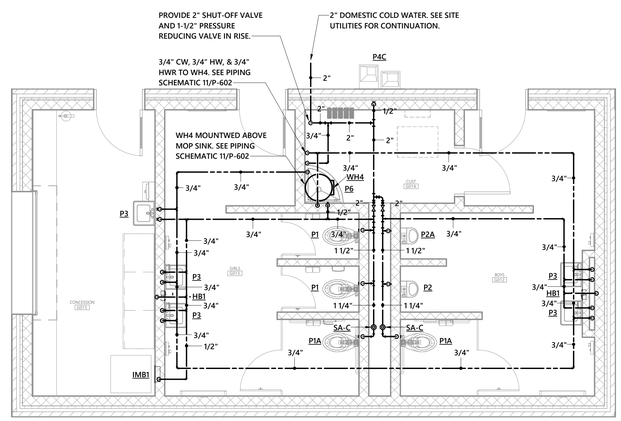


1 ENLARGED CONCESSION BUILDING PLAN - DRAINAGE PIPING - (TYPICAL FOR 2)
1/4" = 1'-0"



2 ENLARGED CONCESSION BUILDING PLAN - SUPPLY PIPING - (TYPICAL FOR 2)
1/4" = 1'-0"

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

ENLARGED PLUMBING PLANS

P-303

Optima # 22-0082

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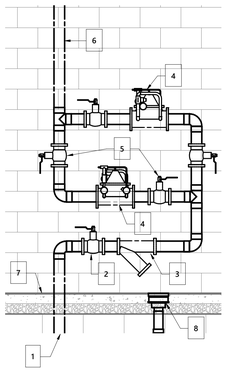
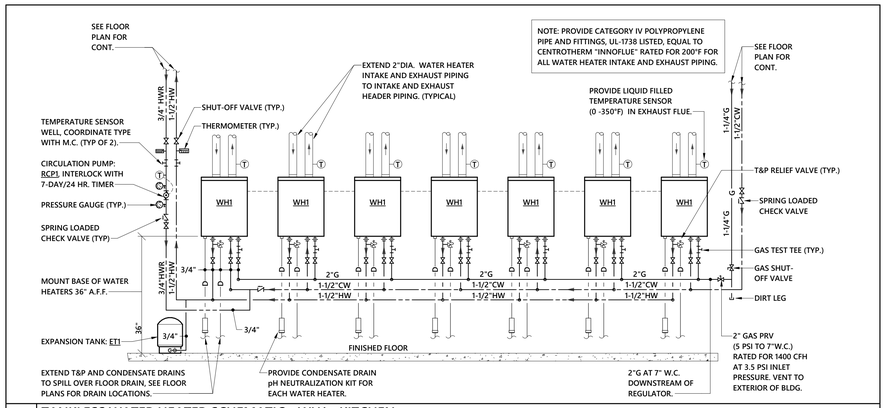
NOTES: #

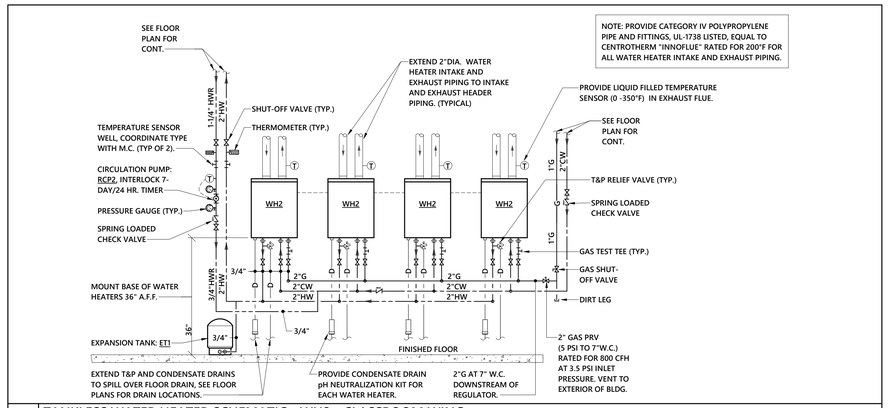
1. 4"CW UNDERGROUND TO 5'-0" OUTSIDE THE BUILDING BY P.C. PROVIDE PIPE SLEEVES WHERE PIPING PENERATES FLOOR SLAB AND MASONRY FOOTING WALL. SEAL PENETRATIONS WATER TIGHT.
2. 4"SHUT-OFF VALVE, (TYPICAL OF 5).
3. PROVIDE A 4" LEAD FREE, NSF 61 LISTED STRAINER WITH BLOWDOWN VAVLE EQUAL TO ZURN MODEL FSC. INSTALL STRAINER DRAIN OUTLET ALIGNED WITH ADJACENT FLOOR DRAIN.
4. PROVIDE A 3" LEAD FREE, NSF 61 LISTED PILOT OPERATED PRESSURE REDUCING VALVE WITH INTEGRAL LOW FLOW BYPASS, INLET AND OUTLET PRESSURE GAUGES EQUAL TO ZURN MODEL ZW209BP. SET OUTLET PRESSURE TO 65 PSI.
5. 4" NORMALLY CLOSED SHUT-OFF VALVE (TYPICAL OF 2)
6. 4"CW TO BUILDING FIXTURES, SEE FLOOR PLANS FOR CONTINUATION.
7. FINISHED FLOOR
8. FLOOR DRAIN - SEE PLANS



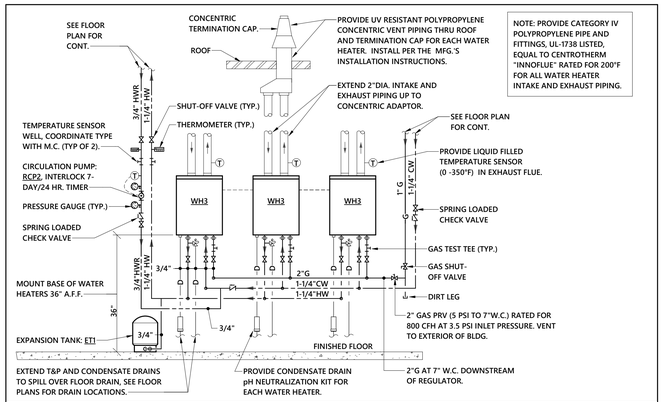
1 WATER SERVICE ENTRANCE SCHEMATIC
NOT TO SCALE



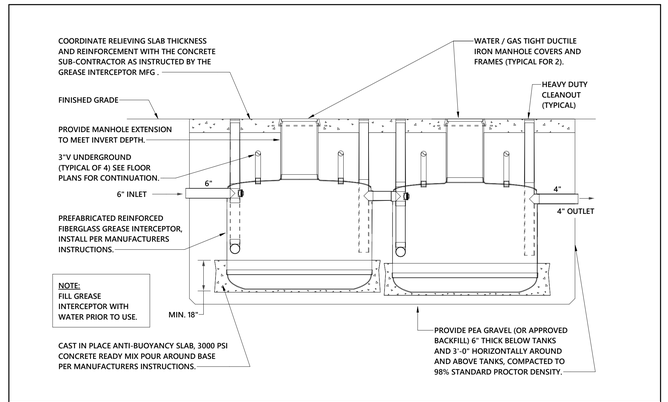
2 TANKLESS WATER HEATER SCHEMATIC - WH1 - KITCHEN
NOT TO SCALE



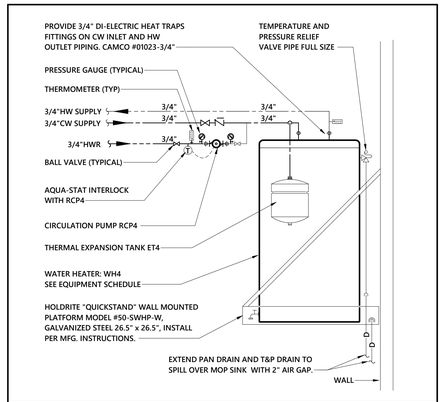
3 TANKLESS WATER HEATER SCHEMATIC - WH2 - CLASSROOM WING
NOT TO SCALE



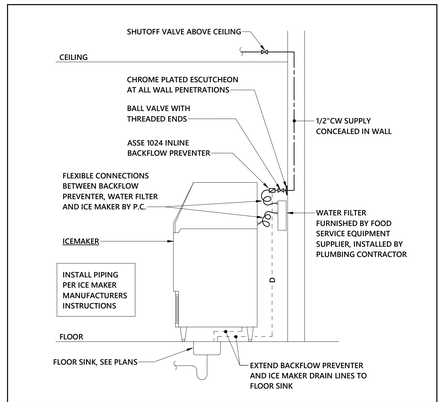
4 TANKLESS WATER HEATER SCHEMATIC - WH3 - GYMNASIUM
NOT TO SCALE



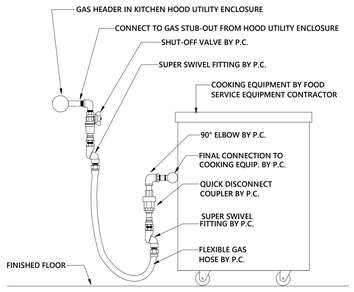
5 GREASE INTERCEPTOR SCHEMATIC - GRS1
NOT TO SCALE



6 WATER HEATER SCHEMATIC - WH4 (TYPICAL CONCESSIONS)
NO SCALE

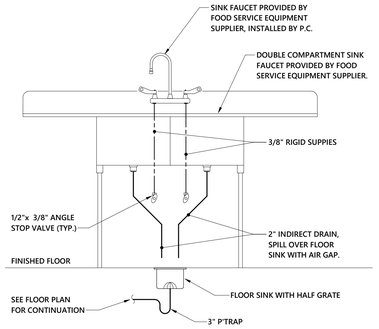


7 ICE MAKER PIPING SCHEMATIC
NOT TO SCALE

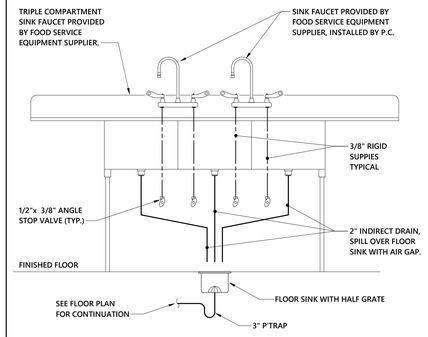


NOTE: P.C. SHALL PROVIDE ALL GAS PIPING, FITTINGS, AND ACCESSORIES FROM GAS HEADER TO THE COOKING EQUIPMENT.

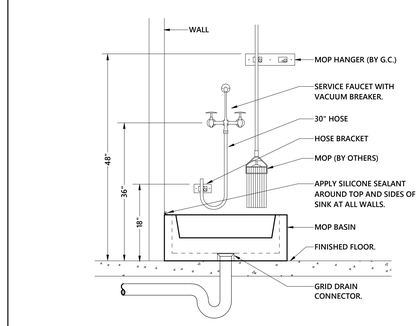
8 TYPICAL GAS CONNECTION TO KITCHEN EQUIPMENT
NOT TO SCALE



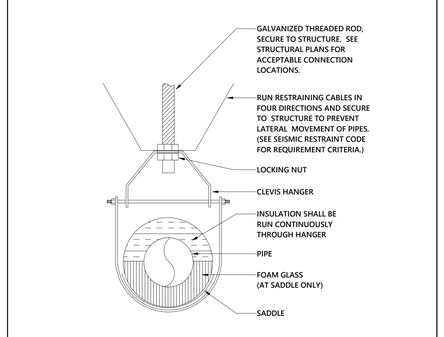
9 DOUBLE COMPARTMENT SINK PIPING DETAIL
NOT TO SCALE



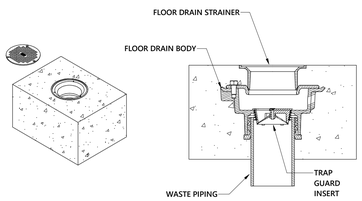
10 TRIPLE COMPARTMENT SINK PIPING DETAIL
NOT TO SCALE



11 MOP BASIN AND ACCESSORIES
NOT TO SCALE



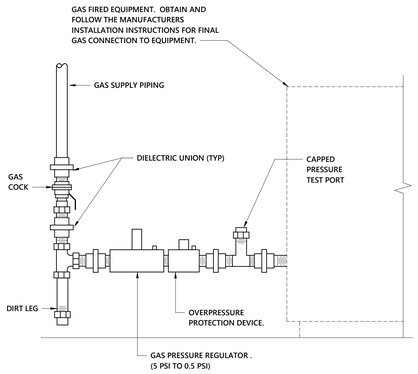
12 PIPE HANGER SCHEMATIC
NOT TO SCALE



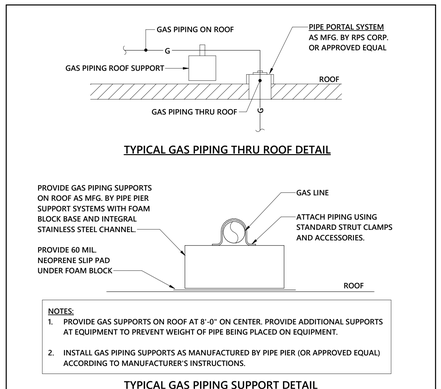
NOTES:

1. REMOVE SCREWS AND STRAINER FROM INSTALLED DRAIN. MAKE SURE DRAIN OUTLET IS CLEAR OF ANY DEBRIS OR OBSTRUCTIONS PRIOR TO INSTALLING THE TRAP GUARD.
2. ALIGN TRAP GUARD WITH THE CENTER OF THE DRAIN ASSEMBLY.
3. PUSH TRAP GUARD INTO BOTTOM OF DRAIN BODY OR OUTLET PIPE UNTIL THE UNDERSIDE OF THE BARRIER TRAP IS FLUSH WITH BOTTOM OF DRAIN OR TOP OF THE PIPE.

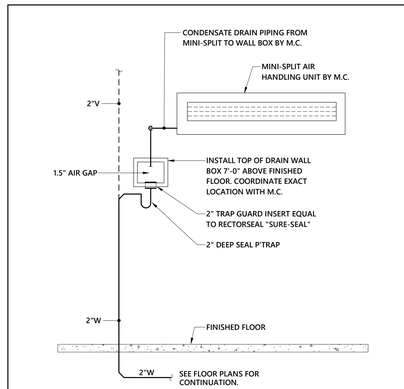
13 FLOOR DRAIN TRAP GUARD DETAIL
NO SCALE



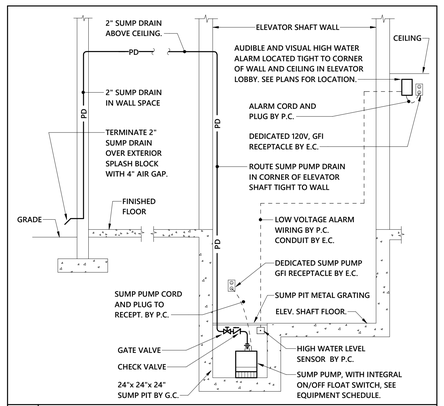
14 TYPICAL GAS PIPING CONNECTION TO EQUIPMENT DETAIL
NOT TO SCALE



15 TYPICAL GAS PIPING ROOF SUPPORT DETAILS
NOT TO SCALE



16 CONDENSATE DRAIN WALL BOX SCHEMATIC
NOT TO SCALE



17 ELEVATOR SUMP PUMP SCHEMATIC - SP1 (TRACTION TYPE ELEVATOR)
NOT TO SCALE

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

PLUMBING DETAILS AND SCHEMATICS

P-601

Optima # 22-0082

01.12.2023 - BID SET

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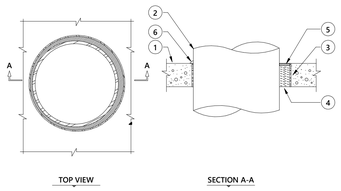
U.L. SYSTEM NO. CAJ1155
METAL PIPE THROUGH A SLEEVE IN CONCRETE WALL OR FLOOR

F RATING = 3-HR.
T RATING = 0-HR.
L RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.
L RATING AT 400°F = 4 CFM/SQ. FT.



1. FLOOR OR WALL ASSEMBLY: B. U.L. CLASSIFIED CONCRETE BLOCK WALL (MINIMUM 8" BLOCK). A. MINIMUM 4-1/2" THICK LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR.

2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
   A. MAXIMUM 20" DIAMETER STEEL PIPE.
   B. MAXIMUM 6" DIAMETER COPPER PIPE.
   C. MAXIMUM 6" DIAMETER STEEL CONDUIT.
   D. MAXIMUM 4" DIAMETER EMT.

3. OPTIONAL: MAXIMUM 22" DIAMETER STEEL PIPE SLEEVE (SCHEDULE 10 OR HEAVIER).

4. MINIMUM 4" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) RECESSED 1/2" FROM TOP OF SLEEVE.

5. MINIMUM 1/2" DEPTH HILTI FS-ONE FIRESTOP SEALANT.

6. A GENEROUS BEAD OF HILTI FS-ONE FIRESTOP SEALANT AROUND OUTER PERIMETER OF STEEL SLEEVE.

NOTES:
1. MAXIMUM DIAMETER OF OPENING = 22".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1-1/2".

INSTALLATION INSTRUCTIONS FOR UL NO.CAJ1155

STEP 1 - PREPARATION: to application of firestopping materials. All surfaces must be clean, sound, dry and frost free prior

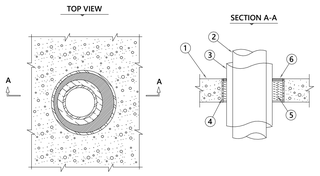
STEP 2 - BACKING MATERIAL: Firmly pack mineral wool around the penetrating item recessing it 1/2" below surface of the sleeve (or both ends of sleeve in wall)

STEP 3 - FIRESTOP SEALANT: Apply the Firestop Sealant over the backing material to a min. depth of 1/2" flush with the end(s) of the sleeve. Wall penetrations require Firestop Sealant installed on both sides. Leave completed seal undisturbed for 48 hours.

1 U.L. SYSTEM NO CAJ-1155 DETAIL
NOT TO SCALE

U.L. SYSTEM NO. CAJ5090
INSULATED METALLIC PIPE THROUGH CONCRETE WALL OR FLOOR

F RATING = 3-HR.
T RATING = 0-HR.
L RATING AT AMBIENT = 4 CFM/SQ. FT.
L RATING AT 400°F = LESS THAN 1 CFM/SQ. FT.



1. CONCRETE FLOOR ASSEMBLY (MINIMUM 4-1/2" THICK)
2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
   A. MAXIMUM 4" DIAMETER STEEL PIPE.
   B. MAXIMUM 4" DIAMETER COPPER PIPE.
   C. MAXIMUM 4" DIAMETER STEEL CONDUIT.
   D. MAXIMUM 4" DIAMETER EMT.
3. MAXIMUM 3/4" THICK AB/PVC PIPE INSULATION.
4. OPTIONAL: MAXIMUM 8" DIAMETER STEEL PIPE SLEEVE (SCHEDULE 10 OR HEAVIER).
5. MINIMUM 4" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) TIGHTLY PACKED.
6. MINIMUM 1/4" DEPTH HILTI FS-ONE FIRESTOP SEALANT.

NOTES:
1. MAXIMUM DIAMETER OF OPENING = 8-5/8".
2. ANNULAR SPACE = MINIMUM 1/2", MAXIMUM 1-1/2".

INSTALLATION INSTRUCTIONS FOR UL NO.CAJ5090

STEP 1 - PREPARATION: All surfaces must be clean, sound, dry and frost free prior to application of firestopping materials.

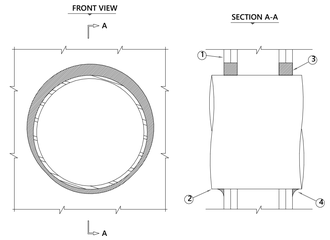
STEP 2 - BACKING MATERIAL: Pack mineral wool tightly around the penetrating item to the depth shown in the drawings, and recess it below the top surface of the floor (or both surfaces of a wall) to allow proper space for the firestop material.

STEP 3 - FIRESTOP SEALANT: Apply the Firestop Sealant over the backing material to the depth shown. Wall penetrations require Firestop Sealant on both sides. Leave completed seal undisturbed for 48 hours.

2 U.L. SYSTEM NO CAJ5090 DETAIL
NOT TO SCALE

U.L. SYSTEM NO. WL1054
METAL PIPE THROUGH GYPSUM WALL ASSEMBLY

F RATING = 1-HR OR 2-HR
T RATING = 0-HR
L RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.
L RATING AT 400°F = 4 CFM/SQ. FT.



1. GYPSUM-WALL ASSEMBLY (1-HR. AND 2-HR. FIRE RATING)(2-HR. SHOWN).

2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
   A. MAXIMUM 20" DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
   B. MAXIMUM 6" DIAMETER COPPER PIPE.
   C. MAXIMUM 6" DIAMETER STEEL CONDUIT.
   D. MAXIMUM 4" DIAMETER STEEL EMT.

1. MINIMUM DEPTH
   A. MINIMUM 5/8" DEPTH HILTI FS-ONE FIRESTOP SEALANT = 1-HR. FIRE-RATING. B. MINIMUM 1-1/4" DEPTH HILTI FS-ONE FIRESTOP SEALANT = 2-HR. FIRE-RATING.

2. MINIMUM 1/2" BEAD HILTI FS-ONE FIRESTOP SEALANT FOR POINT OF CONTACT.

NOTES: 1. MAXIMUM DIAMETER OF OPENING = 22-1/4".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 2-1/4".

INSTALLATION INSTRUCTIONS FOR UL NO.WL1054

STEP 1 - PREPARATION: All surfaces must be clean, sound, dry and frost free prior to application of firestopping materials.

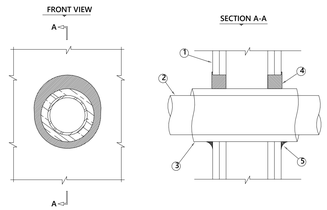
STEP 2 - FIRESTOP SEALANT: Apply a minimum 5/8" or 1-1/4" depth of FS-ONE in the annular space around the penetrating item. Tool excess sealant beyond perimeter of the opening 1/2" onto wall surface. Leave completed seal undisturbed for for 48 hours.

3 U.L. SYSTEM NO WL1054 DETAIL
NOT TO SCALE

U.L. SYSTEM NO. WL5028
INSULATED METAL PIPE THROUGH 1-HR. OR 2-HR. GYPSUM WALL ASSEMBLY

F RATING = 1-HR AND 2-HR
T RATING = 1/2-HR

L RATING AT AMBIENT = 4 CFM/SQ. FT.
L RATING AT 400°F = LESS THAN 1 CFM/SQ. FT.



1. GYPSUM-WALL ASSEMBLY (1-HR. OR 2-HR. FIRE RATING)(2-HR. SHOWN).

2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
   A. MAXIMUM 4" DIAMETER STEEL PIPE.
   B. MAXIMUM 2" DIAMETER COPPER PIPE.
   C. MAXIMUM 4" DIAMETER EMT.
   D. MAXIMUM 4" DIAMETER STEEL CONDUIT.

3. MAXIMUM 3/4" THICK (AB/PVC) FLEXIBLE FOAM TYPE PIPE INSULATION.

4. HILTI FS-ONE FIRESTOP SEALANT:
   A. MINIMUM 5/8" DEPTH, FOR A 1-HR. FIRE-RATING.
   B. MINIMUM 1-1/4" DEPTH, FOR A 2-HR. FIRE-RATING.

5. MINIMUM 1/2" CROWN HILTI FS-ONE FIRESTOP SEALANT AT PIPE INSULATION/WALL ASSEMBLY INTERFACE.

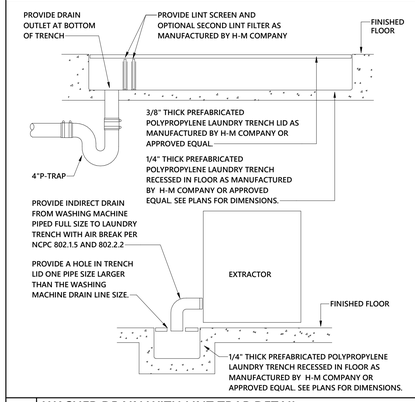
NOTES: 1. MAXIMUM DIAMETER OF OPENING = 7-1/2".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1-1/2".

INSTALLATION INSTRUCTIONS FOR UL NO.WL5028

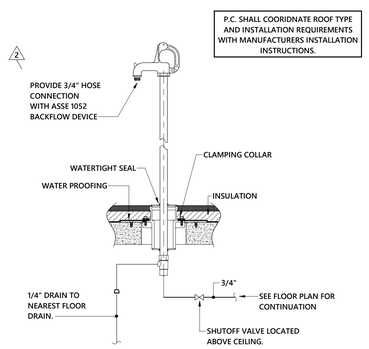
STEP 1 - PREPARATION: All surfaces must be clean, sound, dry and frost free prior to application of firestopping materials.

STEP 2 - FIRESTOP SEALANT: Apply a minimum 5/8" or 1-1/4" depth of FS-ONE in the annular space between the pipe and wall on both sides and tool it with a putty knife until flush with surface. Tool excess beyond the perimeter of the opening 1/2" onto each wall surface. Leave completed seal undisturbed for 48 hours.

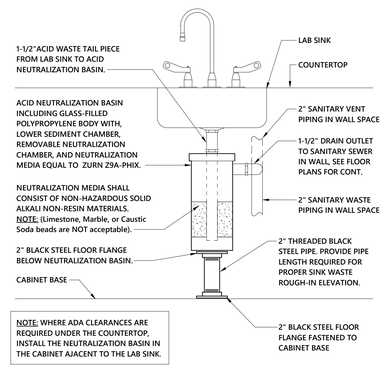
4 U.L. SYSTEM NO WL5028 DETAIL
NOT TO SCALE



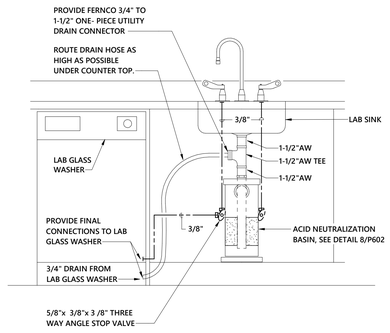
5 WASHER DRAIN WITH LINT TRAP DETAIL
NOT TO SCALE



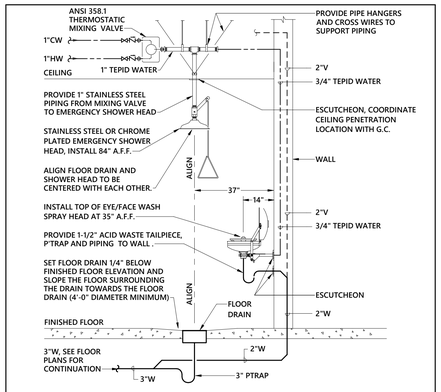
6 ROOF MOUNTED HOSE BIB - HB4
NOT TO SCALE



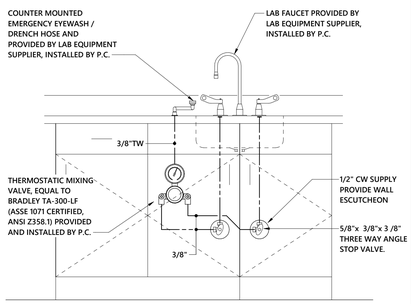
7 LAB SINK ACID NEUTRALIZATION BASIN DETAIL
NOT TO SCALE



8 ACID NEUTRALIZATION BASIN DETAIL
NOT TO SCALE



9 EMERGENCY SHOWER PIPING SCHEMATIC - ES1
NOT TO SCALE



10 DECK MOUNTED EYEWASH DETAIL
NOT TO SCALE

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022
2	Permit Revisions	01-11-2023

PROJECT: 9201-218240
DATE: 01-12-2023

PLUMBING DETAILS AND SCHEMATICS

P-602

Optima # 22-0082
[redacted]

01.12.2023 - BID SET

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COMMISSIONING NOTE

THIS PROJECT INCLUDES A THIRD PARTY COMMISSIONING AGENT CONTRACTED BY THE OWNER. THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH OWNER'S COMMISSIONING AGENT AND PROVIDE ALL NECESSARY TIME, MATERIALS, AND PROCEDURES REQUIRED FOR A FULLY COMMISSIONED PROJECT. SEE COMMISSIONING REQUIREMENTS IN THE PROJECT MANUAL FOR FURTHER INFORMATION.

MECHANICAL ACCESSORIES SYMBOL LEGEND

SYMBOL	DESCRIPTION
SD	CEILING MOUNTED SMOKE DETECTOR.
FD	RECTANGULAR DUCT FIRE DAMPER W/ ACCESS DOOR (SEE DETAIL)
F/SD	RECTANGULAR DUCT COMBINATION FIRE/SMOKE DAMPER W/ ACCESS DOOR (SEE DETAIL)
FD	ROUND DUCT FIRE DAMPER W/ACCESS DOOR (SEE DETAIL)
DD	RECTANGULAR DUCT MOUNTED DUCT DETECTOR. FURNISHED AND CONNECTED BY ELECTRICAL CONTRACTOR, INSTALLED BY MECHANICAL CONTRACTOR. CUTTING OF DUCT, INSTALLATION OF DETECTOR. AND DETERMINATION OF SAMPLING TUBE LENGTH SHALL BE THE MECHANICAL CONTRACTOR. PROVIDE REMOTE INDICATING LIGHT WITH EACH DETECTOR.
M	RECTANGULAR DUCT MOUNTED MOTOR OPERATED DAMPER, INTERLOCK WITH FAN AS INDICATED. (DAMPER BY M.C.)

MECHANICAL PIPING SYSTEMS LEGEND

SYMBOL	DESCRIPTION
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
D	CONDENSATE DRAINAGE
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
G	NATURAL GAS

2018 NORTH CAROLINA ENERGY CONSERVATION CODE

COMMERCIAL ENERGY EFFICIENCY - MECHANICAL SUMMARY

C401 METHOD OF COMPLIANCE

- ■ 2018 NCECC CHAPTER 4
- ☐ ASHRAE 90.1-2013 PRESCRIPTIVE
- ☐ ASHRAE 90.1-2013 PERFORMANCE
- ☐ N/A (EXISTING LIGHTING, HVAC, AND DOM. WATER HEATING SYSTEMS TO REMAIN)
- ☐ COMCHECK PROVIDED (2018 NCECC)
- ☐ COMCHECK PROVIDED (90.1-2013)
- ☐ ENERGY MODELING DATA PROVIDED

C406 ADDITIONAL EFFICIENCY PACKAGE OPTIONS

- ☐ C406.2 EFFICIENT MECH EQUIPMENT
- ■ C406.3 REDUCED LTG DENSITY
- ☐ C406.4 ENHANCED LTG CONTROLS
- ☐ C406.5 ON-SITE RENEWABLE ENERGY
- ☐ C406.6 DEDICATED OA SYSTEM
- ☐ C406.7 SERVICE WATER HEATING

C301 CLIMATE ZONE

3A - GASTON COUNTY, NORTH CAROLINA

DESIGN CONDITIONS

EXTERIOR (ASHRAE 90.1-2013 TABLE D-1)

winter dry bulb	18° F.
summer dry bulb	91° F.
summer wet bulb	74° F.

INTERIOR (2018 NCECC SECTION C302.1)

winter dry bulb	72° F.
summer dry bulb	75° F.

C403.2 HEATING & COOLING LOADS AND EQUIPMENT & SYSTEM SIZING

BUILDING HEATING LOAD	2,560,200 BTUH (peak)
BUILDING COOLING LOAD	391.4 TONS (peak)
INSTALLED HEATING CAPACITY	2,726,000 BTUH [5,452,000 BTUH (with redundant boiler)]
INSTALLED COOLING CAPACITY	275 TONS [550 TONS (with redundant chiller)]

C403.2.3 & C406.2 - REQUIRED & INCREASED HVAC EQUIPMENT PERFORMANCE

SYSTEM DESCRIPTION - 4-PIPE AHU'S WITH SINGLE ZONE REHEAT TERMINAL BOXES, AIR COOLED CHILLER, CAST IRON BOILERS, DX/GAS ROOFTOP UNITS.

- ■ MINIMUM HVAC EQUIP EFFICIENCY COMPLIANCE - TABLE C403.2.3
- ☐ INCREASED HVAC EQUIP EFFICIENCY COMPLIANCE - 10% OVER TABLE C403.2.3

EQUIP TYPE	SIZE CATEGORY (BTUH)	SUBCATEGORY	C403.2.3 MINIMUM EFFICIENCY (a)	10% INCREASED EFF. (a)	DESIGN EFFIC.
TABLE C403.2.3(1) - UNITARY AIR CONDITIONERS AND CONDENSING UNITS					
AIR COND, AIR COOLED	< 65,000 (<= 5 TONS)	SPLIT SYSTEM & SINGLE PACKAGE	13.0 SEER	14.3 SEER	SEE SCHEDULE
AIR COND, AIR COOLED	>= 65,000 & < 135,000	SPLIT SYSTEM & SINGLE PACKAGE	11.2 EER 12.8 IEER	12.3 EER 14.1 IEER	SEE SCHEDULE
AIR COND, AIR COOLED	>= 135,000 & < 240,000	SPLIT SYSTEM & SINGLE PACKAGE	11.0 EER 12.4 IEER	12.1 EER 13.6 IEER	SEE SCHEDULE
TABLE C403.2.3(4) - WARM AIR FURNACES					
WARM AIR GAS FURN	< 225,000	-	78% AFUE OR 80% Et	86% AFUE OR 88% Et	SEE SCHEDULE
WARM AIR GAS FURN	>= 225,000	MAXIMUM CAPACITY	80% Et	88% Et	SEE SCHEDULE
TABLE C403.2.3(5) - BOILERS, GAS AND OIL FIRED					
BOILERS GAS FIRED	>= 300,000 & < 2,500,000	HOT WATER	80% Et	88% Et	SEE SCHEDULE
TABLE C403.2.3(7) - WATER CHILLING PACKAGES					
AIR COOLED CHILLERS	>= 150 TONS	1.01 EER 14 IPLV OR	9.7 EER 16.1 IPLV'	10% BETTER	SEE SCHEDULE

C403.2.4 THRU C403.2.11

- ■ HVAC SYSTEMS ARE FULLY COMPLIANT WITH THE REQUIREMENTS FOR HVAC SYSTEM CONTROL, VENTILATION, ENERGY RECOVERY, DUCT AND PLENUM INSULATION AND SEALING, PIPING INSULATION, AND SYSTEM COMPLETION.

C403.2.12 - AIR SYSTEM DESIGN AND CONTROL

- ☐ ALL FANS INSTALLED ON THE PROJECT ARE 5 HP OR LESS AND ARE EXEMPT FROM THESE REQUIREMENTS.
- ■ FANS ABOVE 5 HP MEET THE CFM LIMITATIONS SHOWN BELOW:

OPTION 1 - FAN SYSTEM MOTOR NAMEPLATE HP - TABLE C403.2.12.1(1)

ALLOWABLE NAMEPLATE MOTOR HP	CONSTANT VOLUME MINIMUM CFM	VARIABLE VOLUME MINIMUM CFM	DESIGN CFM
7.5	6,818 CFM	5,000 CFM	SEE SCHEDULE
10	9,091 CFM	6,667 CFM	SEE SCHEDULE
15	13,636 CFM	10,000 CFM	SEE SCHEDULE
20	18,182 CFM	13,333 CFM	SEE SCHEDULE
25	22,727 CFM	16,667 CFM	SEE SCHEDULE
30	27,272 CFM	20,000 CFM	SEE SCHEDULE
40	36,364 CFM	26,667 CFM	SEE SCHEDULE
50	45,455 CFM	33,333 CFM	SEE SCHEDULE

C405.8 - ELECTRICAL MOTORS (MANDATORY REQUIREMENTS).

- ■ ELECTRICAL MOTORS HAVE BEEN SPECIFIED TO MEET MINIMUM EFFICIENCY REQUIREMENTS PER C405.8, EXCEPT WHERE EXEMPT.
- ☐ NOT APPLICABLE.

C408 - SYSTEM COMMISSIONING

- ☐ PROJECT AREA IS LESS THAN 10,000 SQUARE FEET AND IS EXEMPT FROM THE SYSTEM COMMISSIONING REQUIREMENTS OF SECTION C408.
- ■ PROJECT AREA IS GREATER THAN 10,000 SQUARE FEET AND REQUIRES SYSTEM COMMISSIONING PER SECTION C408.

BOILER SCHEDULE

BOILER #1 WEIL-McLAIN BG-1288-WF
CAST-IRON SECTIONAL BOILER; 3,135 MBH GROSS OUTPUT; 2,726 MBH NET OUTPUT; 3,773 MBH INPUT (NATURAL GAS); BURNER - WEBSTER MODEL WJB2G-15 GAS BURNER, 1 1/2 H.P., 120V-1∅, IRI GAS TRAIN WITH "POUNDS TO INCH" REGULATOR (5 PSI GAS SUPPLY), U.L. LABEL ON BURNER, 50 PSI RELIEF VALVE (ASME).

BOILER #2 WEIL-McLAIN BG-1288-WF
CAST-IRON SECTIONAL BOILER; 3,135 MBH GROSS OUTPUT; 2,726 MBH NET OUTPUT; 3,773 MBH INPUT (NATURAL GAS); BURNER - WEBSTER MODEL WJB2G-15 GAS BURNER, 1 1/2 H.P., 120V-1∅, IRI GAS TRAIN WITH "POUNDS TO INCH" REGULATOR (5 PSI GAS SUPPLY), U.L. LABEL ON BURNER, 50 PSI RELIEF VALVE (ASME).

NOTES:
1. 5 PSIG GAS SERVICE TO BOILERS WITH SHUT-OFF VALVE IS FURNISHED BY THE PLUMBING CONTRACTOR. MECHANICAL CONTRACTOR SHALL PROVIDE GAS PRESSURE REGULATOR/REDUCING VALVE AND MAKE FINAL CONNECTION TO BOILERS.

MECHANICAL GENERAL NOTES

SEE SPECIFICATIONS FOR ADDITIONAL PROJECT REQUIREMENTS. THESE GENERAL NOTES ARE INTENDED TO SUPPLEMENT THE SPECIFICATIONS. IN THE EVENT THAT THE VERBIAGE IS IN CONFLICT OR CONTRADICTS THE REQUIREMENTS LISTED HERE, THE QUESTION SHALL BE ASKED PRIOR TO BIDDING OR THE MORE STRINGENT SHALL APPLY AT THE ENGINEER'S DISCRETION.

1. DO NOT SCALE DRAWINGS. SEE ARCHITECTURAL DRAWINGS AND REFLECTED CEILING PLANS FOR EXACT LOCATION OF DOORS, WINDOWS, CEILING DIFFUSERS, ETC.

2. ALL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT TO COMPLY WITH BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, PIPING, SHEET METAL, ELECTRICAL, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASE BID. NO ADDITIONAL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT WILL BE APPROVED DURING CONSTRUCTION AND ALL COST WILL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR. THIS INCLUDES ANY MODIFICATIONS TO ANY ASSOCIATED MECHANICAL, PLUMBING, OR ELECTRICAL SYSTEMS REQUIRED BY THIS SPECIFIC MANUFACTURER'S INSTALLATION INSTRUCTIONS.

3. ALL DUCTWORK SHALL BE GALVANIZED SHEET METAL CONSTRUCTED IN ACCORDANCE WITH THE LATEST SMACNA STANDARDS. ALL SUPPLY, RETURN AND OUTSIDE AIR DUCTWORK SHALL BE WRAPPED WITH 2" THICK DUCT WRAP WITH VAPOR BARRIER. INSULATION (INCLUDING FLEXIBLE DUCT INSULATION) SHALL HAVE A MINIMUM INSTALLED R-VALUE OF 6.0. ROOFTOP UNIT RETURN DUCTWORK AND TRANSFER DUCTS SHALL BE LINED WITH 1" THICK FIBERGLASS DUCT LINER FOR ACOUSTICAL PURPOSES. DUCT DIMENSIONS ON PLANS ARE FREE AREA SIZE.

4. ALL DUCTWORK SHALL BE SEALED PER THE REQUIREMENTS OF THE NORTH CAROLINA INTERNATIONAL MECHANICAL CODE. SEAL MEDIUM PRESSURE SUPPLY DUCTWORK FOR POSITIVE 3" PRESSURE CLASS, SMACNA SEAL CLASS A, SMACNA LEAKAGE CLASS 4. SEAL LOW PRESSURE SUPPLY, RETURN, OUTSIDE AIR, AND EXHAUST DUCTWORK FOR POSITIVE/NEGATIVE 2" PRESSURE CLASS, SMACNA SEAL CLASS A, SMACNA LEAKAGE CLASS 4.

5. ALL PIPING, DUCTS, VENTS, ETC., EXTENDING THROUGH WALLS AND ROOF SHALL BE FLASHED AND COUNTERFLASHED IN A WATERPROOF MANNER.

6. ALL PIPING AND DUCTWORK LOCATIONS SHALL BE COORDINATED WITH THE WORK UNDER OTHER DIVISIONS OF THE SPECIFICATIONS, TO AVOID INTERFERENCE.

7. THE MECHANICAL CONTRACTOR SHALL BALANCE ALL MECHANICAL SYSTEMS TO THE PERFORMANCE SPECIFICATIONS INDICATED ON PLANS AND PROVIDE THE ENGINEER WITH THREE COPIES OF A COMPLETE TEST AND BALANCE REPORT. THE REPORT IS TO BE ISSUED A MINIMUM OF TWO WEEKS PRIOR TO PROJECT COMPLETION. THE TEST AND BALANCE REPORT WILL BE SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER. ANY ADDITIONAL TESTING, ADJUSTING AND BALANCING REQUIRED (AT ENGINEER'S REQUEST) AFTER REVIEW OF THE INITIAL REPORT SHALL BE PROVIDED AT NO ADDITIONAL COST. TESTING AND BALANCING CONTRACTOR TO CONFIRM FILTERS ARE CLEAN, AND FREE OF DEBRIS PRIOR TO BEGINNING WORK. THE MECHANICAL CONTRACTOR SHALL REPLACE ANY DIRTY FILTERS, AS NEEDED. TEST AND BALANCE REPORT TO BE COMPLETED BY AN INDEPENDENT, CERTIFIED TEST AND BALANCE CONTRACTOR.

8. UPON PROJECT COMPLETION, THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE OWNER INSTALLATION INFORMATION INCLUDING RECORD SUBMITTALS (WITH ANY SUBMITTAL REVIEW COMMENTS ADDRESSED) AND O&M MANUALS FOR EACH PIECE OF EQUIPMENT INCLUDING ALL SELECTED OPTIONS, THE NAME AND ADDRESS OF AT LEAST ONE SERVICE AGENCY, FULL CONTROL SYSTEM O&M AND CALIBRATION INFORMATION INCLUDING WIRING DIAGRAMS, SCHEMATICS, FULL SEQUENCE OF OPERATION, AND PROGRAMMED SETPOINTS. IN ADDITION, THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE TO HIRE A REGISTERED DESIGN PROFESSIONAL TO COMMISSION THE INSTALLED SYSTEM AND PROVIDE THE OWNER AND CODE REVIEWER A SEALED STATEMENT OF COMMISSIONING (PER 20128 NCECC APPENDIX C1).

9. PROVIDE A ONE YEAR WARRANTY FOR ALL WORK PERFORMED BEGINNING ON THE DAY THE SYSTEM IS COMPLETELY OPERATIONAL AND ACCEPTABLE BY THE OWNER.

10. PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND ALL EQUIPMENT FOR MAINTENANCE AND FILTER REMOVAL.

11. CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 PVC PIPE AND FITTINGS. DRAINS FROM AIR HANDLING UNITS SHALL BE TRAPPED. CONDENSATE DRAINS SHALL BE INSULATED WITH 1" THICK ARMAFLEX INSULATION. MINIMUM DRAIN SIZE SHALL BE ¾". TERMINATE ROOFTOP UNIT DRAINS ON A CONCRETE SPLASHBLOCK.

12. ALL REFRIGERANT PIPE SHALL BE NITROGENIZED ACR COPPER TUBE. SIZE, INSULATE, AND INSTALL REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATIONS. REFRIGERANT PIPING INSULATION EXPOSED OUTDOORS SHALL BE COVERED WITH AN OUTER ALUMINUM JACKET.

13. ANY DEVICE REQUIRING A THERMOSTAT FOR CONTROL SHALL BE FURNISHED WITH A THERMOSTAT WHETHER INDICATED ON THE DRAWINGS OR NOT.

14. INSTALL THE TOP OF ALL THERMOSTATS, SENSORS, AND SWITCHES AT 4'-0" (MAXIMUM) ABOVE FINISH FLOOR. COORDINATE EXACT THERMOSTAT LOCATION WITH OWNER PRIOR TO INSTALLATION. ANY DEVICE ON A PERIMETER WALL SHALL BE MOUNTED ON A FOAM-FILLED ELECTRICAL BOX, WITH ALL GAPS BETWEEN BOX AND WALL SEALED TO PREVENT INFILTRATION.

15. CONTRACTOR SHALL VERIFY LOCATION OF ALL ROOF PENETRATIONS WITH ARCHITECT & OWNER PRIOR TO INSTALLATION. NEW ROOF PENETRATIONS MADE THROUGH EXISTING ROOF SYSTEMS SHALL BE VERIFIED WITH THE OWNER'S EXISTING ROOF WARRANTY PRIOR TO INSTALLATION.

16. ALL ROOF CURBS SHALL EXTEND A MINIMUM OF 8" ABOVE ROOF INSULATION OR AS INDICATED ON THE DRAWINGS, WHICHEVER IS GREATER. IN ADDITION, ALL ROOF CURBS OR EQUIPMENT SUPPORT RAILS THAT SUPPORT EQUIPMENT, PIPING, CONDUIT, ETC. EXPOSED ON THE ROOF SHALL HAVE SUFFICIENT HEIGHT TO MAINTAIN A MINIMUM OF 18" CLEARANCE BELOW SUPPORTED EQUIPMENT FOR ROOF MAINTENANCE.

17. CONTRACTOR SHALL LOCATE EXHAUST FANS, OUTLETS, AND GAS FLUES A MINIMUM OF 15'-0" FROM ANY OUTSIDE AIR INTAKE.

18. DRYER VENT WALL CAPS SHALL BE PROVIDED WITH A BACKDRAFT DAMPER. DRYER VENT SHALL NOT EXCEED A TOTAL EQUIVALENT LENGTH OF 35'-0" WITH A 2.5' DEDUCTION FOR EACH 45° BEND AND A 5' DEDUCTION FOR EACH 90° BEND.

19. KITCHEN HOOD EXHAUST DUCT SHALL BE 16 GAUGE CARBON STEEL. ALL JOINTS AND SEAMS SHALL BE CONSTRUCTED WITH A CONTINUOUS LIQUID - TIGHT EXTERNAL WELD. ALL DUCTWORK SHALL SLOPE A MINIMUM OF 1/4 INCH PER FOOT TOWARD HOOD. PROVIDE CLEANOUTS AT EVERY CHANGE OF DIRECTION IN THE EXHAUST DUCT AND AT 20'-0" (MINIMUM) INTERVALS. PROVIDE 2 HR FIRE BLANKET INSULATION ON GREASE EXHAUST DUCT FROM HOOD COLLAR TO ROOF DECK. INCLUDE ACCESS TO DUCT CLEANOUTS. THE MECHANICAL CONTRACTOR SHALL PERFORM A LIGHT TEST (AS REQUIRED BY THE MECHANICAL CODE) FOR ALL JOINTS AND SEAMS IN THE PRESENCE OF THE LOCAL AUTHORITY HAVING JURISDICTION PRIOR TO CONCEALING KITCHEN HOOD EXHAUST DUCTWORK.

20. DISHWASHER EXHAUST DUCT SHALL BE STAINLESS STEEL. ALL JOINTS AND SEAMS SHALL HAVE A LIQUID TIGHT CONTINUOUS EXTERNAL WELD. EXHAUST DUCT SHALL SLOPE DOWN IN DIRECTION OF HOOD A MINIMUM OF 1" PER FOOT.

21. MINIMUM GAS PIPING SIZE SHALL BE 3/4".

22. GAS PIPING AND FITTINGS SHALL BE BLACK STEEL, SCHEDULE 40, IN ACCORDANCE WITH ASTM SPECIFICATION A 106, WITH 150 PSI BLACK MALLEABLE IRON FITTINGS IN ACCORDANCE WITH ASTM SPECIFICATION A 47, GRADE 32510, AND ASA SPECIFICATION B16.3, 125 LB.

23. GAS PIPING SHALL BE INSTALLED TO THE REQUIREMENTS OF THE STATE BUILDING CODE AND NFPA STANDARD NO. 54. ALL PIPING TO BE SUPPORTED BY CLEVIS HANGERS WITH GALVANIZED ROD A MAXIMUM OF 8' ON CENTER. PIPING SHALL BE SUPPORTED BY ROD HANGERS IN THE PIPE RUN 12" OR LESS IN LENGTH FROM THE TOP OF THE PIPE TO THE SUPPORTING STRUCTURE PER THE STATE BUILDING CODE AND ASCE 7.

24. GAS PIPING SHALL BE TESTED IN ACCORDANCE WITH THE PROCEDURES DESCRIBED IN NFPA NO 54. ANY OTHER TEST AS REQUIRED BY THE LOCAL GAS INSPECTION DEPARTMENT OR GAS COMPANY SHALL ALSO BE PERFORMED.

25. NATURAL GAS PIPING AND FITTINGS ABOVE GRADE: SCHEDULE 40 BLACK STEEL PIPING, TYPE S, SEAMLESS, GRADE B (ASTM A 53) AND 150 PSI MALLEABLE BLACK IRON FITTINGS, GRADE 32510, (ASTM B 16.3) OR FORGED STEEL WELDING TYPE FITTINGS (ASTM A234). PROVIDE THREADED JOINTS FOR PIPE 2" AND SMALLER. PROVIDE WELDED JOINTS (ASME B31.9) FOR PIPE 2½" AND LARGER.

26. SPACE GAS PIPING HANGER RODS 8'-0" ON CENTER MAXIMUM AND SPACE TRANSVERSE BRACING 20'-0" ON CENTER MAXIMUM. TRANSVERSE BRACING FOR ONE SECTION MAY ACT AS LONGITUDINAL BRACING FOR THE PIPE SECTION CONNECTED TO IT IF THE BRACING IS INSTALLED WITHIN 24" OF THE ELBOW OR TEE. COORDINATE HANGER LOCATIONS WITH STRUCTURAL DRAWING DETAILS.

27. PROVIDE A.G.A. CERTIFIED SHUT-OFF VALVES MINIMUM, 125 PSI RATED, NON- LUBRICATED PLUG TYPE WITH BRONZE BODY AND BRONZE PLUG, STRAINERS AND REGULATORS (AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER) FOR ALL EQUIPMENT CONNECTED TO THE NATURAL GAS SYSTEM.

28. PAINT ALL GAS PIPING WITH 2 COATS OF YELLOW ENAMEL PAINT APPLIED WITH A BRUSH (2 MIL THICKNESS MINIMUM). PROVIDE PRE-PRINTED LABELS WITH BLACK LETTERING INDICATING THE GAS PRESSURE AND THE WORD "GAS" ON THE PIPE AT 5'-0" CENTERS FOR ALL GAS PIPING.

29. ALL CHILLED WATER AND HOT WATER PIPING 2" AND LESS SHALL BE SCHEDULE 40 BLACK STEEL OR HARD-DRAWN TYPE-L COPPER PIPE AND FITTINGS. ALL CHILLED WATER AND HOT WATER PIPING GREATER THAN 2" SHALL BE (WELDED) SCHEDULE 40 BLACK STEEL. PROVIDE BRONZE VALVES AND FITTINGS WITH COPPER PIPING AND CAST IRON VALVES AND FITTINGS WITH SCHEDULE 40 BLACK STEEL.

30. CHILLED WATER PIPING SHALL BE INSULATED WITH 1½" THICK PHENOLIC CLOSED CELL, ASTM C1126 RIGID FOAM, 2.2 LBS. NOMINAL DENSITY, CFC FREE; ASTM C518, K-VALUE OF 0.13 AT 75° F. HOT WATER PIPING (1½" AND SMALLER) SHALL BE INSULATED WITH 1½" THICK FIBERGLASS INSULATION. HOT WATER PIPING (2" AND LARGER) SHALL BE INSULATED WITH 2" THICK FIBERGLASS INSULATION. FIBERGLASS INSULATION SHALL HAVE A K-VALUE OF 0.27 (OR LESS) AT 75°F. INSULATION SHALL HAVE A FACTORY APPLIED PRESSURIZED VAPOR BARRIER JACKET WITH PRESSURE SENSITIVE ADHESIVE SELF SEALING LAP. ALL FITTINGS SHALL HAVE PVC FITTING COVERS. ALL PIPING OUTSIDE SHALL HAVE A BITUMINOUS COATING ALUMINUM JACKET AND PVC FITTING COVERS.

31. ALL CHILLED WATER AND HOT WATER PIPING SHALL PITCH DOWN IN DIRECTION OF FLOW WITH MANUAL AIR VENTS AT ALL HIGH POINTS AND ½" RAIN VALVES AT ALL LOW POINTS.

32. PROVIDE UNIONS, FLANGES OR COUPLINGS AT CONNECTION TO ALL VALVES AND EQUIPMENT. DO NOT USE DIRECT WELDED OR THREADED CONNECTIONS TO VALVES, EQUIPMENT OR OTHER APPARATUS.

33. PROVIDE NON-CONDUCTING DIELECTRIC UNIONS WHENEVER CONNECTING DISSIMILAR METALS.

34. ALL ISOLATION VALVES, TERMINAL UNITS, CONTROLS, ETC. REQUIRING ACCESS AND SERVICE SHALL BE INSTALLED WITHIN 18" OF THE CEILING FOR SERVICE ACCESSIBILITY. LOCATIONS SHALL BE INDICATED ON THE CEILING GRID PER THE SPECIFICATIONS.

35. ALL EQUIPMENT CONCRETE PAD SIZES FOR MECHANICAL EQUIPMENT SHALL BE CONFIRMED WITH APPROVED SHOP DRAWING SUBMITTALS AND ASSOCIATED UNIT MANUFACTURER ANCHOR LOCATIONS PRIOR TO FABRICATION/INSTALLATION. THE MECHANICAL AND PLUMBING CONTRACTORS SHALL COORDINATE THE EXACT LOCATION OF MECHANICAL EQUIPMENT HOUSEKEEPING PADS WITH THE FLOOR DRAIN LOCATIONS PRIOR TO INSTALLATION OF DRAINS AT EQUIPMENT/PAD LOCATIONS.

36. DUCTWORK AND PIPING PASSING THROUGH/ABOVE ELECTRICAL ROOMS SHALL BE CLOSELY COORDINATED WITH THE ELECTRICAL CONTRACTOR. DUCTWORK OR PIPING SHALL NOT BE LOCATED ABOVE ELECTRICAL PANELS.

37. EQUIPMENT OPERATED DURING CONSTRUCTION SHALL USE FILTERED MEDIA TO PREVENT CONSTRUCTION DEBRIS FROM ENTERING COILS, DUCTWORK SYSTEMS, AIR TERMINALS ETC. AT COMPLETION OF CONSTRUCTION, MECHANICAL CONTRACTOR SHALL CLEAN ALL SYSTEMS WITH ALL CONTROL DEVICES WIDE OPEN AND REMOVE ANY REMAINING DEBRIS PRIOR TO TEST AND BALANCING. MECHANICAL CONTRACTOR SHALL REPLACE ALL FILTRATION WITH NEW FILTERS AT COMPLETION OF CONSTRUCTION. ANY DUCTWORK, AIR TERMINALS, AND/OR OTHER EQUIPMENT UPSTREAM OF FILTRATION SHALL BE CLEANED THOROUGHLY OF CONSTRUCTION DEBRIS BEFORE HANDING OVER TO OWNER.

38. COMMERCIAL DRYER EXHAUST DUCTWORK SHALL BE CONSTRUCTED OF GALVANIZED SHEET METAL NOT LESS THAN 0.0195 INCHES THICK. EXHAUST DUCT SHALL BE ASSEMBLED WITH SMOOTH INTERIOR SURFACE SO THAT THE JOINTS DO NOT PERMIT THE ACCUMULATION OF LINT, DO NOT USE SHEET METAL SCREWS AT JOINTS. ALL 90° TURN SHALL HAVE LONG RADIUS ELBOWS. ALL DUCTWORK SHALL BE INSTALLED PER THE DRYER MANUFACTURER'S RECOMMENDATIONS. COMMERCIAL DRYER EXHAUST DUCTWORK SHALL BE WRAPPED WITH TWO LAYERS OF 1½" THICK THERMAL INSULATION BLANKET AS MANUFACTURED BY FIREMASTER (OR EQUAL). INSULATION SHALL BE INSTALLED PER NFPA-96 AND IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS TO OBTAIN A 2-HOUR RATED ASSEMBLY. ASSEMBLY SHALL BE U.L. APPROVED.

39. PROVIDE COMBINATION FIRE/SMOKE DAMPERS WITH AN IONIZATION TYPE DUCT MOUNTED SMOKE DETECTOR IN DUCTED APPLICATIONS, OR SPOT DETECTORS IN OPENING APPLICATIONS (WITHIN 5'-0" OF THE DAMPER WITH NO AIR OUTLETS OR INLETS BETWEEN DETECTOR AND DAMPER), INSTALLED IN THE DUCT WIRED, TO CLOSE THE DAMPER UPON ACTIVATION. DUCT MOUNTED SMOKE DETECTORS AND SPOT DETECTORS SHALL BE SUPPLIED, WIRED FOR INTERFACE WITH FIRE ALARM SYSTEM AND UNIT SHUTDOWN BY THE ELECTRICAL CONTRACTOR. DETECTORS SHALL BE INSTALLED IN THE DUCT BY THE MECHANICAL CONTRACTOR.

40. ALL MECHANICAL EQUIPMENT SHALL BE U.L. LISTED AND LABELED AS A COMPLETE PACKAGE, NOT THOUGH INDIVIDUAL COMPONENTS OR PARTS. PROVIDE REQUIRED 3RD PARTY FIELD UL LISTING SERVICES AS REQUIRED TO COMPLY.

EQUIVALENT MANUFACTURERS LISTING

LISTING OF MANUFACTURER'S NAME DOES NOT GUARANTEE APPROVAL. ALL EQUIPMENT MUST MEET OR EXCEED QUALITY AND CAPACITIES OF SPECIFIED EQUIPMENT. FINAL APPROVAL WILL BE BASED ON EQUIPMENT SUBMITTALS. ANY MANUFACTURER NOT LISTED BUT WISHING TO BID THIS PROJECT SHALL SUBMIT A WRITTEN REQUEST A MINIMUM OF 7 DAYS PRIOR TO BID DATE OR AS INDICATED IN THE SPECIFICATIONS, PRIOR APPROVAL IS REQUIRED FOR ALL MANUFACTURERS NOT LISTED.

(*) PACKAGED ROOFTOP UNITS: CARRIER, TRANE, YORK/JOHNSON, DAIKIN

FANS: COOK, GREENHECK, PENN, TWIN CITY

AIR DISTRIBUTION: CARNES, METAL*AIRE, NAILOR, PRICE, TITUS, TUTTLE & BAILEY, KRUEGER

FIRE DAMPERS: AIR BALANCE INC., GREENHECK, NAILOR, RUSKIN, POTTORFF, NCA, SAFE-AIRE

DUCTLESS SPLIT SYSTEMS: DAIKIN, MITSUBISHI, TRANE, L.G., EMI, YORK

VAV TERMINAL UNITS: CARRIER, ENVIRO-TEC, NAILOR, PRICE, TITUS, TRANE, KRUEGER

ELECTRIC UNIT HEATERS: REZNOR, MARKEL, MODINE, RAYWALL

PUMPS & HYDRONIC EQUIPMENT: ARMSTRONG, BELL & GOSSETT, PATTERSON

(*) AIR-COOLED CHILLERS: CARRIER, TRANE, YORK/JOHNSON, DAIKIN

(*) MODULAR AIR HANDLING UNITS: CARRIER, TRANE, YORK/JOHNSON, DAIKIN

KITCHEN HOODS: CAPTIVE-AIRE, GREENHECK, SELECT AIR SYSTEMS

(*) CAST IRON BOILERS: H.B. SMITH, PEERLESS, WEIL-McLAIN BURNERS : RIELLO, POWERFLAME, WEBSTER

(*) DDC CONTROLS: UNITED AUTOMATION, ALERTON, SCHNEIDER, ENGINEERED CONTROL SOLUTIONS

(*) - SEE ALTERNATES NOTE, THIS PAGE

NOTE:

1. ALL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT TO COMPLY WITH BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, PIPING, SHEET METAL, ELECTRICAL, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASE BID. NO ADDITIONAL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT WILL BE APPROVED DURING CONSTRUCTION AND ALL COST WILL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.

CHILLER SCHEDULE

CHILLER #1 DAIKIN AWV018B (HIGH EFFICIENCY AIR-COOLED CHILLER)
275 TONS (MIN.); 95° F. AMBIENT; EVAPORATOR: 550 GPM, 44° F. L.W.T., 56° F. E.W.T., 13' MAX. P.D.,
ELEC. DATA: 460V-3∅, COMPRESSORS (2): COMPR. CIRCUIT A: 196 RLA; COMPR. CIRCUIT B: 196 RLA;
FANS: 18 TOTAL, 3.3 FLA (EA); UNIT ELECTRICAL DATA: (SINGLE POINT ELECTRICAL CONNECTION) 502 MCA, 600 MOCP; 20 AMP, 120V CIRCUIT FOR CONTROLS AND HEATERS;
CHILLER SHALL BE FURNISHED WITH: 2 COMPRESSORS WITH TWO INDEPENDENT REFRIGERANT CIRCUITS, WYE DELTA STARTER,
MICROPROCESSOR BASED CONTROL SYSTEM TO MAINTAIN A CONSTANT LEAVING WATER TEMPERATURE OF 44° F., LEAD-LAG CONTROLS TO MAINTAIN EQUAL COMPRESSOR RUN TIMES, BACnet Card WITH OPEN PROTOCOL TO ALLOW COMMUNICATION WITH THE BUILDING AUTOMATION SYSTEM,
FACTORY INSTALLED WATER FLOW SWITCH, ARCHITECTURAL LOUVERED PANELS,
PROTECTIVE COIL GUARDS, 5-YEAR COMPRESSOR, PARTS, LABOR, AND REFRIGERANT WARRANTY,
STANDARD SOUND PACKAGE FOR A MAXIMUM SOUND PRESSURE OF 73 DBA @ 30'.
OPERATING WEIGHT = 18,939 POUNDS. PROVIDE CHILLER WITH R-134A REFRIGERANT.
FULL LOAD EFFICIENCY – 10.51 EER, 17.76 EER IPLV

CHILLER #2 DAIKIN AWV018B (HIGH EFFICIENCY AIR-COOLED CHILLER)
275 TONS (MIN.); 95° F. AMBIENT; EVAPORATOR: 550 GPM, 44° F. L.W.T., 56° F. E.W.T., 13' MAX. P.D.,
ELEC. DATA: 460V-3∅, COMPRESSORS (2): COMPR. CIRCUIT A: 196 RLA; COMPR. CIRCUIT B: 196 RLA;
FANS: 18 TOTAL, 3.3 FLA (EA); UNIT ELECTRICAL DATA: (SINGLE POINT ELECTRICAL CONNECTION) 502 MCA, 600 MOCP; 20 AMP, 120V CIRCUIT FOR CONTROLS AND HEATERS;
CHILLER SHALL BE FURNISHED WITH: 2 COMPRESSORS WITH TWO INDEPENDENT REFRIGERANT CIRCUITS, WYE DELTA STARTER,
MICROPROCESSOR BASED CONTROL SYSTEM TO MAINTAIN A CONSTANT LEAVING WATER TEMPERATURE OF 44° F., LEAD-LAG CONTROLS TO MAINTAIN EQUAL COMPRESSOR RUN TIMES, BACnet Card WITH OPEN PROTOCOL TO ALLOW COMMUNICATION WITH THE BUILDING AUTOMATION SYSTEM,
FACTORY INSTALLED WATER FLOW SWITCH, ARCHITECTURAL LOUVERED PANELS,
PROTECTIVE COIL GUARDS, 5-YEAR COMPRESSOR, PARTS, LABOR, AND REFRIGERANT WARRANTY,
STANDARD SOUND PACKAGE FOR A MAXIMUM SOUND PRESSURE OF 73 DBA @ 30'.
OPERATING WEIGHT = 18,939 POUNDS. PROVIDE CHILLER WITH R-134A REFRIGERANT.
FULL LOAD EFFICIENCY – 10.51 EER, 17.76 EER IPLV

NOTES:
1. PROVIDE PHASE LOSS/BROWNOUT PROTECTION.
2. PROVIDE LOW AND HIGH-PRESSURE SWITCHES, NOT SIMPLY A LOSS OF CHARGE SWITCH.
3. PROVIDE OIL PROTECTION FOR SEMI-HERMETIC COMPRESSORS.
4. ALL UNITS SHALL HAVE STANDARD 24-VOLT CONTROL CIRCUIT OPERATION WITH CONTROL SYSTEM WITHOUT ADDITIONAL INTERFACES OR GATEWAYS, COORDINATE WITH CONTROLS CONTRACTOR.
5. ALL ELECTRICAL COMPONENTS SERVING AND WITHIN CHILLER MUST HAVE A MINIMUM SCCR RATING OF 65 KAIC.

MECHANICAL DUCT SYMBOLS

SYMBOL	DESCRIPTION
16x8	SQUARE DUCT SIZE TAG (WIDTH x HEIGHT)
16"Ø	ROUND DUCT SIZE TAG (DIAMETER)
S/A	SUPPLY AIR
O/A	OUTDOOR AIR
R/A	RETURN AIR
E/A	EXHAUST AIR
L/A	RELIEF AIR
	SUPPLY AIR DIFFUSER (4-WAY)
	RETURN AIR GRILLE
	RETURN AIR GRILLE WITH SOUND BOOT
	EXHAUST AIR GRILLE
M.C.	MECHANICAL CONTRACTOR
E.C.	ELECTRICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
N.I.C.	NOT IN CONTRACT
AFF	ABOVE FINISHED FLOOR
DN	DOWN
UP	UP
T	THERMOSTAT (4'-0" AFF TO TOP)
H	HUMIDITY SENSOR (4'-0" AFF TO TOP)
S	SWITCH (4'-0" AFF TO TOP)
B	BUILDING PRESSURE SENSOR (4'-0" AFF TO TOP UNO)
SP	DUCT STATIC PRESSURE SENSOR
C	CO2 SENSOR (4'-0" AFF TO TOP UNO)
CO	CARBON MONOXIDE SENSOR (4'-0" AFF TO TOP)
X / X	SECTION CUT REFERRING DETAIL NUMBER REFERRING SHEET NUMBER

MECHANICAL PIPING SYMBOLS

SYMBOL	DESCRIPTION
	BUTTERFLY VALVE
	3-PIECE BALL VALVE
	CHECK VALVE
	STRAINER WITH BLOWDOWN VALVE WITH HOSE CONN.
	BALANCING VALVE
	B&G CIRCUIT SETTER
	UNION
	THERMOMETER
P	PRESSURE GAGE & COCK
	GAGE COCK
	FLOW SWITCH
	ECCENTRIC REDUCER
	CONCENTRIC REDUCER
	CONTROL VALVE
	GAS COCK
	PRESSURE REDUCING/REGULATING VALVE
S	SOLENOID VALVE

MECHANICAL SHEET INDEX

SHEET NUMBER	SHEET NAME
M-001	MECHANICAL LEGEND AND NOTES
M-002	MECHANICAL SCHEDULES
M-003	MECHANICAL SCHEDULES
M-004	VENTILATION CALCULATIONS
M-005	VENTILATION CALCULATIONS
M-006	MECHANICAL SEQUENCE OF OPERATION
M-007	MECHANICAL POINTS LISTS
M-100	BASEMENT FLOOR MECHANICAL PLAN
M-101	OVERALL FIRST FLOOR MECHANICAL PLAN
M-101A	FIRST FLOOR MECHANICAL PLAN AREA A
M-101B	FIRST FLOOR MECHANICAL PLAN AREA B
M-101C	FIRST FLOOR MECHANICAL PLAN AREA C
M-102	OVERALL SECOND FLOOR MECHANICAL PLAN
M-102A	SECOND FLOOR MECHANICAL PLAN AREA A
M-102B	SECOND FLOOR MECHANICAL PLAN AREA B
M-102C	SECOND FLOOR MECHANICAL PLAN AREA C
M-103	ATHLETIC BUILDINGS MECHANICAL PLANS
M-151	OVERALL ROOF MECHANICAL PLAN
M-200	BASEMENT FLOOR MECHANICAL PIPING PLAN
M-201	OVERALL FIRST FLOOR MECHANICAL PIPING PLAN
M-201A	FIRST FLOOR MECHANICAL PIPING PLAN AREA A
M-201B	FIRST FLOOR MECHANICAL PIPING PLAN AREA B
M-201C	FIRST FLOOR MECHANICAL PIPING PLAN AREA C
M-202	OVERALL SECOND FLOOR MECHANICAL PIPING PLAN
M-202A	SECOND FLOOR MECHANICAL PIPING PLAN AREA A
M-202B	SECOND FLOOR MECHANICAL PIPING PLAN AREA B
M-202C	SECOND FLOOR MECHANICAL PIPING PLAN AREA C
M-301	ENLARGED MECHANICAL PLANS
M-302	ENLARGED MECHANICAL PLANS
M-303	ENLARGED MECHANICAL PLANS
M-501	MECHANICAL DETAILS
M-502	MECHANICAL SCHEMATICS AND DETAILS
M-503	MECHANICAL UL DETAILS

MECHANICAL ALTERNATES

Alternate #5
OWNER PREFERRED VENDOR PACKAGE - DDC CONTROLS PROVIDED BY SCHNEIDER

Alternate #7
OWNER PREFERRED VENDOR -PROVIDE ALTERNATE PRICE FOR BOILERS BY WEIL MCLAIN

Alternate #8
OWNER PREFERRED VENDOR -PROVIDE ALTERNATE PRICE FOR CHILLERS, AIR HANDLING UNITS, AND ROOFTOP UNITS BY TRANE, AND DDC CONTROLS PROVIDED BY SCHNEIDER

GASTON COUNTY SCHOOLS

Gaston County Schools

GRIER MIDDLE SCHOOL REPLACEMENT

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

MECHANICAL LEGEND AND NOTES

M-001

Optima # 22-0082

01.12.2023 - BID SET

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AIR HANDLING UNIT SCHEDULE (CHILLED WATER COOLING WITH HOT WATER PRE-HEAT/REHEAT)

SYMBOL	LOCATION	AREA SERVED	SUPPLY FAN AIR FLOW (CFM)	SUPPLY FAN E.SP. (IN H20)	RETURN FAN/AIR FLOW AIR FLOW (CFM)	RETURN FAN/AIR FLOW E.S.P. (IN H20)	OCCUPIED MIN. OUTSIDE AIRFLOW (CFM)	DESIGN OUTSIDE AIRFLOW (CFM)	PREHEAT COIL TOTAL CAPACITY (BTUH)	PREHEAT COIL GPM	PREHEAT COIL RUNOUT SIZE	PREHEAT COIL E.W.T. (°F)	PREHEAT COIL L.W.T. (°F)	PREHEAT COIL MAX. P.D. (FT)	PREHEAT COIL MAX. S.P. (IN w.g.)	COOLING COIL TOTAL CAPACITY (BTUH)	COOLING COIL SENSIBLE (BTUH)	COOLING COIL GPM	COOLING COIL RUNOUT SIZE	COOLING COIL E.W.T. (F°)	COOLING COIL L.W.T. (F°)	COOLING COIL MAX. P.D. (FT)	COOLING COIL MAX. S.P. (IN w.g.)	REHEAT COIL TOAL CAPACITY (BTUH)	REHEAT COIL GPM	REHEAT COIL RUNOUT SIZE	REHEAT COIL E.W.T. (F°)	REHEAT COIL L.W.T. (F°)	REHEAT COIL MAX. P.D. (FT)	REHEAT COIL MAX. S.P. (IN w.g.)	SUPPLY FAN QTY	SUPPLY FAN HP	RELIEF FAN QTY	RELIEF FAN HP	ELECTRICAL DATA VOLTS	ELECTRICAL DATA PH	ELECTRICAL DATA HZ	MANUFACTURER	MODEL	SEQUENCE OF OPERATION	UNIT WEIGHT (LBS)	MAX UNIT LENGTH	ACCESSORIES	UNIT NUMBER
AHU-1	MECH 151	1ST FL CLASSROOMS	14,800	2.00	14,800	0.50	2,100	3800	412,586	20.2	2"	180.0	139.2	3.2	0.13	576,070	403,063	98.0	3"	44.0	55.8	11.6	0.75								1	15.0	1	10.0	480 V	3	60	DAIKIN APPLIED	CAH 030	VAV	5328	232"	A,C,D,E,F,G,H,J	AHU-1
AHU-2	MECH 152	1ST FL CLASSROOMS	16,600	2.00	16,600	0.50	1,850	3750	446,316	22.7	2"	180.0	140.7	3.2	0.11	619,224	432,662	134.2	4"	44.0	53.2	14.4	0.57								2	10.0	1	10.0	480 V	3	60	DAIKIN APPLIED	CAH 035	VAV	6593	250"	A,B,C,D,E,F,G,H,J	AHU-2
AHU-3	MECH 151	2ND FL CLASSROOMS	19,900	2.00	19,900	0.50	2,100	4500	540,335	27.2	2"	180.0	140.3	5.0	0.11	736,541	518,768	123.7	3"	44.0	55.9	16.8	0.65								2	10.0	2	10.0	480 V	3	60	DAIKIN APPLIED	CAH 040	VAV	9601	262"	B,C,D,E,F,G,H,J	AHU-3
AHU-4	MECH 152	2ND FL CLASSROOMS	24,800	2.00	24,800	0.50	2,100	5200	643,519	33.9	2"	180.0	142.0	5.9	0.10	925,105	649,967	154.2	4"	44.0	56.0	17.8	0.63								1	25.0	1	20.0	480 V	3	60	DAIKIN APPLIED	CAH 050	VAV	8951	256"	A,C,D,E,F,G,H,J	AHU-4
AHU-5	MECH 221	ADMIN	6,400	2.00	6,400	0.50	1,000	1100	177,597	8.7	1 1/4"	180.0	139.4	1.3	0.10	252,249	175,252	42.7	2"	44.0	55.8	14.5	0.58								1	5.0	1	5.0	480 V	3	60	DAIKIN APPLIED	CAH 014	VAV	2906	198"	A,C,D,E,F,G,H,J	AHU-5
AHU-6	MECH 221	MEDIA	5,900	2.00	5,900	0.50	1,000	1400	163,815	8.1	1 1/4"	180.0	139.4	1.0	0.12	220,086	154,089	47.7	2 1/2"	44.0	53.2	14.1	0.53								1	7.5	1	5.0	480 V	3	60	DAIKIN APPLIED	CAH 012	VAV	2659	198"	A,C,D,E,F,G,H,J	AHU-6
AHU-8	MECH PENT G007	PE AREAS	7,800	2.00	7,800	0.50	1,600	3750	210,203	10.7	1 1/4"	180.0	140.6	1.7	0.10	284,632	200,489	48.5	2 1/2"	44.0	55.7	17.1	0.52								1	10.0	2	5.0	480 V	3	60	DAIKIN APPLIED	CAH 017	VAV	3566	196"	A,B,C,D,E,F,G,H,J,K,L	AHU-8
AHU-10	MECH PENT G007	GYM	13,600	0.75	13,600	0.50	0	5000	352,636	18.6	1 1/2"	180.0	142.1	2.7	0.09	500,013	354,139	84.6	3"	44.0	55.8	8.9	0.58								1	15.0	1	10.0	480 V	3	60	DAIKIN APPLIED	CAH 030	VAV	5217	228"	A,C,D,E,F,G,H,J	AHU-10
AHU-7	MECH 221	DINING/PLATFORM	15,460	0.75	15,460	0.50	1,000	6800	[redacted]			[redacted]				578,191	407,551	96.4	3"	44.0	56.0	9.7	0.55	430,077	21.2	2"	180.0	139.4	2.9	0.10	1	15.0	1	10.0	480 V	3	60	DAIKIN APPLIED	CAH 035	SZ VAV	5630	226"	A,C,D,E,F,G,H,J	AHU-7
AHU-9	MECH PENT G007	GYM/LOCKER	9,000	0.75	9,000	0.50	2650 FROM	ERV-1	[redacted]		0	[redacted]				350,139	242,976	59.6	2 1/2"	44.0	55.8	16.0	0.52	254,722	12.3	1 1/2"	180.0	138.6	2.2	0.13	1	10.0	1	5.0	480 V	3	60	DAIKIN APPLIED	CAH 021	SZ VAV	3824	216"	A,C,D,E,F,G,H,J	AHU-9

NOTES:

1. COOLING COIL CAPACITY IS BASED ON 80° F D.B./67° F W.B. E.A.T. AND 56.0° F. W.B. L.A.T.
2. MAXIMUM FACE VELOCITY OF COOLING COILS SHALL BE 515 FPM.
3. HEATING COIL CAPACITY IS BASED ON 65° F. E.A.T.
4. ALL AIR HANDLERS SHALL HAVE DIRECT DRIVE FANS WITH HIGH EFFICIENCY FAN MOTORS.
5. ALL AIR HANDLING UNIT SHALL BE PROVIDED WITH AN PHOTO-ELECTRIC TYPE SMOKE DETECTOR MOUNTED IN THE RETURN DUCT. THE SMOKE DETECTOR SHALL BE FURNISHED AND WIRED FOR UNIT SHUT DOWN AND FIRE ALARM INTERFACE BY DIVISION 26 AND SHALL BE INSTALLED IN THE DUCT(S) BY DIVISION 23.
6. ALL UNITS SHALL HAVE A FACTORY INSTALLED 6" HIGH BASE RAIL. MOUNT AHU'S ON A 4" THICK CONCRETE PAD.
7. CONTRACTOR SHALL INSTALL NEW SET OF MERV 8 PLEATED FILTERS AT SUBSTANTIAL COMPLETION, AND PROVIDE SPARE SETS OF FILTERS TO THE OWNER.
8. ALL UNITS SHALL BE DOUBLE WALL CONSTRUCTION WITH 18 GAUGE MINIMUM CASING.
9. ALL UNITS SHALL HAVE A MINIMUM 14" ACCESS SECTION WITH HINGED DOOR BETWEEN EACH SET OF ADJACENT COILS.
10. FAN VFD'S AND BYPASS SHALL BE PROVIDED WITH BUILT IN PHASE LOSS PROTECTION.
11. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
12. OUTSIDE AIR FOR AHU-9 SHALL BE PROVIDED THROUGH ERV-1 (2,650 CFM).
13. PROVIDE UNIT MOUNTED VFDS.
14. PROVIDE MARINE LIGHT IN RETURN FAN SECTION, SUPPLY FAN SECTION, INLET PLENUM AND DISCHAGE PLENUM. LIGHTS SHALL BE WIRED TO SINGLE SWITCH ON EXTERIOR OF UNIT, NEAR SUPPLY FAN VFD.
15. ALL ELECTRICAL COMPONENTS SERVING AND WITHIN AIR HANDLING UNITS, INCLUDING VFDs, MUST HAVE A MINIMUM SCCR RATING OF 35 KAIC.

ACCESSORIES:

A - VARIABLE FREQUENCY DRIVE WITH BYPASS FOR EACH SINGLE SUPPLY/RETURN FAN
B - INDIVIDUAL VARIABLE FREQUENCY DRIVES (NO BYPASS) FOR EACH SET OF MULTIPLE SUPPLY/RETURN FAN(S) WITH SINGLE POINT ELECTRICAL CONNECTION FOR EACH SET OF FANS
C - PLENUM SUPPLY FAN (SEE PLANS FOR DISCHARGE LOCATION)
D - PLENUM RETURN/RELIEF FAN
E - HORIZONTAL DRAW THROUGH
F - ECONOMIZER SECTION WITH MOTORIZED OUTSIDE AIR, RETURN (MIXED) AIR AND RELIEF AIR DAMPERS.
G - 2" PLEATED FILTERS (MERV-8 MINIMUM)
H - CO2 SENSOR FOR DEMAND LIMITING CONTROL
J - INTERNAL VIBRATION ISOLATION
K - SUPPLY AIR THROUGH BOTTOM OF UNIT
L - RETURN AIR THROUGH BOTTOM OF UNIT

FAN SCHEDULE

SYMBOL	LOCATION	TYPE	CFM	APPROX. ESP	DRIVE TYPE	ELECTRICAL DATA WATTS	ELECTRICAL DATA H.P.	ELECTRICAL DATA VOLT - Ø	MANUFACTURER GREENHECK MODEL NO.	ACCESSORIES	CONTROL TYPE
F-1	KITCHEN HOOD	EXHAUST	4725	1.400	BELT	[redacted]	2.00	208 V-3Ø	CUBE-220-20	A,D,E,O,P,Q	7
F-2	KITCHEN HOOD	MAKE UP AIR	4016	0.400	BELT		3.00	208 V-3Ø	DXG-115-H22	A,C,D,L,Q,U	7
F-3	DISHWASHER	EXHAUST	600	0.400	BELT	[redacted]	0.25	120 V-1Ø	CUBE-099-4	A,B,D,E	8
F-4	CONCESSION BLDG (TYP FOR 2)	EXHAUST	800	0.500	DIRECT	[redacted]	0.25	120 V-1Ø	G-100-C	A,B,D,E,I	2
F-5	NOT USED		0	0.000		[redacted]		120 V-1Ø			
F-6	BOILER ROOM	SUPPLY	3500	0.250	BELT	[redacted]	0.50	120 V-1Ø	SBE1-20-	A,B,G,J,M	1
F-7	MAIN ELEC ROOM	EXHAUST	2000	0.250	DIRECT	1285	[redacted]	120 V-1Ø	CSP-A2150	A,B,G,K,X	1
F-8	KITCHEN TLT/LCKR	EXHAUST	425	0.500	DIRECT	[redacted]	0.07	120 V-1Ø	G-090-E	A,B,D,E	5
F-9	SCIENCE STORAGE	EXHAUST	150	0.250	DIRECT	128	[redacted]	120 V-1Ø	SP-B150	A,B,F,N,X	6
F-10	SCIENCE PREP	EXHAUST	250	0.250	DIRECT	81	[redacted]	120 V-1Ø	SP-A290	A,B,F,N,X	6
F-11	SCIENCE LAB	EXHAUST	1600	0.250	DIRECT	934	[redacted]	120 V-1Ø	CSP-A1550	A,B,F,G,X	4
F-12	GYM TLTS	EXHAUST	1075	0.500	DIRECT	[redacted]	0.50	120 V-1Ø	G-120-C	A,B,D,E	5
F-13	GYM LOCKER RMS	VENTILATION	2230	0.500	DIRECT	[redacted]	0.50	120 V-1Ø	SQ-160	A,B,F,G	5
F-14	ART ROOM	EXHAUST	1600	0.250	DIRECT	943	[redacted]	120 V-1Ø	CSP-A1550	A,B,F,G,X	4
F-15	KILN	EXHAUST	150	0.250	DIRECT	128	[redacted]	120 V-1Ø	SP-B150	A,B,F,H,N	1
F-16	SCIENCE STORAGE	EXHAUST	150	0.250	DIRECT	128	[redacted]	120 V-1Ø	SP-B150	A,B,F,N	6
F-17	SCIENCE PREP	EXHAUST	250	0.250	DIRECT	81	[redacted]	120 V-1Ø	SP-A290	A,B,F,N	6
F-18	SCIENCE LAB	EXHAUST	1600	0.250	DIRECT	934	[redacted]	120 V-1Ø	CSP-A1550	A,B,F,G,X	4
F-19	SCIENCE LAB	EXHAUST	1600	0.250	DIRECT	934	[redacted]	120 V-1Ø	CSP-A1550	A,B,F,G,X	4
F-20	SCIENCE STORAGE	EXHAUST	150	0.250	DIRECT	128	[redacted]	120 V-1Ø	SP-B150	A,B,F,N,X	6
F-21	SCIENCE PREP	EXHAUST	250	0.250	DIRECT	81	[redacted]	120 V-1Ø	SP-A290	A,B,F,N,X	6
F-22	SCIENCE LAB	EXHAUST	1600	0.250	DIRECT	934	[redacted]	120 V-1Ø	CSP-A1550	A,B,F,G,X	4
F-23	SCIENCE STORAGE	EXHAUST	150	0.250	DIRECT	128	[redacted]	120 V-1Ø	SP-B150	A,B,F,N,X	6
F-24	SCIENCE PREP	EXHAUST	250	0.250	DIRECT	81	[redacted]	120 V-1Ø	SP-A290	A,B,F,N,X	6
F-25	SCIENCE LAB	EXHAUST	1600	0.250	DIRECT	934	[redacted]	120 V-1Ø	CSP-A1550	A,B,F,G,X	4
F-26	SCIENCE STORAGE	EXHAUST	150	0.250	DIRECT	128	[redacted]	120 V-1Ø	SP-B150	A,B,F,N,X	6
F-27	SCIENCE PREP	EXHAUST	250	0.250	DIRECT	81	[redacted]	120 V-1Ø	SP-A290	A,B,F,N,X	6
F-28	SCIENCE LAB	EXHAUST	1600	0.250	DIRECT	934	[redacted]	120 V-1Ø	CSP-A1550	A,B,F,G,X	4
F-29	SCIENCE LAB	EXHAUST	1700	0.250	DIRECT	1153	[redacted]	120 V-1Ø	CSP-A1750	A,B,F,G,X	4
F-30	SCIENCE STORAGE	EXHAUST	150	0.250	DIRECT	128	[redacted]	120 V-1Ø	SP-B150	A,B,F,N,X	6
F-31	SCIENCE PREP	EXHAUST	250	0.250	DIRECT	81	[redacted]	120 V-1Ø	SP-A290	A,B,F,N,X	6
F-32	SCIENCE LAB	EXHAUST	1600	0.250	DIRECT	934	[redacted]	120 V-1Ø	CSP-A1550	A,B,F,G,X	4
F-33	SCIENCE LAB	EXHAUST	1600	0.250	DIRECT	934	[redacted]	120 V-1Ø	CSP-A1550	A,B,F,G,X	4
F-34	HEALTH TLTS	EXHAUST	875	0.500	DIRECT	[redacted]	0.25	120 V-1Ø	G-100-C	A,B,D,E	5
F-35	ADMIN TLTS	EXHAUST	325	0.500	DIRECT	[redacted]	0.07	120 V-1Ø	G-090-E	A,B,D,E	5
F-36	CLASSROOM CORE	EXHAUST	1500	0.250	DIRECT	[redacted]	0.25	120 V-1Ø	G-140-C	A,B,D,E	5
F-37	CLASSROOM CORE	EXHAUST	1600	0.250	DIRECT	[redacted]	0.25	120 V-1Ø	G-140-C	A,B,D,E	5
F-38	WORKRM TLTS	EXHAUST	250	0.250	DIRECT	[redacted]	0.05	120 V-1Ø	G-070-E	A,B,D,E	5
F-39	WORKRM TLTS	EXHAUST	400	0.250	DIRECT	[redacted]	0.07	120 V-1Ø	G-090-E	A,B,D,E	5
F-40	CLASSROOM CORE	EXHAUST	1500	0.250	DIRECT	[redacted]	0.25	120 V-1Ø	G-140-C	A,B,D,E	5
F-41	CLASSROOM CORE	EXHAUST	1500	0.250	DIRECT	[redacted]	0.25	120 V-1Ø	G-140-C	A,B,D,E	5
F-42	YARD STORAGE	EXHAUST	750	0.250	DIRECT	[redacted]	0.25	120 V-1Ø	SBE1-20-	A,B,D,E	6
F-43	EMER ELEC	EXHAUST	225	0.250	DIRECT	83	[redacted]	120 V-1Ø	SP-A250	A,B,F,N,X	1
F-44	ELEC G112	EXHAUST	600	0.250	DIRECT	368	[redacted]	120 V-1Ø	CSP-A700	A,B,F,G,X	1
F-45	WATER ENTRANCE RM	VENTILATION	1200	0.250	DIRECT	[redacted]	0.25	120 V-1Ø	SQ-100	A,B,G,K	1
F-46	GYM CONCESSION	EXHAUST	300	0.250	DIRECT	[redacted]	0.05	120 V-1Ø	G-080-E	A,B,D,E	3
F-47	BASEMENT TLTS	EXHAUST	150	0.500	DIRECT	179	[redacted]	120 V-1Ø	CSP-B200	A,B,F,G,H,X	2

EXHAUST FAN SCHEDULE ACCESSORIES:

A. DISCONNECT SWITCH
B. GRAVITY BACKDRAFT DAMPER
C. MOTORIZED BACKDRAFT DAMPER
D. PREFAB, ROOF CURB
E. BIRDSCREEN
F. ACOUSTICAL LINING
G. HANGING BRACKETS WITH VIBRATION ISOLATION
H. WL, WALL LOUVER DISCHARGE
I. RCC OR GRS ROOF CAP (FLAT ROOF) OR RJ ROOF CAP (PITCHED ROOF)
J. WALL MOUNTING COLLAR
K. INLET GUARD
L. 2" WASHABLE ALUMINUM FILTERS
M. MOTORSIDE FAN GUARD
N. ALUMINUM EXHAUST GRILLE
O. U.L. 762
P. VENTED ROOF CURB EXTENSION
Q. COMBINATION KITCHEN HOOD FAN CURB
R. NOT USED
S. PROVIDE DRAIN PLUG ACCESSORY
T. PRESSURE SENSING SWITCH
U. 200,000 BTUH DIRECT FIRED MODULATING NATURAL GAS HEATER WITH INTEGRAL CONTROLS TO MAINTAIN DISCHARGE AIR TEMPERATURE OF 60°
V. ROOF SUPPORT RAILS
W. VFD
X. ALUMINUM OR GALV STEEL FAN WHEEL

EXHAUST FAN SCHEDULE CONTROLS:

1. WALL MOUNTED THERMOSTAT (REVERSE ACTING, SET FOR 80°)
2. INTERLOCK WITH ROOM LIGHT SWITCH (FAN SHALL OPERATE WHEN LIGHT IS ON IF ANY ROOM IS SERVED BY FAN)
3. WALL MOUNTED ON/OFF SWITCH WITH IDENTIFICATION LABEL
4. WALL MOUNTED TWIST TIMER WITH 0-3 HOUR RANGE WITH IDENTIFICATION LABEL
5. CONTROLLED BY BUILDING AUTOMATION SYSTEM
6. CONTINUOUS OPERATION
7. INTERLOCK WITH KITCHEN HOOD CONTROLS
8. INTERLOCK WITH DISHWASHER

EXHAUST FAN SCHEDULE NOTES:

1. ALL FANS SHALL BE U.L. LISTED AND LABELED AND SHALL BE AMCA CERTIFIED FOR SOUND AND AIR FLOW. ALL FANS INSTALLED INSIDE, ABOVE, OR ADJACENT TO OCCUPIED SPACES SHALL HAVE A MAXIMUM 9.0 INLET SONE LEVEL.
2. ALL FANS SHALL BE SUPPLIED BY ONE MANUFACTURER UNLESS NOTED OTHERWISE.
3. MECHANICAL CONTRACTOR SHALL PROVIDE MAGNETIC STARTER WITH AUXILIARY CONTACTS AS REQUIRED.
4. PROVIDE ALL DIRECT DRIVE FANS WITH SPEED CONTROLLERS.
5. BACKDRAFT DAMPER ON ROOF SUPPLY FANS SHALL BE MOTORIZED.
6. SEE ATHLETIC BUILDING FLOOR PLAN NOTES FOR DUPLICATE BUILDINGS AND DUPLICATE EQUIPMENT.

ROOFTOP UNIT SCHEDULE (DX COOLING, GAS HEAT, R-410 REFRIGERANT)

SYMBOL	CFM	NOMINAL TONNAGE	O.A. (CFM)	SUPPLY FAN E.S.P. (IN. H2O)	COOLING CAPACITY T.C. (BTUH)	COOLING CAPACITY S.C. (BTUH)	EFFICIENCY SEER	EFFICIENCY EER	EFFICIENCY IEER	HEATING CAPACITY INPUT (BTUH)	HEATING CAPACITY OUTPUT (BTUH)	EFFICIENCY AFUE	COMPRESSOR (EA) QTY	COMPRESSOR (EA) RLA	COMPRESSOR (EA) LRA	OFM QTY	OFM FLA	SUPPLY FAN HP	SUPPLY FAN FLA	COMB. FAN FLA	POWER SUPPLY MCA	POWER SUPPLY MOCP	POWER SUPPLY VOTAGE	POWER SUPPLY PH	OPERATING WEIGHT (LBS)	MANUFACTURER DAIKIN MODEL	ACCESSORIES
RTU-1	6,000	15	900	0.50	181,937	147,485	0	10.8	17.5	300,000	240,000	80%	2	12.8	0.0	2	1.8	4.0	4.0	0.0	29.7	40.0	480	3	2,595	DPS015	

NOTES:

1. COOLING CAPACITIES BASED ON 95° AMBIENT, 80/67 ENTERING AIR.
2. PROVIDE ALL UNITS WITH: ROOF CURB, DDC CONTROLS, BACNET INTERFACE, 2" THROWAWAY FILTERS (MERV 8 MINIMUM), ENTHAPLY ECONOMIZER, INTERMITTENT PILOT IGNITION, CONDENSER COIL HAIL GUARDS, LOW AMBIENT CONTROLS, AND HINGED ACCESS DOORS WITH "TOOL-LESS" ENTRY.
3. ALL UNITS SHALL BE AGA CERTIFIED, U.L. LABELED, AND ASHRAE 90.1 COMPLIANT.
4. PROVIDE EACH UNIT WITH A IONIZATION TYPE SMOKE DETECTOR, INSTALLED IN THE RETURN DUCT WIRED TO SHUT DOWN THE UNIT UPON ACTIVATION. SMOKE DETECTOR SHALL BE SUPPLIED, WIRED FOR INTERFACE WITH FIRE ALARM SYSTEM AND UNIT SHUTDOWN BY THE ELECTRICAL CONTRACTOR. SMOKE DETECTOR SHALL BE INSTALLED IN THE RETURN DUCT BY THE MECHANICAL CONTRACTOR.
5. PRIMARY COOLING COIL DRAIN PAN SHALL BE PROVIDED WITH A FLOAT SWITCH BY UNIT MFR; ACTIVATION OF THE FLOAT SWITCH SHALL SHUT DOWN UNIT AND SEND AN ALARM TO THE CENTRAL BAS.
6. ALL ELECTRICAL COMPONENTS SERVING AND WITHIN ROOFTOP UNITS MUST HAVE A MINIMUM SCCR RATING OF 35 KAIC.

ELECTRIC UNIT & WALL HEATER SCHEDULE

SYMBOL	LOCATION	CFM	BTUH	KW	MOTOR RPM	MOTOR H.P.	MOTOR VOLT	MOTOR PH	MANUFACTURER (MARKEL)	NOTES
EUH-1	MECH 148	400	11,200	3.3	1500	0.01	277 V	1	G1G5103N	1,2,6
EUH-2	ELEC G112	400	11,200	3.3	1500	0.01	277 V	1	G1G5103N	1,2,6
EWH-1	MECH G124	175	6,826	2	600	0.01	277 V	1	G3314T2-RP	1,3,6
EWH-2	OUTDOOR STORAGE G105	175	6,826	2	600	0.01	277 V	1	G3314T2-RP	1,3,6
EWH-3	BOYS G008	175	6,826	2	600	0.01	277 V	1	G3314T2-RP	1,3,7
EWH-4	CUST G011	175	6,826	2	600	0.01	277 V	1	G3314T2-RP	1,3,7
EWH-5	GIRLS G009	175	6,826	2	600	0.01	277 V	1	G3314T2-RP	1,3,7
EWH-6	CONCESSIONS G010	175	6,826	2	600	0.01	277 V	1	G3314T2-RP	1,3,7

NOTES:

1. HEATING CAPACITY BASED ON 65° F. E.A.T.,
2. PROVIDE EACH UNIT HEATER WITH: DISCONNECT SWITCH, BUILT-IN THERMOSTAT, ROOF MOUNTED BRACKETS, AND ADJUSTABLE DISCHARGE LOUVERS.
3. PROVIDE EACH WALL HEATER WITH BUILT-IN DISCONNECT SWITCH AND THERMOSTAT, PENCIL-PROOF LOUVERS, AND CABINET FOR SURFACE MOUNTING.
4. PROVIDE EACH CEILING HEATER WITH BUILT-IN DISCONNECT SWITCH AND THERMOSTAT, RECESSED MOUNTING, PLASTER FRAME, AND THERMAL OVERLOAD PROTECTION.
5. THERMOSTATS SHALL BE LOW VOLTAGE, LINE VOLTAGE THERMOSTATS ARE NOT ACCEPTABLE.
6. FOR MAIN BUILDING HEATERS, PROVIDE ADDITIONAL DDC TEMPERATURE SENSOR.
7. SEE ATHLETIC BUILDING FLOOR PLAN NOTES FOR DUPLICATE BUILDINGS AND DUPLICATE EQUIPMENT.

GRILLE AND DIFFUSER SCHEDULE

SYMBOL	SERVICE	CFM RANGE	FACE SIZE (*)	NECK SIZE	TYPE	OBD	LINDAB
A	SUPPLY	(SEE PLANS FOR SIZE AND CFM)			DBL. DEFL.	NO	RGS-3
							PRICE
B	SUPPLY	(SEE PLANS FOR SIZE AND CFM)			DBL. DEFL.	NO	520
C	SUPPLY	0-125	12x12	6x6	LOUVERED	NO	SMD
D	SUPPLY	0-125	24x24	6x6	LOUVERED	NO	SMD
E	SUPPLY	130-280	24x24	9x9	LOUVERED	NO	SMD
F	SUPPLY	285-500	24x24	12x12	LOUVERED	NO	SMD
G	SUPPLY	505-780	24x24	15x15	LOUVERED	NO	SMD
H	RET/EXH	(SEE PLANS FOR SIZE AND CFM)			FIXED BLADE	YES	530
J	RET/EXH	0-195	12x12	8x8	CUBE CORE	NO	80
K	RET/EXH	0-195	24x24	8x8	CUBE CORE	NO	80
L	RET/EXH	200-300	24x24	10x10	CUBE CORE	NO	80
M	RET/EXH	305-450	24x24	12x12	CUBE CORE	NO	80
N	RET/EXH	455-800	24x24	16x16	CUBE CORE	NO	80
P	S/R/E	805-1500	24x24	22x20	CUBE CORE	NO	80
R	RETURN	0-1800	24x24	NON-DUCTED	CUBE CORE	NO	80
S	RETURN	(SEE PLANS FOR SIZE AND CFM)			HEAVY DUTY	NO	96
U	SUPPLY	0-300	4x48 (3) SLOT	10"Ø	1" SLOT DIFFUSER	NO	SDS
V	RET/EXH	0-300	4x48 (3) SLOT	10"Ø	1" SLOT RETURN	NO	SDR
TF	THERMAFUSER		NOTE 6				

(*) - FOR DEVICES INSTALLED IN GYP CEILINGS, PROVIDE MINIMUM FACE SIZE FOR SPECIFIED NECK SIZE.

NOTES:

1. ALL CEILING AND WALL MOUNTED DEVICES SHALL BE FURNISHED WITH AN ENAMEL OFF-WHITE FINISH.
2. ALL DEVICES SHALL BE FURNISHED WITH FRAMES SUITABLE FOR TYPE OF INSTALLATION REQUIRED.
3. ALL AIR DISTRIBUTION DEVICES LOCATED IN KITCHEN, LOCKER ROOMS, AND TOILETS SHALL BE ALL ALUMINUM CONSTRUCTION.
4. ALL DOUBLE DEFLECTION SUPPLY GRILLES SHALL HAVE DAMPER BLADES ADJUSTED TO PROVIDE AIRFLOW PATTERN INDICATED BY FLOW ARROWS ON PLANS. DAMPERS SHALL BE ADJUSTED TO A 30 DEGREE POSITION UNLESS NOTED OTHERWISE ON PLANS.
5. PROVIDE INSULATED PLENUM WITH ROUND NECK CONNECTION ON SLOT TYPE AIR DISTRIBUTION.
6. GRILLES MARKED "TF" SHALL BE SQUARE THERMA-FUSERS (ACUTHERM MODEL TF-HC THERMALLY POWERED VARIABLE AIR VOLUME DIFFUSERS). BALANCE AIR QUANTITY TO DELIVER LISTED CFM AS A MAXIMUM WHEN GRILLE BLADES ARE WIDE OPEN IN EITHER HEATING OR COOLING MODE. PROVIDE WITH FACTORY RELIEF RING TO DIVERT UNUSED SUPPLY AIR INTO THE CEILING PLENUM. SEE PLANS FOR NECK SIZES.

PUMP SCHEDULE

SYMBOL	SERVICE	GPM	HEAD (FT)	DESIGN EFF	MOTOR RPM	MOTOR H.P.	MOTOR VOLT	MOTOR PH	MANUFACTURER B&G MODEL NO.	REMARKS
P-1	CHILLER #1	550.0	25	80.0%	1800	5.0	460	3	3 AD	
P-2	CHILLER #2	550.0	25	80.0%	1800	5.0	460	3	3 AD	
P-3	CHILLED WATER SECONDARY	275.0	85	71.0%	1800	10.0	460	3	2.5 AC-es	
P-4	CHILLED WATER SECONDARY	275.0	85	71.0%	1800	10.0	460	3	2.5 AC-es	
P-5	BOILER #1 PRIMARY	140.0	25	68.0%	1800	1.5	120	3	3x3x7C	
P-6	BOILER #2 PRIMARY	140.0	25	68.0%	1800	1.5	120	3	3x3x7C	
P-7	HOT WATER SECONDARY	140.0	95	63.0%	1750	7.5	460	3	e1510 - 2 EB	
P-8	HOT WATER SECONDARY	140.0	95	68.0%	1750	7.5	460	3	e1510 - 2 EB	

NOTES:

1. ALL PUMPS SHALL BE FURNISHED WITH STARTERS AND HIGH EFFICIENCY MOTORS PER EPACT REQUIREMENTS.
2. ALL BASE MOUNTED END SUCTION PUMPS SHALL BE FURNISHED WITH TRIPLE DUTY VALVES AND SUCTION DIFFUSERS.
3. PUMPS P-3 & P-4 AND P-7 & P-8 OPERATE IN PARALLEL AND SHALL BE NON-OVERLOADING.
4. PUMPS P-3 & P-4 AND P-7 & P-8 SHALL BE FURNISHED WITH VARIABLE FREQUENCY DRIVES AND INVERTOR DUTY MOTORS.
5. SUBMITTALS FOR NON-OVERLOADING PUMPS SHALL SHOW BOTH SINGLE AND DUAL PUMP OPERATION.
6. PUMP STARTERS SHALL BE PROVIDED WITH PHASE LOSS PROTECTION.
7. PUMP VFD AND BYPASS SHALL BE PROVIDED WITH BUILT IN PHASE LOSS PROTECTION.
8. ALL ELECTRICAL COMPONENTS SERVING PUMPS MUST HAVE A MINIMUM SCCR RATING OF 10 KAIC.

ROOF MOUNTED GRAVITY VENTILATOR SCHEDULE

SYMBOL	LOCATION	SERVICE	CFM	MAX. THROAT VELOCITY (FPM)	MAX. SP DROP (IN.)	MANUFACTURER	MODEL
RIV-1	MECH 151 ROOF	AHU-1 INTAKE	14800 CFM	740	0.10	Greenheck	FGI-54X90
RIV-2	MECH 152 ROOF	AHU-2 INTAKE	16600 CFM	740	0.10	Greenheck	FGI-54X90
RIV-3	MECH 151 ROOF	AHU-3 INTAKE	19900 CFM	740	0.10	Greenheck	FGI-54X90
RIV-4	MECH 152 ROOF	AHU-4 INTAKE	24800 CFM	740	0.10	Greenheck	FGI-54X90
RIV-5	MECH 221 ROOF	AHU-5&6 INTAKE	12300 CFM	740	0.10	Greenheck	FGI-48X48
RIV-6	MECH PENT G007 ROOF	ERV-1 INTAKE	2650 CFM	665	0.10	Greenheck	FGI-24X24
RIV-7	MECH 221 ROOF	AHU-7 INTAKE	15500 CFM	740	0.10	Greenheck	FGI-42X72
RIV-8	MECH PENT G007 ROOF	AHU-8 INTAKE	7800 CFM	750	0.10	Greenheck	FGI-36X42
RIV-9	MECH PENT G007 ROOF	AHU-9 INTAKE	9000 CFM	860	0.10	Greenheck	FGI-42X42
RIV-10	MECH PENT G007 ROOF	AHU-10 INTAKE	13600 CFM	740	0.10	Greenheck	FGI-42X72
REV-1	MECH 221 ROOF	AHU-5&6 RELIEF	12300 CFM	740	0.10	Greenheck	FGR-48X48
REV-2	MECH 221 ROOF	AHU-7 RELIEF	15500 CFM	740	0.10	Greenheck	FGR-42X72

ROOF VENT NOTES:

1. PROVIDE ALL VENTILATORS WITH FACTORY ROOF CURBS. CURBS AND VENTILATORS SHALL BE INSTALLED LEVEL.

ACCESSORIES:

1. ROOF CURB
2. BIRD SCREEN
3. GRAVITY BACKDRAFT DAMPER
4. MOTORIZED DAMPER (SEE PLANS FOR INTERLOCK DETAILS)
5. WASHABLE ALUMINUM FILTERS
6. BAROMETRIC DAMPER

BLOWER COIL UNIT SCHEDULE (CHILLED WATER COOLING WITH HOT WATER REHEAT)

SYMBOL	SUPPLY FAN AIR FLOW (CFM)	SUPPLY FAN E.SP. (IN H20)	DESIGN OUTSIDE AIRFLOW (CFM)	COOLING COIL TOTAL CAPACITY (BTUH)	COOLING COIL SENSIBLE (BTUH)	COOLING COIL GPM	COOLING COIL RUNOUT SIZE	COOLING COIL E.W.T. (F°)	COOLING COIL L.W.T. (F°)	COOLING COIL MAX. P.D.	COOLING COIL MAX. S.P.	REHEAT COIL TOTAL CAPACITY (BTUH)	REHEAT COIL GPM	REHEAT COIL RUNOUT SIZE	REHEAT COIL E.W.T. (°F)	REHEAT COIL L.W.T. (°F)	REHEAT COIL MAX. P.D.	REHEAT COIL MAX. S.P.	SUPPLY FAN QTY	SUPPLY FAN HP	ELECTRICAL DATA VOLTS	ELECTRICAL DATA PH	ELECTRICAL DATA HZ	MANUFACTURER	MODEL	SEQUENCE OF OPERATION	UNIT WEIGHT (LBS)	ACCESSORIES
AHU-11	3,800	0.50	1,600	147,930	103,867	24.6	2"	44.0	56.0	8.2	0.63	132,580	6.7	1"	160.0	120.0	4.3	0.11	1	3.0	480 V	3	60	DAIKIN APPLIED	BC HC 0401	CV	700	

FAN COIL UNIT SCHEDULE

SYMBOL	SUPPLY FAN AIRFLOW (CFM)	SUPPLY FAN ESP (IN H2O)	DESIGN OUTSIDE AIRFLOW (CFM)	COOLING COIL TOTAL CAPACITY (BTUH)	COOLING COIL SENSIBLE (BTUH)	COOLING COIL GPM	COOLING COIL RUNOUT SIZE	COOLING COIL E.W.T. (F°)	COOLING COIL L.W.T. (F°)	COOLING COIL MAX. PD (FT.)	HEATING COIL (REHEAT) TOTAL CAPACITY (BTUH)	HEATING COIL (REHEAT) GPM	HEATING COIL (REHEAT) RUNOUT	HEATING COIL (REHEAT) E.W.T. (F°)	HEATING COIL (REHEAT) L.W.T. (F°)	HEATING COIL (REHEAT) MAX. PD (FT.)	ELECTRICAL DATA MOTOR HP	ELECTRICAL DATA FLA	ELECTRICAL DATA MCA	ELECTRICAL DATA MOCP	ELECTRICAL DATA VOLTAGE	ELECTRICAL DATA PH	MANUFACTURER	MODEL	UNIT SIZE	UNIT WEIGHT (LBS)	ACCESSORIES
FCU-1	400	0.50	50	15,197	10,691	2.5	3/4"	44.0	56.0	2.8	12,268	0.6	3/4"	180.0	140.0	1.2	0.25	3.5	4.4	15.0	120	1	DAIKIN	FCHC	204	108	
FCU-2	700	0.50	250	27,137	18,701	4.5	1"	44.0	56.0	3.1	21,998	1.1	3/4"	180.0	140.0	4.5	0.25	3.5	4.4	15.0	120	1	DAIKIN	FCHC	208	153	
FCU-3	200	0.50	0	7,045	5,153	1.2	3/4"	44.0	56.0	1.0	[redacted]						0.25	3.5	4.4	15.0	120	1	DAIKIN	FCHC	203	94	

BLOWER COIL & FAN COIL UNIT SCHEDULE NOTES:

1. COOLING COIL CAPACITY IS BASED ON 80° F. D.B. AND 67° F. W.B. E.A.T.
2. HEATING COIL CAPACITY IS BASED ON 65° F. E.A.T. ALL HEATING COILS SHALL BE LOCATED IN THE REHEAT POSITION.
3. FURNISH ALL UNITS WITH: DDC THERMOSTAT, INSULATED RETURN AIR PLENUM, SECONDARY DRAIN PAN, 2" FILTERS (SEE NOTE 5), MERV-8 FILTERS, DISCHARGE DUCT COLLAR, VIBRATION ISOLATORS.
4. CONTROLS CONTRACTOR SHALL PROVIDE INDIVIDUAL CONTROL POWER TRANSFORMER (120V, 277V OR 480V) FOR EACH UNIT. POWER WILL BE FROM UNIT CIRCUIT.
5. UNITS SHALL HAVE CONSTRUCTION FILTERS REPLACED AT PROJECT COMPLETION WITH PERMANENT FILTERS (MERV-8 MINIMUM).
6. ACCESS DOORS FOR ALL UNITS SHALL BE HINGED WITH HANDLES FOR EASE OF MAINTENANCE. REMOVABLE PANELS WITH SCREWED SECUREMENTS ARE NOT ACCEPTABLE.

ELECTRIC DUCT HEATER SCHEDULE

SYMBOL	CFM	TEMP. RISE	K.W.	STEPS	VOLT	PH	MAX. RPESSURE DROP
EDH-1	500	42.2	6	2	460 V	3	0.25

NOTES:

1. ALL HEATERS SHALL BE OPEN-COIL, SLIP IN TYPE HEATER
2. ALL HEATERS SHALL HAVE STEP CONTROL WITH NUMBER OF STEPS AS INDICATED IN SCHEDULE
3. PROVIDE HEATERS WITH THE FOLLOWING BUILT-IN AND PRE-WIRED COMPONENTS:
   A. DISCONNECTING TYPE MAGNETIC CONTACTORS
   B. FUSES PER N.E.C.
   C. CONTROL VOLTAGE TRANSFORMER
   D. AIR FLOW SWITCH

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

MECHANICAL SCHEDULES

M-002

Optima # 22-0082

01.12.2023 - BID SET

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DUCTLESS SPLIT SYSTEMS (DX COOLING ONLY AND HEAT PUMP)

INDOOR UNIT

SYMBOL	LOCATION	CFM	COOLING CAPACITY TC (BTUH)	COOLING CAPACITY SHC (BTUH)	HEATING CAPACITY (BTUH)	ELECTRICAL DATA FAN FLA	ELECTRICAL DATA MCA	ELECTRICAL DATA VOLT	ELECTRICAL DATA PH	MANUFACTUERER MITSUBISHI
A/C-1	MDF	775	30000		0	0.36	1.0	208 V	1	PKA-A30KA
A/C-2	IDF ROOM	425	12000		0	0.33	1.0	208 V	1	PKA-A12HA
A/C-4	DATA ROOM	425	12000		0	0.33	1.0	208 V	1	PKA-A12HA
A/C-5	COACH OFFICE	425	18000		20000	0.33	1.0	208 V	1	PKA-A18HA7
A/C-6	COACH OFFICE	425	18000		20000	0.33	1.0	208 V	1	PKA-A18HA7
A/C-7	IDF ROOM	425	12000		0	0.33	1.0	208 V	1	PKA-A12HA
A/C-8	IDF ROOM	425	12000		0	0.33	1.0	208 V	1	PKA-A12HA

OUTDOOR UNIT

SYMBOL	LOCATION	COOLING CAPACITY TC (BTUH)	COOLING CAPACITY SHC (BTUH)	EFF. EER	HEATING CAPACITY (BTUH)	COMPRESSOR LRA	COMPRESSOR RLA	FAN FLA	ELECTRICAL DATA MCA	ELECTRICAL DATA FUSE	ELECTRICAL DATA VOLT	ELECTRICAL DATA PH	OPERATING WEIGHT	MANUFACTUERER MITSUBISHI
ODU-1	ROOF	30000	21000	15.5	0	17.5	12	0.75	25.0	40	208 V	1	163 lb	PUY-A30NHA
ODU-2	ROOF	12000	9720	15.2	0	14.0	12	0.35	13.0	15	208 V	1	90 lb	PUY-A12NHA
ODU-4	ROOF	12000	9720	15.2	0	14.0	12	0.35	13.0	15	208 V	1	90 lb	PUY-A12NHA
ODU-5	ROOF	18000	12240	15.0	20000	14.0	12	0.35	13.0	20	208 V	1	99 lb	PUZ-A18NKA7
ODU-6	ROOF	18000	12240	15.0	20000	14.0	12	0.35	13.0	20	208 V	1	99 lb	PUZ-A18NKA7
ODU-7	ROOF	12000	9720	15.2	0	14.0	12	0.35	13.0	15	208 V	1	90 lb	PUY-A12NHA
ODU-8	ROOF	12000	9720	15.2	0	14.0	12	0.35	13.0	15	208 V	1	90 lb	PUY-A12NHA

NOTES:
1. ALL UNITS SHALL BE U.L. LISTED AND HAVE A MINIMUM SEER OF 13.
2. COOLING CAPACITIES ARE BASED ON 95° AMBIENT, 80° ENTERING AIR DRY BULB, 67° ENTERING AIR WET BULB. AIRFLOWS INDICATED ARE AT 'HIGH' SPEED.
3. HEATING CAPACITIES ARE BASED ON 47°F AMBIENT, 68° ENTERING AIR DRY BULB. AIRFLOWS INDICATED ARE AT 'HIGH' SPEED.
4. MOUNT UNITS ON ROOF ON EQUIPMENT SUPPORT RAILS AS MFG. BY ROOF PRODUCTS AND SYSTEMS, CORP (OR EQUAL).
5. PROVIDE MANUFACTURER'S SUGGESTED CLEARANCES AROUND UNIT.
6. PROVIDE UNITS WITH MANUFACTURER'S WIND BAFFLES OR LOW AMBIENT CONTROLS FOR OPERATION DOWN TO 0° F, INVERTER COMPRESSOR, DDC THERMOSTAT (WALL-MOUNTED), INTEGRAL NON-LOCKING DISCONNECT FOR INDOOR UNIT.
7. PROVIDE OUTDOOR UNITS WITH 6 YEAR EXTENDED COMPRESSOR WARRANTY.
8. SEE MANUFACTURER'S RECOMMENDATIONS FOR REQUIRED ADDITIONAL REFRIGERANT CHARGE AND RECOMMENDED LINE-SET LENGTHS.
9. POWER SUPPLY TO CONDENSING UNIT IS A SINGLE POINT ELECTRICAL CONNECTION FOR THE SYSTEM (A/C UNIT AND CONDENSING UNIT). THE ELECTRICAL CONTRACTOR SHALL PROVIDE POWER TO THE CONDENSING UNIT AND FROM THE CONDENSING UNIT TO THE A/C UNIT. CODE REQUIRED DISCONNECT SWITCHES ARE PROVIDED BY MECHANICAL CONTRACTOR.
10. REFRIGERANT PIPING AND WIRING FOR WALL-MOUNTED INDOOR UNITS SHALL BE ROUTED IN WALL WHERE POSSIBLE. ANY EXPOSED PIPING SHALL BE PAINTED TO MATCH WALL-FINISH.
11. ALL ELECTRICAL COMPONENTS SERVING UNITS MUST HAVE A MINIMUM SCCR RATING OF 5 KAIC.

ENERGY RECOVERY VENTILATOR SCHEDULE

SYMBOL	MANUFACTURER	MODEL	SUPPLY FAN AIRFLOW (CFM)	SUPPLY FAN E.S.P. (IN. WG)	SUPPLY FAN DRIVE	SUPPLY FAN MOTOR HP	EXHAUST FAN AIRFLOW (CFM)	EXHAUST FAN E.S.P. (IN. WG)	EXHAUST FAN DRIVE	EXHAUST FAN MOTOR (HP)	SUMMER OA EAT (°Fdb/°Fwb)	SUMMER OA EAT (°Fdb/°Fwb)	SUMMER OA LAT (°Fdb/°Fwb)	SUMMER OA LAT (°Fdb/°Fwb)	SUMMER EA EAT °Fdb	SUMMER EFFECTIVENESS TOTAL (%)	WINTER OA EAT (°Fdb/°Fwb)	WINTER OA EAT (°Fdb/°Fwb)	WINTER OA LAT (°Fdb/°Fwb)	WINTER OA LAT (°Fdb/°Fwb)	WINTER EA EAT °Fdb	WINTER EFFECTIVENESS TOTAL (%)	VOLTAGE	PH	HZ	MCA	MOCP	WEIGHT (LBS)	NOTES	ACCESSORIES
ERV-1	Greenheck	ERV-45-30L	2650	0.5"	DIRECT	1.5	2650	0.5"	DIRECT	2	94.1	77.1	78.0	65.5	75.0	80.2	20.5	17.0	63.1	50.1	72.0	81.6	460V	3	60	7.9 A	15.0 A	1200		

NOTES:
1. ALL TEMPERATURES ARE MEASURED IN DEGREES FAHRENHEIT, SPECIFIC HUMIDITY IS MEASURED IN GRAINS PER POUND DRY AIR, AND ENTHALPY IS MEASURED IN BTU'S PER POUND.
2. OUTDOOR DESIGN CONDITIONS: SEE SCHEDULE
3. INDOOR DESIGN CONDITIONS: SUMMER: 75° F. D.B., 50% RELATIVE HUMIDITY. WINTER: 72° F. D.B., 35% RELATIVE HUMIDITY.
4. FURNISH UNITS WITH: HINGED ACCESS DOORS, ENTHALPY SENSOR WITH AUTOMATIC WINTER OVERRIDE, PLEATED 30% EXHAUST AND OUTSIDE AIR FILTERS, SINGLE POINT ELECTRICAL CONNECTION, MOTORIZED OUTSIDE AIR AND EXHAUST DAMPERS, ROOF CURB.
5. UNITS MUST BE AMCA CERTIFIED.

KITCHEN HOOD SCHEDULE

(FURNISHED AND INSTALLED BY M.C.)

KH-1

ACCUREX MODEL XXEW-160.00-S (INSTALL BACK TO BACK WITH KH-2);
KH-1: 13'-4"x4'-9""x2'-0" DEEP HOOD WITH 14" WIDE SUPPLY PLENUM AT FRONT;
3000 CFM EXHAUST @ 0.75" S.P. (MAX.); 2400 CFM SUPPLY @ 0.25" S.P. (MAX.);
ALL STAINLESS STEEL CONSTRUCTION. ALL COMPONENTS SHALL BE U.L. LISTED AND LABELED. PROVIDE A REMOTE CONTROL PANEL MOUNTED ON FACE OF HOOD WITH MASTER DISCONNECT SWITCH, STARTER FOR FAN, CONTROL VOLTAGE TRANSFORMER, FIRE CONTROL SYSTEM RELAY AND TERMINAL STRIP. MOUNT HOOD 6'-8" ABOVE FINISH FLOOR, PROVIDE STAINLESS STEEL ENCLOSURE AROUND TOP OF HOOD AS REQUIRED TO CLOSE TO CEILING. HOOD SHALL BE PROVIDED WITH: AUTOMATICALLY OPERATED FIXED PIPE FIRE SUPPRESSION SYSTEM IN ACCORDANCE WITH NFPA 96, CONTROL SWITCHES AND PILOT LIGHT FOR EXHAUST FAN, TWO 4' LED TWO LAMP LIGHT FIXTURES (2 PER HOOD), AND STAINLESS STEEL GREASE FILTERS. FIRE SUPPRESSION SYSTEM SHALL BE ANSUL R-102 WITH ANSULEX LIQUID FIRE SUPPRESSANT. REMOTE PULL STATION FOR ACTIVATION OF FIRE SUPPRESSION SYSTEM SHALL BE PROVIDED AND INSTALLED WHERE INDICATED ON THE PLANS. FIRE SUPPRESSION SYSTEM SHALL BE UL 300 LISTED.

KH-2

ACCUREX MODEL XXEW-160.00-S (INSTALL BACK TO BACK WITH KH-1);
KH-2: 13'-4"x4'-9""x2'-0" DEEP HOOD WITH 14" WIDE SUPPLY PLENUM AT FRONT;
3200 CFM EXHAUST @ 0.75" S.P. (MAX.); 2560 CFM SUPPLY @ 0.25" S.P. (MAX.);
ALL STAINLESS STEEL CONSTRUCTION. ALL COMPONENTS SHALL BE U.L. LISTED AND LABELED. PROVIDE A REMOTE CONTROL PANEL MOUNTED ON FACE OF HOOD WITH MASTER DISCONNECT SWITCH, STARTER FOR FAN, CONTROL VOLTAGE TRANSFORMER, FIRE CONTROL SYSTEM RELAY AND TERMINAL STRIP. MOUNT HOOD 6'-8" ABOVE FINISH FLOOR, PROVIDE STAINLESS STEEL ENCLOSURE AROUND TOP OF HOOD AS REQUIRED TO CLOSE TO CEILING. HOOD SHALL BE PROVIDED WITH: AUTOMATICALLY OPERATED FIXED PIPE FIRE SUPPRESSION SYSTEM IN ACCORDANCE WITH NFPA 96, CONTROL SWITCHES AND PILOT LIGHT FOR EXHAUST FAN, TWO 4' LED TWO LAMP LIGHT FIXTURES (2 PER HOOD), AND STAINLESS STEEL GREASE FILTERS. FIRE SUPPRESSION SYSTEM SHALL BE ANSUL R-102 WITH ANSULEX LIQUID FIRE SUPPRESSANT. REMOTE PULL STATION FOR ACTIVATION OF FIRE SUPPRESSION SYSTEM SHALL BE PROVIDED AND INSTALLED WHERE INDICATED ON THE PLANS. FIRE SUPPRESSION SYSTEM SHALL BE UL 300 LISTED.

HOOD MANUFACTURER SHALL PROVIDE 12" STAINLESS STEEL ISLAND UTILITY CHASE BETWEEN SECTIONS OF HOOD, INCLUDING WATER, GAS, AND ELECTRICAL, TO SERVE ITEMS UNDER HOOD. PROVIDE QUICK DISCONNECTS FOR ALL UTILITIES. COORDINATE REQUIREMENTS WITH KITCHEN PLANS AND KITCHEN EQUIPMENT SUPPLIER.

NOTES:
1. KITCHEN HOOD SHALL BE CONSTRUCTED AND INSTALLED PER NFPA 96.
2. UPON ACTIVATION OF FIRE CONTROL SYSTEM, KITCHEN HOOD EXHAUST FAN SHALL CONTINUE TO OPERATE. PROVIDE INTERLOCK FOR AUTOMATIC OPERATION OF FIRE SUPPRESSION SYSTEM WITH:
   A. SOLENOID GAS VALVE (BY HOOD FIRE SYSTEM SUPPLIER)
   B. HOOD MAKE UP AIR FAN CONTACTOR (DISABLE FAN OPERATION)
   C. HOOD EXHAUST FAN
   D. REMOTE MANUAL PULL STATION
   E. ALL ASSOCIATED AIR HANDLING UNITS
   F. FIRE ALARM SYSTEM NOTIFICATION (BY ELEC. CONTR.)
3. SEE HOOD DETAILS 12/M-502 AND 13/M-502 FOR ADDITIONAL INFORMATION.
4. KITCHEN HOOD EXHAUST DUCT SHALL BE CONSTRUCTED OF 16 GAUGE CARBON STEEL. ALL JOINTS AND SEAMS SHALL BE SEALED WITH A LIQUID TIGHT CONTINUOUS EXTERNAL WELD. HORIZONTAL KITCHEN HOOD EXHAUST DUCT SHALL SLOPE 1/4" PER FOOT CONTINUOUSLY TOWARD HOOD. PROVIDE 2 HR FIRE BLANKET INSULATION ON GREASE EXHAUST DUCT FROM HOOD COLLAR TO ROOF DECK. INCLUDE ACCESS TO DUCT CLEANOUTS.
5. ALL EXPOSED PIPING WITH FIRE SUPPRESSION SYSTEM SHALL TO COVERED WITH A CHROME SLEEVE.
6. MECHANICAL CONTRACTOR SHALL INSTALL 1/2" CONDUIT IN WALL FOR MANUAL PULL STATION. SEE PLANS FOR LOCATION OF MANUAL PULL STATION.
7. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR HOOD CERTIFICATION IN COMPLIANCE WITH LOCAL CODE REQUIREMENTS. CERTIFICATION SHALL BE WITNESSED AND PERFORMED BY A PERSON CERTIFIED THROUGH AABC, TABB, NEBB OR NBC AND SHALL PROVIDE DOCUMENTATION OF PERFORMANCE TO THE CODE OFFICIAL. ALL EQUIPMENT SHALL BE ENERGIZED AND IN OPERATION DURING THE TEST. TEST SHALL ALSO INCLUDE VERIFYING ACTUAL FLOW RATES VERSUS DESIGN FLOW RATES.
8. PROVIDE FULL ELECTRICAL PANEL, BREAKERS, BRANCH WIRING TO UDS MOUNTED DEVICES, EMERGENCY RESETTABLE SWITCH WITH SHUNT/CONTACTOR PROTECTION.

ADDITIONAL FIRE SUPPRESSION NOTES (2018 NC FIRE CODE):

904.12.1 A MANUAL ACTUATION DEVICE SHALL BE LOCATED AT OR NEAR A MEANS OF EGRESS FROM THE COOKING AREA, A MINIMUM OF 10 FEET AND A MAXIMUM OF 20 FEET FROM THE KITCHEN EXHAUST SYSTEM. THE MANUAL ACTUATION DEVICE SHALL BE LOCATED A MINIMUM OF 3.5 FEET AND A MAXIMUM OF 4 FEET ABOVE THE FLOOR AND CLEARLY INDICATE THE HAZARD PROTECTED. THE MANUAL ACTUATION SHALL REQUIRE A MAXIMUM FORCE OF 40 POUNDS AND A MAXIMUM MOVEMENT OF 14 INCHES TO ACTUATE THE FIRE SUPPRESSION SYSTEM.

904.12.2 THE ACTUATION OF THE FIRE SUPPRESSION SYSTEM SHALL AUTOMATICALLY SHUT DOWN THE FUEL OF ELECTRICAL POWER SUPPLY TO THE COOKING EQUIPMENT. THE FUEL AND ELECTRICAL SUPPLY RESET SHALL BE MANUAL.

VAV BOX SCHEDULE (COOLING ONLY)

SYMBOL	COOLING MAX CFM	COOLING MIN CFM	AIR TEMPS EAT(db)	AIR TEMPS LAT(db)	ENVIRO-TEC SDR	RUNOUT SIZE
VAV-1.9	500	0	55.0 °F	55.0 °F	8	10
VAV-1.13	500	0	55.0 °F	55.0 °F	8	10
VAV-2.16	500	0	55.0 °F	55.0 °F	8	10
VAV-3.17	500	0	55.0 °F	55.0 °F	8	10
VAV-3.19	500	0	55.0 °F	55.0 °F	8	10
VAV-4.21	500	0	55.0 °F	55.0 °F	8	10
VAV-4.22	500	0	55.0 °F	55.0 °F	8	10
VAV-5.15	500	0	55.0 °F	55.0 °F	8	10
VAV-8.9	500	0	55.0 °F	55.0 °F	8	10

VAV BOX SCHEDULE NOTES:
1. MINIMUM INLET PRESSURE TO TERMINAL UNITS SHALL BE 1.0" W.G.
2. MAXIMUM PRESSURE DROP THROUGH TERMINAL UNITS SHALL BE 0.5" S.P.
3. FURNISH TERMINAL UNITS WITH: FACTORY MOUNTED DDC CONTROLS (SEE NOTE 5), ACOUSTICAL LINING, THERMOSTAT, CONTROL VOLTAGE TRANSFORMER.
4. MECHANCIAL CONTRACTOR SHALL EXTEND CONTROL POWER WIRING (120 V) FROM J-BOX TO VAV BOX. 120 V J-BOX BY ELECTRICAL CONTRACTOR, WIRING FROM J-BOX AND FINAL CONNECTION TO UNIT BY MECHANICAL CONTRACTOR. COORDINATE LOCATION OF 120 V J-BOXES WITH ELECTRICAL CONTRACTOR.
5. DDC CONTROLS SHALL BE FURNISHED TO THE BOX MANUFACTURER BY THE CONTROLS VENDOR. BOX MANUFACTURER SHALL FACTORY MOUNT AND WIRE CONTROLS. INSTALLATION OF CONTROLS SHALL INCLUDE CONTROLS TRANSFORMER, CONTROL COVER, AND ALL WIRING AND LABOR FOR A COMPLETE AND OPERATIONAL SYSTEM.

VAV BOX SCHEDULE

SYMBOL	COOLING MAX CFM	COOLING MIN CFM	HEATING CFM	WATER TEMPS EWT	WATER TEMPS LWT	HOT WATER COIL BTUH	HOT WATER COIL GPM	HOT WATER COIL RUNOUT	AIR TEMPS EAT(db)	AIR TEMPS LAT(db)	ENVIRO-TEC SDR-WC	RUNOUT SIZE
VAV-1.1	1685	430	850	180 °F	140 °F	37000	1.9	3/4"	55.0 °F	95.0 °F	12	14
VAV-1.2	1890	480	950	180 °F	140 °F	41000	2.1	3/4"	55.0 °F	95.0 °F	12	14
VAV-1.3	1640	410	820	180 °F	140 °F	36000	1.8	3/4"	55.0 °F	95.0 °F	12	14
VAV-1.4	2275	570	1140	180 °F	140 °F	50000	2.5	3/4"	55.0 °F	95.0 °F	14	16
VAV-1.5	1140	290	570	180 °F	140 °F	25000	1.3	3/4"	55.0 °F	95.0 °F	10	12
VAV-1.6	1500	380	750	180 °F	140 °F	33000	1.7	3/4"	55.0 °F	95.0 °F	12	14
VAV-1.7	600	150	300	180 °F	140 °F	13000	1.0	3/4"	55.0 °F	95.0 °F	8	10
VAV-1.8	2250	570	1130	180 °F	140 °F	49000	2.5	3/4"	55.0 °F	95.0 °F	14	16
VAV-1.10	1000	250	500	180 °F	140 °F	22000	1.1	3/4"	55.0 °F	95.0 °F	10	12
VAV-1.11	1190	300	600	180 °F	140 °F	26000	1.3	3/4"	55.0 °F	95.0 °F	10	12
VAV-1.12	1490	380	750	180 °F	140 °F	33000	1.7	3/4"	55.0 °F	95.0 °F	12	14
VAV-1.14	830	210	420	180 °F	140 °F	19000	1.0	3/4"	55.0 °F	95.0 °F	10	12
VAV-2.1	1560	390	780	180 °F	140 °F	34000	1.7	3/4"	55.0 °F	95.0 °F	12	14
VAV-2.2	980	250	490	180 °F	140 °F	22000	1.1	3/4"	55.0 °F	95.0 °F	10	12
VAV-2.3	1280	320	640	180 °F	140 °F	28000	1.4	3/4"	55.0 °F	95.0 °F	10	12
VAV-2.4	1790	450	900	180 °F	140 °F	39000	2.0	3/4"	55.0 °F	95.0 °F	12	14
VAV-2.5	1590	400	800	180 °F	140 °F	35000	1.8	3/4"	55.0 °F	95.0 °F	12	14
VAV-2.6	1560	390	780	180 °F	140 °F	34000	1.7	3/4"	55.0 °F	95.0 °F	12	14
VAV-2.7	1560	390	780	180 °F	140 °F	34000	1.7	3/4"	55.0 °F	95.0 °F	12	14
VAV-2.8	350	90	180	180 °F	140 °F	8000	1.0	3/4"	55.0 °F	95.0 °F	6	8
VAV-2.9	860	220	430	180 °F	140 °F	19000	1.0	3/4"	55.0 °F	95.0 °F	10	12
VAV-2.10	1995	500	1000	180 °F	140 °F	44000	2.2	3/4"	55.0 °F	95.0 °F	14	16
VAV-2.11	1600	400	800	180 °F	140 °F	35000	1.8	3/4"	55.0 °F	95.0 °F	12	14
VAV-2.12	1250	320	630	180 °F	140 °F	28000	1.4	3/4"	55.0 °F	95.0 °F	10	12
VAV-2.13	1560	390	780	180 °F	140 °F	34000	1.7	3/4"	55.0 °F	95.0 °F	12	14
VAV-2.14	1560	390	780	180 °F	140 °F	34000	1.7	3/4"	55.0 °F	95.0 °F	12	14
VAV-2.15	1560	390	780	180 °F	140 °F	34000	1.7	3/4"	55.0 °F	95.0 °F	12	14
VAV-2.17	1000	250	500	180 °F	140 °F	22000	1.1	3/4"	55.0 °F	95.0 °F	10	12
VAV-3.1	1100	280	550	180 °F	140 °F	24000	1.2	3/4"	55.0 °F	95.0 °F	10	12
VAV-3.2	1770	450	890	180 °F	140 °F	39000	2.0	3/4"	55.0 °F	95.0 °F	12	14
VAV-3.3	1100	280	550	180 °F	140 °F	24000	1.2	3/4"	55.0 °F	95.0 °F	10	12
VAV-3.4	2020	510	1010	180 °F	140 °F	44000	2.2	3/4"	55.0 °F	95.0 °F	14	16
VAV-3.5	955	240	480	180 °F	140 °F	21000	1.1	3/4"	55.0 °F	95.0 °F	10	12
VAV-3.6	1650	420	830	180 °F	140 °F	36000	1.8	3/4"	55.0 °F	95.0 °F	12	14
VAV-3.7	1730	440	870	180 °F	140 °F	38000	1.9	3/4"	55.0 °F	95.0 °F	12	14
VAV-3.8	1770	450	890	180 °F	140 °F	39000	2.0	3/4"	55.0 °F	95.0 °F	12	14
VAV-3.9	350	90	180	180 °F	140 °F	8000	1.0	3/4"	55.0 °F	95.0 °F	6	8
VAV-3.10	1640	410	820	180 °F	140 °F	36000	1.8	3/4"	55.0 °F	95.0 °F	12	14
VAV-3.11	2370	600	1190	180 °F	140 °F	52000	2.6	3/4"	55.0 °F	95.0 °F	14	16
VAV-3.12	1740	440	870	180 °F	140 °F	38000	1.9	3/4"	55.0 °F	95.0 °F	12	14
VAV-3.13	1630	410	820	180 °F	140 °F	36000	1.8	3/4"	55.0 °F	95.0 °F	12	14
VAV-3.14	630	160	320	180 °F	140 °F	14000	1.0	3/4"	55.0 °F	95.0 °F	8	10
VAV-3.15	1570	400	790	180 °F	140 °F	35000	1.8	3/4"	55.0 °F	95.0 °F	12	14
VAV-3.16	1770	450	890	180 °F	140 °F	39000	2.0	3/4"	55.0 °F	95.0 °F	12	14
VAV-3.18	830	210	420	180 °F	140 °F	19000	1.0	3/4"	55.0 °F	95.0 °F	10	12
VAV-4.1	1080	270	540	180 °F	140 °F	24000	1.2	3/4"	55.0 °F	95.0 °F	10	12
VAV-4.2	1690	430	850	180 °F	140 °F	37000	1.9	3/4"	55.0 °F	95.0 °F	12	14
VAV-4.3	1080	270	540	180 °F	140 °F	24000	1.2	3/4"	55.0 °F	95.0 °F	10	12
VAV-4.4	1880	470	940	180 °F	140 °F	41000	2.1	3/4"	55.0 °F	95.0 °F	12	14
VAV-4.5	550	140	280	180 °F	140 °F	13000	1.0	3/4"	55.0 °F	95.0 °F	8	10
VAV-4.6	1590	400	800	180 °F	140 °F	35000	1.8	3/4"	55.0 °F	95.0 °F	12	14
VAV-4.7	1610	410	810	180 °F	140 °F	35000	1.8	3/4"	55.0 °F	95.0 °F	12	14
VAV-4.8	1730	440	870	180 °F	140 °F	38000	1.9	3/4"	55.0 °F	95.0 °F	12	14
VAV-4.9	430	110	220	180 °F	140 °F	10000	1.0	3/4"	55.0 °F	95.0 °F	8	10
VAV-4.10	1180	300	590	180 °F	140 °F	26000	1.3	3/4"	55.0 °F	95.0 °F	10	12
VAV-4.11	2290	580	1150	180 °F	140 °F	50000	2.5	3/4"	55.0 °F	95.0 °F	14	16
VAV-4.12	1520	380	760	180 °F	140 °F	33000	1.7	3/4"	55.0 °F	95.0 °F	12	14
VAV-4.13	1680	420	840	180 °F	140 °F	37000	1.9	3/4"	55.0 °F	95.0 °F	12	14
VAV-4.14	1575	400	790	180 °F	140 °F	35000	1.8	3/4"	55.0 °F	95.0 °F	12	14
VAV-4.15	1610	410	810	180 °F	140 °F	35000	1.8	3/4"	55.0 °F	95.0 °F	12	14
VAV-4.16	680	170	340	180 °F	140 °F	15000	1.0	3/4"	55.0 °F	95.0 °F	8	10
VAV-4.17	1690	430	850	180 °F	140 °F	37000	1.9	3/4"	55.0 °F	95.0 °F	12	14
VAV-4.18	1280	320	640	180 °F	140 °F	28000	1.4	3/4"	55.0 °F	95.0 °F	10	12
VAV-4.19	1690	430	850	180 °F	140 °F	37000	1.9	3/4"	55.0 °F	95.0 °F	12	14
VAV-4.20	915	230	460	180 °F	140 °F	20000	1.0	3/4"	55.0 °F	95.0 °F	10	12
VAV-5.1	810	210	410	180 °F	140 °F	18000	1.0	3/4"	55.0 °F	95.0 °F	10	12
VAV-5.2	545	140	280	180 °F	140 °F	13000	1.0	3/4"	55.0 °F	95.0 °F	8	10
VAV-5.3	1120	280	560	180 °F	140 °F	25000	1.3	3/4"	55.0 °F	95.0 °F	10	12
VAV-5.4	290	80	150	180 °F	140 °F	7000	1.0	3/4"	55.0 °F	95.0 °F	6	8
VAV-5.5	700	180	350	180 °F	140 °F	16000	1.0	3/4"	55.0 °F	95.0 °F	8	10
VAV-5.6	815	210	410	180 °F	140 °F	18000	1.0	3/4"	55.0 °F	95.0 °F	10	12
VAV-5.7	610	160	310	180 °F	140 °F	14000	1.0	3/4"	55.0 °F	95.0 °F	8	10
VAV-5.8	500	130	250	180 °F	140 °F	11000	1.0	3/4"	55.0 °F	95.0 °F	8	10
VAV-5.9	315	80	160	180 °F	140 °F	7000	1.0	3/4"	55.0 °F	95.0 °F	6	8
VAV-5.10	580	150	290	180 °F	140 °F	13000	1.0	3/4"	55.0 °F	95.0 °F	8	10
VAV-5.11	260	70	130	180 °F	140 °F	6000	1.0	3/4"	55.0 °F	95.0 °F	6	8
VAV-5.12	275	70	140	180 °F	140 °F	7000	1.0	3/4"	55.0 °F	95.0 °F	6	8
VAV-5.13	370	100	190	180 °F	140 °F	9000	1.0	3/4"	55.0 °F	95.0 °F	6	8
VAV-5.14	365	100	190	180 °F	140 °F	9000	1.0	3/4"	55.0 °F	95.0 °F	6	8
VAV-6.1	1600	400	800	180 °F	140 °F	35000	1.8	3/4"	55.0 °F	95.0 °F	12	14
VAV-6.2	1600	400	800	180 °F	140 °F	35000	1.8	3/4"	55.0 °F	95.0 °F	12	14
VAV-6.3	800	200	400	180 °F	140 °F	18000	1.0	3/4"	55.0 °F	95.0 °F	10	12
VAV-6.4	800	200	400	180 °F	140 °F	18000	1.0	3/4"	55.0 °F	95.0 °F	10	12
VAV-6.5	1000	250	500	180 °F	140 °F	22000	1.1	3/4"	55.0 °F	95.0 °F	10	12
VAV-6.6	500	130	250	180 °F	140 °F	11000	1.0	3/4"	55.0 °F	95.0 °F	8	10
VAV-8.1	1345	340	680	180 °F	140 °F	30000	1.5	3/4"	55.0 °F	95.0 °F	12	14
VAV-8.2	1230	310	620	180 °F	140 °F	27000	1.4	3/4"	55.0 °F	95.0 °F	10	12
VAV-8.3	925	240	470	180 °F	140 °F	21000	1.1	3/4"	55.0 °F	95.0 °F	10	12
VAV-8.4	500	130	250	180 °F	140 °F	11000	1.0	3/4"	55.0 °F	95.0 °F	8	10
VAV-8.5	1230	310	620	180 °F	140 °F	27000	1.4	3/4"	55.0 °F	95.0 °F	10	12
VAV-8.6	1535	390	770	180 °F	140 °F	34000	1.7	3/4"	55.0 °F	95.0 °F	12	14
VAV-8.7	605	160	310	180 °F	140 °F	14000	1.0	3/4"	55.0 °F	95.0 °F	8	10
VAV-8.8	605	160	310	180 °F	140 °F	14000	1.0	3/4"	55.0 °F	95.0 °F	8	10

VAV BOX SCHEDULE NOTES:
1. MINIMUM INLET PRESSURE TO TERMINAL UNITS SHALL BE 1.0" W.G.
2. MAXIMUM PRESSURE DROP THROUGH TERMINAL UNITS SHALL BE 0.5" S.P.
3. FURNISH TERMINAL UNITS WITH: FACTORY MOUNTED DDC CONTROLS (SEE NOTE 5), ACOUSTICAL LINING, THERMOSTAT, CONTROL VOLTAGE TRANSFORMER.
4. MECHANCIAL CONTRACTOR SHALL EXTEND CONTROL POWER WIRING (120 V) FROM J-BOX TO VAV BOX. 120 V J-BOX BY ELECTRICAL CONTRACTOR, WIRING FROM J-BOX AND FINAL CONNECTION TO UNIT BY MECHANICAL CONTRACTOR. COORDINATE LOCATION OF 120 V J-BOXES WITH ELECTRICAL CONTRACTOR.
5. DDC CONTROLS SHALL BE FURNISHED TO THE BOX MANUFACTURER BY THE CONTROLS VENDOR. BOX MANUFACTURER SHALL FACTORY MOUNT AND WIRE CONTROLS. INSTALLATION OF CONTROLS SHALL INCLUDE CONTROLS TRANSFORMER, CONTROL COVER, AND ALL WIRING AND LABOR FOR A COMPLETE AND OPERATIONAL SYSTEM.
6. SEE SEQUENCE OF OPERATION FOR VAV BOX HEATING MODE, FOR ENERGY CODE COMPLIANT HEATING SEQUENCING INFORMATION.

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

MECHANICAL SCHEDULES

M-003

Optima # 22-0082

01.12.2023 - BID SET

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VENTILATION CALCULATIONS (NCMC 2018, SECT 403):

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCULATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
	AHU-01	AHU-01										
001C	CORRIDOR	Corridors	0	0.06	0	0	1980	0	0	119	149	0
100	CORRIDOR	Corridors	0	0.06	0	0	806	0	0	48	60	0
105C	CORRIDOR	Corridors	0	0.06	0	0	1310	0	0	79	98	0
110C	CORRIDOR	Corridors	0	0.06	0	0	635	0	0	38	48	0
128	BOYS	Toilet Room - Public	0	0	0	70	4	0	0	0	0	280
129	GIRLS	Toilet Room - Public	0	0	0	70	4	0	0	0	0	280
137	STEM / CPU LAB	Computer Lab.	10	0.12	25	0	1005	25	251	121	465	0
137A	STORAGE	Storage rooms	0	0.12	0	0	55	0	0	7	8	0
137B	STORAGE	Storage rooms	0	0.12	0	0	55	0	0	7	8	0
138	IDF	Storage rooms	0	0.12	0	0	120	0	0	14	18	0
143	BOYS	Toilet Room - Public	0	0	0	70	4	0	0	0	0	280
144	GIRLS	Toilet Room - Public	0	0	0	70	4	0	0	0	0	280
151	MECHANICAL	Storage rooms	0	0.12	0	0	1054	0	0	126	158	0
297	CORRIDOR	Corridors	0	0.06	0	0	2587	0	0	155	194	0
A100	STORAGE	Storage rooms	0	0.12	0	0	360	0	0	43	54	0
A101	EXCEPTIONAL SUITE	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
A101A	CONF.	Conference Rm (Office)	5	0.06	50	0	78	4	19	5	30	0
A101B	LAUNDRY	Storage rooms	0	0.12	0	0	58	0	0	7	9	0
A101C	TLT	Toilet Room - Public	0	0	0	70	2	0	0	0	0	140
A102	EXCEPTIONAL	Classrooms (age 9 plus)	7.5	0	25	0	898	22	168	0	210	0
A103	FOREIGN LANGUAGE ARTS	Classrooms (age 9 plus)	7.5	0	25	0	845	21	158	0	198	0
A104	ART	Art classroom	10	0.18	20	0.7	1025	21	205	185	487	718
A104A	STORAGE	Storage rooms	0	0.12	0	0	128	0	0	15	19	0
A104B	KILN	Storage rooms	0	0.12	0	0	107	0	0	13	16	0
A105	CHORUS	Classrooms (age 9 plus)	7.5	0	25	0	940	24	176	0	220	0
A105A	OFFICE	Office space	5	0.06	5	0	103	1	3	6	11	0
A105B	LIBRARY	Storage rooms	0	0.12	0	0	96	0	0	12	14	0
A105C	STORAGE	Storage rooms	0	0.12	0	0	96	0	0	12	14	0
A106	BAND	Music/theater/dance	10	0.06	35	0	1470	51	514	88	753	0
A106A	OFFICE	Office space	5	0.06	5	0	103	1	3	6	11	0
A106B	PRACTICE	Office space	5	0.06	5	0	96	0	2	6	10	0
A106C	PRACTICE	Office space	5	0.06	5	0	96	0	2	6	10	0
A106D	STORAGE	Storage rooms	0	0.12	0	0	73	0	0	9	11	0
A106E	WASH	Storage rooms	0	0.12	0	0	85	0	0	10	13	0
A106F	STORAGE	Storage rooms	0	0.12	0	0	57	0	0	7	9	0
A107	BOOK ROOM	Storage rooms	0	0.12	0	0	167	0	0	20	25	0
D103	ELEC	Storage rooms	0	0.12	0	0	62	0	0	7	9	0
D116	TLT	Toilet Room - Public	0	0	0	70	1	0	0	0	0	70
D117	CUST LOCKERS	Locker/Dressing Rooms	0	0	0	0.25	53	0	0	0	0	13
D118	CUST	Storage rooms	0	0.12	0	0	42	0	0	5	6	0
D119	CENTRAL RECEIVING	Office space	5	0.06	5	0	472	2	12	28	50	0
G013	VESTIBULE	Corridors	0	0.06	0	0	120	0	0	7	9	0
M106	AV PRODUCTION	Office space	5	0.06	5	0	396	2	10	24	42	0
S102	STAIR 01	Corridors	0	0.06	0	0	429	0	0	26	32	0
S104	STAIR 04	Corridors	0	0.06	0	0	424	0	0	25	32	0
			0	0	0	0	0	0	0	0	0	0
						TOTALS	19404	197	1693	1285	3723	2061
										PROVIDED	**3800**	**3450**

VENTILATION CALCULATIONS (NCMC 2018, SECT 403):

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCULATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
	AHU-02	AHU-02										
001C	CORRIDOR	Corridors	0	0.06	0	0	551	0	0	33	41	0
110C	CORRIDOR	Corridors	0	0.06	0	0	251	0	0	15	19	0
120C	CORRIDOR	Corridors	0	0.06	0	0	2273	0	0	136	171	0
131	GIRLS	Toilet Room - Public	0	0	0	70	4	0	0	0	0	280
132	BOYS	Toilet Room - Public	0	0	0	70	4	0	0	0	0	280
133	ISS	Classrooms (age 9 plus)	7.5	0	25	0	400	10	75	0	94	0
134	MDF	Storage rooms	0	0.12	0	0	280	0	0	34	42	0
135	STORAGE 6	Storage rooms	0	0.12	0	0	374	0	0	45	56	0
136	RESOURCE 6	Conference Rm (Office)	5	0.06	50	0	440	22	110	26	171	0
140	TEACHER WORKROOM	Office space	5	0.06	5	0	239	1	6	14	25	0
140A	TLT	Toilet Room - Public	0	0	0	70	1	0	0	0	0	70
140B	TLT	Toilet Room - Public	0	0	0	70	1	0	0	0	0	70
141	GIRLS	Toilet Room - Public	0	0	0	70	4	0	0	0	0	280
142	BOYS	Toilet Room - Public	0	0	0	70	4	0	0	0	0	280
152	MECHANICAL	Storage rooms	0	0.12	0	0	1054	0	0	126	158	0
298	CORRIDOR	Corridors	0	0.06	0	0	2519	0	0	151	189	0
B001	VESTIBULE	Corridors	0	0.06	0	0	149	0	0	9	11	0
B101	CLASSROOM 6-1 / LA	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
B102	CLASSROOM 6-2 / SS	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
B103	CLASSROOM 6-3 / MATH	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
B104	CLASSROOM 6-4 / SCIENCE	Classrooms (age 9 plus)	7.5	0	25	0	933	23	175	0	219	0
B104A	SCIENCE PREP	Storage rooms	0	0.12	0	0	219	0	0	26	33	0
B104B	STORAGE	Storage rooms	0	0.12	0	0	98	0	0	12	15	0
B105	CLASSROOM 6-5 / LA	Classrooms (age 9 plus)	7.5	0	25	0	927	23	174	0	217	0
B106	CLASSROOM 6-6 / SS	Classrooms (age 9 plus)	7.5	0	25	0	926	23	174	0	217	0
B107	CLASSROOM 6-7 / MATH	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
B108	CLASSROOM 6-8 / SCIENCE	Classrooms (age 9 plus)	7.5	0	25	0	933	23	175	0	219	0
B108A	SCIENCE PREP	Storage rooms	0	0.12	0	0	236	0	0	28	35	0
B108B	STORAGE	Storage rooms	0	0.12	0	0	105	0	0	13	16	0
B109	CLASSROOM 6-10 / SCIENCE	Classrooms (age 9 plus)	7.5	0	25	0	933	23	175	0	219	0
B110	CLASSROOM 6-9 / LA	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
B111	CLASSROOM 6-12 / MATH	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
B112	CLASSROOM 6-11 / SS	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
S101	STAIR 02	Corridors	0	0.06	0	0	429	0	0	26	32	0
S103	STAIR 03	Corridors	0	0.06	0	0	424	0	0	25	32	0
			0	0	0	0	0	0	0	0	0	0
						TOTALS	21010	307	2244	720	3706	1260
										PROVIDED	**3750**	**1650**

VENTILATION CALCULATIONS (NCMC 2018, SECT 403):

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCULATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
	AHU-03	AHU-03										
200C	CORRIDOR	Corridors	0	0.06	0	0	689	0	0	41	52	0
201	TESTING COORD.	Office space	5	0.06	5	0	278	1	7	17	29	0
201C	CORRIDOR	Corridors	0	0.06	0	0	2260	0	0	136	169	0
202	TESTING	Office space	5	0.06	5	0	149	1	4	9	16	0
203	COUNSELOR	Office space	5	0.06	5	0	128	1	3	8	14	0
204	COUNSELOR	Office space	5	0.06	5	0	127	1	3	8	13	0
205	ASST PRIN #1	Office space	5	0.06	5	0	185	1	5	11	20	0
206	STORAGE	Storage rooms	0	0.12	0	0	65	0	0	8	10	0
207	STORAGE	Storage rooms	0	0.12	0	0	36	0	0	4	5	0
208	TLT	Toilet Room - Public	0	0	0	70	1	0	0	0	0	70
209	TLT	Toilet Room - Public	0	0	0	70	1	0	0	0	0	70
210	CONF	Conference Rm (Office)	5	0.06	50	0	189	9	47	11	73	0
210C	CORRIDOR	Corridors	0	0.06	0	0	2297	0	0	138	172	0
211	COUNSELOR	Office space	5	0.06	5	0	128	1	3	8	14	0
212	OFFICE STORAGE	Storage rooms	0	0.12	0	0	91	0	0	11	14	0
213	PSYCH	Office space	5	0.06	5	0	148	1	4	9	16	0
214	SOC. WORK	Office space	5	0.06	5	0	108	1	3	6	11	0
215	STORAGE	Storage rooms	0	0.12	0	0	24	0	0	3	4	0
216	GUIDANCE	Office space	5	0.06	5	0	561	3	14	34	60	0
217	BOYS	Toilet Room - Public	0	0	0	70	4	0	0	0	0	280
218	GIRLS	Toilet Room - Public	0	0	0	70	4	0	0	0	0	280
219	COLLAB	Office space	5	0.06	5	0	852	4	21	51	91	0
224	TEACHER WORKROOM	Office space	5	0.06	5	0	239	1	6	14	25	0
224A	TLT	Toilet Room - Public	0	0	0	70	1	0	0	0	0	70
224B	TLT	Toilet Room - Public	0	0	0	70	1	0	0	0	0	70
225	ELEC	Storage rooms	0	0.12	0	0	136	0	0	16	20	0
225A	IDF	Storage rooms	0	0.12	0	0	103	0	0	12	15	0
225F	COLLAB	Office space	5	0.06	5	0	409	2	10	25	43	0
226	CUST	Storage rooms	0	0.12	0	0	91	0	0	11	14	0
230	BOYS	Toilet Room - Public	0	0	0	70	4	0	0	0	0	280
230C	CORRIDOR	Corridors	0	0.06	0	0	650	0	0	39	49	0
231	GIRLS	Toilet Room - Public	0	0	0	70	4	0	0	0	0	280
232	STORAGE	Storage rooms	0	0.12	0	0	226	0	0	27	34	0
240	COLLAB	Office space	5	0.06	5	0	664	3	17	40	71	0
240C	CORRIDOR	Corridors	0	0.06	0	0	998	0	0	60	75	0
241	STEM LAB	Computer Lab.	10	0.12	25	0	1005	25	251	121	465	0
241A	STORAGE	Storage rooms	0	0.12	0	0	55	0	0	7	8	0
A201	CLASSROOM 8-1	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
A202	CLASSROOM 8-2	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
A203	CLASSROOM 8-3	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
A204	SCIENCE 8-1	Classrooms (age 9 plus)	7.5	0	25	0	933	23	175	0	219	0
A204A	SCIENCE PREP	Storage rooms	0	0.12	0	0	221	0	0	26	33	0
A204B	STORAGE	Storage rooms	0	0.12	0	0	98	0	0	12	15	0
A205	CLASSROOM 8-4	Classrooms (age 9 plus)	7.5	0	25	0	933	23	175	0	219	0
A206	RESOURCE 8	Conference Rm (Office)	5	0.06	50	0	396	20	99	24	153	0
A207	CLASSROOM 8-5	Classrooms (age 9 plus)	7.5	0	25	0	926	23	174	0	217	0
A208	CLASSROOM 8-6	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
A209	SCIENCE CLASSROOM 8-2	Classrooms (age 9 plus)	7.5	0	25	0	933	23	175	0	219	0
A209A	SCIENCE PREP	Storage rooms	0	0.12	0	0	236	0	0	28	35	0
A209B	STORAGE	Storage rooms	0	0.12	0	0	105	0	0	13	16	0
A210	SCIENCE CLASSROOM 8-3	Classrooms (age 9 plus)	7.5	0	25	0	922	23	173	0	216	0
A211	CLASSROOM 8-8	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
A212	CLASSROOM 8-7	Classrooms (age 9 plus)	7.5	0	25	0	894	22	168	0	210	0
A213	CLASSROOM 8-9	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
B208A	STORAGE	Storage rooms	0	0.12	0	0	55	0	0	7	8	0
S201	STAIR 01	Corridors	0	0.06	0	0	429	0	0	26	32	0
S203	STAIR 03	Corridors	0	0.06	0	0	424	0	0	25	32	0
						TOTALS	25810	348	2548	1044	4490	1400
										PROVIDED	**4500**	**1900**

VENTILATION CALCULATIONS (NCMC 2018, SECT 403):

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCULATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
	AHU-04											
130	ELEV	Storage rooms	0	0.12	0	0	58	0	0	7	9	0
200C	CORRIDOR	Corridors	0	0.06	0	0	466	0	0	28	35	0
202	CORRIDOR	Corridors	0	0.06	0	0	2260	0	0	136	169	0
220	CUST	Storage rooms	0	0.12	0	0	199	0	0	24	30	0
220C	CORRIDOR	Corridors	0	0.06	0	0	2297	0	0	138	172	0
222	GIRLS	Toilet Room - Public	0	0	0	70	4	0	0	0	0	280
223	BOYS	Toilet Room - Public	0	0	0	70	4	0	0	0	0	280
225G	COLLAB	Office space	5	0.06	5	0	409	2	10	25	43	0
227	TEACHER WORKROOM	Conference Rm (Office)	5	0.06	50	0	239	12	60	14	93	0
227A	TLT	Toilet Room - Public	0	0	0	70	1	0	0	0	0	70
227B	TLT	Toilet Room - Public	0	0	0	70	1	0	0	0	0	70
228	IDF	Storage rooms	0	0.12	0	0	246	0	0	30	37	0
229	CUST	Storage rooms	0	0.12	0	0	91	0	0	11	14	0
230C	CORRIDOR	Corridors	0	0.06	0	0	313	0	0	19	23	0
236	GIRLS	Toilet Room - Public	0	0	0	70	4	0	0	0	0	280
237	BOYS	Toilet Room - Public	0	0	0	70	4	0	0	0	0	280
238	ELEC	Storage rooms	0	0.12	0	0	226	0	0	27	34	0
239	COLLAB	Office space	5	0.06	5	0	664	3	17	40	71	0
240C	CORRIDOR	Corridors	0	0.06	0	0	881	0	0	53	66	0
B201	COLLAB	Office space	5	0.06	5	0	749	4	19	45	80	0
B201A	STORAGE	Storage rooms	0	0.12	0	0	84	0	0	10	13	0
B202	CLASSROOM 7-1	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
B203	EXPLORING TECH SYSTEMS	Computer Lab.	10	0.12	25	0	1408	35	352	169	651	0
B203A	STORAGE	Storage rooms	0	0.12	0	0	151	0	0	18	23	0
B204	CLASSROOM 7-2	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
B205	CLASSROOM 7-3	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
B206	XPLORING/ BUSINESS/ MARKETIN	Classrooms (age 9 plus)	7.5	0	25	0	1009	25	189	0	236	0
B206A	STORAGE	Storage rooms	0	0.12	0	0	138	0	0	17	21	0
B207	SCIENCE CLASSROOM 7-4	Classrooms (age 9 plus)	7.5	0	25	0	933	23	175	0	219	0
B207A	SCIENCE PREP	Storage rooms	0	0.12	0	0	221	0	0	26	33	0
B207B	STORAGE	Storage rooms	0	0.12	0	0	98	0	0	12	15	0
B208	CPU LAB	Computer Lab.	10	0.12	25	0	1009	25	252	121	467	0
B209	CLASSROOM 7-5	Classrooms (age 9 plus)	7.5	0	25	0	927	23	174	0	217	0
B210	RESOURCE 7	Conference Rm (Office)	5	0.06	50	0	440	22	110	26	171	0
B211	CLASSROOM 7-6	Classrooms (age 9 plus)	7.5	0	25	0	926	23	174	0	217	0
B212	CLASSROOM 7-9	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
B213	SCIENCE CLASSROOM 7-7	Classrooms (age 9 plus)	7.5	0	25	0	933	23	175	0	219	0
B213A	SCIENCE PREP	Storage rooms	0	0.12	0	0	238	0	0	29	36	0
B213B	STORAGE	Storage rooms	0	0.12	0	0	105	0	0	13	16	0
B214	SCIENCE CLASSROOM 7-8	Classrooms (age 9 plus)	7.5	0	25	0	933	23	175	0	219	0
B215	CLASSROOM 7-11	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
B216	CLASSROOM 7-10	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
B217	CLASSROOM 7-12	Classrooms (age 9 plus)	7.5	0	25	0	900	23	169	0	211	0
S202	STAIR 02	Corridors	0	0.06	0	0	429	0	0	26	32	0
S204	STAIR 04	Corridors	0	0.06	0	0	424	0	0	25	32	0
			0	0	0	0	0	0	0	0	0	0
						TOTALS	25818	402	3062	1087	5186	1260
										PROVIDED	**5200**	**1850**

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

VENTILATION CALCULATIONS

M-004

Optima # 22-0082

[redacted]

01.12.2023 - BID SET

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VENTILATION CALCULATIONS (NCMC 2018, SECT 403):

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCULATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
	AHU-05											
100	VESTIBULE	Corridors	0	0.06	0	0	381	0	0	23	29	0
101	SECURITY CONFERENCE	Conference Rm (Office)	5	0.06	50	0	198	10	49	12	77	0
102	NURSE	Office space	5	0.06	5	0	106	1	3	6	11	0
103	HEALTH ROOM	Office space	5	0.06	5	0	260	1	7	16	28	0
103A	TLT	Toilet Room - Public	0	0	0	70	1	0	0	0	0	70
104	RESOURCE OFFICERS	Office space	5	0.06	5	0	191	1	5	11	20	0
105	STORAGE	Storage rooms	0	0.12	0	0	49	0	0	6	7	0
106	RECORDS	Storage rooms	0	0.12	0	0	73	0	0	9	11	0
107	OFFICE	Office space	5	0.06	5	0	101	1	3	6	11	0
108	COUNSELOR	Office space	5	0.06	5	0	160	1	4	10	17	0
109	REGISTRAR	Office space	5	0.06	5	0	159	1	4	10	17	0
110	OFFICE	Office space	5	0.06	5	0	160	1	4	10	17	0
110C	CORRIDOR	Corridors	0	0.06	0	0	652	0	0	39	49	0
111	STORAGE	Storage rooms	0	0.12	0	0	145	0	0	17	22	0
112	ELEC	Storage rooms	0	0.12	0	0	65	0	0	8	10	0
113	AP #2	Office space	5	0.06	5	0	160	1	4	10	17	0
114	TLT	Toilet Room - Public	0	0	0	70	1	0	0	0	0	70
115	TLT	Toilet Room - Public	0	0	0	70	1	0	0	0	0	70
116C	CORRIDOR	Corridors	0	0.06	0	0	304	0	0	18	23	0
120	RECEPTION	Office space	5	0.06	5	0	442	2	11	27	47	0
121	PRINCIPAL	Office space	5	0.06	5	0	264	1	7	16	28	0
121A	TLT	Toilet Room - Public	0	0	0	70	1	0	0	0	0	70
122	CONFERENCE	Conference Rm (Office)	5	0.06	50	0	224	11	56	13	87	0
123	WORK ROOM / MAIL ROOM	Office space	5	0.06	5	0	355	2	9	21	38	0
124	SEC. / FIN. SEC.	Office space	5	0.06	5	0	140	1	4	8	15	0
125	TEACHER LOUNGE	Office space	5	0.06	5	0	362	2	9	22	38	0
125A	TLT	Toilet Room - Public	0	0	0	70	1	0	0	0	0	70
125B	TLT	Toilet Room - Public	0	0	0	70	1	0	0	0	0	70
126	CUST	Storage rooms	0	0.12	0	0	37	0	0	4	6	0
130C	CORRIDOR	Corridors	0	0.06	0	0	224	0	0	13	17	0
225H	SIMS / CONTROL	Office space	5	0.06	5	0	166	1	4	10	18	0
A100A	LOBBY	Office space	5	0.06	5	0	993	5	25	60	106	0
			0	0	0	0	0	0	0	0	0	0
						TOTALS	6378	41	206	404	763	420
										PROVIDED	**1100**	**900**

VENTILATION CALCULATIONS (NCMC 2018, SECT 403):

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCULATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
	AHU-06											
130	ELEV	Storage rooms	0	0.12	0	0	58	0	0	7	9	0
M100	MEDIA CENTER	Libraries	5	0.12	10	0	3928	39	196	471	835	0
M101	EQUIPMENT STORAGE	Storage rooms	0	0.12	0	0	198	0	0	24	30	0
M102	WORKROOM	Conference Rm (Office)	5	0.06	50	0	309	15	77	19	120	0
M103	OFFICE	Office space	5	0.06	5	0	207	1	5	12	22	0
M104	CONFERENCE ROOM	Conference Rm (Office)	5	0.06	50	0	241	12	60	14	93	0
M105	PROFESSIONAL LIBRARY	Libraries	5	0.12	10	0	241	2	12	29	51	0
221	MECHANICAL	Storage rooms	0	0.12	0	0	995	0	0	119	149	0
			0	0	0	0	0	0	0	0	0	0
						TOTALS	6176	70	351	696	1308	0
										PROVIDED	**1400**	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403):

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCULATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
	AHU-07											
139	STORAGE	Storage rooms	0	0.12	0	0	228	0	0	27	34	0
D100	CAFETERIA	Dining Rooms	7.5	0.18	70	0	6546	458	3436	1178	5768	0
D102	STORAGE	Storage rooms	0	0.12	0	0	130	0	0	16	19	0
D104	STAIR5	Corridors	0	0.06	0	0	41	0	0	2	3	0
D105	RAMP	Corridors	0	0.06	0	0	237	0	0	14	18	0
D101	PLATFORM	Stages, studios	10	0.06	70	0	994	70	696	60	945	0
			0	0	0	0	0	0	0	0	0	0
						TOTALS	8176	528	4132	1298	6787	0
										PROVIDED	**6800**	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403):

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCULATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
	AHU-08											
G002	VESTIBULE	Corridors	0	0.06	0	0	235	0	0	14	18	0
G003	LOBBY	Corridors	0	0.06	0	0	2499	0	0	150	187	0
G001	CORRIDOR	Corridors	0	0.06	0	0	393	0	0	24	30	0
G101	COMMUNITY STORAGE	Storage rooms	0	0.12	0	0	336	0	0	40	50	0
G102	TLT	Toilet Room - Public	0	0	0	70	1	0	0	0	0	70
G103	GIRLS	Toilet Room - Public	0	0	0	70	6	0	0	0	0	420
G104	BOYS	Toilet Room - Public	0	0	0	70	6	0	0	0	0	420
G106	PE CLASSROOM	Classrooms (age 9 plus)	7.5	0	25	0	873	22	164	0	205	0
G107	FITNESS	Health club/aerobics room	20	0.06	40	0	676	27	541	41	727	0
G107A	STORAGE	Storage rooms	0	0.12	0	0	54	0	0	6	8	0
G108	CONCESSION	Office space	5	0.06	5	0	156	1	4	9	17	0
G108A	STORAGE	Storage rooms	0	0.12	0	0	52	0	0	6	8	0
G109	AD OFFICE	Office space	5	0.06	5	0	100	1	3	6	11	0
G110	DATA	Storage rooms	0	0.12	0	0	57	0	0	7	9	0
G111	STORAGE	Storage rooms	0	0.12	0	0	710	0	0	85	106	0
G112	ELEC	Storage rooms	0	0.12	0	0	117	0	0	14	18	0
G113	STORAGE	Storage rooms	0	0.12	0	0	38	0	0	5	6	0
G114	ACTIVITY	Health club/aerobics room	20	0.06	40	0	2097	84	1678	126	2255	0
G121	CUST	Storage rooms	0	0.12	0	0	45	0	0	5	7	0
G007	MECHANICAL PENTHOUSE	Storage rooms	0	0.12	0	0	560	0	0	67	84	0
			0	0	0	0	0	0	0	0	0	0
G123A	TLT					TOTALS	9012	134	2389	606	3743	910
G124	MECH									**PROVIDED**	**3750**	**1375**

VENTILATION CALCULATIONS (NCMC 2018, SECT 403):

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCULATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
	AHU-09											
G115	GYMNASIUM	Gym, stadium (play area)	0	0.3	0	0	7000	0	0	2100	2625	0
			0	0	0	0	0	0	0	0	0	0
						TOTALS	7000	0	0	2100	2625	0
										PROVIDED	**2650**	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403):

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCULATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
	AHU-10											
G115	GYMNASIUM SEATING	Auditorium seating area	5	0.06	150	0	2338	351	1754	140	2368	0
G115	GYMNASIUM SEATING	Auditorium seating area	5	0.06	150	0	2514	377	1886	151	2545	0
			0	0	0	0	0	0	0	0	0	0
						TOTALS	4852	728	3639	291	4913	0
										PROVIDED	**5000**	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403):

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCULATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
	AHU-11											
10	GEN. STORAGE	Storage rooms	0	0.12	0	0	10607	0	0	1273	1591	0
			0	0	0	0	0	0	0	0	0	0
						TOTALS	10607	0	0	1273	1591	0
										PROVIDED	**1600**	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403):

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCULATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
	FCU-1											
11	OFFICE	Office space	5	0.06	5	0	162	1	4	10	17	0
12	OFFICE	Office space	5	0.06	5	0	161	1	4	10	17	0
154	SUPPLY	Storage rooms	0	0.12	0	0	39	0	0	5	6	0
			0	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0	0
						TOTALS	362	2	8	24	40	0
										PROVIDED	**50**	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403):

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCULATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
	FCU-2											
13	CONF RM	Conference Rm (Office)	5	0.06	50	0	644	32	161	39	250	0
			0	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0	0
						TOTALS	644	32	161	39	250	0
										PROVIDED	**250**	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403):

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCULATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
	ERV-01											
G004	CORRIDOR	Corridors	0	0.06	0	0	912	0	0	55	68	0
G005	CORRIDOR	Corridors	0	0.06	0	0	168	0	0	10	13	0
G006	CORRIDOR	Corridors	0	0.06	0	0	179	0	0	11	13	0
G116	GIRLS LOCKER	Locker/Dressing Rooms	0	0	0	0.25	200	0	0	0	0	50
G117	GIRLS TEAM	Locker/Dressing Rooms	0	0	0	0.25	459	0	0	0	0	115
G118	GIRLS COACH	Office space	5	0.06	5	0	165	1	4	10	18	0
G119	GIRLS RESTROOM	Toilet Room - Public	0	0	0	70	5	0	0	0	0	350
G119A	TLT	Toilet Room - Public	0	0	0	70	2	0	0	0	0	140
G120	LAUNDRY	Storage rooms	0	0.12	0	0	183	0	0	22	27	0
G122	BOYS COACH	Office space	5	0.06	5	0	165	1	4	10	18	0
G123	BOYS RESTROOM	Toilet Room - Public	0	0	0	70	5	0	0	0	0	350
G123A	TLT	Toilet Room - Public	0	0	0	70	2	0	0	0	0	140
G124	MECH	Storage rooms	0	0.12	0	0	97	0	0	12	15	0
G125	BOYS TEAM	Locker/Dressing Rooms	0	0	0	0.25	459	0	0	0	0	115
G126	BOYS LOCKER	Locker/Dressing Rooms	0	0	0	0.25	200	0	0	0	0	50
			0	0	0	0	0	0	0	0	0	0
						TOTALS	3199	2	8	129	171	1309
										PROVIDED	**2650**	**2650**

VENTILATION CALCULATIONS (NCMC 2018, SECT 403):

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCULATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
	RTU-01											
145	COOLER	Storage rooms	0	0.12	0	0	244	0	0	29	37	0
146	FREEZER	Storage rooms	0	0.12	0	0	293	0	0	35	44	0
D106	SERVING	Kitchens (Cooking)	0	0	0	0.7	971	0	0	0	0	680
D107	DISH	Kitchens (Cooking)	0	0	0	0.7	307	0	0	0	0	215
D108	KITCHEN	Kitchens (Cooking)	0	0	0	0.7	1336	0	0	0	0	935
D109	DRY STORAGE	Storage rooms	0	0.12	0	0	288	0	0	35	43	0
D110	OFFICE	Office space	5	0.06	5	0	100	1	3	6	11	0
D111	STORAGE	Storage rooms	0	0.12	0	0	164	0	0	20	25	0
D112	STORAGE	Storage rooms	0	0.12	0	0	139	0	0	17	21	0
D113	LAUNDRY	Storage rooms	0	0.12	0	0	84	0	0	10	13	0
D114	LOCKERS	Locker/Dressing Rooms	0	0	0	0.25	53	0	0	0	0	13
D115	TLT	Toilet Room - Public	0	0	0	70	1	0	0	0	0	70
			0	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0	0
						TOTALS	3980	1	3	151	192	1913
										PROVIDED	**900**	

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

VENTILATION CALCULATIONS

M-005

Optima # 22-0082

[redacted]

01.12.2023 - BID SET

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SEQUENCE OF OPERATION

A COMPLETE AND OPERATIONAL DDC CONTROL SYSTEM (BAS) SHALL BE INSTALLED IN ACCORDANCE WITH THE SPECIFICATIONS (SECTION 230900) AND AS INTENDED ON THESE PLANS. ALL CONTROL POINTS AND EQUIPMENT SEQUENCES OF OPERATION LISTED IN SPECIFICATION SECTION 230900 SHALL BE CONSIDERED IN ADDITION TO THOSE LISTED HERE. IN THE EVENT THAT THE VERBIAGE IS IN CONFLICT OR CONTRADICTS THE REQUIREMENTS LISTED HERE, THE QUESTION SHALL BE ASKED PRIOR TO BIDDING OR THE MORE STRINGENT SHALL APPLY. MECHANICAL CONTRACTOR SHALL COORDINATE ALL BAS INTEGRATION REQUIREMENTS WITH EQUIPMENT VENDORS AND CONTROLS CONTRACTOR PRIOR TO PURCHASING EQUIPMENT AND PROVIDE ALL EQUIPMENT WITH COMMUNICATION/INTERFACE CARDS AS REQUIRED FOR SYSTEM INTEGRATION.

<u>CHILLER PLANT (PRIMARY SECONDARY WITH AIR COOLED REDUNDANT CHILLERS)</u>

THE CHILLED WATER SYSTEM SHALL BE ENABLED TO OPERATE WHEN THE OUTSIDE AIR TEMPERATURE IS ABOVE 50° F OR ANY CHILLED WATER CONTROL VALVE IS COMMANDED OPEN FOR COOLING. THE LEAD CHILLED WATER PUMP SHALL BE STARTED FIRST. AFTER A ONE MINUTE DELAY, THE CHILLER CONTROL PANEL SHALL BE ENABLED TO ENERGIZE THE LEAD CHILLER. EACH CHILLER CONTROL PANEL SHALL START THE ASSOCIATED CHILLED WATER PUMP PRIOR TO THE START OF THE ASSOCIATED CHILLER. AFTER PROOF OF PRIMARY CHILLED WATER FLOW, THE ASSOCIATED CHILLER WILL START. THE BAS SHALL MONITOR AND DISPLAY PUMP COMMAND AND STATUS. (IF THE CHILLER CONTROL PANEL DOES NOT PROVIDE FOR PUMP CONTROL, THIS SHALL BE ACCOMPLISHED BY THE BAS.)

CHILLER SUPPLY TEMPERATURE SHALL BE CONTROLLED BY CHILLER CONTROL PANEL. THE BAS SHALL SEND A CHILLED WATER SUPPLY TEMPERATURE SETPOINT COMMAND TO ALL CHILLER CONTROL PANELS. THE SETPOINT SHALL BE MAINTAINED PER THE RESET SCHEDULE BELOW:

CHILLED WATER SUPPLY TEMPERATURE RESET SCHEDULE (ADJ)
44° F CHS AT 85° F OUTSIDE AIR TEMPERATURE (OR ABOVE)
50° F CHS AT 60° F OUTSIDE AIR TEMPERATURE (OR BELOW)
CHS SHALL VARY LINEARLY BETWEEN THE HIGH AND LOW TEMPERATURES (AS MEASURED IN THE CHS LOOP, NOT AT THE CHILLERS). THE INITIAL SETPOINT FOR THE CHILLED WATER SUPPLY TEMPERATURE SHALL BE 44° F.

CHILLERS AND CHILLED WATER PUMPS SHALL BE SETUP IN A LEAD/STAND-BY CONFIGURATION. BAS SHALL ALTERNATE LEAD/STAND-BY PUMPS AND CHILLERS TO EQUALIZE RUN TIME. THE LEAD CHILLER AND PUMP SHALL BE ROTATED ON A WEEKLY BASIS. UPON FAILURE OF THE LEAD PUMP OR CHILLER, OR IF THE CHILLED WATER SUPPLY TEMPERATURE INCREASES 4° ABOVE THE INDICATED HIGH LIMIT FOR A PERIOD OF 10 MINUTES, THE BAS SHALL GENERATE AN ALARM, DE-ENERGIZE THE LEAD CHILLER AND PUMP, AND ENERGIZE THE STAND-BY CHILLER AND PUMP. THE ENERGY MANAGEMENT SYSTEM SHALL MONITOR THE PRIMARY PUMP COMMAND. THE BAS SHALL GENERATE AN ALARM IF THE PUMP FAILS TO RUN, OR IF THE CHILLER CONTROLS INDICATE AN ALARM. WHEN ACTIVATED, CHILLER SHALL OPERATE FOR A MINIMUM OF 30 MINUTES, AND WHEN DEACTIVATED CHILLER SHALL REMAIN IDLE FOR A MINIMUM OF 30 MINUTES (ADJUSTABLE).

THE CHILLED WATER SECONDARY PUMPS ARE VARIABLE FLOW PUMPS WITH VARIABLE FREQUENCY DRIVES, SETUP IN A LEAD/LAG CONFIGURATION. THE BAS SHALL START THE VARIABLE SPEED CHILLED WATER SECONDARY PUMPS. SECONDARY PUMP SPEEDS ARE CONTROLLED BY VFD'S. THE BAS SHALL MONITOR THE VFD OPERATING SPEEDS AND ALARM CONDITIONS. THE VARIABLE FREQUENCY DRIVES FOR THE PUMPS SHALL BE CONTROLLED BY DIFFERENTIAL PRESSURE SENSORS IN THE CHILLED WATER PIPING SYSTEM (SEE PIPING PLANS FOR SENSOR LOCATIONS). AS AIR HANDLING EQUIPMENT CONTROL VALVES OPEN, LEAD PUMP SPEED SHALL BE INCREASED VIA VARIABLE FREQUENCY DRIVE TO MAINTAIN SYSTEM PRESSURE SETPOINT. AS SYSTEM PRESSURE FALLS BELOW SETPOINT FOR A PERIOD OF 15 MINUTES (ADJ), LAG PUMP SHALL BE STARTED AND PUMP SPEED SHALL BE EQUALIZED BETWEEN THE TWO PUMPS. WHEN SYSTEM PRESSURE IS SATISFIED FOR A PERIOD OF 15 MINUTES (ADJ) WITH PUMP SPEEDS BELOW 45%, THE LEAD PUMP SHALL STOP AND THE LAG PUMP SHALL CONTINUE TO RUN. THE INITIAL CHILLED WATER DIFFERENTIAL PRESSURE SETPOINT SHALL BE 12 PSI, THIS SETTING SHALL BE ESTABLISHED DURING TESTING & BALANCING. IF ONE OR MORE OF THE SENSORS ARE BELOW SETPOINT, THE DRIVE SPEED SHALL BE INCREASED IN RESPONSE TO THE SENSOR WITH THE LARGEST DEVIATION BELOW SETPOINT. IF ALL OF THE SENSORS ARE ABOVE SETPOINT, THE DRIVE SPEED SHALL BE DECREASED IN RESPONSE TO THE SENSOR WITH THE SMALLEST DEVIATION ABOVE SETPOINT. PROVIDE DEAD-BAND AND/OR TIME DELAYS TO PREVENT RAPID CYCLING OF PUMPS. 3-WAY CONTROL VALVES ARE PROVIDED WITH CERTAIN UNITS TO MAINTAIN MINIMUM PUMP FLOW (SEE PIPING PLANS FOR UNIT LOCATIONS). LAG PUMP SHALL START AUTOMATICALLY UPON FAILURE OF LEAD PUMP, AND AN ALARM INDICATING PUMP FAILURE SHALL BE SENT TO THE BAS.

THE BAS SHALL GENERATE AN ALARM IF THE SYSTEM PRESSURE DEVIATES FROM SETPOINT BY GREATER THAN 6 PSI FOR MORE THAN 5 MINUTES, IF THE LAG PUMP FAILS TO START, OR IF THE VARIABLE FREQUENCY DRIVE INDICATES AN ALARM. THE CHILLED WATER SECONDARY PUMPS SHALL OPERATE FOR 10 MINUTES AFTER ALL CHILLERS ARE COMMANDED TO STOP.

<u>BOILER PLANT (PRIMARY/SECONDARY WITH CAST IRON BOILERS)</u>

THE HOT WATER SYSTEM WILL BE COMMANDED TO RUN IF THE OUTDOOR TEMPERATURE IS BELOW 60˚F OR ANY HOT WATER CONTROL VALVE IS COMMANDED OPEN FOR HEATING OR DEHUMIDIFICATION.

BOILERS AND HOT WATER PUMPS SHALL BE STOPPED/STARTED BY THE BAS ON A PROGRAMMED BASIS. PRIMARY AND SECONDARY HOT WATER PUMPS SHALL BE ENABLED, WITH LEAD BOILER AND ASSOCIATED PRIMARY HOT WATER PUMP AND LEAD SECONDARY HOT WATER PUMP STARTED BY THE BAS. BOILERS AND PRIMARY PUMPS SHALL BE STAGED BY THE BOILERS FACTORY CONTROLS AND CASCADING SEQUENCER AS REQUIRED TO MAINTAIN A SYSTEM HOT WATER SUPPLY TEMPERATURE PER THE RESET SCHEDULE BELOW.

HOT WATER SUPPLY TEMPERATURE RESET SCHEDULE (ADJ)
180° F. HWS AT 30° F. O.A. TEMP. (OR BELOW)
140° F. HWS AT 60° F. O.A. TEMP. (OR ABOVE)
HWS SHALL VARY LINEARLY BETWEEN THE HIGH AND LOW TEMPERATURES (AS MEASURED IN THE HWS LOOP, NOT AT THE BOILERS). THE INITIAL SETPOINT FOR THE HOT WATER SUPPLY TEMPERATURE SHALL BE 180° F.

BOILER STAGING SHALL EQUALIZE BOILER RUN TIME BY ROTATING LEAD BOILER ON A WEEKLY BASIS. AN ALARM SIGNAL SHALL BE SENT TO THE ENERGY MANAGEMENT SYSTEM IF THE HEATING SUPPLY WATER TEMPERATURE DROPS MORE THAN 20°F BELOW THE OPERATING SETPOINT FOR A PERIOD OF 10 MINUTES. THE BAS SHALL ALSO GENERATE AN ALARM IF ANY BOILER OR HOT WATER PUMP VARIABLE FREQUENCY DRIVE INDICATES AN ALARM.

THE HOT WATER SECONDARY PUMPS ARE VARIABLE FLOW PUMPS WITH VARIABLE FREQUENCY DRIVES, SETUP IN A LEAD/LAG CONFIGURATION. THE BAS SHALL START THE VARIABLE SPEED SECONDARY HOT WATER PUMPS. SECONDARY PUMP SPEEDS ARE CONTROLLED BY VFD'S. THE BAS SHALL MONITOR THE VFD OPERATING SPEEDS AND ALARM CONDITIONS. THE VARIABLE FREQUENCY DRIVES FOR THE PUMPS SHALL BE CONTROLLED BY DIFFERENTIAL PRESSURE SENSORS IN THE HOT WATER PIPING SYSTEM (SEE PIPING PLANS FOR SENSOR LOCATIONS). AS AIR HANDLING EQUIPMENT CONTROL VALVES OPEN, LEAD PUMP SPEED SHALL BE INCREASED VIA VARIABLE FREQUENCY DRIVE TO MAINTAIN SYSTEM PRESSURE SETPOINT. AS SYSTEM PRESSURE FALLS BELOW SETPOINT FOR A PERIOD OF 15 MINUTES (ADJ), LAG PUMP SHALL BE STARTED AND PUMP SPEED SHALL BE EQUALIZED BETWEEN THE TWO PUMPS. WHEN SYSTEM PRESSURE IS SATISFIED FOR A PERIOD OF 15 MINUTES (ADJ) WITH PUMP SPEEDS BELOW 45%, THE LEAD PUMP SHALL STOP AND THE LAG PUMP SHALL CONTINUE TO RUN. THE INITIAL HOT WATER DIFFERENTIAL PRESSURE SETPOINT SHALL BE 12 PSI. THIS SETTING SHALL BE ESTABLISHED DURING TESTING & BALANCING. IF ONE OR MORE OF THE SENSORS ARE BELOW SETPOINT, THE DRIVE SPEED SHALL BE INCREASED IN RESPONSE TO THE SENSOR WITH THE LARGEST DEVIATION BELOW SETPOINT. IF ALL OF THE SENSORS ARE ABOVE SETPOINT, THE DRIVE SPEED SHALL BE DECREASED IN RESPONSE TO THE SENSOR WITH THE SMALLEST DEVIATION ABOVE SETPOINT. PROVIDE DEAD-BAND AND/OR TIME DELAYS TO PREVENT RAPID CYCLING OF PUMPS. 3-WAY CONTROL VALVES ARE PROVIDED WITH CERTAIN UNITS TO MAINTAIN MINIMUM PUMP FLOW (SEE PIPING PLANS FOR UNIT LOCATIONS). LAG PUMP SHALL START AUTOMATICALLY UPON FAILURE OF LEAD PUMP, AND AN ALARM INDICATING PUMP FAILURE SHALL BE SENT TO THE BAS.

THE BAS SHALL GENERATE AN ALARM IF THE SYSTEM PRESSURE DEVIATES FROM SETPOINT BY GREATER THAN 6 PSI FOR MORE THAN 5 MINUTES, IF THE LAG PUMP FAILS TO START, OR IF THE VARIABLE FREQUENCY DRIVE INDICATES AN ALARM. THE HOT WATER SECONDARY PUMPS SHALL OPERATE FOR 10 MINUTES AFTER THE BOILER SYSTEM IS COMMANDED TO STOP.

DURING THE UNOCCUPIED MODE, IF THE OA TEMPERATURE DROPS BELOW 32° (ADJ.), THE PRIMARY PUMPS AND BOILERS SHALL BE ACTIVATED, AND SECONDARY HOT WATER PUMPS SHALL BE ACTIVATED AT LOW SPEED. ALL HOT WATER CONTROL VALVES SHALL BE COMMANDED OPEN.

A LOW VOLTAGE THERMOSTAT SHALL START PUMP ROOM VENTILATION FAN WHEN BOILER ROOM TEMPERATURE RISES ABOVE 85° F (ADJUSTABLE). RELIEF/COMBUSTION AIR LOUVER MOTORIZED DAMPER SHALL BE INTERLOCKED TO OPEN UPON ACTIVATION OF VENTILATION FAN, EITHER BOILER, OR DOMESTIC WATER HEATER.

A CARBON MONOXIDE/OXYGEN DEPLETION SENSOR SHALL BE PROVIDED IN THE BOILER ROOM AND SHALL ACTIVATE AN AUDIBLE AND VISUAL ALARM INSIDE THE BOILER ROOM, ACTIVATE THE VENTILATION FAN, AND SEND AN ALARM TO THE CENTRAL BAS IF ACTIVATED.

A PUSHBUTTON EMERGENCY GAS SHUTOFF SWITCH SHALL BE PROVIDED AT THE BOILER ROOM TO CLOSE A SOLENOID VALVE IN THE GAS LINE SERVING HVAC AND DOMESTIC WATER HEATING EQUIPMENT. ACTIVATION OF THE SWITCH SHALL CLOSE THE GAS VALVE AND ALARM THE CENTRAL BAS (VALVE AND SWITCH BY E.C.)

IN ORDER TO PREVENT LOW RETURN WATER TEMPERATURE, PROVDE AN ELECTRIC ACTUATED THREE-WAY MIXING VALVE WITH SLOW (1 MINUTE) TRAVEL TIME FOR EACH BOILER. IF THE BOILER RETURN WATER TEMPERATURE IS BELOW 130°F (BAS ADJUSTABLE), THE VALVE SHALL SLOWLY JOG CLOSED, CAUSING BOILER SUPPLY WATER TO BLEND WITH THE RETURN WATER. WHEN THE RETURN WATER TEMPERATAURE RETURNS TO 140°F, THE BOILER SUPPLY VALVE SHALL SLOWLY JOG OPEN.

<u>4-PIPE AIR HANDLING UNITS</u>

AIR HANDLING UNITS SHALL BE STOPPED/STARTED ON A TIME OF DAY SCHEDULE THROUGH THE BAS. THIS SCHEDULE SHALL BE MODIFIED BY A START STOP OPTIMIZATION PROGRAM. UPON PROOF OF AIR FLOW THRU THE SUPPLY FAN, AS SENSED BY A RESPECTIVE CURRENT SENSING RELAY, THE NORMALLY CLOSED OUTSIDE AIR DAMPER SHALL BE ENABLED.

WHILE IN THE OCCUPIED MODE, THE SUPPLY FAN SHALL OPERATE CONTINUOUSLY. WHILE IN THE UNOCCUPIED MODE, THE UNIT SUPPLY FAN SHALL CYCLE WITH HEATING AND COOLING LOADS, THE CHILLED WATER AND HOT WATER CONTROL VALVES SHALL BE CLOSED TO THE UNIT. UPON A CALL FOR HEATING OR COOLING TO MEET UNOCCUPIED SETPOINTS, THE UNIT FAN SHALL BE STARTED AND THE UNIT SHALL OPERATE AS DESCRIBED BELOW AS REQUIRED BY THE SPACE TEMPERATURE. THE BOILER PLANT OR CHILLER PLANT SHALL ALSO BE STARTED AS REQUIRED TO SATISFY SETPOINTS. THE UNIT AND ASSOCIATED CENTRAL PLANT SHALL OPERATE FOR A MINIMUM OF 30 MINUTES (OR AS REQUIRED TO SATISFY UNOCCUPIED SETPOINT) AND SHALL NOT BE ALLOWED TO RESTART FOR A MINUM OF 15 MINUTES FOLLOWING SATISFACTION OF UNOCCUPIED SETPOINT AND SYSTEM SHUT-DOWN.

DEMAND CONTROL VENTILATION:
OUTSIDE AIR INTAKE SHALL BE PROVIDED WITH A MOTORIZED DAMPER. ON UNIT START UP, THE OUTSIDE AIR INTAKE DAMPER SHALL REMAIN CLOSED UNTIL THE RETURN AIR TEMPERATURE RISES ABOVE 65° F (ADJ) OR FALLS BELOW 75° F. (ADJ). ONCE RETURN AIR TEMPERATURE IS SATISFIED, THE OUTSIDE AIR DAMPER SHALL OPEN TO THE OCCUPIED MINIMUM SETPOINT. OUTSIDE AIR DAMPERS AND AIR FLOW MONITORING STATIONS SHALL MODULATE AS REQUIRED TO MAINTAIN MINIMUM OUTSIDE AIR FLOW. THE OUTSIDE AIR INTAKE DAMPER SHALL BE CLOSED WHILE UNIT IS IN THE UNOCCUPIED MODE. BAS SHALL BE CAPABLE OF OPENING AND CLOSING OUTSIDE AIR DAMPERS. CO_2 SENSOR MOUNTED IN THE RETURN DUCT SHALL MODULATE THE OUTSIDE AIR DAMPER BASED ON CO_2 LEVELS IN THE SPACE. DAMPER SHALL MODULATE OPEN FROM THE OCCUPIED MINIMUM SETPOINT OF 800 PPM TO DESIGN MAXIMUM AT 1200 PPM. AN ALARM SHALL BE ACTIVATED IF THE SPACE CO_2 LEVEL RISES ABOVE 1500 PPM. SEE AHU SCHEDULE FOR MINIMUM AND DESIGN OUTSIDE AIR SETPOINTS.

AIRSIDE ECONOMIZER CYCLE:
DURING THE OCCUPIED PERIOD, AND WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW 68° F. AND ABOVE 45° F AND THE OUTDOOR ENTHALPY IS BELOW 25 BTU/LB, THE ECONOMIZER CYCLE SHALL BE ENABLED. UNDER THOSE CONDITIONS, THE OUTDOOR AIR DAMPER CAN MODULATE PAST ITS "DESIGN" POSITION TO FULL OPEN.

MODULATING DAMPER CONTROL:
MODULATING RETURN, RELIEF, AND OUTSIDE AIR DAMPERS SHALL OPERATE IN CONJUNCTION. RELIEF AND OUTSIDE AIR DAMPERS SHALL OPEN TO THE SAME POSITION (BASED ON DEMAND CONTROL VENTILATION OR ECONOMIZER CONTROL), AND RETURN DAMPER SHALL CLOSE TO THE INVERSE POSITION OF THE OUTSIDE AND RELIEF DAMPER SETTINGS.

RETURN FANS:
RETURN FANS SHALL BE PROVIDED WHERE INDICATED IN THE AHU SCHEDULE. RETURN FAN SHALL START ALONG WITH OPENING OF ALL ASSOCIATED RETURN AIR SMOKE DAMPERS AND ISOLATION DAMPERS. SUPPLY FAN SHALL START AFTER PROOF OF THE RETURN FAN, AND ONCE ALL ASSOCIATED SUPPLY AIR DAMPERS ARE OPEN. VARIABLE FREQUENCY DRIVE SHALL CONTROL RETURN FAN TO MAINTAIN A CONSTANT DIFFERENTIAL FROM THE SUPPLY AIR VOLUME. RETURN FAN CONTROL MAY BE OVERRIDDEN BY A BUILDING PRESSURE SENSOR, IF THE BUILDING PRESSURE GETS OUT OF THE +/- 0.02" STATIC PRESSURE RANGE FOR A PERIOD OF 10 MINUTES. ONCE BUILDING PRESSURE IS SATISFIED, RETURN FAN CONTROL SHALL REVERT BACK TO TRACKING THE SUPPLY FAN.

HUMIDITY CONTROL:
WITH SYSTEM IN OCCUPIED OR UNOCCUPIED MODE, HUMIDITY CONTROL SYSTEM SHALL BE CAPABLE OF BEING ACTIVATED. UNDER NORMAL OPERATION, UNIT SHALL CONTROLLED AS OUTLINED BELOW. PROVIDE HUMIDISTAT AS INDICATED ON PLANS, IF SPACE OR RETURN AIR HUMIDITY REACHES 65% R.H. (ADJ), ALARM SHALL BE SENT AND HUMIDITY CONTROL SEQUENCE SHALL BE ACTIVATED. AIR HANDLING UNIT CHILLED WATER CONTROL VALVE SHALL BE DRIVEN FULL OPEN. AND UNIT REHEAT COIL OR TERMINAL BOX REHEAT SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE. WHEN SPACE HUMIDITY DROPS BELOW 55% R.H. (ADJ), BAS SHALL DEACTIVATE HUMIDITY CONTROL SEQUENCE. CONTROL OF UNIT SHALL REVERT BACK AS INDICATED BELOW. BOLIER(S) AND ASSOCIATED PUMP(S) SHALL BE STARTED IF THE HEATING PLANT IS IDLE AT THE TIME THE HUMIDITY CONTROL SEQUENCE IS ACTIVATED.

SMOKE DETECTION & AHU SHUTDOWN:
UPON DETECTION OF SMOKE IN THE AIR HANDLING SYSTEM BY THE DUCT-MOUNTED RETURN AIR SMOKE DETECTOR, AN ALARM CONDITION SHALL BE SENT TO THE BUILDING FIRE ALARM SYSTEM AND ALL AIR HANDLING UNITS SHALL BE SHUTDOWN BY THE BUILDING FIRE ALARM SYSTEM. THE BUILDING FIRE ALARM SYSTEM SHALL PROVIDE ONE DIGITAL OUTPUT TO THE BAS TO
INDICATE ACTIVATION OR FAILURE OF ANY SMOKE DETECTOR.

FREEZE PROTECTION:
A MIXED AIR TEMPERATURE SENSOR SHALL BE LOCATED UPSTREAM OF THE FIRST COIL IN THE AHU. UPON A DROP IN TEMPERATURE BELOW 40° F AT THE MIXED AIR SENSOR, AN ALARM SHALL BE SENT TO THE CENTRAL BAS, THE OUTSIDE AIR DAMPER SHALL BE OVERRIDDEN TO THE MINIMUM OCCUPIED POSITION. AFTER A TIME DELAY OF 20 MINUTES (ADJ.), THE CONTROL OF THE OA DAMPER SHALL RETURN TO NORMAL OPERATION. MIXED AIR TEMPERATURE SHALL HAVE SOFTWARE RESET AND A 20 MINUTE DELAY (ADJ).

A FREEZE-STAT SHALL BE LOCATED UPSTREAM OF THE COOLING COIL, AND SHALL SHUT DOWN THE AHU FANS AND ALARM THE CENTRAL BAS IF THE TEMPERATURE IS BELOW 38° F. THE SECONDARY CHILLED WATER PUMP AND THE HOT WATER PUMP SHALL START, AND THE HOT WATER AND CHILLED WATER CONTROL VALVES AT THE AIR HANDLING UNIT SHALL OPEN FULLY. FREEZE-STAT SHALL HAVE MANUAL RESET ONLY.

<u>VARIABLE AIR VOLUME (VAV) AIR HANDLING UNITS:</u>

A DISCHARGE AIR TEMPERATURE SENSOR SHALL CONTROL CHILLED WATER CONTROL VALVE TO MAINTAIN SUPPLY AIR TEMPERATURE PER THE RESET SCHEDULE BELOW.

SUPPLY AIR TEMPERATURE RESET SCHEDULE (ADJ)
55° F. SAT AT 70° F. O.A. TEMP. (OR ABOVE)
65° F. SAT AT 30° F. O.A. TEMP. (OR ABOVE)
SUPPLY AIR TEMPERATURE SHALL VARY LINEARLY BETWEEN THE HIGH AND LOW TEMPERATURES. THE INITIAL SETPOINT FOR THE DISCHARGE AIR SUPPLY TEMPERATURE SHALL BE 60° F. SUPPLY AIR TEMPERATURE SETPOINT SHALL HAVE A HIGH LIMIT OF OF 62° REGARDLESS OF OUTSIDE AIR TEMPERATURE, WHEN ANY ZONE ON THE AHU HAS A CALL FOR COOLING.

THE STATIC PRESSURE SENSOR IN THE SUPPLY DUCT SHALL MODULATE THE VARIABLE FREQUENCY DRIVE TO MAINTAIN THE SETPOINT ESTABLISHED DURING FINAL TESTING AND BALANCING. THE PRELIMINARY SETPOINT SHALL BE 0.75" STATIC PRESSURE. THIS SETPOINT SHALL BE RESET BASED ON THE ZONE REQUIRING THE MOST PRESSURE; I.E., THE SETPOINT IS RESET LOWER UNTIL ONE TERMINAL BOX DAMPER IS NEARLY WIDE OPEN.

<u>SINGLE ZONE VARIABLE VOLUME (SZVAV) AIR HANDLING UNITS:</u>

A TEMPERAUTRE SENSOR SHALL BE UTILIZED TO MAINTAIN SPACE TEMPERATURE. THE UNIT SUPPLY FAN SHALL START AT LOW SPEED. ON A RISE IN TEMPERATURE ABOVE SETPOINT, THE CHILLED WATER CONTROL VALVE SHALL OPEN TO THE CHILLED WATER COIL. ON A CONTINUED RISE IN TEMPERATURE, VARIABLE FREQUENCY DRIVE SHALL INCREASE AIR FLOW TO SATISFY SPACE TEMPERATURE REQUIREMENTS. AS THE SPACE TEMPERATURE DROPS BELOW SETPOINT, THE FAN SPEED SHALL RESET FROM MAXIMUM TO MINIMUM. AS THE SPACE TEMPERATURE CONTINUES TO DROP, THE CHILLED WATER CONTROL VALVE SHALL CLOSE TO THE COOLING COIL AND THE HOT WATER CONTROL VALVE SHALL OPEN TO THE HEATING COIL. ON A CONTINUED DROP IN SPACE TEMPERATURE, THE SUPPLY FAN SPEED SHALL INCREASE TO MAINTAIN SETPOINT. THE TEMPERATURE SENSOR SHALL BE PROVIDED WITH AN OVERRIDE FUNCTION THAT WILL PLACE THE SYSTEM IN THE OCCUPIED MODE FOR A PERIOD OF UP TO 2 HOURS.

<u>4-PIPE AIR HANDLING UNIT (BLOWER COIL)</u>

AIR HANDLING UNITS SHALL BE STOPPED/STARTED ON A TIME OF DAY SCHEDULE THROUGH THE BAS. THIS SCHEDULE SHALL BE MODIFIED BY A START STOP OPTIMIZATION PROGRAM. UPON PROOF OF AIR FLOW THRU THE SUPPLY FAN, AS SENSED BY A RESPECTIVE CURRENT SENSING RELAY, THE NORMALLY CLOSED OUTSIDE AIR DAMPER SHALL BE ENABLED.

WHILE IN THE OCCUPIED MODE, THE SUPPLY FAN SHALL OPERATE CONTINUOUSLY. WHILE IN THE UNOCCUPIED MODE, THE UNIT SUPPLY FAN SHALL CYCLE WITH HEATING AND COOLING LOADS, THE CHILLED WATER AND HOT WATER CONTROL VALVES SHALL BE CLOSED TO THE UNIT. UPON A CALL FOR HEATING OR COOLING TO MEET UNOCCUPIED SETPOINTS, THE UNIT FAN SHALL BE STARTED AND THE UNIT SHALL OPERATE AS DESCRIBED BELOW AS REQUIRED BY THE SPACE TEMPERATURE. THE BOILER PLANT OR CHILLER PLANT SHALL ALSO BE STARTED AS REQUIRED TO SATISFY SETPOINTS. THE UNIT AND ASSOCIATED CENTRAL PLANT SHALL OPERATE FOR A MINIMUM OF 30 MINUTES (OR AS REQUIRED TO SATISFY UNOCCUPIED SETPOINT) AND SHALL NOT BE ALLOWED TO RESTART FOR A MINUM OF 15 MINUTES FOLLOWING SATISFACTION OF UNOCCUPIED SETPOINT AND SYSTEM SHUT-DOWN.

AIRSIDE ECONOMIZER CYCLE:
DURING THE OCCUPIED PERIOD, AND WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW 68° F. AND ABOVE 45° F AND THE OUTDOOR ENTHALPY IS BELOW 25 BTU/LB, THE ECONOMIZER CYCLE SHALL BE ENABLED. UNDER THOSE CONDITIONS, THE OUTDOOR AIR DAMPER CAN MODULATE PAST ITS "DESIGN" POSITION TO FULL OPEN.

MODULATING DAMPER CONTROL:
MODULATING RETURN, RELIEF, AND OUTSIDE AIR DAMPERS SHALL OPERATE IN CONJUNCTION. RELIEF AND OUTSIDE AIR DAMPERS SHALL OPEN TO THE SAME POSITION (BASED ON ECONOMIZER CONTROL), AND RETURN DAMPER SHALL CLOSE TO THE INVERSE POSITION OF THE OUTSIDE AND RELIEF DAMPER SETTINGS.

HUMIDITY CONTROL:
WITH SYSTEM IN OCCUPIED OR UNOCCUPIED MODE, HUMIDITY CONTROL SYSTEM SHALL BE CAPABLE OF BEING ACTIVATED. UNDER NORMAL OPERATION, UNIT SHALL CONTROLLED AS OUTLINED BELOW. PROVIDE HUMIDISTAT AS INDICATED ON PLANS, IF SPACE OR RETURN AIR HUMIDITY REACHES 65% R.H. (ADJ), ALARM SHALL BE SENT AND HUMIDITY CONTROL SEQUENCE SHALL BE ACTIVATED. AIR HANDLING UNIT CHILLED WATER CONTROL VALVE SHALL BE DRIVEN FULL OPEN. AND UNIT REHEAT COIL OR TERMINAL BOX REHEAT SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE. WHEN SPACE HUMIDITY DROPS BELOW 55% R.H. (ADJ), BAS SHALL DEACTIVATE HUMIDITY CONTROL SEQUENCE. CONTROL OF UNIT SHALL REVERT BACK AS INDICATED BELOW. BOLIER(S) AND ASSOCIATED PUMP(S) SHALL BE STARTED IF THE HEATING PLANT IS IDLE AT THE TIME THE HUMIDITY CONTROL SEQUENCE IS ACTIVATED.

SMOKE DETECTION & AHU SHUTDOWN:
UPON DETECTION OF SMOKE IN THE AIR HANDLING SYSTEM BY THE DUCT-MOUNTED RETURN AIR SMOKE DETECTOR, AN ALARM CONDITION SHALL BE SENT TO THE BUILDING FIRE ALARM SYSTEM AND ALL AIR HANDLING UNITS SHALL BE SHUTDOWN BY THE BUILDING FIRE ALARM SYSTEM. THE BUILDING FIRE ALARM SYSTEM SHALL PROVIDE ONE DIGITAL OUTPUT TO THE BAS TO
INDICATE ACTIVATION OR FAILURE OF ANY SMOKE DETECTOR.

FREEZE PROTECTION:
A MIXED AIR TEMPERATURE SENSOR SHALL BE LOCATED UPSTREAM OF THE FIRST COIL IN THE AHU. UPON A DROP IN TEMPERATURE BELOW 40° F AT THE MIXED AIR SENSOR, AN ALARM SHALL BE SENT TO THE CENTRAL BAS, THE OUTSIDE AIR DAMPER SHALL BE OVERRIDDEN TO THE MINIMUM OCCUPIED POSITION. AFTER A TIME DELAY OF 20 MINUTES (ADJ.), THE CONTROL OF THE OA DAMPER SHALL RETURN TO NORMAL OPERATION. MIXED AIR TEMPERATURE SHALL HAVE SOFTWARE RESET AND A 20 MINUTE DELAY (ADJ).

A FREEZE-STAT SHALL BE LOCATED UPSTREAM OF THE COOLING COIL, AND SHALL SHUT DOWN THE AHU FANS AND ALARM THE CENTRAL BAS IF THE TEMPERATURE IS BELOW 38° F. THE SECONDARY CHILLED WATER PUMP AND THE HOT WATER PUMP SHALL START, AND THE HOT WATER AND CHILLED WATER CONTROL VALVES AT THE AIR HANDLING UNIT SHALL OPEN FULLY. FREEZE-STAT SHALL HAVE MANUAL RESET ONLY.

<u>4-PIPE FAN COIL UNIT</u>

FAN COIL UNITS SHALL BE STOPPED/STARTED ON A TIME OF DAY SCHEDULE THROUGH THE BAS. THIS SCHEDULE SHALL BE MODIFIED BY A START STOP OPTIMIZATION PROGRAM. UPON PROOF OF AIR FLOW THRU THE SUPPLY FAN, AS SENSED BY A RESPECTIVE CURRENT SENSING RELAY, THE NORMALLY CLOSED OUTSIDE AIR DAMPER SHALL BE ENABLED.

WHILE IN THE OCCUPIED MODE, THE SUPPLY FAN SHALL OPERATE CONTINUOUSLY AND THE OUTSIDE AIR DAMPER SHALL BE OPEN. WHILE IN THE UNOCCUPIED MODE, THE UNIT SUPPLY FAN SHALL CYCLE WITH HEATING AND COOLING LOADS, THE OUTSIDE AIR DAMPER SHALL BE CLOSED AND THE CHILLED WATER AND HOT WATER CONTROL VALVES SHALL BE CLOSED TO THE UNIT. UPON A CALL FOR HEATING OR COOLING TO MEET UNOCCUPIED SETPOINTS, THE UNIT FAN SHALL BE STARTED AND THE UNIT SHALL OPERATE AS DESCRIBED BELOW AS REQUIRED BY THE SPACE TEMPERATURE. THE BOILER PLANT OR CHILLER PLANT SHALL ALSO BE STARTED AS REQUIRED TO SATISFY SETPOINTS. THE UNIT AND ASSOCIATED CENTRAL PLANT SHALL OPERATE FOR A MINIMUM OF 30 MINUTES (OR AS REQUIRED TO SATISFY UNOCCUPIED SETPOINT) AND SHALL NOT BE ALLOWED TO RESTART FOR A MINUM OF 15 MINUTES FOLLOWING SATISFACTION OF UNOCCUPIED SETPOINT AND SYSTEM SHUT-DOWN.

HUMIDITY CONTROL:
WITH SYSTEM IN OCCUPIED OR UNOCCUPIED MODE, HUMIDITY CONTROL SYSTEM SHALL BE CAPABLE OF BEING ACTIVATED. UNDER NORMAL OPERATION, UNIT SHALL CONTROLLED AS OUTLINED BELOW. PROVIDE HUMIDISTAT AS INDICATED ON PLANS, IF SPACE OR RETURN AIR HUMIDITY REACHES 65% R.H. (ADJ), ALARM SHALL BE SENT AND HUMIDITY CONTROL SEQUENCE SHALL BE ACTIVATED. FAN COIL UNIT CHILLED WATER CONTROL VALVE SHALL BE DRIVEN FULL OPEN. AND UNIT REHEAT COIL SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE. WHEN SPACE HUMIDITY DROPS BELOW 55% R.H. (ADJ), BAS SHALL DEACTIVATE HUMIDITY CONTROL SEQUENCE. CONTROL OF UNIT SHALL REVERT BACK AS INDICATED BELOW. BOLIER(S) AND ASSOCIATED PUMP(S) SHALL BE STARTED IF THE HEATING PLANT IS IDLE AT THE TIME THE HUMIDITY CONTROL SEQUENCE IS ACTIVATED.

FREEZE PROTECTION:
A MIXED AIR TEMPERATURE SENSOR SHALL BE LOCATED UPSTREAM OF THE FIRST COIL IN THE AHU. UPON A DROP IN TEMPERATURE BELOW 40° F AT THE MIXED AIR SENSOR, AN ALARM SHALL BE SENT TO THE CENTRAL BAS, THE OUTSIDE AIR DAMPER SHALL BE OVERRIDDEN TO THE CLOSED POSITION. AFTER A TIME DELAY OF 20 MINUTES (ADJ.), THE CONTROL OF THE OA DAMPER SHALL RETURN TO NORMAL OPERATION. MIXED AIR TEMPERATURE SHALL HAVE SOFTWARE RESET AND A 20 MINUTE DELAY (ADJ).

A FREEZE-STAT SHALL BE LOCATED UPSTREAM OF THE COOLING COIL, AND SHALL SHUT DOWN THE FAN COIL FANS AND ALARM THE CENTRAL BAS IF THE TEMPERATURE IS BELOW 38° F. THE SECONDARY CHILLED WATER PUMP AND THE HOT WATER PUMP SHALL START, AND THE HOT WATER AND CHILLED WATER CONTROL VALVES AT THE UNIT SHALL OPEN FULLY. FREEZE-STAT SHALL HAVE MANUAL RESET ONLY.

<u>2-PIPE FAN COIL UNIT</u>

FAN COIL UNITS SHALL BE STOPPED/STARTED ON A TIME OF DAY SCHEDULE THROUGH THE BAS. THIS SCHEDULE SHALL BE MODIFIED BY A START STOP OPTIMIZATION PROGRAM. UPON PROOF OF AIR FLOW THRU THE SUPPLY FAN, AS SENSED BY A RESPECTIVE CURRENT SENSING RELAY, THE NORMALLY CLOSED OUTSIDE AIR DAMPER SHALL BE ENABLED.

WHILE IN THE OCCUPIED MODE, THE SUPPLY FAN SHALL OPERATE CONTINUOUSLY. WHILE IN THE UNOCCUPIED MODE, THE UNIT SUPPLY FAN SHALL CYCLE WITH COOLING LOADS AND THE CHILLED WATER CONTROL VALVE SHALL BE CLOSED TO THE UNIT. UPON A CALL FOR COOLING TO MEET UNOCCUPIED SETPOINTS, THE UNIT FAN SHALL BE STARTED AND THE UNIT SHALL OPERATE AS DESCRIBED BELOW AS REQUIRED BY THE SPACE TEMPERATURE. THE CHILLER PLANT SHALL ALSO BE STARTED AS REQUIRED TO SATISFY SETPOINTS. THE UNIT AND ASSOCIATED CENTRAL PLANT SHALL OPERATE FOR A MINIMUM OF 30 MINUTES (OR AS REQUIRED TO SATISFY UNOCCUPIED SETPOINT) AND SHALL NOT BE ALLOWED TO RESTART FOR A MINUM OF 15 MINUTES FOLLOWING SATISFACTION OF UNOCCUPIED SETPOINT AND SYSTEM SHUT-DOWN.

FREEZE PROTECTION:
A MIXED AIR TEMPERATURE SENSOR SHALL BE LOCATED UPSTREAM OF THE FIRST COIL IN THE AHU. UPON A DROP IN TEMPERATURE BELOW 40° F AT THE MIXED AIR SENSOR, AN ALARM SHALL BE SENT TO THE CENTRAL BAS, THE OUTSIDE AIR DAMPER SHALL BE OVERRIDDEN TO THE CLOSED POSITION. AFTER A TIME DELAY OF 20 MINUTES (ADJ.), THE CONTROL OF THE OA DAMPER SHALL RETURN TO NORMAL OPERATION. MIXED AIR TEMPERATURE SHALL HAVE SOFTWARE RESET AND A 20 MINUTE DELAY (ADJ).

A FREEZE-STAT SHALL BE LOCATED UPSTREAM OF THE COOLING COIL, AND SHALL SHUT DOWN THE FAN COIL FANS AND ALARM THE CENTRAL BAS IF THE TEMPERATURE IS BELOW 38° F. THE SECONDARY CHILLED WATER PUMP SHALL START, AND THE HOT WATER AND CHILLED WATER CONTROL VALVES AT THE UNIT SHALL OPEN FULLY. FREEZE-STAT SHALL HAVE MANUAL RESET ONLY.

<u>DX/GAS ROOFTOP UNITS</u>

ROOFTOP UNITS SHALL BE STOPPED/STARTED ON A TIME OF DAY SCHEDULE THROUGH THE BAS. THIS SCHEDULE SHALL BE MODIFIED BY A START STOP OPTIMIZATION PROGRAM. UPON PROOF OF AIR FLOW THRU THE SUPPLY FAN, AS SENSED BY A RESPECTIVE CURRENT SENSING RELAY, THE NORMALLY CLOSED OUTSIDE AIR DAMPER SHALL BE ENABLED.

WHILE IN THE OCCUPIED MODE, THE SUPPLY FAN SHALL OPERATE CONTINUOUSLY. WHILE IN THE UNOCCUPIED MODE, THE UNIT SUPPLY FAN SHALL CYCLE WITH HEATING AND COOLING LOADS. UPON A CALL FOR HEATING OR COOLING TO MEET UNOCCUPIED SETPOINTS, THE UNIT FAN SHALL BE STARTED AND THE UNIT SHALL OPERATE AS DESCRIBED BELOW AS REQUIRED BY THE SPACE TEMPERATURE. THE UNIT SHALL OPERATE FOR A MINIMUM OF 30 MINUTES (OR AS REQUIRED TO SATISFY UNOCCUPIED SETPOINT) AND SHALL NOT BE ALLOWED TO RESTART FOR A MINUM OF 15 MINUTES FOLLOWING SATISFACTION OF UNOCCUPIED SETPOINT AND SYSTEM SHUT-DOWN.

AIRSIDE ECONOMIZER CYCLE:
INTERNAL UNIT CONTROLS SHALL OPERATE ENTHALPY ECONOMIZER WHEN OUTSIDE AIR ENTHALPY IS LOWER THAN RETURN AIR ENTHALPY. UNIT CONTROLS SHALL ALSO ACTIVATE POWER EXHAUST AS REQUIRED BASED ON BUILDING PRESSURE, TO MAINTAIN A MINIMUM OF +0.05" POSITIVE PRESSURE RELATIVE TO AMBIENT.

SMOKE DETECTION & AHU SHUTDOWN:
UPON DETECTION OF SMOKE IN THE AIR HANDLING SYSTEM BY THE DUCT-MOUNTED RETURN AIR SMOKE DETECTOR, AN ALARM CONDITION SHALL BE SENT TO THE BUILDING FIRE ALARM SYSTEM AND ALL AIR HANDLING UNITS SHALL BE SHUTDOWN BY THE BUILDING FIRE ALARM SYSTEM. THE BUILDING FIRE ALARM SYSTEM SHALL PROVIDE ONE DIGITAL OUTPUT TO THE BAS TO
INDICATE ACTIVATION OR FAILURE OF ANY SMOKE DETECTOR.

<u>CONSTANT VOLUME (CV) ROOFTOP UNITS:</u>

A TEMPERATURE SENSOR SHALL BE UTILIZED TO MAINTAIN SPACE TEMPERATURE. ON A RISE IN TEMPERATURE ABOVE SENSOR SETPOINT, DX COMPRESSORS SHALL STAGE AS REQUIRED TO MAINTAIN SETPOINT. AS THE TEMPERATURE SPACE FALLS BELOW SETPOINT, GAS HEAT SHALL BE ENERGIZED IN STAGES TO MAINTAIN SPACE TEMPERATURE. THE TEMPERATURE SENSOR SHALL BE PROVIDED WITH AN OVERRIDE FUNCTION THAT WILL PLACE THE SYSTEM IN THE OCCUPIED MODE FOR A PERIOD OF UP TO 2 HOURS.

<u>VARIABLE AIR VOLUME BOXES</u>

THE VARIABLE VOLUME (VAV) TERMINAL UNITS SHALL BE CONTROLLED INDEPENDENT OF SYSTEM PRESSURE FLUCTUATIONS BY AN APPLICATION SPECIFIC DDC CONTROLLER UTILIZING ELECTRIC ACTUATION.

OCCUPIED AND UNOCCUPIED OPERATIONS ARE THE SAME, A TEMPERATURE SENSOR SHALL BE UTILIZED TO MAINTAIN SPACE TEMPERATURE SETPOINT. UPON A RISE IN SPACE TEMPERATURE ABOVE SETPOINT, THE VOLUME DAMPER SHALL MODULATE OPEN AS REQUIRED TO MAINTAIN SPACE TEMPERATURE. UPON A DROP IN SPACE TEMPERATURE BELOW SETPOINT, THE VOLUME DAMPER SHALL MODULATE CLOSED UNTIL THE MINIMUM DAMPER POSITION IS REACHED. UPON CONTINUED DROP IN SPACE TEMPERATURE BELOW SETPOINT, THE HOT WATER CONTROL VALVE SHALL MODULATE OPEN TO THE HEATING COIL. IF THE SPACE TEMPERATURE DROPS ONE MORE DEGREE, THE TERMINAL UNIT DAMPER SHALL MODULATE OPEN UNTIL THE THE MAX HEATING CFM IS REACHED (AS INDICATED IN THE SCHEDULE). AS THE TEMPERATURE RISES ABOVE SETPOINT, THE HOT WATER CONTROL VALVE SHALL MODULATE CLOSED AND THE DAMPER SHALL RETURN TO THE MINIMUM POSITION.

WHEN WARM AIR IS SENSED BY THE TERMINAL UNIT DURING MORNING WARM-UP, THE DAMPER SHALL RESPOND TO THE SPACE TEMPERATURE. THE TERMINAL UNIT DAMPER SHALL OPEN TO HEATING SETPOINT ON A CALL FOR HEATING AND SHALL REMAIN CLOSED IF THE SPACE TEMPERATURE IS AT OR ABOVE OCCUPIED SETPOINT. HOT WATER CONTROL VALVE SHALL REMAIN CLOSED DURING MORNING WARM-UP.

THE TEMPERATURE SENSOR SHALL BE PROVIDED WITH AN OVERRIDE FUNCTION THAT WILL PLACE THE SYSTEM IN THE OCCUPIED MODE FOR A PERIOD OF UP TO 2 HOURS. THE OVERRIDE SHALL ACTIVATE THE SYSTEM AHU AND THE HEATING OR COOLING CENTRAL PLANT AS REQUIRED TO MAINTAIN SPACE TEMPERATURE.

<u>GYMNASIUM AND LOCKER ROOM AREA:</u>

GYMNASIUM SHALL BE STAGED SUCH THAT AHU-9 SHALL ACT AS THE FIRST STAGE OF HEATING AND COOLING, AND LOW OCCUPANCY CONSTANT VENTILATION DURING OCCUPIED TIMES (PROVIDED THROUGH ERV-1). AHU-9 SUPPLY FAN SHALL RUN CONTINUOUSLY IN THE OCCUPIED MODE AND OPERATE AS A SINGLE ZONE VAV UNIT AS SEQUENCED ABOVE. AHU-10 SHALL ACT AS THE SECOND STAGE OF HEATING, COOLING, DEHUMIDIFICATION, AND VENTILATION, OPERATING AS OUTLINED FOR A SINGLE ZONE VAV UNIT SEQUENCED ABOVE. THERMOSTAT SETPOINTS FOR AHU-10 SHALL BE SET 2° HOTTER/COLDER THAN SETPOINTS FOR PRIMARY UNIT AHU-9, AND UNIT SHALL ONLY BE ACTIVATED UPON A CALL FOR HEATING AND COOLING FROM THE THERMOSTAT, OR BY THE CO_2 SENSOR INSTALLED IN THE SPACE UTILIZING DEMAND CONTROL VENTILATION AS DESCRIBED IN THE SEQUENCE.

ERV-1, AND FAN F-13 SHALL BE INTERLOCKED WITH AHU-9 TO RUN ANYTIME THE GYMNASIUM IS IN THE OCCUPIED MODE, EITHER DURING AS SCHOOL DAY OR DURING A SCHEDULED AFTER-HOURS EVENT. FANS SHALL RUN CONTINUOUSLY WHILE IN THE OCCUPIED MODE AND SHALL REMAIN OFF WHILE IN THE UNOCCUPIED MODE, UNLESS OVERRIDDEN BY AN OCCUPANCY SENSOR (CONTROLLING THE LIGHTS) IN ANY ROOM SERVED BY THE ERV. FANS SHALL DEENERGIZE WHEN OCCUPANCY SENSOR SENDS OFF SIGNAL TO LIGHTS.

AHU-9 ECONOMIZER DAMPER IN OA DUCT SHALL BE NORMALLY CLOSED AND SHALL OPEN ONLY WHEN THE GYM IS ECONOMIZER MODE.

<u>HVAC SCHEDULING</u>

INITIAL SCHEDULES OF OPERATION SHALL BE COORDINATED AND CONFIRMED BY THE OWNER, AND PROGRAMMED BY THE CONTROLS CONTRACTOR. MODIFICATION OF SCHEDULES SHALL BE A PART OF REQUIRED OWNER TRAINING. DISCREET SCHEDULES SHALL BE PROVIDED FOR EACH AIR HANDLING UNIT.

SCHOOL CALENDAR SHALL BE PROGRAMMED INTO THE BAS SUCH THAT THE SYSTEMS REMAIN UNOCCPUIED ON DAYS THE SCHOOL IS CLOSED AND ON TEACHER WORKDAYS.

ADMINISTRATION AREA SHALL REMAIN IN THE OCCPUIED MODE DURING THE SUMMER, EXACT HOURS TO BE COORDINATED WITH THE OWNER.

REMAINING AIR HANDLING UNITS SHALL BE INITIALLY SET TO BE IN THE OCCUPIED MODE FROM 30 MINUTES BEFORE THE OPENING BELL TO 30 MINUTES PRIOR TO THE CLOSING BELL, UNTIL MODIFIED BY START/STOP OPTIMIZATION. AFTER HOURS OPERATION FOR ALL ZONES SHALL BE COORDINATED WITH THE OWNER WITH INPUT FROM THE KITCHEN, ATHLETIC, LIBRARY, AND FINE ARTS STAFF.

<u>IDF, MDF, AND DATA ROOMS:</u>

IDF, MDF, AND DATA ROOMS ARE PROVIDED WITH BOTH DUCTLESS SPLIT SYSTEM UNITS AND VAV BOXES. DURING OCCUPIED TIMES, VAV BOX SHALL SERVE AS THE FIRST STAGE OF COOLING, WITH AN OCCUPIED SETPOINT OF 70°. DURING UNOCCUPIED TIMES, THE VAV BOX SHALL SERVE AS THE SECOND STAGE OF COOLING WITH A SETPOINT OF 75°.
DUCTLESS SPLIT SYSTEMS SHALL PERFORM THE OPPOSITE FUNCTION, AS THE SECOND STAGE OF COOLING DURING OCCUPIED TIMES WITH A SETPOINT OF 75°. DURING UNOCCUPIED TIMES, THE DUCTLESS SPLIT SYSTEM SHALL SERVE AS THE FIRST STAGE OF COOLING WITH A SETPOINT OF 70°. IF SPACE TEMPERATURE RISES ABOVE 78° IN EITHER THE OCCUPIED OR UNOCCUPIED MODE, AN ALARM SHALL BE SENT TO THE CENTRAL BAS.
DUCTLESS SPLIT SYSTEM INDOOR UNIT FANS SHALL BE STARTED AND STOPPED WITH THERMOSTAT CALL FOR COOLING. UPON A RISE IN SPACE TEMPERATURE ABOVE THERMOSTAT SETPOINT, UNIT COMPRESSOR SHALL ACTIVATE TO SATISFY SPACE CONDITIONS.

<u>HEAT TAPE</u>

HEAT TAPE FOR ABOVE GRADE EXTERIOR PIPING AND CHILLER HEATER SHALL PROVIDE FREEZE PROTECTION FOR EXTERIOR CHILLED WATER SYSTEM. A TEMPERATURE SENSOR SHALL BE PROVIDED WITHIN THE INSULATION ON ALL EXTERIOR PIPING WITH HEAT TAPE TO VERIFY HEAT TAPE OPERATION. IF TEMPERATURE FALLS BELOW 35° F. (ADJ), AN ALARM SHALL BE SENT AND THE ASSOCIATED CHILLER PRIMARY CHILLED WATER PUMP SHALL BE STARTED.

<u>INTERIOR LIGHTING CONTROL SYSTEM</u>

BAS SHALL INTERFACE WITH LIGHTING CONTACTORS PROVIDED BY THE ELECTRICAL CONTRACTOR (SEE ELECTRICAL PLANS). BAS SHALL MONITOR AND CONTROL LIGHTING CONTACTORS AND PROVIDE TIME SCHEDULE CONTROL AND REMOTE OPERATION (ON/OFF) OF ALL LIGHTING ZONES THROUGH THE BAS VIA BAS PROVIDED RELAYS AS THE INPUT FOR THE CONTACTORS. BAS RELAY WIRING SHALL BE PROVIDED BY THE MECHANICAL CONTROLS CONTRACTOR. PANIC BUTTON ACTUATION SHALL ALSO BE AN INPUT ON THE BAS TO TURN LIGHTING OFF. RESET SHALL PUT LIGHTING BACK ON SCHEDULE. SEE SEQUENCE OF OPERATION AND DIVISION OF LABOR ON THE E-008, DETAIL #2 OF THE ELECTRICAL PLANS.

<u>EXTERIOR LIGHTING CONTROL SYSTEM</u>

BAS SHALL INTERFACE WITH EXTERIOR LIGHTING CONTACTORS PROVIDED BY THE ELECTRICAL CONTRACTOR (SEE ELECTRICAL PLANS). BAS SHALL MONITOR AND CONTROL LIGHTING CONTACTORS AND PROVIDE TIME SCHEDULE CONTROL AND REMOTE OPERATION (ON/OFF) OF ALL LIGHTING ZONES THROUGH THE BAS VIA BAS PROVIDED RELAYS AS THE INPUT FOR THE CONTACTORS. BAS RELAY WIRING SHALL BE PROVIDED BY THE MECHANICAL CONTROLS CONTRACTOR. SEE SEQUENCE OF OPERATION AND DIVISION OF LABOR ON THE E-008, DETAIL #2 OF THE ELECTRICAL PLANS. PROVIDE PHOTOCELL INPUT RELAY TO OPERATE EXTERIOR LIGHTING IN CONJUCTION WITH TIME SCHEDULE.

<u>WALL/UNIT HEATERS</u>

A BUILT-IN THERMOSTAT SHALL OPERATE WALL/UNIT HEATER AND FAN TO MAINTAIN A SETPOINT OF 49° (ADJ). ONCE THE UNIT HEATER IS ENERGIZED, IT WILL RUN FOR AT LEAST FIVE MINUTES TO AVOID SHORT CYCLING. DDC VENDOR SHALL PROVIDE TEMPERATURE SENSOR FOR THOSE ROOMS THAT WILL ALARM DDC SYSTEM WHEN TEMPERATURE RANGE IS OUT OF LIMITS

<u>MISC. EXHAUST FANS</u>

PROVIDE WALL SWITCHES, WALL THERMOSTATS, INTERLOCKS, ETC. AS INDICATED ON THE FAN SCHEDULE TO CONTROL FANS AS INDICATED ON PLANS. BOILER ROOM AND ELECTRICAL ROOM THERMOSTATS SHALL BE SET AT 85° F. (USER ADJUSTABLE, BAS REMOTE).

<u>TOILET EXHAUST FANS</u>

CENTRAL BAS SHALL OPERATE EXHAUST FANS ON A PROGRAMMED SCHEDULE. FANS SHALL RUN WHEN ASSOCATED ZONE IS IN THE OCCUPIED MODE, AND BE OFF WHEN ASSOCIATED ZONE IS IN THE UNOCCUPIED MODE.

<u>KITCHEN EQUIPMENT FREEZER AND COOLER CONTROL</u>

PROVIDE NEW WALL MOUTED TEMPERATURE SENSORS TO MONITOR THE TEMPERATURES IN THE FREEZER AND COOLER.

<u>DOMESTIC HOT WATER SYSTEM</u>

BAS SHALL HAVE GLOBAL CONTROL OVER DOMESTIC WATER HEATING SYSTEM. WATER HEATERS SHALL CYCLE ON AND OFF BASED ON THEIR TANK TEMPERATURES, TO MAINTAN 140° FOR WH-1 AND 110° FOR WH-2 . AN ALARM SHALL BE GENERATED SHOULD EITHER TANK DEVIATE FROM SETPOINT BY 10° EITHER HIGH OR LOW. AN ALARM SHALL ALSO BE GENERATED SHOULD THE DOMESTIC HWS TEMPERATURE DEVIATE FROM SETPOINT BY 10° EITHER HIGH OR LOW. CIRCULATION PUMPS SHALL OPERATE ON A SCHEDULED BASIS BASED ON BUILDING OCCUPANCY. THE PUMPS SHALL BE CAPABLE OF OPERATING ON SEPARATE SCHEDULES, SHOULD THE KITCHEN SCHEDULE DIFFER FROM THE ENTIRE BUILDING. A TEMPERATURE SENSOR SHALL BE MOUNTED IN THE END OF THE LINE CAPABLE OF OVERRIDING THE PUMPS SHOULD THE LOOP TEMPERATURE FALL BELOW 130° FOR CP-1 OR 100° FOR CP-2 . BAS SHALL ALSO MONITOR BOTH DOMESTIC HWR TEMPERATURES AND DOMESTIC WATER SUPPLY TEMPERATURE FOR TRACKING PURPOSES. SEE PLUMBING PLANS FOR ALL TEMPERATURE SENSOR LOCATIONS.

<u>ELEVATOR SUMP ALARM</u>

PROVIDE RELAY FOR CONNECTION TO AUXILIARY CONTACT AT ELEVATOR SUMP ALARM (ALARM AND AUX CONTACT BY P.C.). ACTIVATION OF LOCAL ALARM SHALL SEND AN ALARM THROUGH THE BAS.

<u>START/STOP OPTIMIZATION</u>

BAS SHALL PROVIDE START/STOP OPTIMIZATION (SSO) FOR ALL EQUIPMENT AND SYSTEMS. SSO SHALL BE CAPABLE OF LEARNING BUILDING THERMAL CHARACTERISTICS AND RESPOND TO VARIABLE CONDITIONS. SSO SHALL START/STOP CONTROLLED EQUIPMENT AS LATE AS POSSIBLE PRIOR TO OCCUPIED TIME PERIOD AND AS EARLY AS POSSIBLE PRIOR TO UNOCCUPIED TIME PERIOD. SSO SHALL BE CALCULATED BASED ON OUTDOOR AIR TEMPERATURE, ZONE TEMPERATURES, AND CONTROL SETPOINT/SETBACK TEMPERATURES.

<u>THERMOSTATS & TEMPERATURE SENSORS</u>

THERMOSTATS AND TEMPERATURE SENSORS SHALL BE PROVIDED WHERE INDICATED ON THE DRAWINGS, AND PER THE SPECIFICATIONS. THERMOSTATS IN OCCUPIED SPACES SHALL HAVE ROTARY SWITCH ADJUSTMENT WITH NUMERICAL INDICATION, INITIALLY SET IN THE OCCUPIED MODE FOR COOLING TO 75° AND HEATING TO 70°. THERMOSTATS SHALL HAVE A 3° RANGE IN WHICH THEY ARE SATISFIED (IF SET TO 70°, SATISFIED ANYWHERE BETWEEN 68.5° AND 71.5°). DIAL SHALL HAVE THE CAPABILITY TO ADJUST THE HEATING AND COOLING SETPOINTS BY 3° IN EITHER DIRECTION, BUT MAINTAIN A MINIMUM 4° SPREAD BETWEEN THE HEATING AND COOLING SETPOINT. THEROMSTATS IN DATA ROOMS, CORRIDORS, AND OTHER UNOCCUPIED AREAS SHALL BE FLAT PLATE SENSORS WITH NO LOCAL ADJUSTMENT CONTROL. UNOCCUPIED SETTINGS SHALL BE 80° COOLING AND 60° HEATING. ALL SETPOINTS SHALL BE VERIFIED WITH THE OWNER BEFORE PROGRAMMING, AND FULLY ADJUSTABLE THROUGH THE BAS.

<u>NOTES</u>:

1. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. ALL CONTROL SETPOINTS SHALL BE ADJUSTABLE AND TRENDABLE BY THE USER WITHOUT ASSISTANCE FROM THE CONTROLS MANUFACTURER. THIS SHALL BE COVERED AS PART OF TRAINING WITH OWNER, SCHOOL STAFF, AND MAINTENANCE DEPARTMENT. INDICATED SCHEDULES AND SETPOINTS SHOULD BE USED FOR ORIGINAL SYSTEM SET-UP. ANY CHANGES IN SETPOINT SETTINGS REQUIRED FOR INTENDED SYSTEM OPERATION SHALL BE APPROVED BY THE ENGINEER AND SHALL BE DISCREETLY INDICATED ON THE AS-BUILT DRAWINGS.
3. CURRENT SWITCHES SHALL BE PROVIDED IN THE PIPING OF EACH PUMP TO VERIFY PUMP STATUS.
4. PHOTOELECTRIC TYPE DUCT SMOKE DETECTORS WILL BE PROVIDED BY THE ELECTRICAL CONTRACTOR, INSTALLED IN THE DUCT BY THE MECHANICAL CONTRACTOR AND WIRED TO SHUT-DOWN THE UNIT BY THE ELECTRICAL CONTRACTOR.
5. ELECTRICAL CONTRACTOR SHALL PROVIDE A DEDICATED 120V CIRCUIT IN A J-BOX FOR CONTROL POWER. CONTROLS CONTRACTOR SHALL EXTEND 120V POWER FROM J-BOX TO CONTROL PANELS, DAMPER ACTUATORS, TRANSFORMERS, ETC. AS REQUIRED FOR INSTALLATION OF THE CONTROL SYSTEM. ALL CONTROL TRANSFORMERS SHALL BE SEPARATELY INTERNALLY FUSED OR HAVE MANUAL RESETS.
6. BAS SHALL ALLOW GLOBAL OPERATION OF HOT WATER AND CHILLED WATER CONTROL VALVES, AND GLOBAL CONTROL OF THERMOSTAT SETPOINTS.
7. CONTROLS CONTRACTOR SHALL PROVIDE A MINIMUM OF 24 HOURS OF OWNER TRAINING PROVIDED BY A FACTORY CERTIFIED REPRESENTATIVE. COORDINATE THROUGH THE MECHANICAL CONTRACTOR AND CONSTRUCTION MANAGEMENT FIRM.
8. CONTROLS CONTRACTOR SHALL PROVIDE SPARE CONTROLLERS TO THE OWNER AT COMPLETION OF PROJECT. SPARE CONTROLLERS SHALL INCLUDE ONE AHU CONTROLLER, AND THREE VAV CONTROLLERS. FOUR SPARE TEMPERATURE SENSORS SHALL ALSO BE PROVIDED.
9. BAS SHALL HAVE POINT OF CONTROL ACCESS BY A LAP-TOP COMPUTER AT THE CONTROL PANEL IN EACH MECHANICAL ROOM. ACESSS SHALL BE INDEPENDENT OF OWNERS LAN.
10. ON A CALL FOR HEATING, ALL AIR HANDLING UNIT SUPPLY FANS SHALL BE LOCKED OUT UNTIL SECONDARY HOT WATER SUPPLY LOOP TEMPERATURE REACHES 85° F. (ADJ).
11. ALL BAS CONTROLLERS ON CHILLERS, BOILERS, PUMPS AND AIR HANDLING UNITS SHALL HAVE MANUAL "ON/OFF" OVERRIDE SWITCHES, EITHER ON THE CONTROLLER OR THE PANEL LOCATED IN THE ROOM. SOFTWARE OVERRIDE ONLY IS NOT ACCEPTABLE.
12. ALL CONTROL AND POWER WIRING SHALL BE PLENUM-RATED WITH A MINIMUM FIRE SPREAD RATING OF 25 AND A MINIMUM SMOKE DEVELOPED RATING OF 50 PER ASTM E84.
13. THE SEQUENCE OF OPERATION OF OPERATION AND POINTS LIST IS INTENDED TO COMMUNICATE THE MINIMUM REQUIREMENTS AND GENERAL DESIGN INTENT TO THE CONTROLS CONTRACTOR AND IS NOT INTENDED TO BE A FULLY DEVELOPED OR COMPLETE SEQUENCE OF OPEARTION. IN THE CONTROLS SUBMITTAL THE CONTROLS CONTRACTOR SHALL FULLY DEVELOP THE SEQUENCE OF OPERATIONS FOR ALL SYSTEMS IDENTIFIED AN SHALL PRESENT ALL SETPOINTS, CONTROL PARAMETERS, TIME DELAYS, ALARM POINTS, ETC. AS REQUIRED TO COMPLY WITH THE DESIGN INTENT. THE CONTROLS CONTRACTOR SHALL INCORPORATE STANDARD FEATURES SUCH AS MINIMUM RUN TIME DELAYS AND DEAD BANDS TO PREVENT SHORT CYCLING. ALL MONITORED POINTS SHALL INCLUDE EARLY HIGH/LOW ALARM NOTIFICATIONS PRIOR TO REQUIRED CORRECTIVE ACTIONS OR UNIT SHUT-DOWNS. CONTROL CONTRACTOR SHALL SPECIFY IN THE CONTROL SUBMITTAL FAIL SAFE POSITION FOR OUT OF RANGE, FAIL SAFE POSITIONING FOR OPEN CIRCUITS OR LOSS OF COMMUNICATION.
14. ALARMS THROUGH THE BAS SYSTEM SHALL BE VISIBLE ON THE INDIVIDUAL GRAPHICS THEMSELVES, NOT ONLY ON THE SUMMARY PAGE.

GASTON COUNTY SCHOOLS

Gaston County Schools

GRIER MIDDLE SCHOOL REPLACEMENT

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 027386 STEVEN R. DALEY

01-12-2023

MEMBERS OF THE AMERICAN INSTITUTE OF ARCHITECTS

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

MECHANICAL SEQUENCE OF OPERATION

M-006

Optima # 22-0082

01.12.2023 - BID SET

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INPUT/OUTPUT SUMMARY

SYSTEM, APPARATUS, OR AREA POINT DESCRIPTION	INPUTS																							OUTPUTS							SYSTEM FEATURES														GENERAL	SUPPLMENT. NOTES
	ANALOG																BINARY							DIGITAL				ANALOG			ALARMS					PROGRAMS										
	MEASURED												CALC.																																	
	TEMPERATURE	PRESSURE	RH	KW	AIR FLOW	WATER FLOW	CO2	HERTZ	RPM	VOLTS	AMPS	SETPOINT ADJ.	KWH	ENTHALPY	RUN TIME	EFFICIENCY	STATUS	FILTER	SMOKE	FREEZE	AIR FLOW	METER	OVER-RIDE	OFF-ON	OFF-AUTO-ON	OFF-HI-LO	OPEN-CLOSE	DMPR. POS.	VALVE POS.	STEP CONTROL	HI ANALOG	LO ANALOG	HI BINARY	LO BINARY	PROOF	TIME SCHEDULING	DEMAND LIMITING	DUTY CYCLE	START/STOP OPT.	ENTHALPY OPT.	SMOKE CNT.	TREND	ALARM INSTRUCT	MAIN. WK. ORD.	COLOR GRAPHIC	
CHILLER PLANT																																				X	X	X			X		X		X	
Chiller #1 On/off																								X																						
Chiller #1 Status						X											X																		X											
Chiller #1 Panel Interface	X	X		X								X	X		X	X	X			X			X						X		X	X	X	X												
Chiller #2 On/off																								X																						
Chiller #2 Status						X											X																		X											
Chiller #2 Panel Interface	X	X		X								X	X		X	X	X			X			X						X		X	X	X	X												
Primary CHS Temp	X											X																																		
Primary CHR Temp	X																																													
Primary Pump P-3																	X								X										X											
Primary Pump P-4																	X								X										X											
Secondary Pump P-1																	X								X										X											
Secondary Pump P-2																	X								X										X											
Secondary CHS Temp	X																														X															Building Loop
Secondary CHR Temp	X																																													Building Loop
Differential Pressure		X																																X												Building Loop (Typ of 2)

GENERAL NOTE:

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BOILER PLANT (PRIMARY ONLY)																																				X	X	X			X		X		X	
Boiler Sequencer Interface	X															X	X						X								X	X	X	X												
Boiler #1 On/Off																								X																						
Boiler #1 Status																																			X											
Boiler #2 On/Off																								X																						
Boiler #2 Status																																			X											
HWS Temp	X																																													
HWR Temp	X																																													
Pump P-5																	X								X										X											
Pump P-6																	X								X										X											
Differential Pressure		X																												X				X												Building Loop (Typ of 2)
Boiler Rm Oxygen Depletion																															X															
Boiler Rm Gas Solenoid																																			X											

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MISC. POINTS																																													X	
OA Temp	X													X																																
OA CO2							X																																							
Dew Point	X													X																																
Elec Demand																						X														X	X								X	
Ductless Split Systems	X																														X															
2-Position OA Dampers																											X																			
Modulating OA Dampers					X																							X																		
Domestic Water Meter																											X																			
Gas Meter																											X																			
Fire Alarm Status																	X																													
Interior Lighting Control																								X												X										Contactors by E.C.
Exterior Lighting Control																								X												X										Contactors by E.C.
Freezer Temp	X																														X															
Cooler Temp	X																														X															
Toilet Fans																								X												X										
Misc. Fans																																														See Fan Schedule
Domestic HW Pump																	X								X										X											Typical of 2
Domestic HWS Temp	X																																													Typical of 2
Domestic HWR Temp	X																																													Typical of 2
Storage Tank	X																																													Typical of 2
End of Line Loop Temp	X																																													Typical of 2
Domestic Water Supply	X																																													
Heat Tape	X																																	X												TYP OF 4
Airflow Monitoring Station					X																																									
Building Dashboard																																														
Solar Monitoring/Control																																														
Generator																																														
Elevator Sump																	X																		X											Aux Contact by P.C.

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	MEASURED												CALC.																																	
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AIR HANDLING UNITS, BLOWER COILS AND FAN COILS																																				X			X						X	
Return Temp	X																																													
Return RH			X																																											
Return CO2							X																								X															
Smoke Detector																			X																											
OA Damper																												X																		
OA Airflow Mon. Station					X																																									
Relief Damper																												X																		
Return Damper																												X																		
Return Fan VFD on/off																									X																					Where Indicated
Return Fan VFD Speed												X																																		Where Indicated
Return Fan VFD Status																	X																		X											Where Indicated
Building Pressure		X																																												Where Indicated
Relief Fan VFD on/off																									X																					Where Indicated
Relief Fan VFD Speed												X																																		Where Indicated
Relief Fan VFD Status																	X																		X											Where Indicated
Filter Status																		X																												
Mixed Air Temp	X																															X														
HW Preheat Valve																													X																	
Freezestat																				X												X														
CHW Valve																													X																	
HW Reheat Valve																													X																	
Supply Fan																	X							X											X											CV Only
Supply Fan VFD on/off																									X																					SZVAV & VAV Only
Supply Fan VFD Speed												X																																		SZVAV & VAV Only
Supply Fan VFD Status																	X																		X											SZVAV & VAV Only
Supply Static Pressure		X																																												VAV Only
Supply Temp	X																																													
Space CO2							X																								X															
Space Humidity			X																												X															
Space Temp	X																																													CV & SZVAV Only
Over-ride																							X																							CV & SZVAV Only
Smoke Damper																												X																		

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VAV BOX																																														
Volume Damper					X																							X																		
HW Valve																													X																	
Discharge Temp	X																																													
Over-ride																							X																							
Setpoint Adjust												X																																		
Space Temp	X																																													

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RTU's																																					X			X						X	
Return Temperature	X																																														
Smoke Detector																				X																											
OA Damper																													X																		
Filter Status																			X																												
Compressor #1																		X																													
Compressor #2																		X																													
Gas Furnace																		X													X																
Supply Fan																		X							X											X											
Float Switch																																X															

GENERAL NOTE:

THE POINTS LIST PROVIDED IS INTENDED TO COMMUNICATE THE GENERAL DESIGN INTENT TO THE CONTROLS SUBCONTRACTOR AND IS NOT INTENDED TO BE COMPLETE. IN THE CONTROLS SUBMITTAL, THE SUBCONTRACTOR SHALL FULLY DEVELOP THE POINTS LIST FOR ALL SYSTEMS IDENTIFIED AND SHALL PRESENT ALL SETPOINTS, CONTROL PARAMETERS, AND ALARM POINTS. THE CONTROLS SUBCONTRACTOR SHALL INCORPORATE STANDARD FEATURES SUCH AS MINIMUM RUN TIME DELAYS AND DEAD BANDS FROM SETPOINTS TO PREVENT EQUIPMENT FROM SHORT CYCLING WHEN NEAR SETPOINTS. ALL MONITORED POINTS SHALL INCLUDE EARLY HIGH/LOW ALARM NOTIFICATIONS PRIOR TO HAVING TO TAKE CORRECTIVE ACTIONS OR EQUIPMENT SHUTDOWNS. TRANSMITTERS SHALL INCLUDE OUT-OF-RANGE, FAIL-SAFE POSITIONING FOR OPEN CIRCUITS OR LOSS OF COMMUNICATION. CONTROL CONTRACTOR SHALL SPECIFY TO FAIL DE-ENERGIZER, HOLD LAST STATE, OR DEFAULT TO A PREDETERMINED SETPOINT. THESE BASIC FEATURES THAT ARE NECESSARY AND ARE PART OF A COMPLETE CONTROLS INSTALLATION SHALL BE INCLUDED IN THE SCOPE OF SERVICES FOR DELIVERABLES AT NO ADDITIONAL COSTS TO THE OWNER.

GENERAL NOTE:
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01-12-2023

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No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

MECHANICAL POINTS LISTS

M-007

Optima # 22-0082

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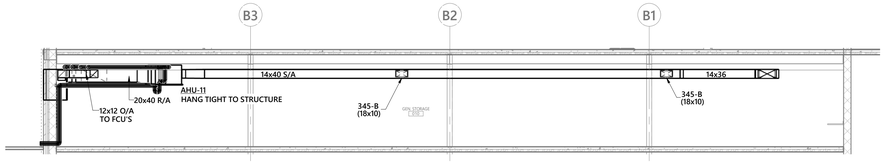
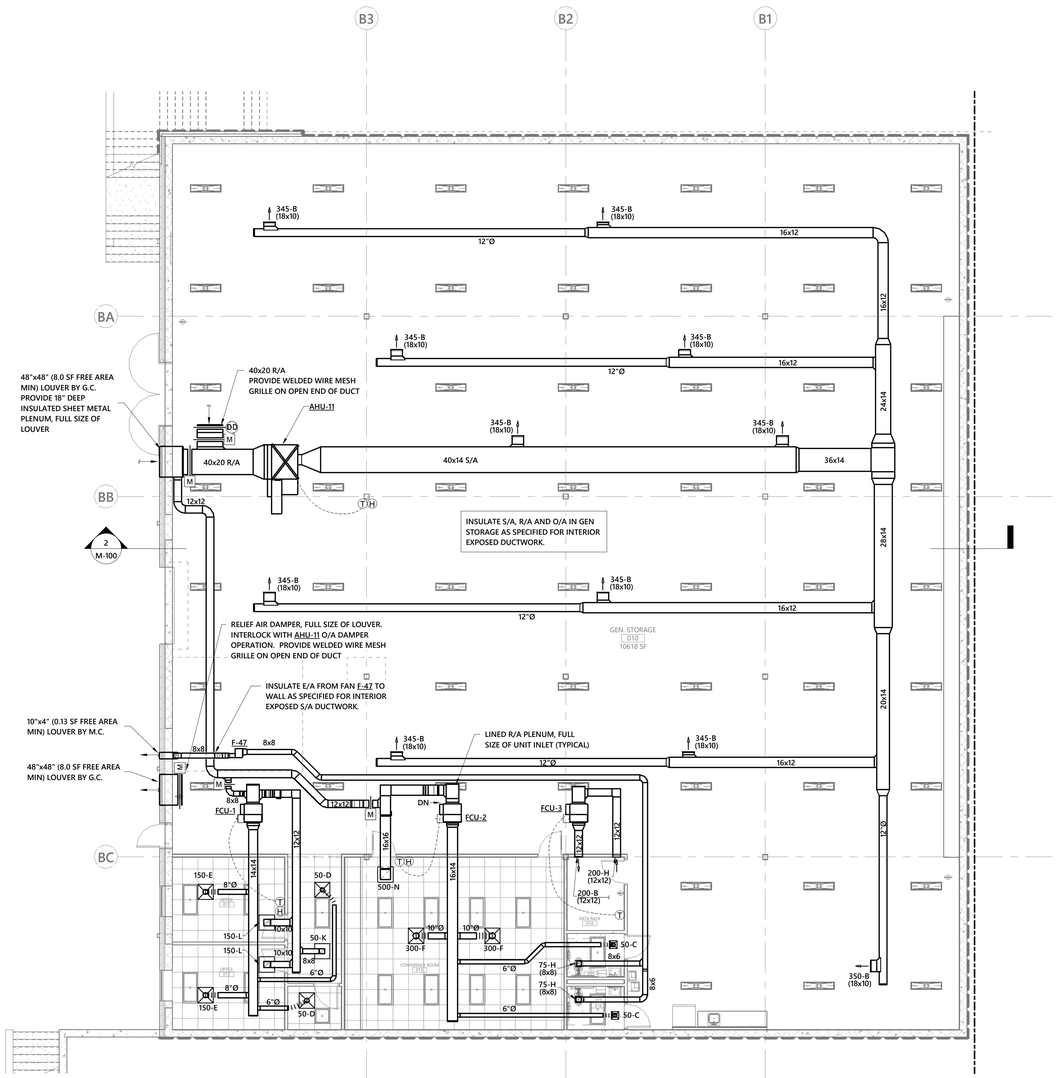


2 PARTIAL BUILDING SECTION 1 GEN STORAGE 010

1/8" = 1'-0"



1 0-BASEMENT MECHANICAL PLAN

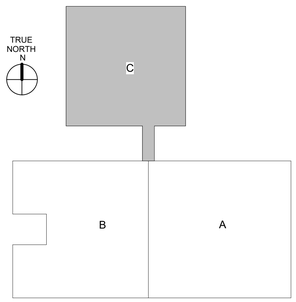
1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

BASEMENT FLOOR MECHANICAL PLAN

M-100

Optima # 22-0082

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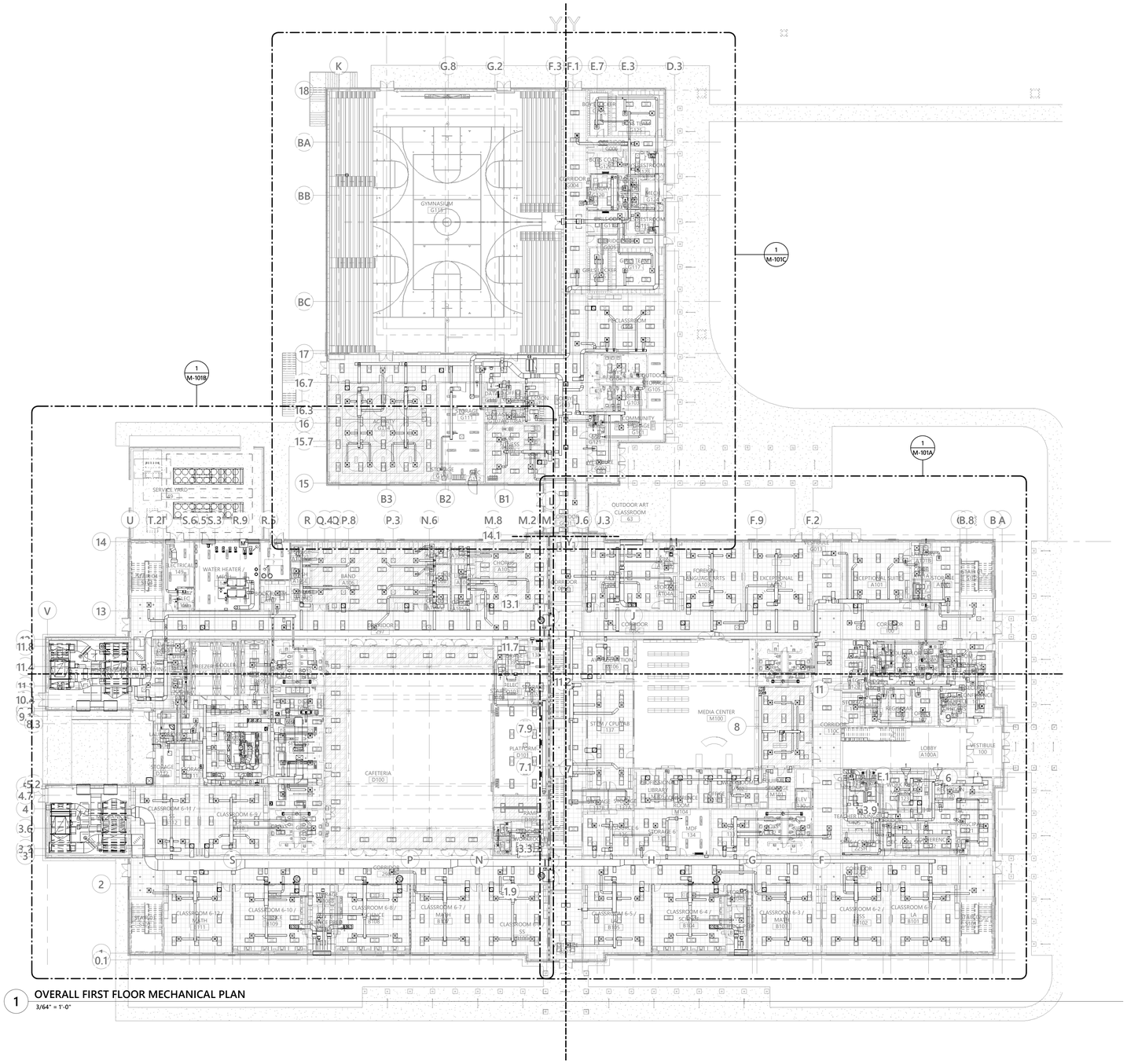

1 OVERALL FIRST FLOOR MECHANICAL PLAN
3/64" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
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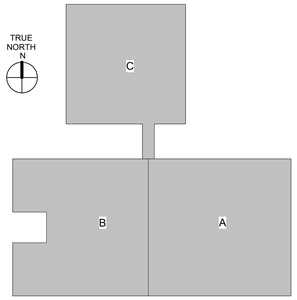
KEY PLAN



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No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

OVERALL FIRST FLOOR MECHANICAL PLAN

M-101

Optima # 22-0082

[redacted]

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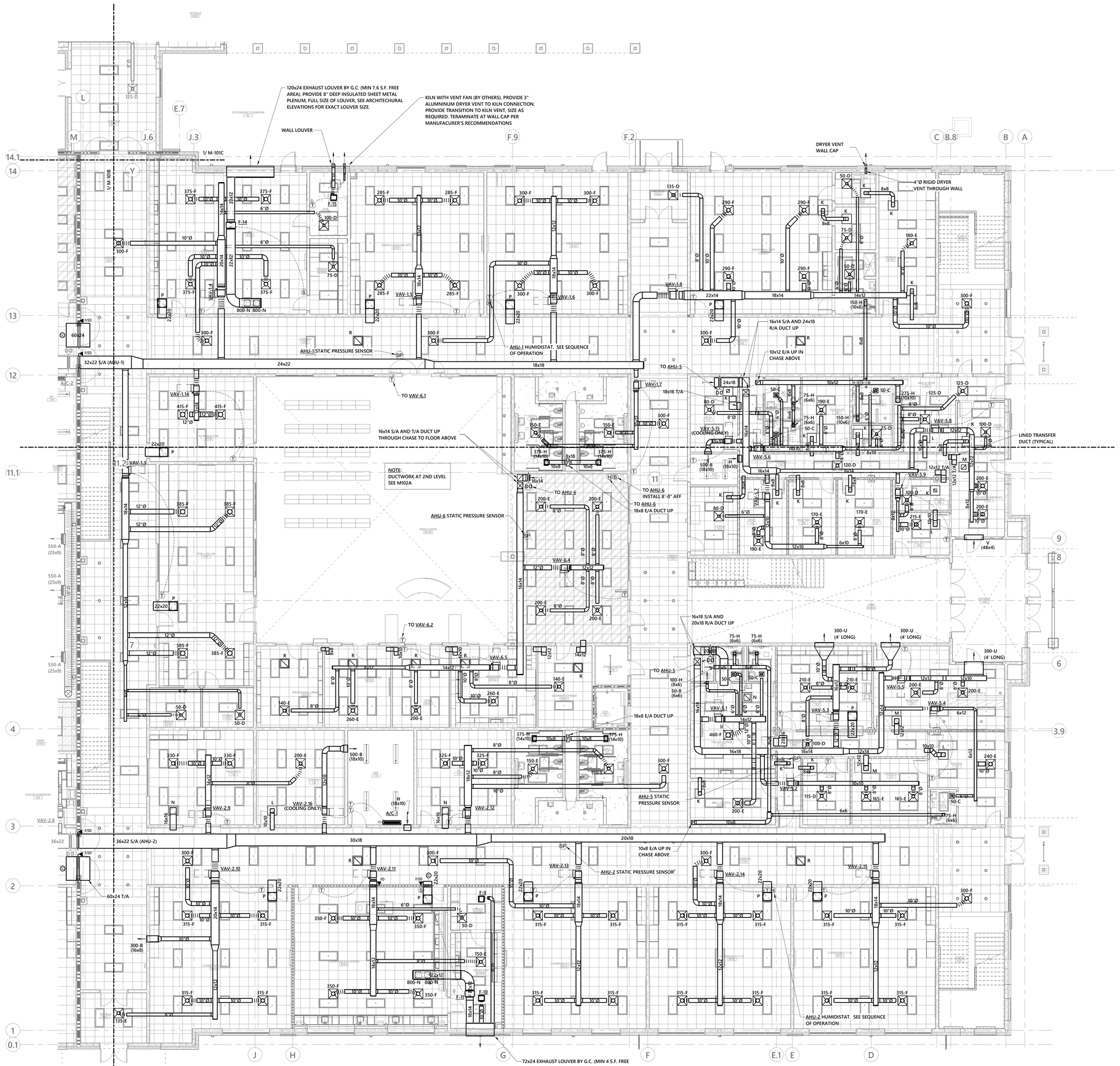

1 FIRST FLOOR MECHANICAL PLAN - AREA A

1/8" = 1'-0"

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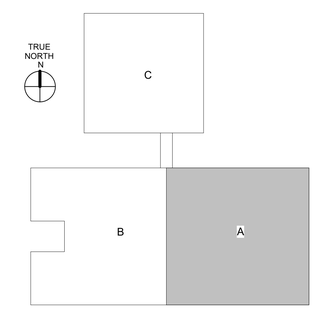
KEY PLAN



PROJECT: 9201-218240

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FIRST FLOOR MECHANICAL PLAN AREA A

M-101A

Optima # 22-0082

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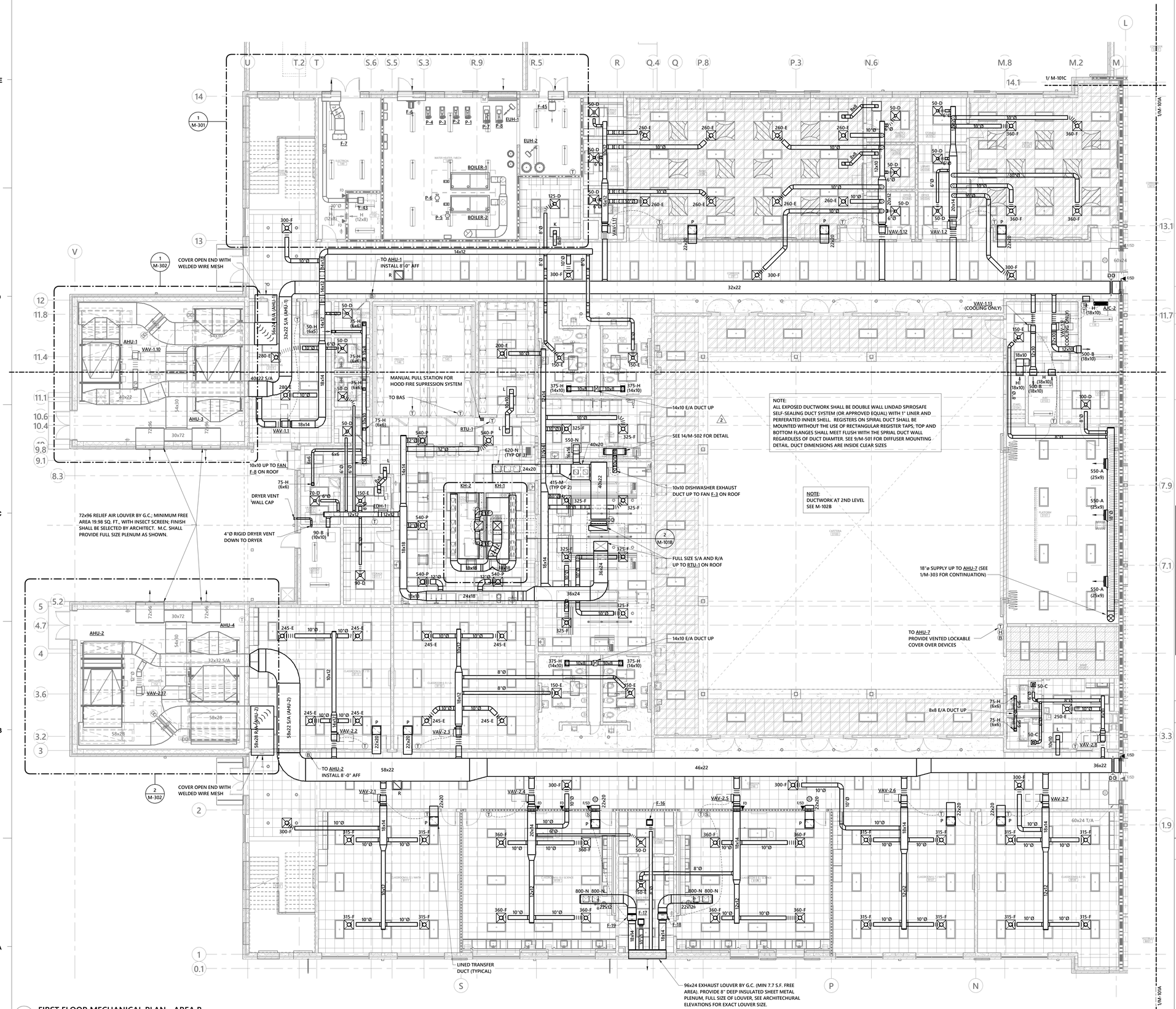
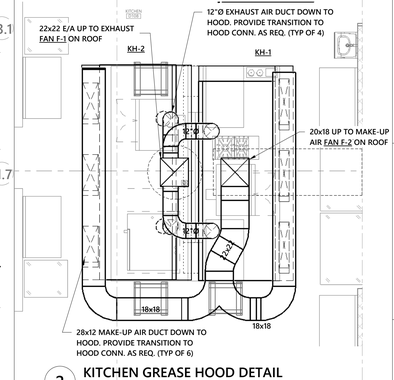


NOTE:
ALL EXPOSED DUCTWORK SHALL BE DOUBLE WALL LINDAD SPIROSAFE SELF-SEALING DUCT SYSTEM (OR APPROVED EQUAL) WITH 1" LINER AND PERFERATED INNER SHELL. REGISTERS ON SPIRAL DUCT SHALL BE MOUNTED WITHOUT THE USE OF RECTANGULAR REGISTER TAPS, TOP AND BOTTOM FLANGES SHALL MEET FLUSH WITH THE SPRIAL DUCT WALL REGARDLESS OF DUCT DIAMETER. SEE 9/M-501 FOR DIFFUSER MOUNTING DETAIL. DUCT DIMENSIONS ARE INSIDE CLEAR SIZES

NOTE:
DUCTWORK AT 2ND LEVEL SEE M-102B

1 FIRST FLOOR MECHANICAL PLAN - AREA B
1/8" = 1'-0"

NOTES:
PROVIDE TRANSITIONS TO HOOD CONNECTIONS AS REQUIRED.
PROVIDE GRASE EXHAUST DUCT WITH 2 HR FIRE BLANKET INSUALTION FROM HOOD COLLAR CONNECTIONS TO FAN CONNECTION.



2 KITCHEN GREASE HOOD DETAIL
1/4" = 1'-0"

KITCHEN AIRFLOW BALANCE SUMMARY

MECHANICAL EQUIPMENT (SYSTEM)	EXHAUST	MAKE UP AIR	OUTSIDE AIR
KITCHEN HOOD E/A (F-1)	4725	--	--
KITCHEN HOOD MAKE UP AIR (F-2)	--	4016	--
DISHWASHER E/A (F-3)	875	--	--
KITCHEN TLT E/A (F-8)	225	--	--
RTU-1	--	--	900
AHU-7	--	--	1000 (MIN)
SUB TOTALS	5825	4016	1900 (MIN)
KITCHEN HOOD E/A (F-1)	5825	5916	
NET PRESSURE SUPPLIED TO KITCHEN AREA: 91 CFM (POSITIVE)			

PARTITION LEGEND

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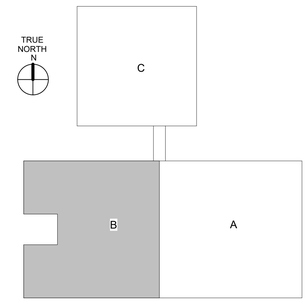

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2	Permit Revisions	01-11-2023

PROJECT: 9201-218240
DATE: 01-12-2023

FIRST FLOOR MECHANICAL PLAN AREA B

M-101B

Optima # 22-0082

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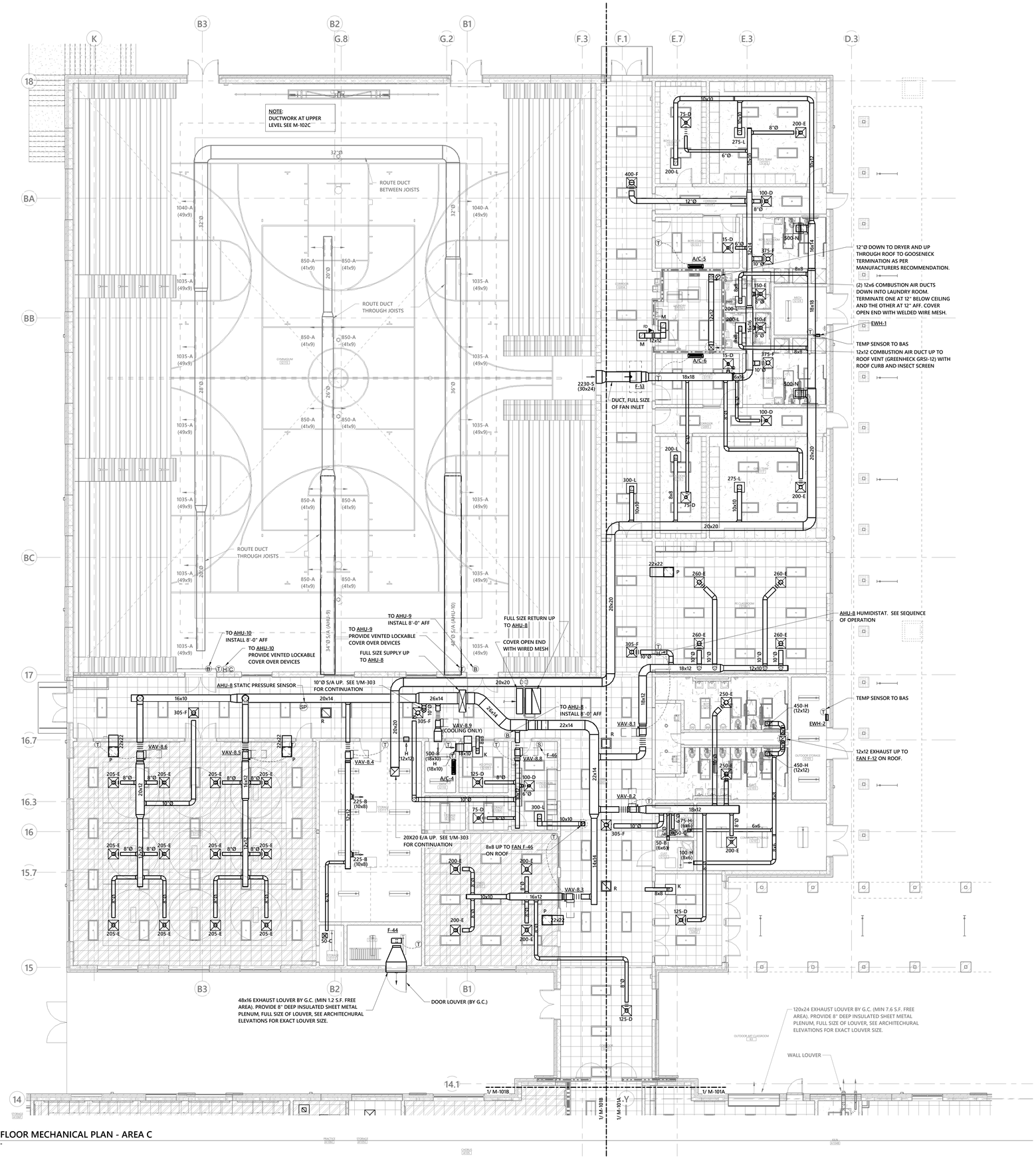

1 FIRST FLOOR MECHANICAL PLAN - AREA C
1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
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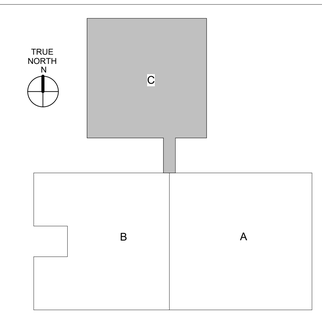
KEY PLAN



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No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

FIRST FLOOR MECHANICAL PLAN AREA C

M-101C

Optima # 22-0082

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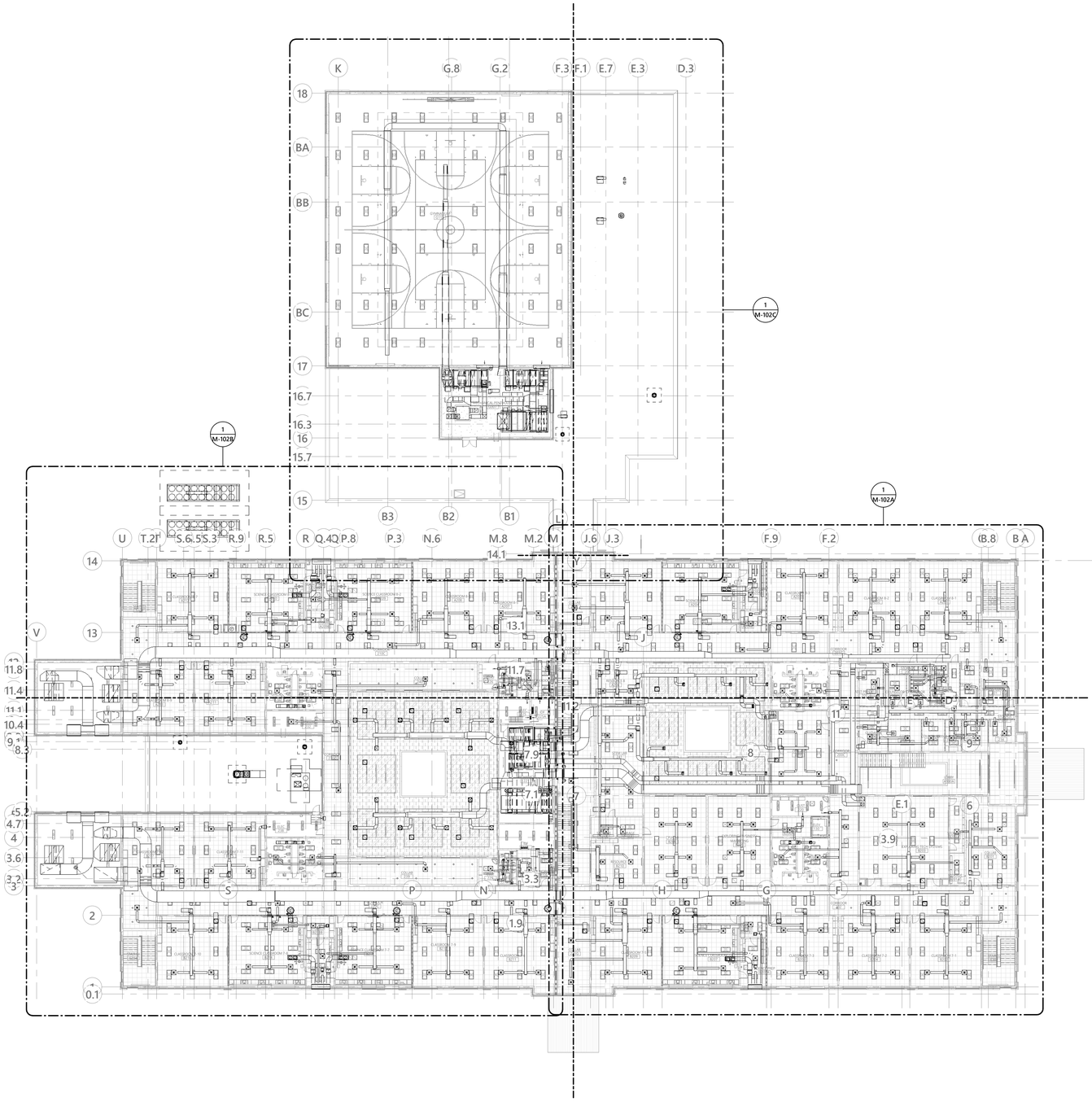

1 OVERALL SECOND FLOOR MECHANICAL PLAN

3/64" = 1'-0"

PARTITION LEGEND

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2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
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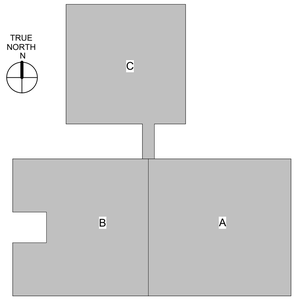

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No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

OVERALL SECOND FLOOR MECHANICAL PLAN

M-102

Optima # 22-0082
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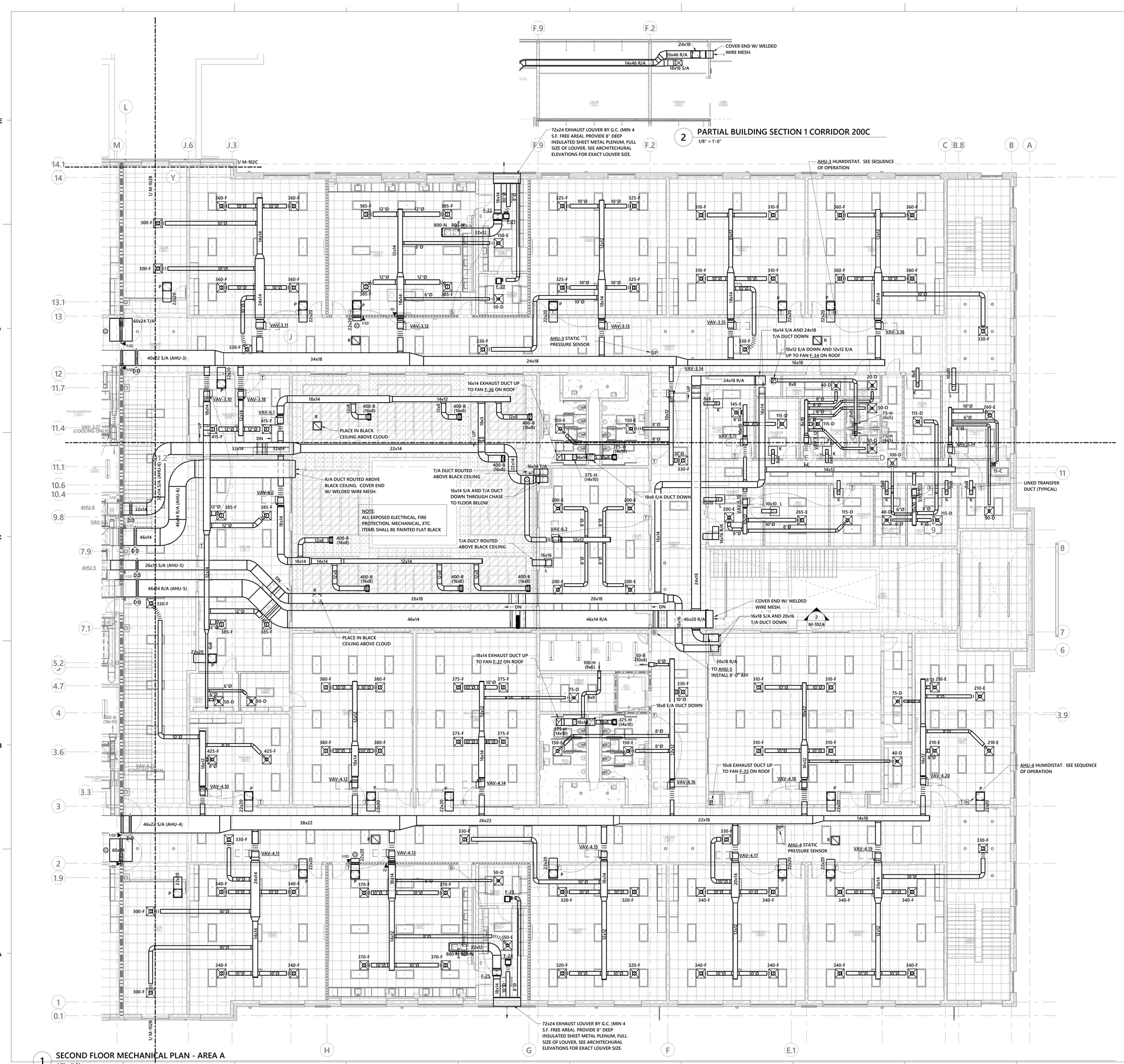

1 SECOND FLOOR MECHANICAL PLAN - AREA A
1/8" = 1'-0"

PARTITION LEGEND

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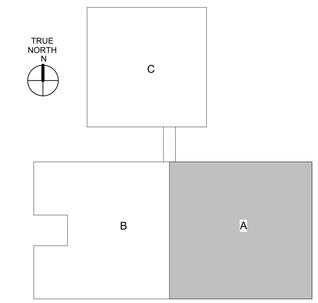

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No.	Description	Date
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PROJECT: 9201-218240
DATE: 01-12-2023

SECOND FLOOR MECHANICAL PLAN AREA A

M-102A

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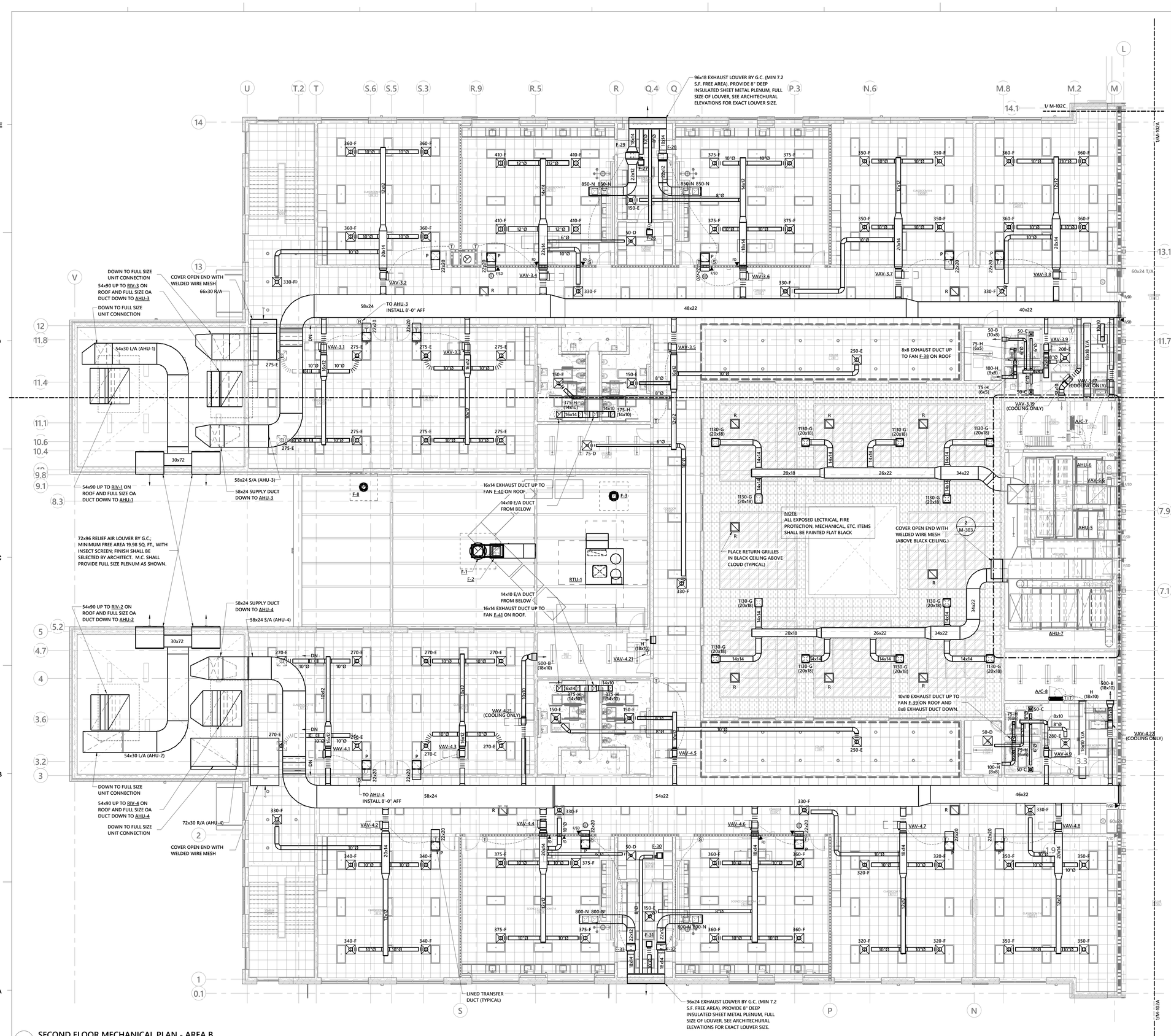


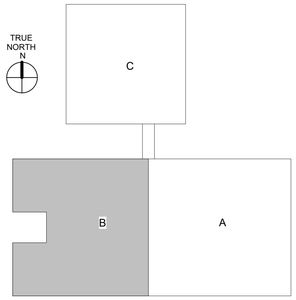
1 SECOND FLOOR MECHANICAL PLAN - AREA B
1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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SECOND FLOOR MECHANICAL PLAN AREA B

M-102B

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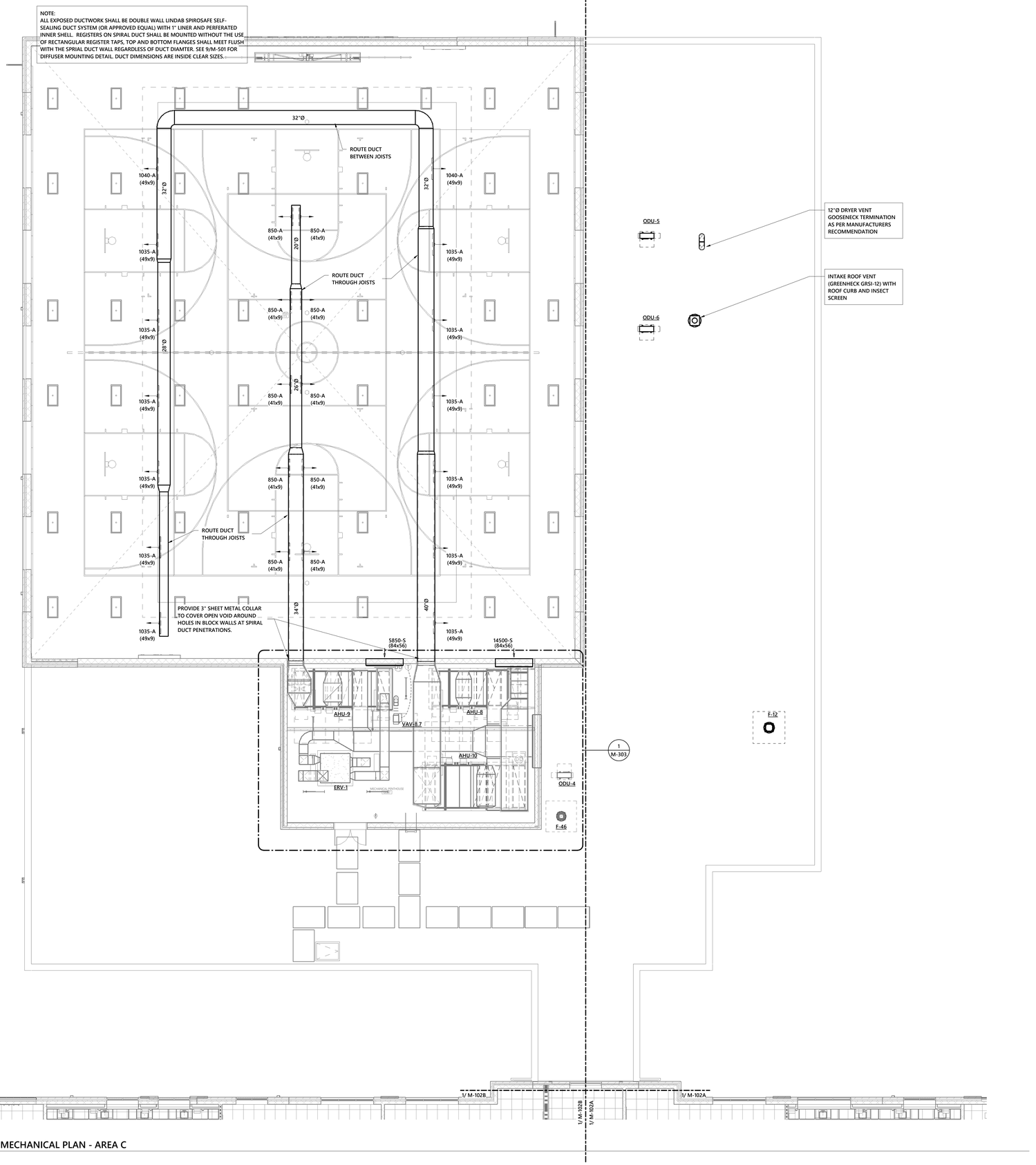
NOTE:
ALL EXPOSED DUCTWORK SHALL BE DOUBLE WALL LINDAB SPIROSAFE SELF-SEALING DUCT SYSTEM (OR APPROVED EQUAL) WITH 1" LINER AND PERFERATED INNER SHELL. REGISTERS ON SPIRAL DUCT SHALL BE MOUNTED WITHOUT THE USE OF RECTANGULAR REGISTER TAPS, TOP AND BOTTOM FLANGES SHALL MEET FLUSH WITH THE SPRIAL DUCT WALL REGARDLESS OF DUCT DIAMTER. SEE 9/M-501 FOR DIFFUSER MOUNTING DETAIL. DUCT DIMENSIONS ARE INSIDE CLEAR SIZES.



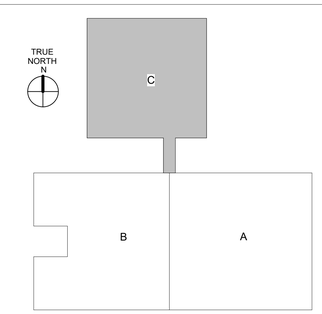
1 SECOND FLOOR MECHANICAL PLAN - AREA C
1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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DATE: 01-12-2023

SECOND FLOOR MECHANICAL PLAN AREA C

M-102C

Optima # 22-0082

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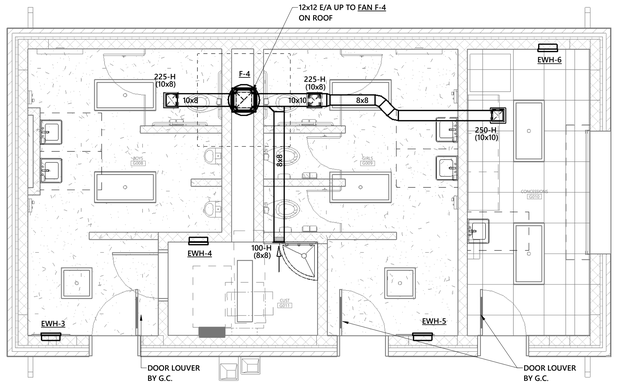
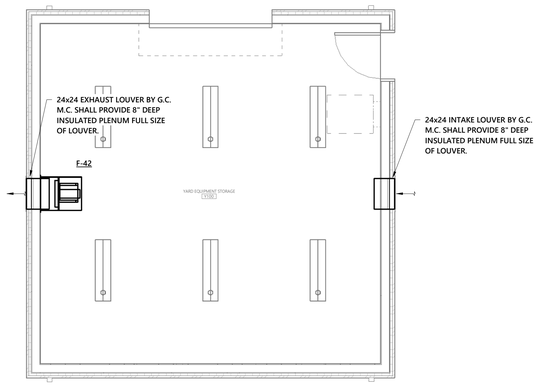


1 CONCESSION BUILDING - MECHANICAL (TYPICAL FOR 2)
1/4" = 1'-0"



2 STORAGE BUILDING - MECHANICAL
1/4" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
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- SMOKE PARTITION TO DECK
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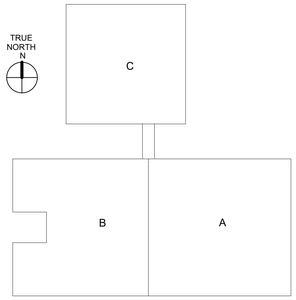
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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ATHLETIC BUILDINGS MECHANICAL PLANS

M-103

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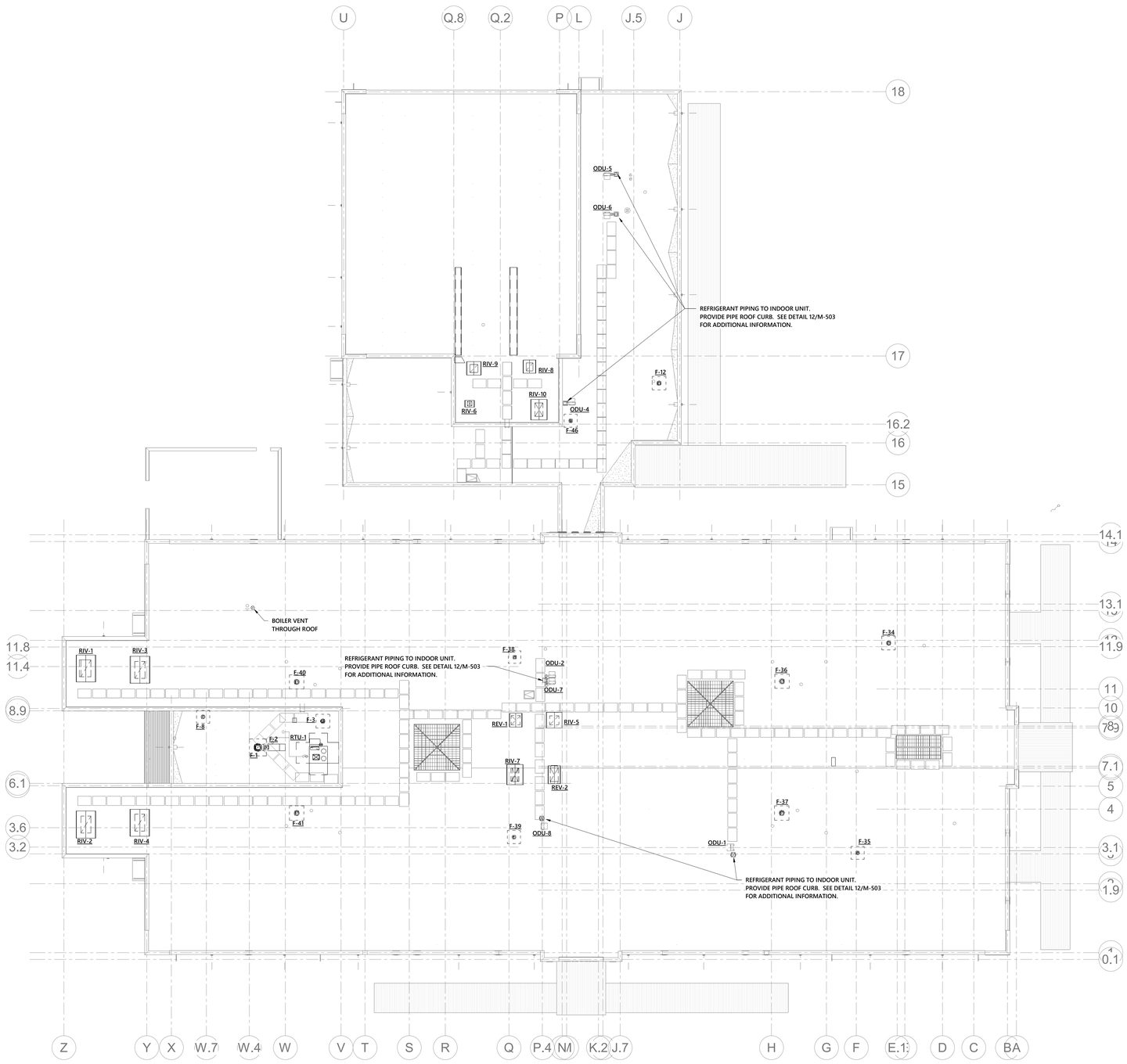

1 OVERALL ROOF MECHANICAL PLAN
3/64" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
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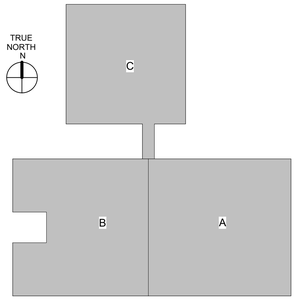
KEY PLAN



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OVERALL ROOF MECHANICAL PLAN

M-151

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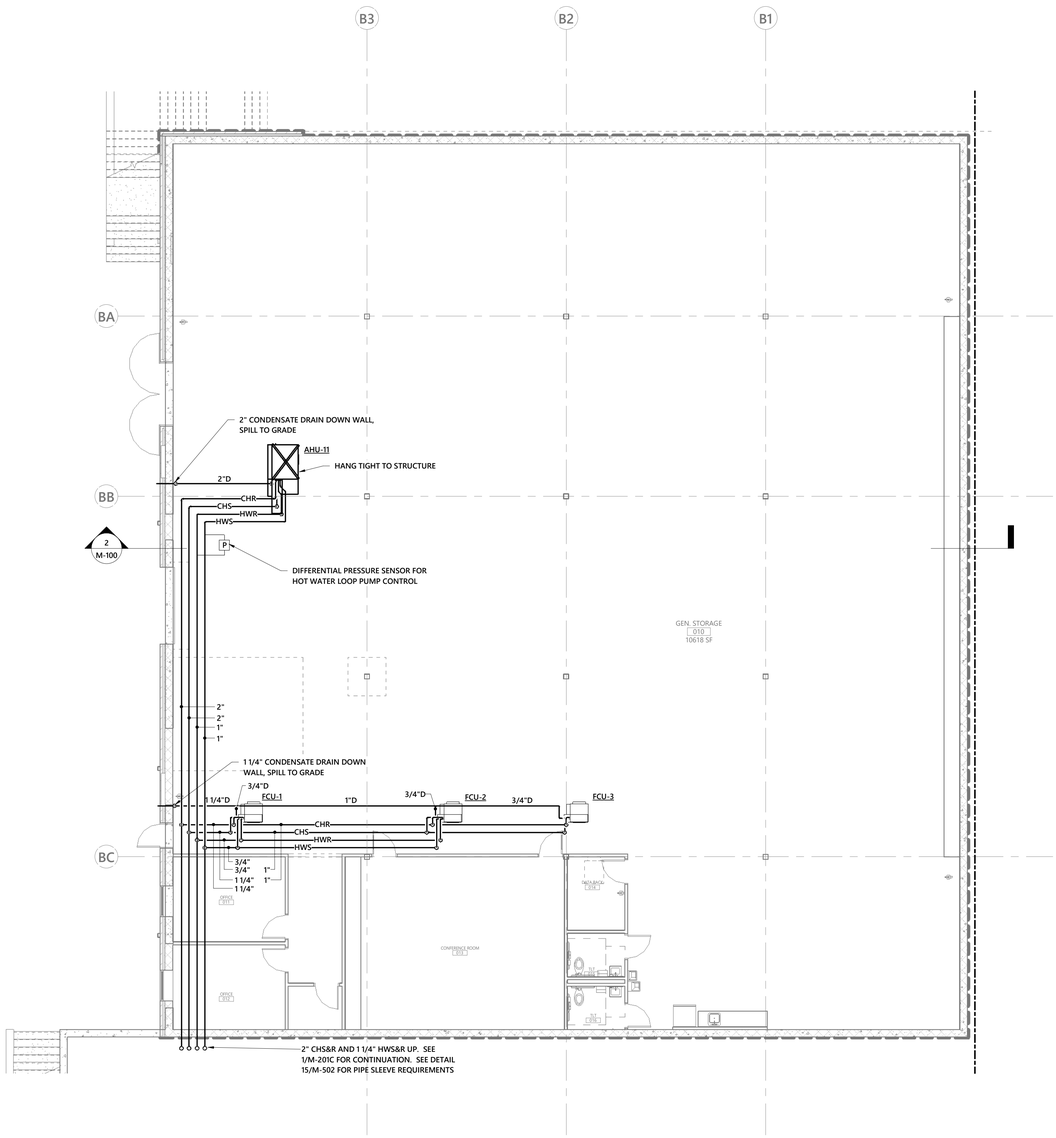

1 0-BASEMENT MECHANICAL PIPING PLAN
1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

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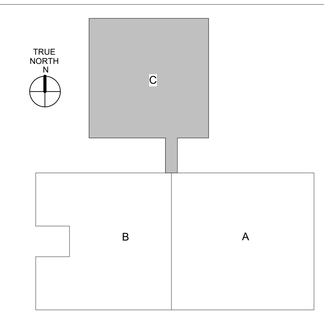
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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BASEMENT FLOOR MECHANICAL PIPING PLAN

M-200

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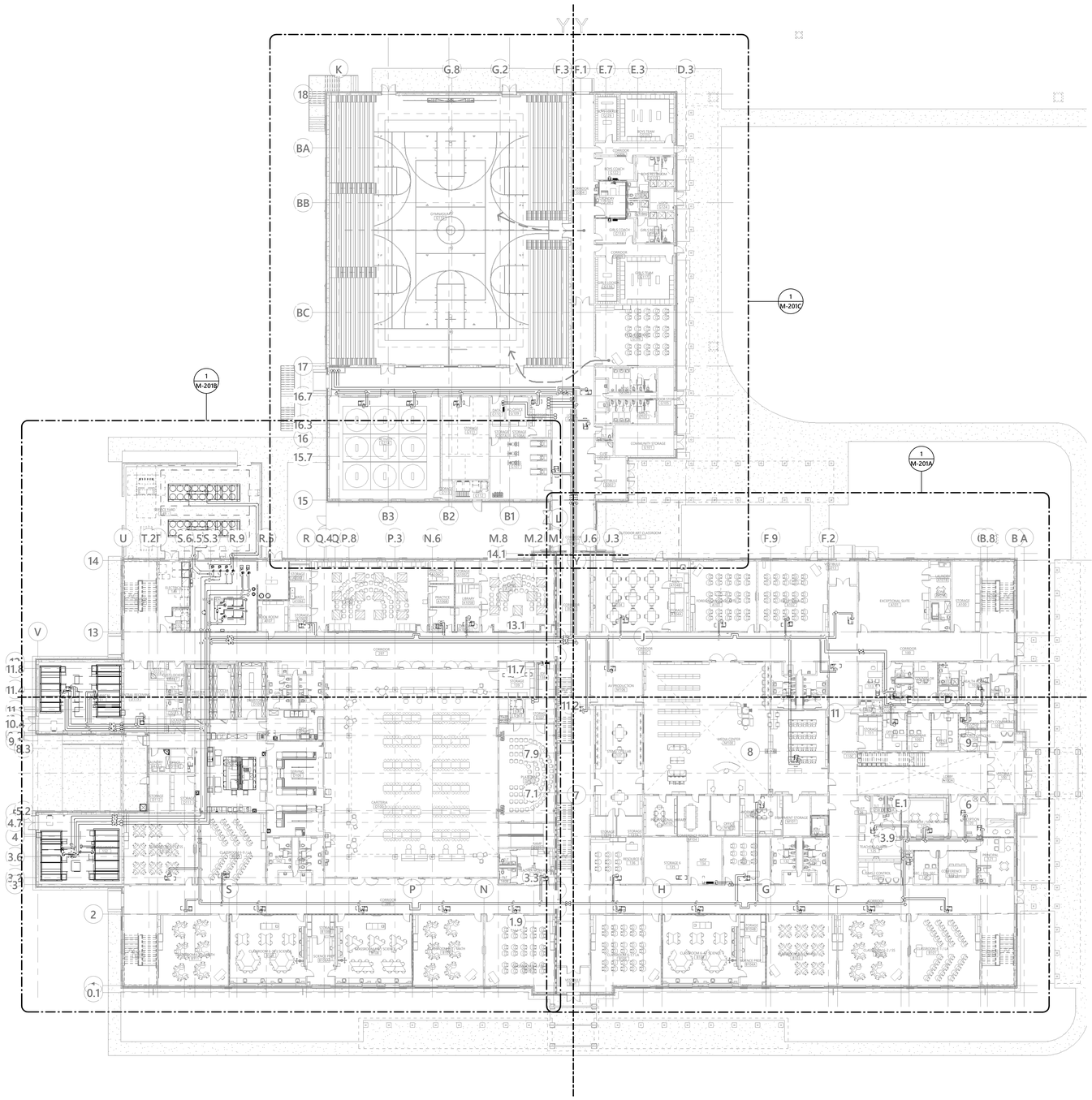

1 OVERALL FIRST FLOOR MECHANICAL PIPING PLAN
3/64" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

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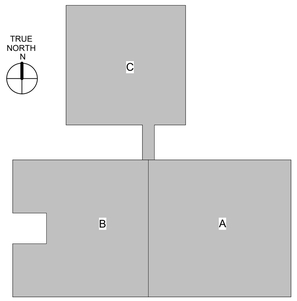
KEY PLAN



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OVERALL FIRST FLOOR MECHANICAL PIPING PLAN

M-201

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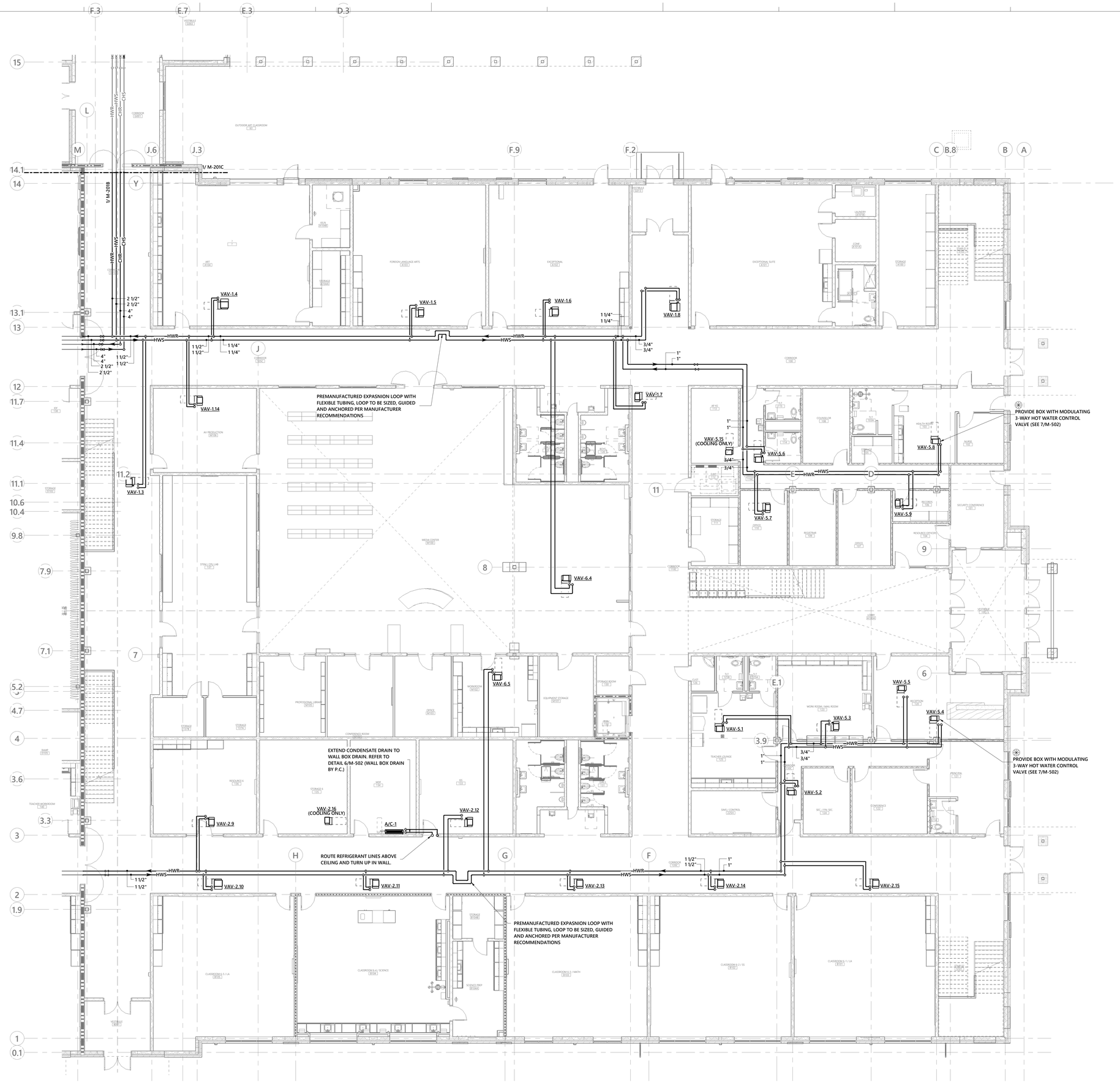

1 FIRST FLOOR MECHANICAL PIPING PLAN - AREA A
1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

NON-RATED PARTITION TO 4" ABOVE CEILING
NON-RATED METAL STUD PARTITION TO DECK
NON-RATED CMU PARTITION
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1 HR. RATED PARTITION TO DECK
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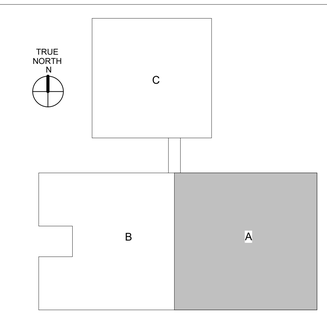
KEY PLAN



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FIRST FLOOR MECHANICAL PIPING PLAN AREA A

M-201A

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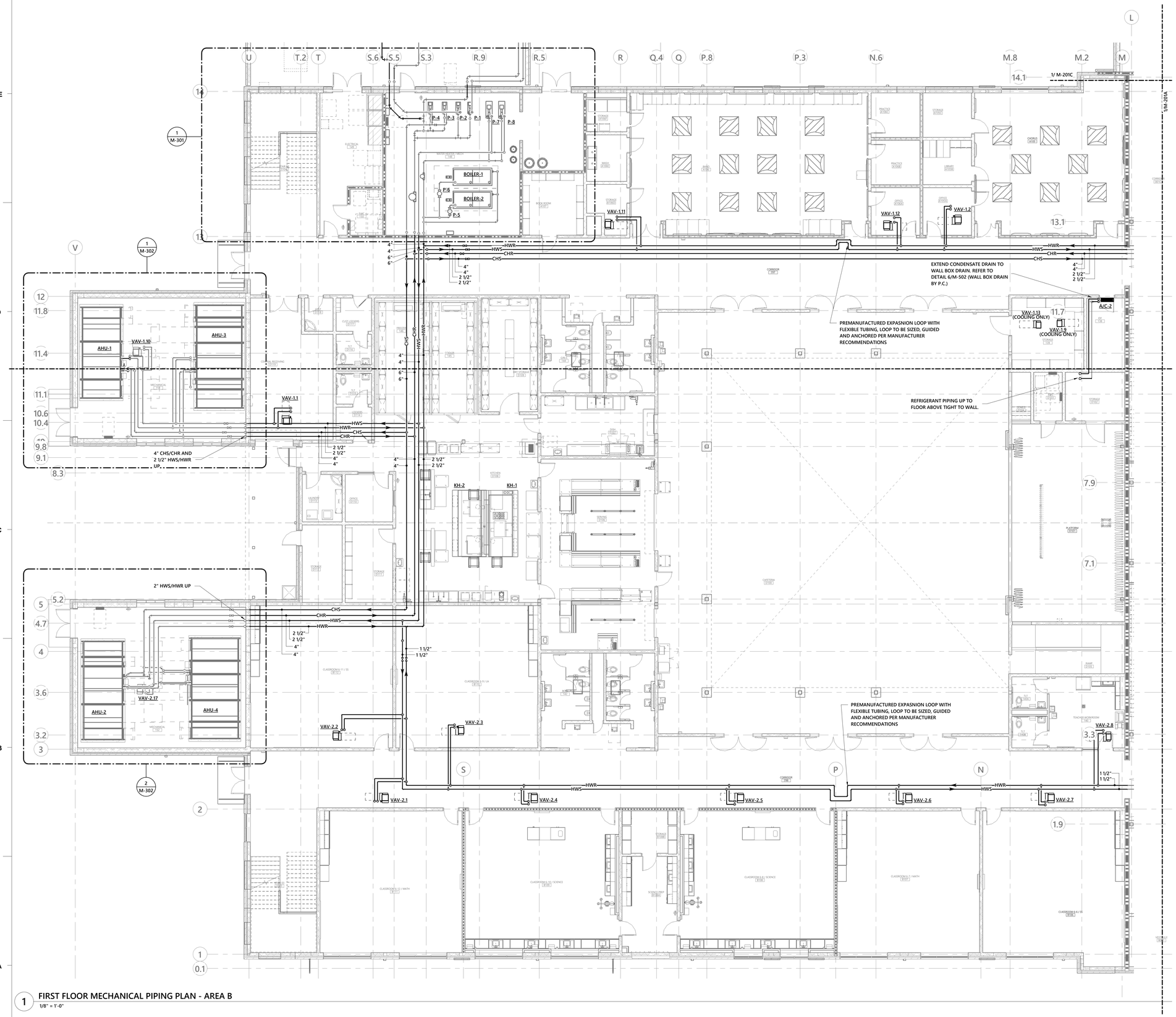

1 FIRST FLOOR MECHANICAL PIPING PLAN - AREA B
1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
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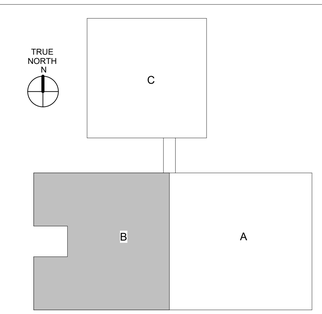

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FIRST FLOOR MECHANICAL PIPING PLAN AREA B

M-201B

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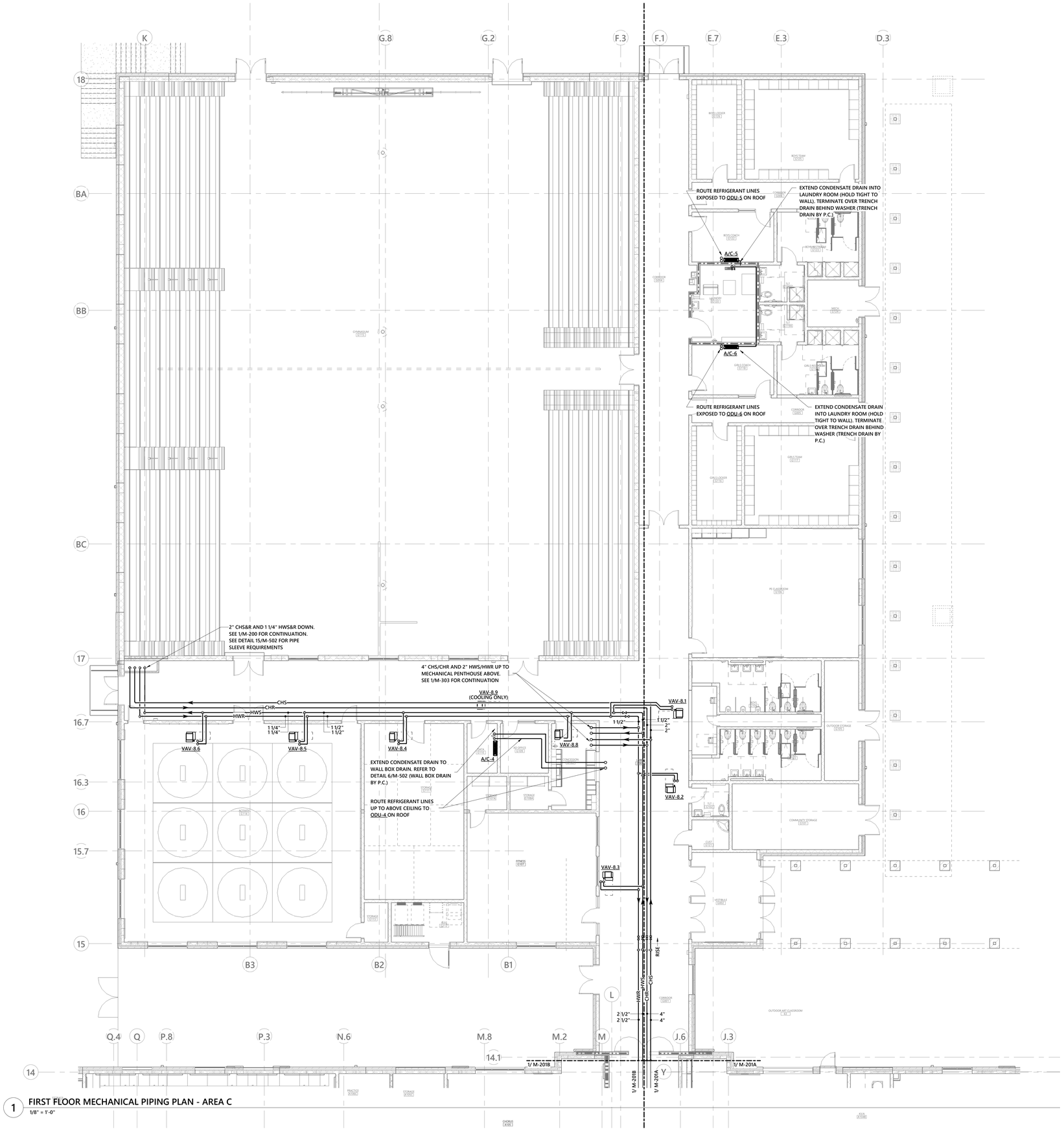

1 FIRST FLOOR MECHANICAL PIPING PLAN - AREA C
1/8" = 1'-0"

PARTITION LEGEND

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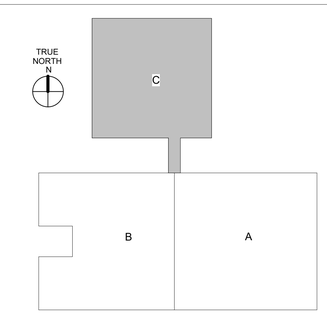

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

FIRST FLOOR MECHANICAL PIPING PLAN AREA C

M-201C

Optima # 22-0082

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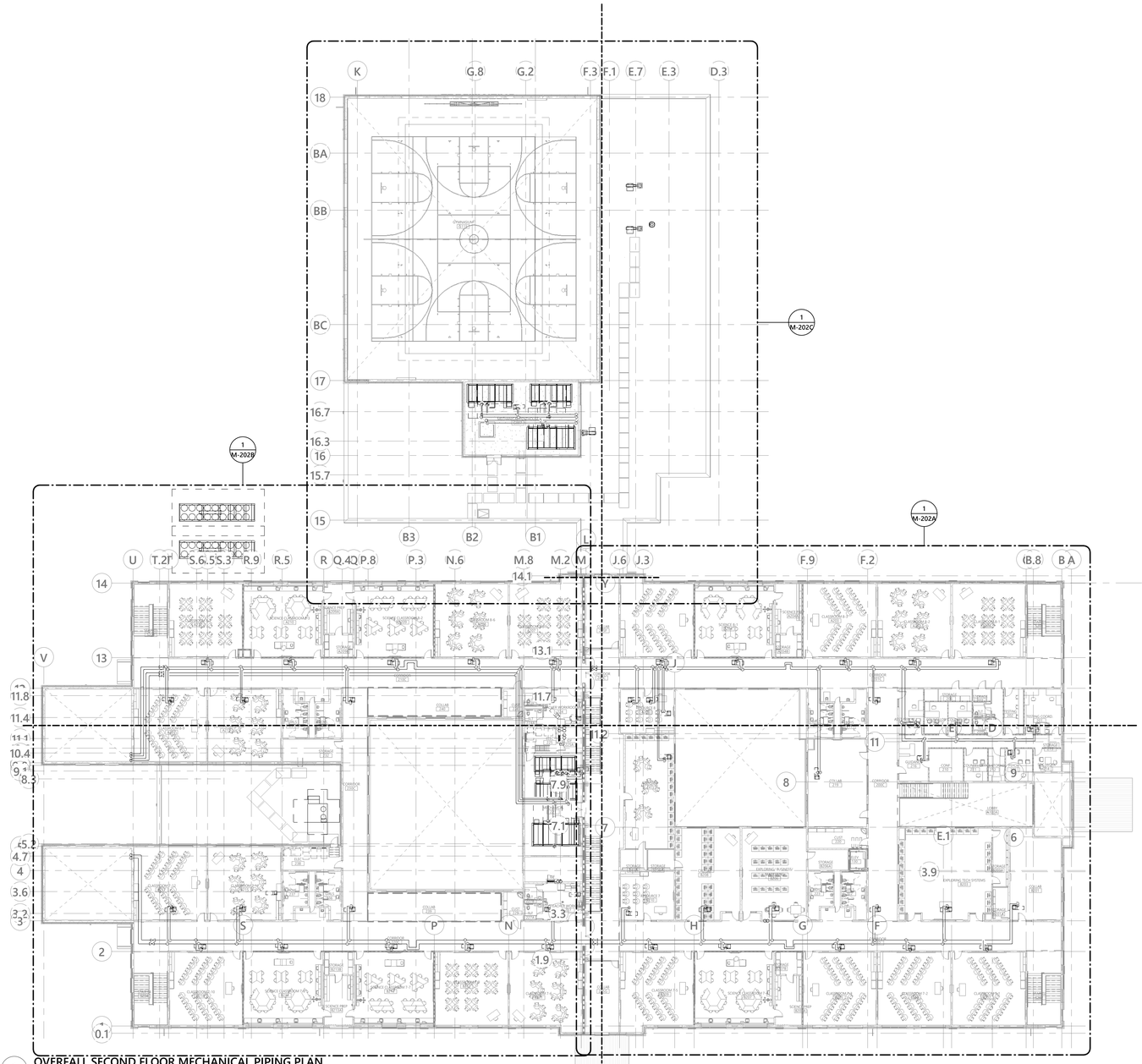


1 OVERFALL SECOND FLOOR MECHANICAL PIPING PLAN

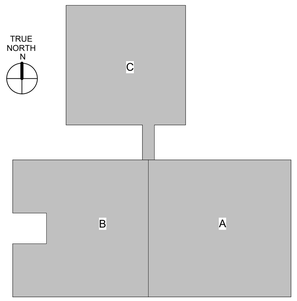
3/64" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

OVERALL SECOND FLOOR MECHANICAL PIPING PLAN

M-202

Optima # 22-0082

[redacted]

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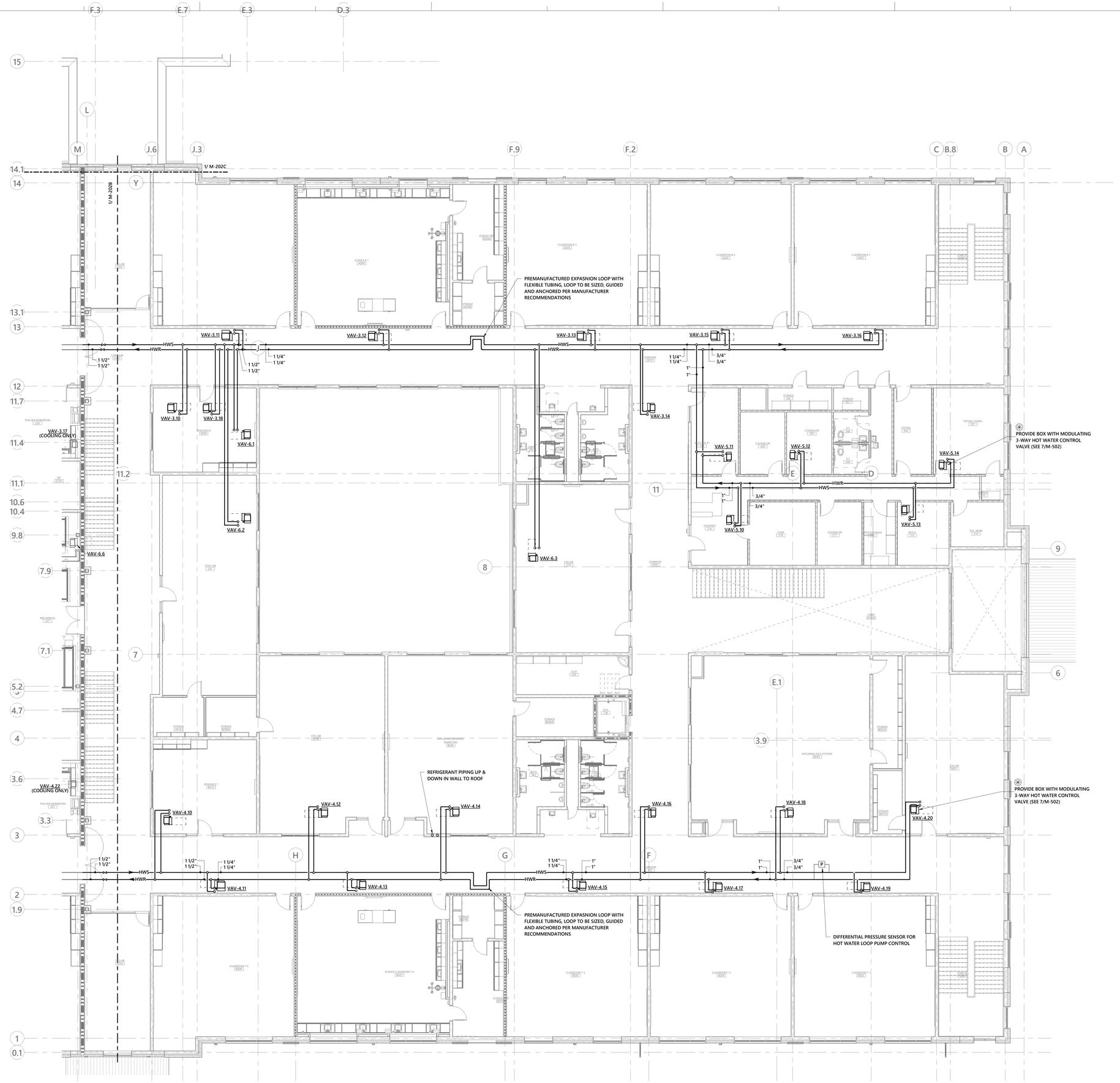


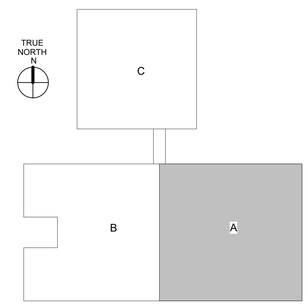
1 SECOND FLOOR MECHANICAL PIPING PLAN - AREA A
1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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PROJECT: 9201-218240
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SECOND FLOOR MECHANICAL PIPING PLAN AREA A

M-202A

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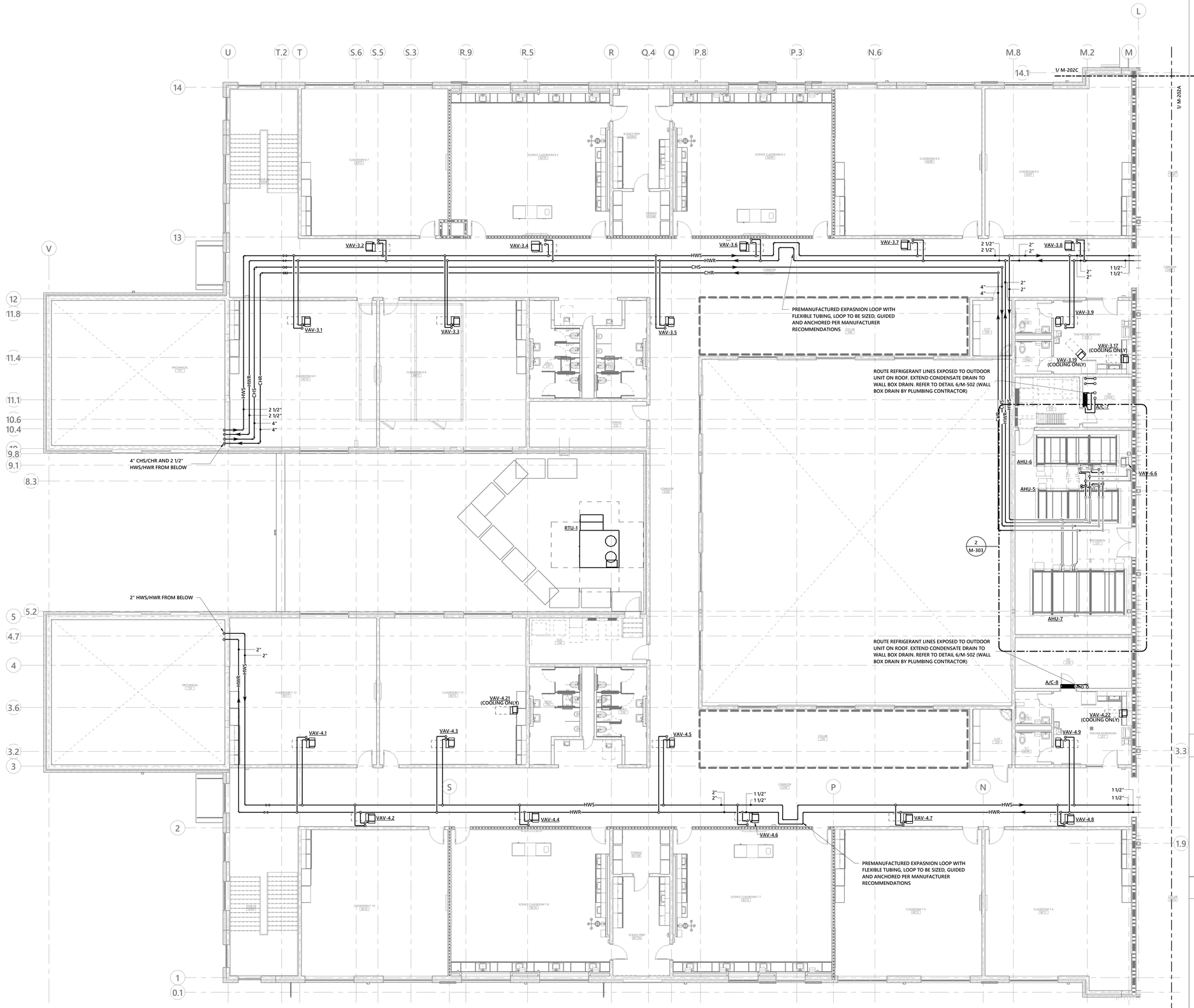


1 SECOND FLOOR MECHANICAL PIPING PLAN - AREA B

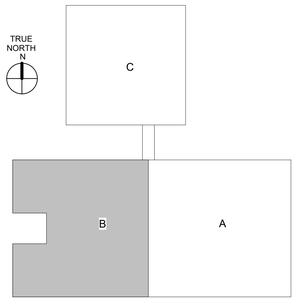
1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

SECOND FLOOR MECHANICAL PIPING PLAN AREA B

M-202B

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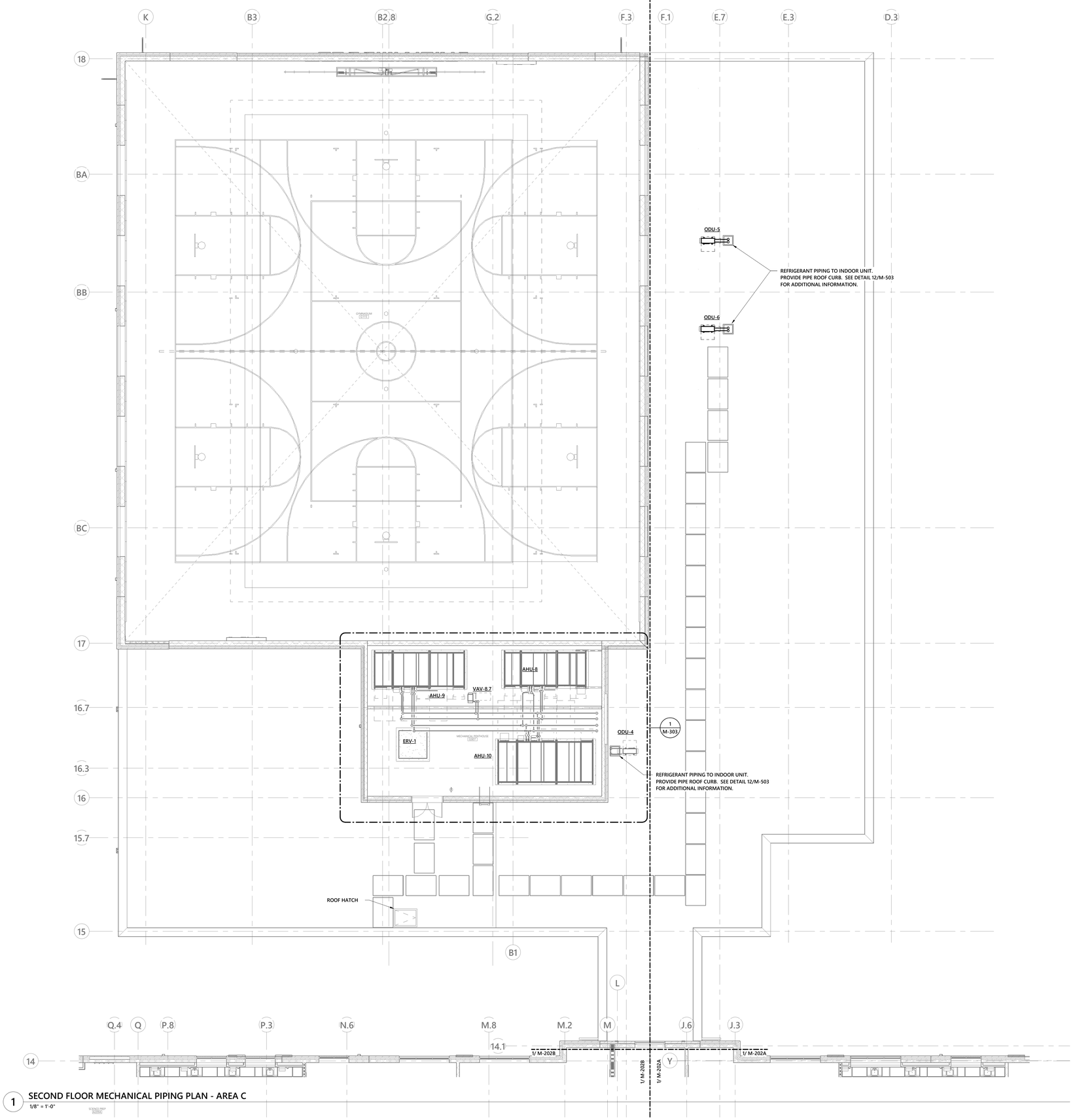


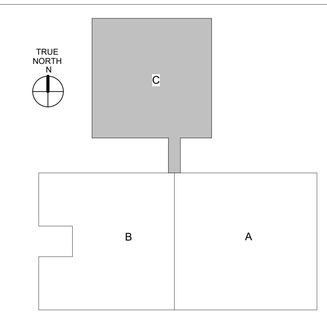
1 SECOND FLOOR MECHANICAL PIPING PLAN - AREA C
1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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PROJECT: 9201-218240
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SECOND FLOOR MECHANICAL PIPING PLAN AREA C

M-202C

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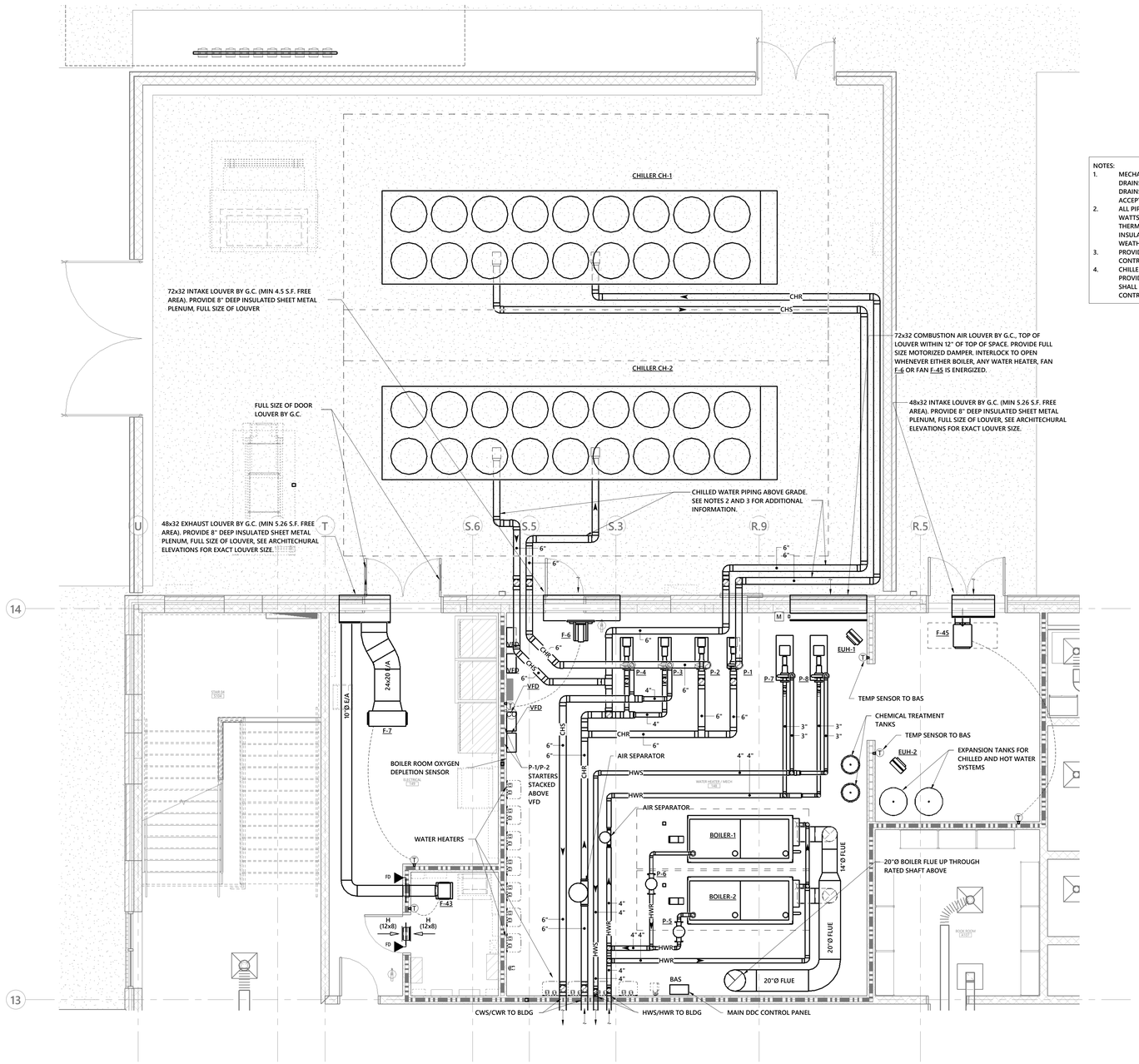


1 ENLARGED MECHANICAL AND ELECTRICAL ROOM PLAN
1/4" = 1'-0"

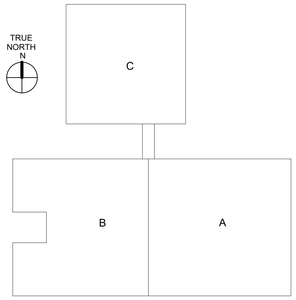
NOTES:
1. MECHANICAL CONTRACTOR SHALL COORDINATE EXACT LOCATION OF FLOOR DRAINS WITH PLUMBING CONTRACTOR PRIOR TO INSTALLATION OF FLOOR DRAINS. INACCESSIBLE DRAINS OR DRAINS LOCATED UNDER EQUIPMENTS ARE NOT ACCEPTABLE.
2. ALL PIPING ABOVE GRADE SHALL HAVE ELECTRIC HEAT TAPE INSTALLED AT 10 WATTS PER LINEAR FOOT (120V-1PH). HEAT TAPE SHALL BE FURNISHED WITH THERMOSTAT AND SHALL BE INSTALLED PRIOR TO INSTALLING INSULATION. PIPE INSULATION SHALL BE COVERED WITH OUTER ALUMNINUM JACKET SEALED WEATHERTIGHT.
3. PROVIDE GRADE MOUNTED PIPE SUPPORTS FOR ALL CHILLED WATER PIPING AND CONTROLS CONDUIT FROM BUILDING TO EACH CHILLER.
4. CHILLERS SHALL BE MOUNTED ON A 6" THICK CONCRETE PAD. PADS SHALL BE PROVIDED AND INSTALLED BY GENERAL CONTRACTOR. MECHANICAL CONTRACTOR SHALL COORDINATE THE EXACT SIZE AND LOCATION OF PADS WITH GENERAL CONTRACTOR.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

ENLARGED MECHANICAL PLANS

M-301

Optima # 22-0082

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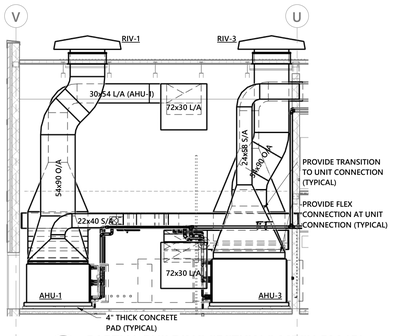
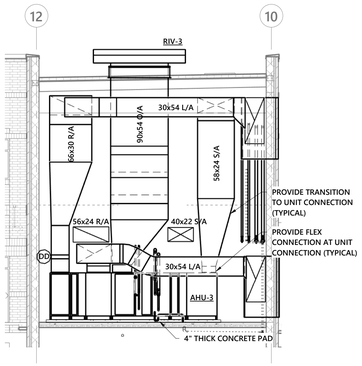
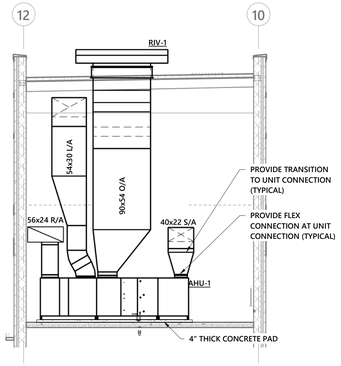


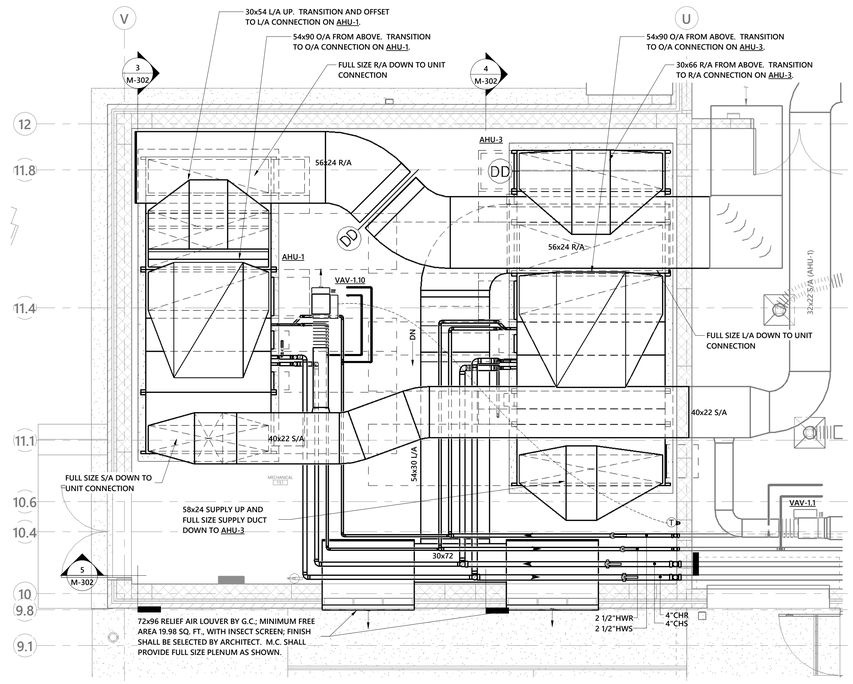
5 PARTIAL BUILDING SECTION 3 MECH RM 151
1/8" = 1'-0"



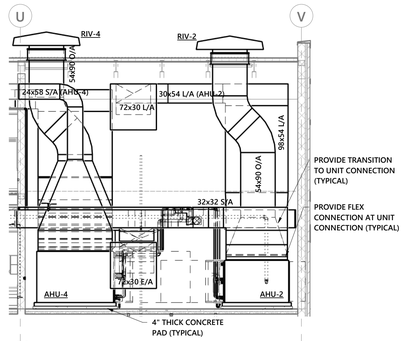
4 PARTIAL BUILDING SECTION 2 MECH RM 151
1/8" = 1'-0"



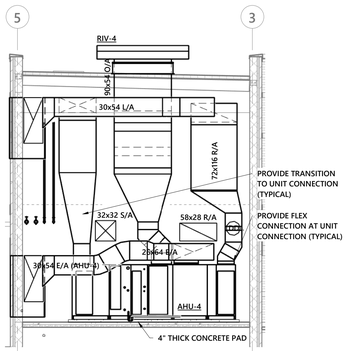
3 PARTIAL BUILDING SECTION 1 MECH RM 151
1/8" = 1'-0"



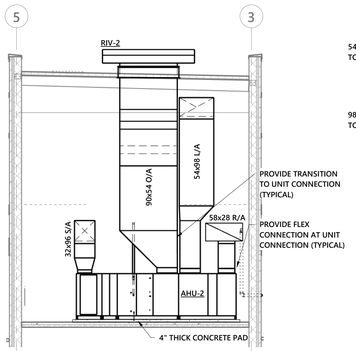
1 ENLARGED MECHANICAL ROOM 151 PLAN
1/4" = 1'-0"



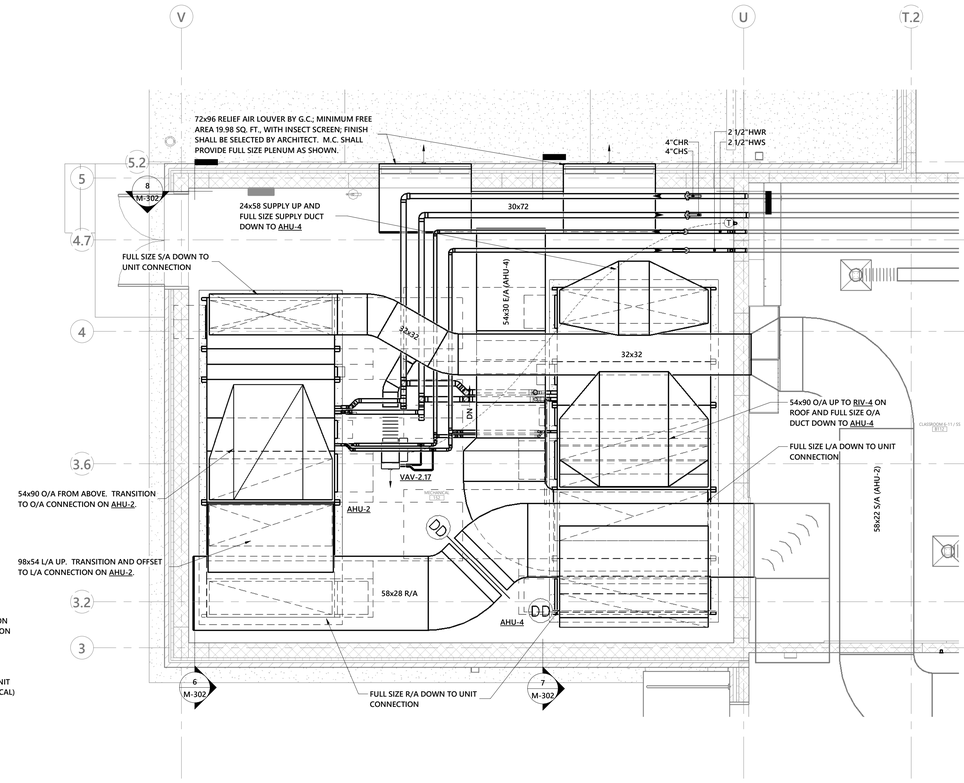
8 PARTIAL BUILDING SECTION 3 MECH RM 152
1/8" = 1'-0"



7 PARTIAL BUILDING SECTION 2 MECH RM 152
1/8" = 1'-0"



6 PARTIAL BUILDING SECTION 1 MECH RM 152
1/8" = 1'-0"



2 ENLARGED MECHANICAL ROOM 152 PLAN
1/4" = 1'-0"

AHU NOTES:

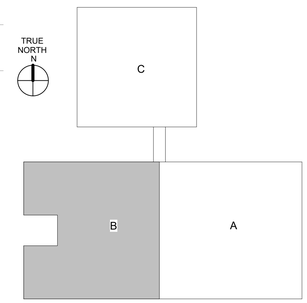
1. SPILL FULL SIZE CONDENSATE DRAIN FROM EACH AIR HANDLING UNIT OVER NEAREST FLOOR DRAIN (FLOOR DRAINS BY PLUMBING CONTRACTOR).
2. ALL FLOOR MOUNTED EQUIPMENT IN MECHANICAL ROOM SHALL BE MOUNTED ON A 4" THICK CONCRETE PAD. PADS SHALL BE PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR. MECHANICAL CONTRACTOR SHALL COORDINATE THE EXACT SIZE AND LOCATION OF ALL PADS WITH THE GENERAL CONTRACTOR.
3. MECHANICAL CONTRACTOR SHALL COORDINATE EXACT LOCATION OF FLOOR DRAINS WITH PLUMBING CONTRACTOR PRIOR TO INSTALLATION OF FLOOR DRAINS. INACCESSIBLE FLOOR DRAINS OR DRAINS LOCATED UNDER EQUIPMENT ARE NOT ACCEPTABLE.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

ENLARGED MECHANICAL PLANS

M-302

Optima # 22-0082

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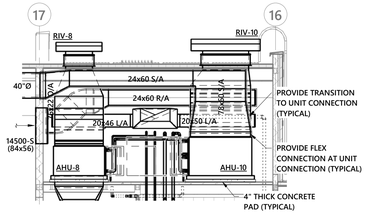
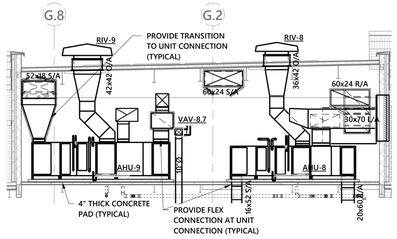
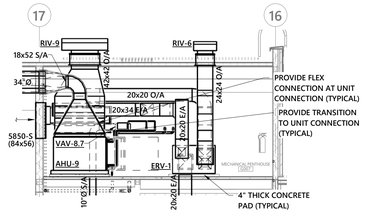


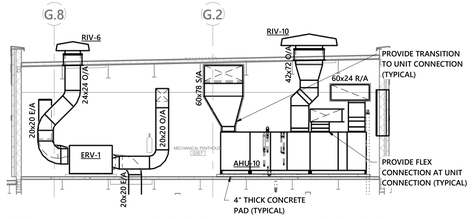
10 PARTIAL BUILDING SECTION 4 MECH PENTHOUSE G007
1/8" = 1'-0"



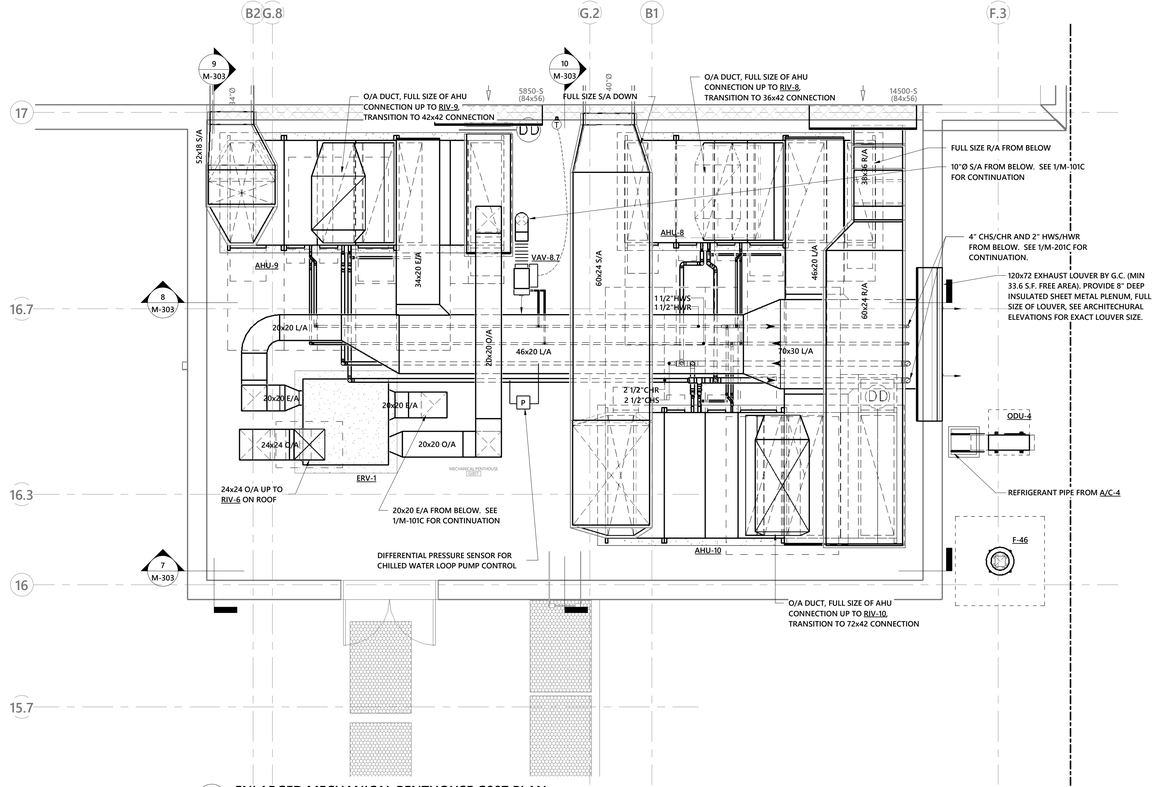
8 PARTIAL BUILDING SECTION 2 MECH PENTHOUSE G007
1/8" = 1'-0"



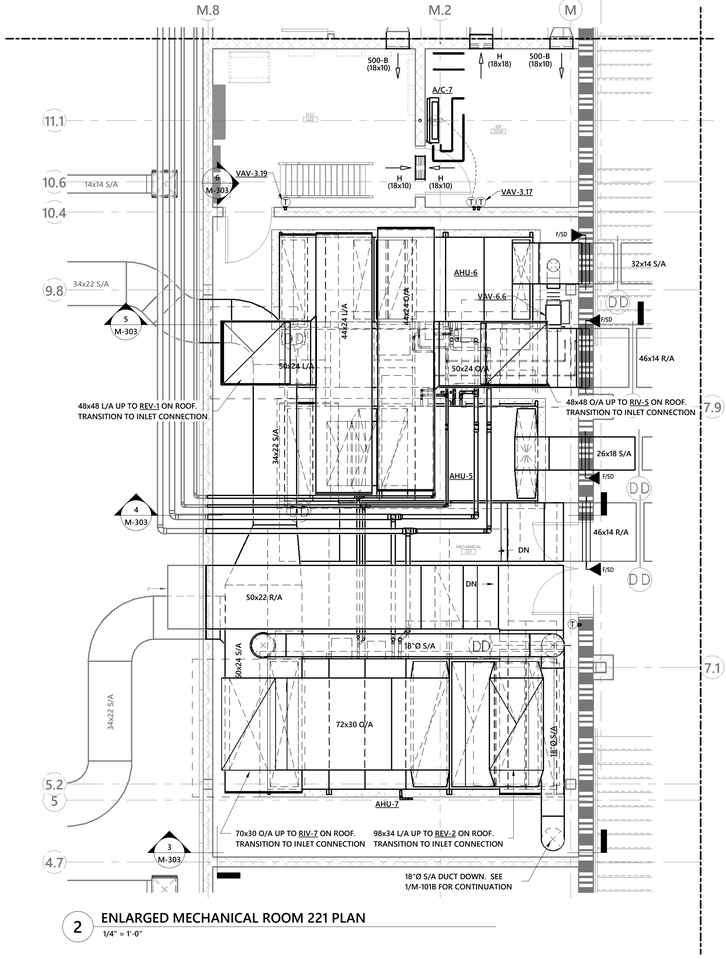
9 PARTIAL BUILDING SECTION 3 MECH PENTHOUSE G007
1/8" = 1'-0"



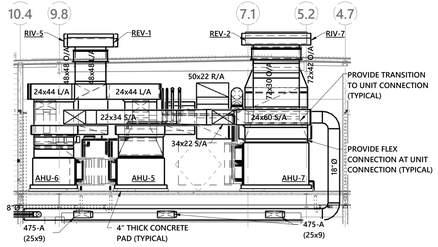
7 PARTIAL BUILDING SECTION 1 MECH PENTHOUSE G007
1/8" = 1'-0"



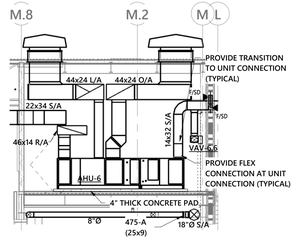
1 ENLARGED MECHANICAL PENTHOUSE G007 PLAN
1/4" = 1'-0"



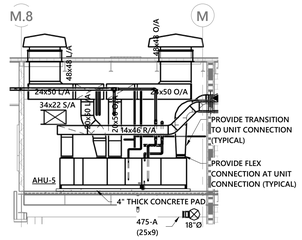
2 ENLARGED MECHANICAL ROOM 221 PLAN
1/4" = 1'-0"



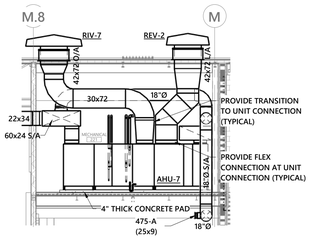
6 PARTIAL BUILDING SECTION 4 MECH RM 221
1/8" = 1'-0"



5 PARTIAL BUILDING SECTION 3 MECH RM 221
1/8" = 1'-0"



4 PARTIAL BUILDING SECTION 2 MECH RM 221
1/8" = 1'-0"



3 PARTIAL BUILDING SECTION 1 MECH RM 221
1/8" = 1'-0"

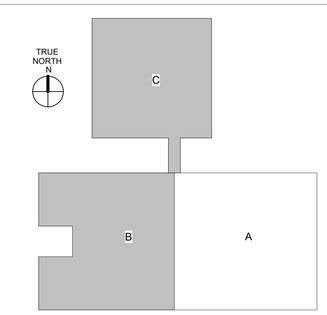
AHU NOTES:
1. SPILL FULL SIZE CONDENSATE DRAIN FROM EACH AIR HANDLING UNIT OVER NEAREST FLOOR DRAIN (FLOOR DRAINS BY PLUMBING CONTRACTOR).
2. ALL FLOOR MOUNTED EQUIPMENT IN MECHANICAL ROOM SHALL BE MOUNTED ON A 4" THICK CONCRETE PAD. PADS SHALL BE PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR. MECHANICAL CONTRACTOR SHALL COORDINATE THE EXACT SIZE AND LOCATION OF ALL PADS WITH THE GENERAL CONTRACTOR.
3. MECHANICAL CONTRACTOR SHALL COORDINATE EXACT LOCATION OF FLOOR DRAINS WITH PLUMBING CONTRACTOR PRIOR TO INSTALLATION OF FLOOR DRAINS. INACCESSIBLE FLOOR DRAINS OR DRAINS LOCATED UNDER EQUIPMENT ARE NOT ACCEPTABLE.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

ENLARGED MECHANICAL PLANS

M-303

Optima # 22-0082

01.12.2023 - BID SET

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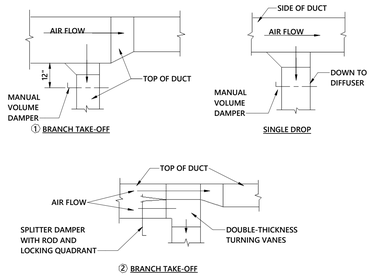
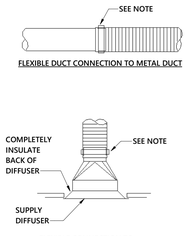


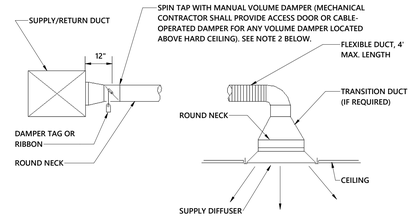
NOTE:
1. USE BRANCH TAKE-OFF ① WHEN MAIN AND BRANCH DUCTS ARE DIFFERENT DEPTHS
2. USE BRANCH TAKE-OFF ② WHEN MAIN AND BRANCH DUCTS ARE SAME DEPTHS
3. MANUAL VOLUME DAMPERS SHALL BE PROVIDED FOR ALL SUPPLY, RETURN AND GENERAL EXHAUST SINGLE DROP DUCT RUNS.

1 DUCTWORK DETAILS
NOT TO SCALE



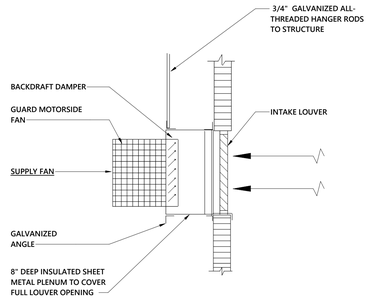
NOTE:
ALL FLEXIBLE DUCT CONNECTIONS TO SHEET METAL SHALL BE SECURED WITH APPROVED STRAP AND SEALANT.

2 FLEX CONNECTION DETAIL
NOT TO SCALE

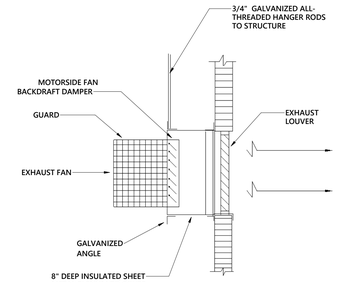


NOTE:
1. MANUAL VOLUME DAMPERS SHALL BE PROVIDED FOR ALL SUPPLY, RETURN AND GENERAL EXHAUST RUNOUTS.
2. ALL MANUAL VOLUME DAMPERS (FOR INSULATED DUCTWORK) SHALL BE PROVIDED WITH AN ELEVATED REGULATOR (STAND-OFF) EQUAL TO DURO DYNE SEST SERIES AND FULL-LENGTH SHAFT. STAND SHALL EXTEND A MINIMUM OF 2" BEYOND DUCTWORK WITH EXTENDED TAB/SHAFT.
3. CONTRACTOR TO COORDINATE WITH ARCHITECT FOR DESIRED DAMPER ACCESS STYLE CABLE-OPERATED DAMPER. ADJUSTMENT SHALL BE THROUGH AIR TERMINAL FACE OPERATION (CONCEALED MOUNTING) OR THROUGH CEILING-MOUNTED RECESSED PORTS EQUAL TO MAT RT-CCM.

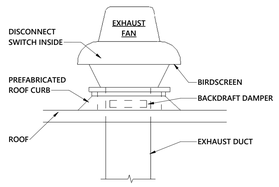
3 SPIN TAP TO ROUND NECK DIFFUSER
NOT TO SCALE



4 SIDEWALL SUPPLY
NOT TO SCALE



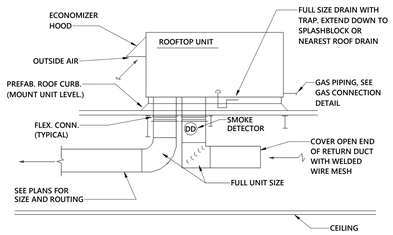
5 SIDEWALL EXHAUST FAN
NO SCALE



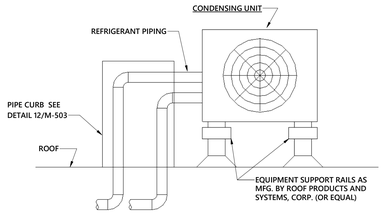
NOTES:
1. SECURE FAN TO CURB WITH NON-FERROUS SCREWS. MIN. 2 PER SIDE, 4-INCHES FROM CORNERS AND MAX, 12-INCHES ON CENTER. PROVIDE EDPM WASHERS FOR BOTH SIDES OF ROOF CURB.

6 EXHAUST FAN ON FLAT ROOF DETAIL
NOT TO SCALE

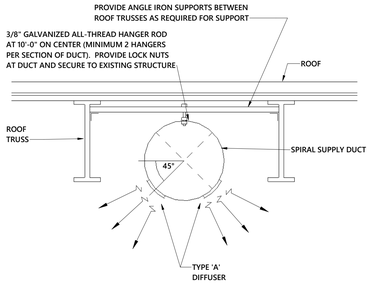
NOTES:
1. PROVIDE OPENING IN ROOF SIZED FOR SUPPLY AND RETURN DUCTS. ALL OTHER AREAS UNDER UNIT SHALL HAVE ANGLES AND SHEET METAL ACROSS UNDER UNIT WITH BATT INSULATION FILLING VOID. DUCT PENETRATIONS OF ROOF DECK SHALL BE SEALED AIRTIGHT.
2. ROOF CURB SHALL BE BY UNIT MANUFACTURER. TOP OF CURB SHALL BE INSTALLED LEVEL. ROOF CURBS SHALL MATCH SLOPE OF ROOF. NO SHIMMING ALLOWED.
3. SMOKE DETECTORS SHALL BE WIRED TO SHUT DOWN THE UNIT UPON ACTIVATION. SMOKE DETECTORS SHALL BE PROVIDED AND WIRED BY THE ELECTRICAL CONTRACTOR AND INSTALLED IN THE DUCT BY THE MECHANICAL CONTRACTOR. PROVIDE PHOTO-ELECTRIC TYPE DETECTORS.
4. FINAL CONNECTION TO UNIT SHALL BE BY MECHANICAL CONTRACTOR.



7 ROOFTOP UNIT DETAIL
NO SCALE

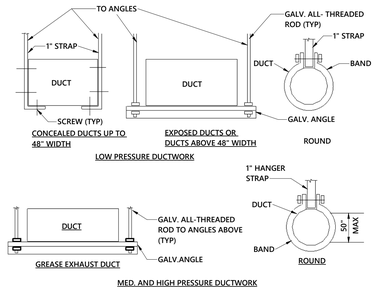


8 ROOF - MOUNTED CONDENSING UNIT
NOT TO SCALE



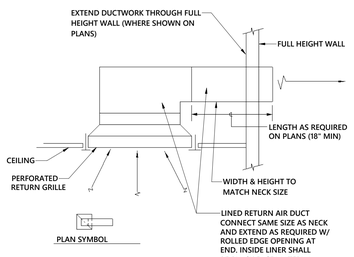
NOTES:
1. DUCTWORK SHALL BE INSTALLED LEVEL, AS HIGH AS POSSIBLE (UNLESS OTHERWISE NOTED).
2. ALL EXPOSED SPIRAL DUCTWORK SHALL BE DOUBLE WALL LINDAB SPIROSAFE SELF-SEALING DUCT SYSTEM (OR APPROVED EQUAL). REGISTERS ON SPIRAL DUCT SHALL BE MOUNTED WITHOUT THE USE OF RECTANGULAR REGISTER TAPS, TOP AND BOTTOM FLANGES SHALL MEET FLUSH WITH THE SPIRAL DUCT WALL REGARDLESS OF DUCT DIAMETER.

9 DBL. DEFL. DIFFUSER MOUNTING ON SPIRAL DUCT
NOT TO SCALE



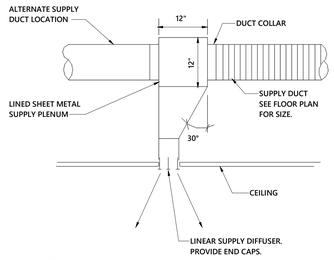
NOTES:
1. SUPPORTS OR FASTENERS SHALL NOT PENETRATE GREASE EXHAUST DUCT.
2. EXPOSED DUCTS SHALL BE SUPPORTED WITH THREADED RODS OR TRAPEZE SUPPORTS.

10 DUCT HANGER
NOT TO SCALE



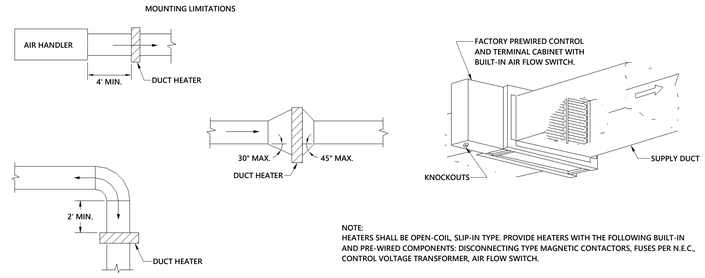
NOTES:
1. ROUND NECK RETURN GRILLES ARE SIMILAR. SOUND ATTENUATION DUCT AND ELBOW SHALL BE NECK SIZE OF GRILLE.
2. A SECTION OF FLEXIBLE DUCTWORK, FULL SIZE OF RETURN GRILLE NECK, MAY SUBSTITUTED AS AN ALTERNATIVE. MINIMUM LENGTH OF FLEXIBLE DUCTWORK SHALL BE 4'-0".

11 RETURN GRILLE WITH SOUND ATTENUATION
NO SCALE



NOTE:
LINEAR DIFFUSER SHOWN ON FLOOR PLANS WITHOUT SUPPLY PLENUM TO BE USED AS RETURN.

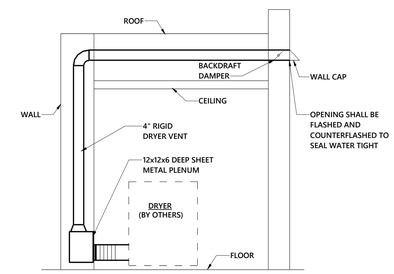
12 DIFFUSER PLENUM
NOT TO SCALE



NOTE:
IF HEATER IS INSTALLED DOWNSTREAM, TURNING VANES MUST BE INSTALLED IN THE TURN.

NOTE:
HEATERS SHALL BE OPEN-COIL, SLIP-IN TYPE. PROVIDE HEATERS WITH THE FOLLOWING BUILT-IN AND PRE-WIRED COMPONENTS: DISCONNECTING TYPE MAGNETIC CONTACTORS, FUSES PER N.E.C., CONTROL VOLTAGE TRANSFORMER, AIR FLOW SWITCH.

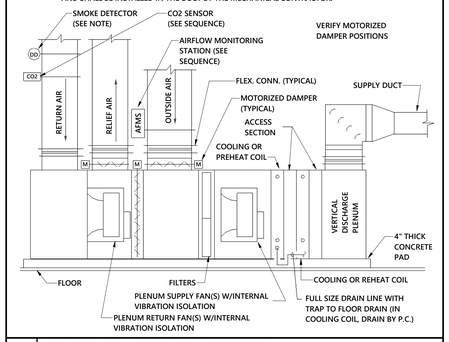
13 ELECTRIC DUCT HEATER DETAIL
NO SCALE



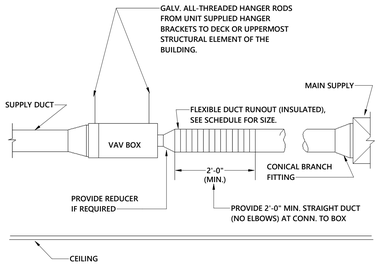
NOTES:
1. DRYER VENT PIPING SHALL BE GALVANIZED SHEET METAL AND SHALL HAVE A SMOOTH INTERIOR FINISH WITH JOINTS RUNNING IN THE DIRECTION OF THE AIR FLOW.
2. MAXIMUM LENGTH OF DRYER VENT SHALL NOT EXCEED 35' IN TOTAL LENGTH (DEDUCT 5' FOR EACH 90° ELBOW AND 3' FOR EACH 45° ELBOW).
3. DRYER VENT SHALL BE NONSCREENED WITH A BACKDRAFT DAMPER AND MINIMUM SIZE OF 4".

14 DRYER VENT THRU WALL
NOT TO SCALE

NOTES:
1. ALL AIR HANDLING UNITS UNITS SHALL BE PROVIDED WITH A PHOTOELECTRIC TYPE SMOKE DETECTOR MOUNTED IN THE RETURN DUCT. THE SMOKE DETECTOR SHALL BE FURNISHED AND WIRED FOR UNIT SHUT DOWN AND FIRE ALARM INTERFACE BY THE ELECTRICAL CONTRACTOR AND SHALL BE INSTALLED IN THE DUCT BY THE MECHANICAL CONTRACTOR.

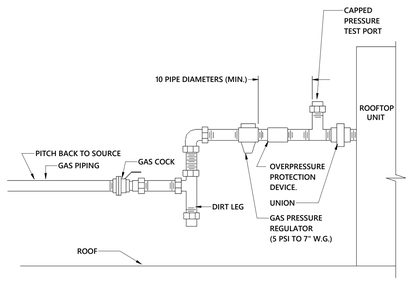


15 UPFLOW AIR HANDLING UNIT DETAIL
NO SCALE



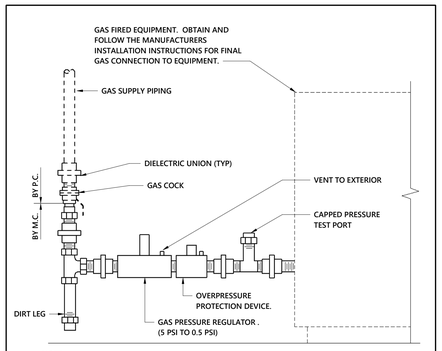
NOTES:
1. MECHANICAL CONTRACTOR SHALL PROVIDE ACCESS DOOR IN CEILING IF REQUIRED.
2. INSTALL VAV TERMINAL PER UNIT MFR'S INSTALLATION INSTRUCTIONS AND PROVIDE MINIMUM CLEARANCES FOR SERVICE, ACCESS, AND PERFORMANCE AS REQUIRED AND/OR RECOMMENDED BY THE UNIT MFR.
3. SEE 7/M-502 FOR COIL PIPING DETAIL.

16 VAV TERMINAL UNIT DETAIL
NOT TO SCALE



NOTE:
1. PROVIDE DIELECTRIC UNIONS WHERE DISSIMILAR METALS ARE JOINED.
2. GAS PRESSURE REGULATORS INSTALLED WITHIN 15 FEET OF AN OUTSIDE AIR INTAKE SHALL BE PROVIDED WITH A VENT PIPE EXTENSION TO EXTEND A MINIMUM OF 3 FEET ABOVE THE OUTSIDE AIR INTAKE.

17 ROOF EQUIPMENT GAS CONNECTION DETAIL
NOT TO SCALE



NOTE:
GAS PIPING AND SHUT-OFF VALVE SHALL BE BY PLBG. CONTR., DIRT LEG, REGULATOR, AND FINAL CONNECTION TO UNIT SHALL BE BY MECH. CONTR.

18 GAS CONNECTION TO INDOOR UNIT (WITH REGULATOR) (FLOOR MOUNTED)
NOT TO SCALE

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022
2	Permit Revisions	01-11-2023

PROJECT: 9201-218240
DATE: 01-12-2023

MECHANICAL DETAILS

M-501

Optima # 22-0082

01.12.2023 - BID SET

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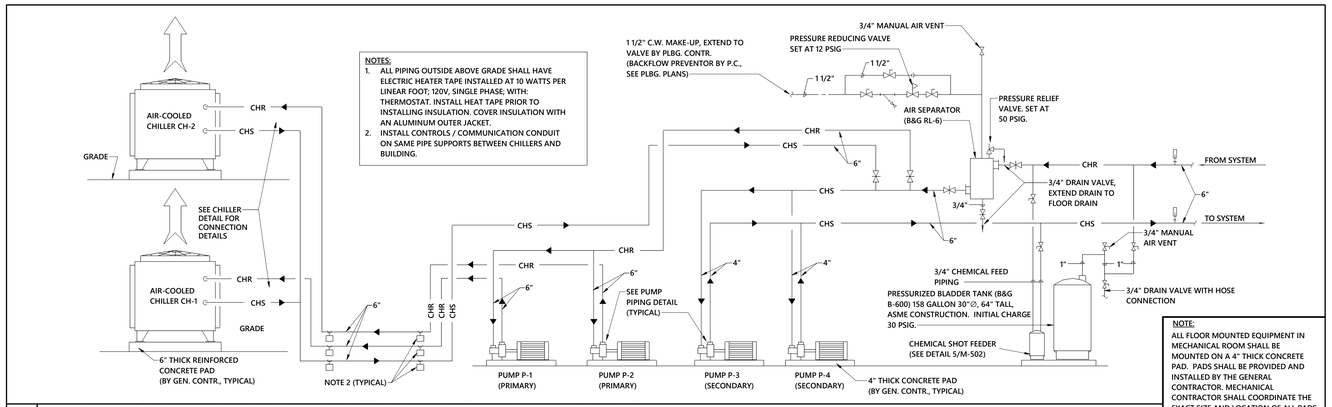
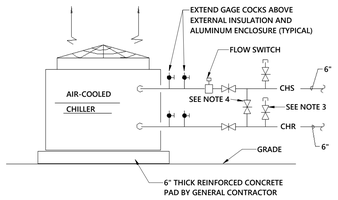


NOTES:
1. ALL PIPING OUTSIDE ABOVE GRADE SHALL HAVE ELECTRIC HEATER TAPE INSTALLED AT 10 WATTS PER LINEAR FOOT; 120V, SINGLE PHASE; WITH: THERMOSTAT. INSTALL HEAT TAPE PRIOR TO INSTALLING INSULATION. COVER INSULATION WITH AN ALUMINUM OUTER JACKET.
2. INSTALL CONTROLS / COMMUNICATION CONDUIT ON SAME PIPE SUPPORTS BETWEEN CHILLERS AND BUILDING.

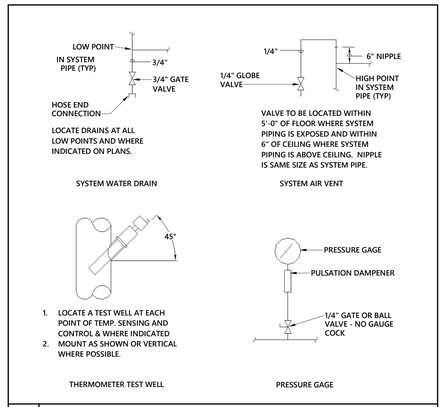
NOTE:
ALL FLOOR MOUNTED EQUIPMENT IN MECHANICAL ROOM SHALL BE MOUNTED ON A 4" THICK CONCRETE PAD. PADS SHALL BE PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR. MECHANICAL CONTRACTOR SHALL COORDINATE THE EXACT SIZE AND LOCATION OF ALL PADS WITH THE GENERAL CONTRACTOR.

1 CHILLED WATER PIPING SCHEMATIC (PRIMARY/SECONDARY WITH DUAL AIR COOLED CHILLERS)
NO SCALE

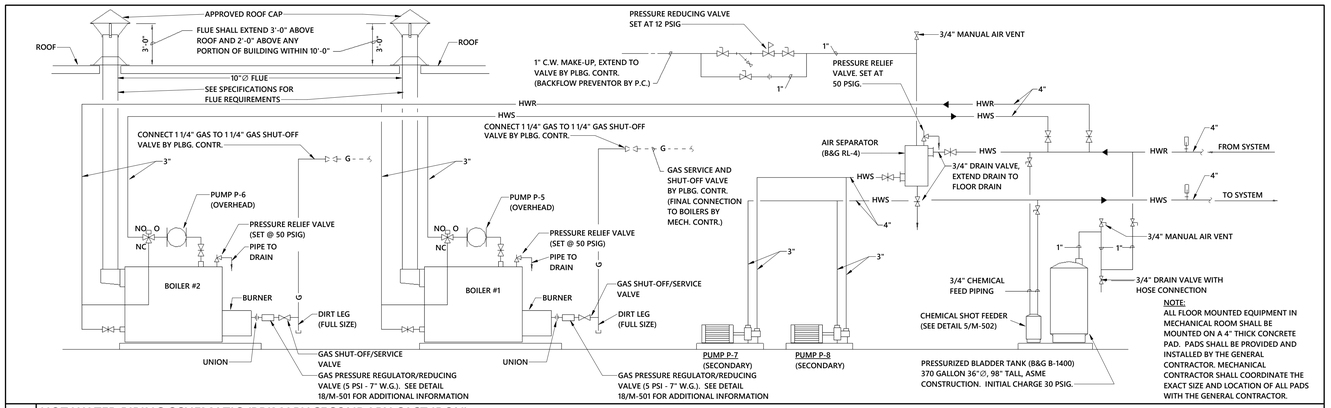
NOTES:
1. ALL PIPING EXPOSED ABOVE GRADE SHALL HAVE ELECTRIC HEAT TAPE WITH THERMOSTAT INSTALLED. HEAT TAPE SHALL BE 120V-1Ø WITH A CAPACITY OF 10 WATTS PER LINEAR FOOT. HEAT TAPE SHALL BE INSTALLED PRIOR TO INSTALLATION OF INSULATION.
2. INSULATION EXPOSED ABOVE GRADE SHALL BE COVERED WITH AN ALUMINUM OUTER JACKET, ELBOWS AND FITTINGS SHALL BE COVERED WITH PVC FITTING COVERS. ALUMINUM ENCLOSURE SHALL BE SEALED WATER TIGHT.
3. PROVIDE CONNECTIONS AT EACH CHILLER TO ALLOW TEMPORARY CHILLER TO BE CONNECTED DURING TIMES WHEN PERMANENT CHILLER IS DOWN FOR MAINTENANCE. PROVIDE ALL NECESSARY VALVING AND FLANGING FOR THIS TO OCCUR WITHOUT DRAINING SYSTEM.
4. PROVIDE FULL SIZE BYPASS WITH BUTTERFLY VALVE FOR SYSTEM FLUSHING. SOLATION VALVES SHALL REMAIN CLOSED UNTIL SYSTEM HAS BEEN FLUSHED AND VERIFIED "CLEAN" BY THE CHEMICAL TREATMENT SUPPLIER. UPON UNIT START-UP, FOLLOWING CLEANING, BYPASS VALVE SHALL BE PERMANENTLY CLOSED.



2 AIR-COOLED CHILLER DETAIL
NO SCALE

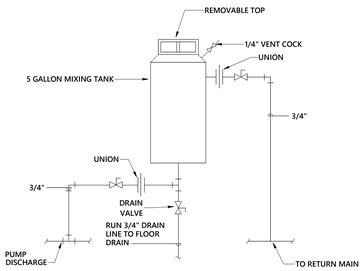


3 PIPING SPECIALTIES
NO SCALE



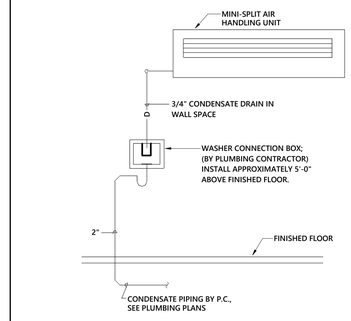
NOTE:
ALL FLOOR MOUNTED EQUIPMENT IN MECHANICAL ROOM SHALL BE MOUNTED ON A 4" THICK CONCRETE PAD. PADS SHALL BE PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR. MECHANICAL CONTRACTOR SHALL COORDINATE THE EXACT SIZE AND LOCATION OF ALL PADS WITH THE GENERAL CONTRACTOR.

4 HOT WATER PIPING SCHEMATIC (PRIMARY SECONDARY CAST IRON)
NO SCALE

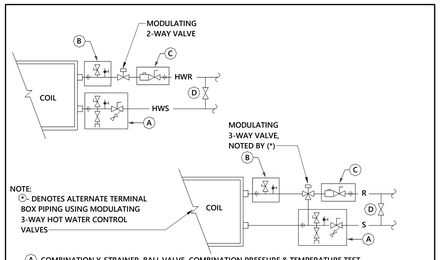


NOTES:
1. TANK FOR CHEMICAL FEED SHALL BE SIZED TO HOLD CARTRIDGE FILTERS. CONTRACTOR SHALL SUPPLY 12 CARTRIDGES FOR EACH MAKEUP STATION

5 CHEMICAL FEED FOR CLOSED WATER SYSTEM DETAIL
NOT TO SCALE



6 WALLBOX CONDENSATE DRAIN SCHEMATIC
NO SCALE

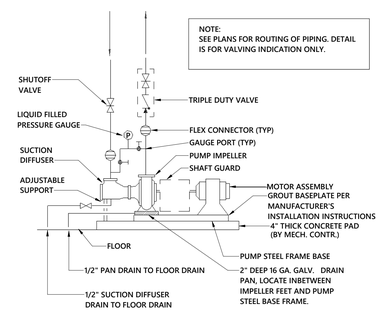


NOTE:
(*)- DENOTES ALTERNATE TERMINAL BOX PIPING USING MODULATING 3-WAY HOT WATER CONTROL VALVES

(A) COMBINATION Y-STRAINER, BALL VALVE, COMBINATION PRESSURE & TEMPERATURE TEST VALVES AND MANUAL AIR VENT, AND DRAIN VALVE WITH 3/4" HOSE CONNECTION, AND UNION (GRISWOLD ISOLATOR S OR EQUAL)
(B) COMBINATION PRESSURE & TEMPERATURE TEST VALVES AND MANUAL AIR VENT, AND UNION (GRISWOLD ISOLATOR U OR EQUAL)
(C) AUTOMATIC CONTROL VALVE ASSEMBLY WITH BALL VALVE AND STAINLESS STEEL FLOW CONTROL CARTRIDGE, AND UNION (GRISWOLD ISOLATOR R OR EQUAL)
(D) FULL SIZE BYPASS VALVE (SEE NOTE 2)

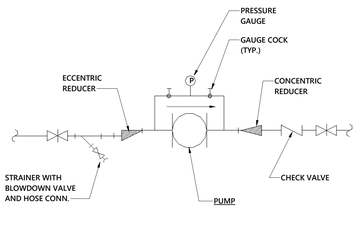
NOTES:
1. PROVIDE 8" OF STRAIGHT PIPE BETWEEN BOX AND VALVE ASSEMBLY. PROVIDE 36" CLEAR SPACE IN FRONT OF CONTROLLER BOX FOR ACCESS, AND LOCATE CONTROLS AND PIPING ON SAME SIDE.
2. PROVIDE FULL SIZE BYPASS VALVE FOR SYSTEM FLUSHING. COIL ISOLATION VALVES SHALL REMAIN CLOSED UNTIL SYSTEM HAS BEEN FLUSHED AND VERIFIED "CLEAN" BY THE CHEMICAL TREATMENT SUPPLIER. UPON UNIT START-UP, FOLLOWING CLEANING, BYPASS VALVE SHALL BE PERMANENTLY CLOSED.

7 TERMINAL BOX PIPING DETAIL
NO SCALE

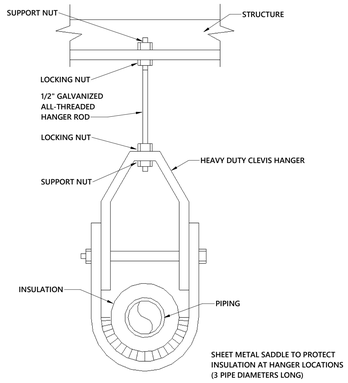


NOTE:
SEE PLANS FOR ROUTING OF PIPING. DETAIL IS FOR VALVING INDICATION ONLY.

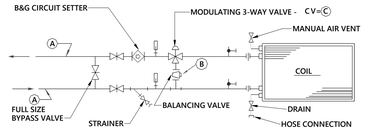
8 PUMP PIPING DETAIL
NO SCALE



9 INLINE PUMP DETAIL
NOT TO SCALE



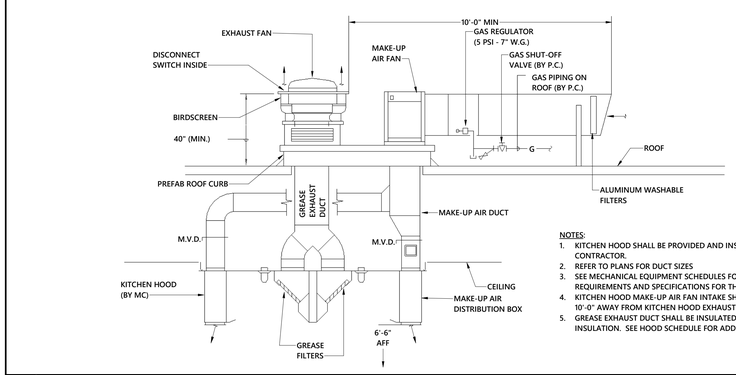
10 PIPE HANGER DETAIL
NOT TO SCALE



SIZES					
UNIT NO.	TYPE COIL	(A)	(B)	(C)	REMARKS
AHU-7	COOLING	3"	2-1/2"	38	96.4 GPM
AHU-9	COOLING	2-1/2"	2"	21	59.6 GPM
AHU-7	HEATING	2"	1-1/2"	12	21.2 GPM
AHU-9	HEATING	1-1/2"	1-1/4"	7	12.3 GPM

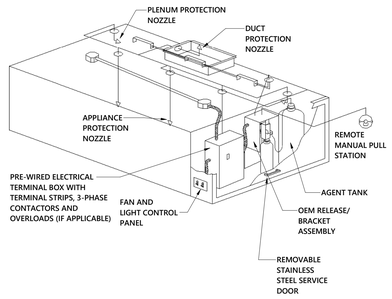
NOTES:
1. PROVIDE MODULATING 3-WAY HOT WATER AND CHILLED WATER CONTROL VALVES WHERE INDICATED. ALL OTHER AIR HANDLING UNITS SHALL HAVE MODULATING 2-WAY HOT WATER AND CHILLED WATER CONTROL VALVES.
2. PROVIDE FULL SIZE BYPASS WITH BUTTERFLY VALVE FOR SYSTEM FLUSHING. COIL ISOLATION VALVES SHALL REMAIN CLOSED UNTIL SYSTEM HAS BEEN FLUSHED AND VERIFIED "CLEAN" BY THE CHEMICAL TREATMENT SUPPLIER. UPON UNIT START-UP, FOLLOWING CLEANING, BYPASS VALVE SHALL BE PERMANENTLY CLOSED.

11 AHU PIPING DETAIL
NO SCALE

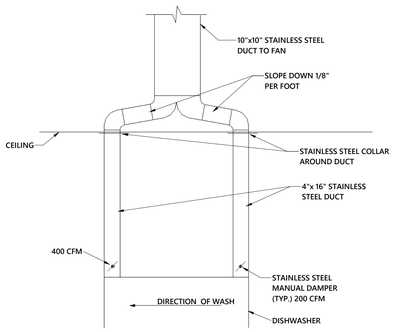


NOTES:
1. KITCHEN HOOD SHALL BE PROVIDED AND INSTALLED BY MECHANICAL CONTRACTOR.
2. REFER TO PLANS FOR DUCT SIZES
3. SEE MECHANICAL EQUIPMENT SCHEDULES FOR ADDITIONAL REQUIREMENTS AND SPECIFICATIONS FOR THE KITCHEN HOOD.
4. KITCHEN HOOD MAKE-UP AIR FAN INTAKE SHALL BE A MINIMUM OF 10'-0" AWAY FROM KITCHEN HOOD EXHAUST FAN.
5. GREASE EXHAUST DUCT SHALL BE INSULATED WITH FIRE BLANKET INSULATION. SEE HOOD SCHEDULE FOR ADDITIONAL INFORMATION.

12 KITCHEN HOOD SYSTEM DETAIL
NO SCALE

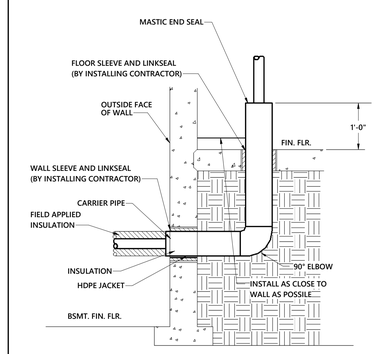


13 KITCHEN HOOD FIRE SUPRESSION
NO SCALE



NOTES:
1. ALL DUCT SEAMS AND JOINTS SHALL BE CONSTRUCTED WATERTIGHT. ALL DUCTWORK SHALL SLOPE TOWARD DISHWASHER.
2. ALL DUCTWORK BELOW CEILING SHALL BE SINGLE CONTINUOUS DUCT DOWN TO DISHWASHER CONNECTION. NO ANGLES OR WELDS BELOW THE CEILING.

14 DISHWASHER EXHAUST DETAIL
NO SCALE



15 BUILDING PIPE SLEEVE DETAIL
NO SCALE

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

MECHANICAL SCHEMATICS AND DETAILS

M-502

Optima # 22-0082

01.12.2023 - BID SET

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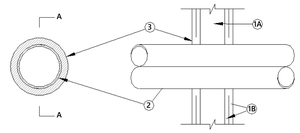
SYSTEM NO. W-L-1054

METAL PIPE THROUGH GYPSUM WALL ASSEMBLY

F RATINGS - 1 AND 2 HR (SEE ITEMS 1 AND 3)
T RATING - 0 HR
L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT
L RATING AT 400 F - 4 CFM/SQ FT



SECTION A-A

1. WALL ASSEMBLY -- THE 1 OR 2 HR FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. STUDS -- WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC. STEEL STUDS TO BE MIN 2-1/2 IN. WIDE AND SPACED MAX 24 IN. OC. WHEN STEEL STUDS ARE USED AND THE DIAM OF OPENING EXCEEDS THE WIDTH OF STUD CAVITY, THE OPENING SHALL BE FRAMED ON ALL SIDES USING LENGTHS OF STEEL STUD INSTALLED BETWEEN THE VERTICAL STUDS AND SCREW-ATTACHED TO THE STEEL STUDS AT EACH END. THE FRAMED OPENING IN THE WALL SHALL BE 4 TO 6 IN. WIDER AND 4 TO 6 IN. HIGHER THAN THE DIAM OF THE PENETRATING ITEM SUCH THAT, WHEN THE PENETRATING ITEM IS INSTALLED IN THE OPENING, A 2 TO 3 IN. CLEARANCE IS PRESENT BETWEEN THE PENETRATING ITEM AND THE FRAMING ON ALL FOUR SIDES.
   B. GYPSUM BOARD* -- 5/8 IN. THICK, 4 FT WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM BOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 32-1/4 IN. FOR STEEL STUD WALLS. MAX DIAM OF OPENING IS 14-1/2 IN. FOR WOOD STUD WALLS. THE F RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE FIRE RATING OF THE WALL ASSEMBLY.
2. THROUGH-PENETRANTS -- ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE SHALL BE MIN 0 IN. TO MAX 2-1/4 IN. PIPE MAY BE INSTALLED WITH CONTINUOUS POINT CONTACT. PIPE, CONDUIT OR TUBING MAY BE INSTALLED AT AN ANGLE NOT GREATER THAN 45 DEGREES FROM PERPENDICULAR. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:
   A. STEEL PIPE -- NOM 30 IN DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
   B. IRON PIPE -- NOM 30 IN. DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
   C. CONDUIT -- NOM 4 IN DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR 6 IN. DIAM STEEL CONDUIT.
   D. COPPER TUBING -- NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
   E. COPPER PIPE -- NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
3. FILL, VOID OR CAVITY MATERIAL* -- SEALANT -- MIN 5/8 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. AT THE POINT OR CONTINUOUS CONTACT LOCATIONS BETWEEN PIPE AND WALL, A MIN 1/2 IN. DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE PIPE WALL INTERFACE ON BOTH SURFACES OF WALL.

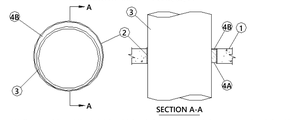
*BEARING THE UL CLASSIFICATION MARK

1 U.L SYSTEM NO W-L-1054 DETAIL
NO SCALE

SYSTEM NO. C-AJ-1226

METAL PIPE THROUGH CONCRETE WALL ASSEMBLY

F RATING — 3 HR
T RATING — 0 HR
L RATING AT AMBIENT — LESS THAN 1 CFM/SQ FT
L RATING AT 400 F — 4 CFM/SQ FT



SECTION A-A

1. Floor or Wall Assembly -- Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 32 in.
2. Metallic Sleeve -- (Optional) Nom 32 in. diam (or smaller) Schedule 40 (or heavier) steel sleeve cast or grouted into floor or wall assembly, flush with floor or wall surfaces or extending a max of 3 in. above floor or beyond both surfaces of wall.
   2a. Sheet Metal Sleeve -- (Optional) Max 6 in. diam, min 26 ga galv steel provided with a 26 GA galv steel square flange spot welded to the sleeve at approx mid-height, or flush with bottom of sleeve in floors, and sized to be a min of 2 in. larger than the sleeve diam. The sleeve is to be cast in place and may extend a max of 4 in. below the bottom of the deck and a max of 1 in. above the top surface of the concrete floor.
   2b. Sheet Metal Sleeve -- (Optional) - Max 12 in. diam, min 24 ga galv steel provided with a 24 GA galv steel square flange spot welded to the sleeve at approx mid-height, or flush with bottom of sleeve in floors, and sized to be a min of 2 in. larger than the sleeve diam. The sleeve is to be cast in place and may extend a max of 4 in. below the bottom of the deck and a max of 1 in. above the top surface of the concrete floor.
3. Through-Penetrant -- One metallic pipe, tube or conduit to be installed either concentrically or eccentrically within the firestop system. The annular space between penetrant and periphery of opening shall be min 0 in. (point contact) to max 1-7/8 in. Penetrant may be installed with continuous point contact. Penetrant to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic penetrants may be used:
   A. Steel Pipe -- Nom 30 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. Iron Pipe -- Nom 30 in. diam (or smaller) cast or ductile iron pipe.
   C. Copper Pipe -- Nom 6 in. diam (or smaller) Regular (or heavier) copper pipe.
   D. Copper Tubing -- Nom 6 in. diam (or smaller) Type L (or heavier) copper tubing.
   E. Conduit -- Nom 6 in. diam (or smaller) steel conduit.
   F. Conduit -- Nom 4 in. diam (or smaller) steel electrical metallic tubing (EMT).
4. Firestop System -- The firestop system shall consist of the following:
   A. Packing Material -- Min 4 in. thickness of min 4 pcf mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or sleeve or from both surfaces of wall or sleeve as required to accommodate the required thickness of fill material.
   B. Fill, Void or Cavity Material* -- Sealant -- Min 1/4 in. thickness of fill material applied within the annulus, flush with top surface of floor or sleeve or with both surfaces of wall or sleeve. At the point or continuous contact locations between penetrant and concrete or sleeve, a min 1/4 in. diam bead of fill material shall be applied at the concrete or sleeve/ pipe penetrant interface on the top surface of floor and on both surfaces of wall.

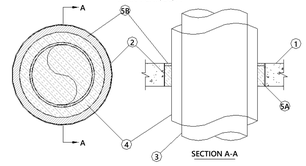
*Bearing the UL Classification Mark

2 U.L SYSTEM NO C-AJ-1226 DETAIL
NO SCALE

SYSTEM NO. C-AJ-5091

INSULATED METAL PIPE THROUGH CONCRETE WALL ASSEMBLY

F RATING — 2 HR
T RATING — 1 HR
L RATING AT AMBIENT — 4 CFM/SQ FT
L RATING AT 400 F — LESS THAN 1 CFM/SQ FT



SECTION A-A

1. Floor or Wall Assembly — Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 19-1/2 in. See Concrete Blocks (CAZT) category in the Fire Resistance directory for names of manufacturers.
2. Metallic Sleeve — (Optional) — Nom 20 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.
   A. Sheet Metal Sleeve — (Optional) - Max 6 in. diam, min 26 ga galv steel provided with a 26 ga galv steel square flange spot welded to the sleeve at approximately mid- height, or flush with bottom of sleeve in floors, and sized to be a min of 2 in. larger than the sleeve diam. The sleeve is to be cast in place flush with bottom surface of floor and may extend a max of 1 in. above the top surface of the floor.
   B. Sheet Metal Sleeve — (Optional) - Max 12 in. diam, min 24 ga galv steel provided with a 24 ga galv steel square flange spot welded to the sleeve at approximately mid- height, or flush with bottom of sleeve in floors, and sized to be a min of 2 in. larger than the sleeve diam. The sleeve is to be cast in place flush with bottom surface of floor and may extend a max of 1 in. above the top surface of the floor.
3. Through Penetrants — One metallic pipe or tubing to be installed either concentrically or eccentrically within the firestop system. Pipe or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes or tubing may be used:
   A. Steel Pipe — Nom 12 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. Iron Pipe — Nom 12 in. diam (or smaller) cast or ductile iron pipe.
   C. Copper Pipe — Nom 6 in. diam (or smaller) Regular (or heavier) copper pipe.
   D. Copper Tubing — Nom 6 in. diam (or smaller) Type L (or heavier) copper tubing.
4. Pipe Covering — Nom 2 in. thick hollow cylindrical heavy density (min 3.5 pcf) glass fiber units jacketed on the outside with an all-service jacket. Longitudinal joints sealed with metal fasteners or factory-applied, self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product. The annular space between the insulated pipe and the edge of the periphery of the opening shall be min 1/2 in. to a max 2-1/4 in. e-017,I0.4;See Pipe Equipment Covering -- Materials -- (BRGU) category in the Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.
   A. Pipe Covering -- (Not Shown) -- As an alternate to Item 4, max 2 in. thick cylindrical calcium silicate (min 14 pcf) units sized to the outside diam of the pipe or tube may be used. Pipe insulation secured with stainless steel bands or min 8 AWG stainless steel wire spaced max 12 in. OC. The annular space shall be min 1/2 in. to max 2-1/4 in.
5. Firestop System -- The firestop system shall consist of the following:
   A. Packing Material -- Min 4 in. thickness of min 4 pcf mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of fill material.
   B. Fill, Void or Cavity Material* -- Sealant -- Min 1/2 in. thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall.

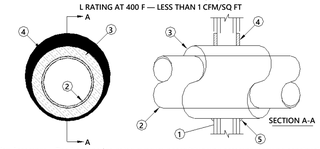
*Bearing the UL Classification Mark

3 U.L SYSTEM NO C-AJ-5091 DETAIL
NO SCALE

SYSTEM NO. W-L-5029

INSULATED METAL PIPE THROUGH GYPSUM WALL ASSEMBLY

F RATINGS — 1 AND 2 HR (SEE ITEM 1)
T RATINGS — 1/2, 3/4, 1, 1-1/2 AND 1-3/4 HR. (SEE ITEM 3)
L RATING AT AMBIENT — 4 CFM/SQ FT
L RATING AT 400 F — LESS THAN 1 CFM/SQ FT



SECTION A-A

1. Wall Assembly -- The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs -- Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced max 24 in. OC.
   B. Gypsum Board* -- 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual Wall and Partition Design. Max diam of opening is 18-5/8 in. The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.
2. Through Penetrants -- One metallic pipe or tubing to be centered within the firestop system. Pipe or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes or tubing may be used:
   A. Steel Pipe -- Nom 12 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. Iron Pipe -- Nom 12 in. diam (or smaller) cast or ductile iron pipe.
   C. Copper Tubing -- Nom 6 in. diam (or smaller) Type L (or heavier) copper tubing.
   D. Copper Pipe -- Nom 6 in. diam (or smaller) Regular (or heavier) copper pipe.
3. Pipe Covering* -- Nom 1, 1-1/2 or 2 in. thick hollow cylindrical heavy density (min 3.5 pcf) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product. See Pipe and Equipment Covering - Materials (BRGU) category in the Building Material Directory for the names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Incex of 25 or less and a Smoke Developed Index of 50 or less may be used. The hourly T Rating of the firestop system is dependent on the hourly fire rating of the wall assembly in which it is installed, the size and type of through penetrant and the pipe covering thickness, as shown in the table below:

Wall Assembly Rating Hr.	Through Penetrant		Pipe Covering Thkng In.	Annular Space		T Rating Hr
	Type +	Max Diam In.		Min In.	Max In.	
1	A	4	1	0	1-1/2	1/2
1	B or C	2	1 or 1-1/2	0	1-1/2	1/2
1	A	4	1-1/2	0	1-1/2	1
1	A	12	2	0	1-7/8	3/4
1	B or C	6	2	0	1-7/8	1
2	A	4	1	0	1-1/2	1
2	B or C	4	1 or 1-1/2	0	1-1/2	1
2	B or C	6	2	0	1-7/8	1
2	A	4	1-1/2	0	1-1/2	1-1/4
2	A	12	2	0	1-7/8	1-1/2
2	B or C	6	2	0	1-7/8	1

+INDICATES PENETRANT TYPE AS ITEMIZED IN ITEM 2.

4. PIPE COVERING* -- (NOT SHOWN) -- AS AN ALTERNATE TO ITEM 3, MAX 2 IN. THICK CYLINDRICAL CALCIUM SILICATE (MIN 14 PCF) UNITS SIZED TO THE OUTSIDE DIAM OF THE PIPE OR TUBE MAY BE USED. PIPE INSULATION SECURED WITH STAINLESS STEEL BANDS OR MIN 8 AWG STAINLESS STEEL WIRE SPACED MAX 12 IN. OC. WHEN THE ALTERNATE PIPE COVERING IS USED, THE T RATING SHALL BE DETERMINED FROM THE TABLE ABOVE. SEE PIPE AND EQUIPMENT COVERING -- MATERIALS (BRGU) CATEGORY IN THE BUILDING MATERIALS DIRECTORY FOR NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.
5. FILL, VOID OR CAVITY MATERIAL* -- SEALANT -- MIN 5/8 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. AT THE POINT CONTACT LOCATION BETWEEN PIPE COVERING AND GYPSUM BOARD, A MIN 1/2 IN. DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE PIPE COVERING/GYPSUM BOARD INTERFACE ON BOTH SURFACES OF WALL.

*BEARING THE UL CLASSIFICATION MARK

4 U.L SYSTEM NO W-L-5029 DETAIL
NO SCALE

THE GENERAL CONTRACTOR IS RESPONSIBLE FOR RETAINING A FIRE STOPPING CONTRACTOR TO PROVIDE AND INSTALL FIRE STOPPING FOR PENETRATIONS OF FIRE RATED WALLS, FLOORS, AND PARTITIONS. ALL FIRE STOP INSTALLATION SHALL BE PERFORMED BY THIS CONTRACTOR. ALL FIRE STOPPING SHALL BE SUPPLIED BY THE SAME MANUFACTURER. ACCEPTABLE FIRE STOP MANUFACTURERS ARE HILTI, 3M, SPECIFIED TECHNOLOGIES, INC., AND TREMCO. SEE SPECIFICATION SECTIONS 078413 AND 078446 FOR ADDITIONAL REQUIREMENTS.

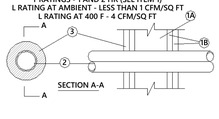
1. ALL INSULATED METAL PIPING PENETRATING A ONE HOUR OR MORE RATED ASSEMBLY SHALL BE SEALED AROUND INSULATION ON BOTH SIDES OF WALL WITH AN APPROVED FIRE STOP WRAP/STRIP MATERIAL. NUMBER OF WRAPS AROUND INSULATION WITHIN WALL OPENING SHALL BE AS REQUIRED FOR THICKNESS OF INSULATION AND MFG. RECOMMENDATIONS. COVER EXPOSED SURFACE AND SEAMS WITH AN APPROVED FIRE STOP CAULK ON BOTH SIDES OF WALL.
2. ALL NON-INSULATED METAL PIPING PENETRATING A ONE HOUR WALL OR MORE RATED WALL OR FLOOR SHALL BE SEALED AROUND PIPE ON BOTH SIDES OF WALL WITH AN APPROVED FIRE STOP CAULK. THICKNESS SHALL BE AS RECOMMENDED BY MANUFACTURER FOR WALL RATING REQUIRED TO MAINTAIN U.L. CLASSIFICATION.
3. ALL METAL DUCTWORK (LESS THAN 100 SQUARE INCHES) PENETRATING A ONE HOUR WALL OR SMOKE SHALL BE SEALED AROUND DUCT ON BOTH SIDES OF WALL WITH A SHEET METAL COLLAR (SAME GAUGE AS DUCT) SECURED TO WALL AND DUCT IN A SMOKE-TIGHT MANNER. DUCT PENETRATIONS EXCEEDING 100 SQUARE INCHES SHALL HAVE A FIRE DAMPER INSTALLED IN THE WALL AS DETAILED.
4. ALL DUCTWORK PENETRATING A TWO HOUR OR MORE RATED WALL OR FLOOR SHALL BE PROVIDED WITH A FIRE DAMPER INSTALLED AS DETAILED.
5. NO FLEXIBLE DUCTWORK WILL BE ALLOWED TO PENETRATE ONE HOUR WALLS, TWO HOUR WALLS, SMOKE WALLS, CORRIDOR WALLS OR WALLS CLOSED-OFF TO STRUCTURE. METAL RIGID DUCTWORK SHALL EXTEND A MINIMUM OF 5'-0" FROM WALL BEFORE THE FIRST AIR DISTRIBUTION DEVICE IS INSTALLED OR BEFORE FLEXIBLE DUCT IS STARTED. FLEXIBLE DUCTWORK IN A SINGLE DUCT RUN IS ALLOWED ON ONE SIDE OF A RATED WALL BUT NOT BOTH SIDES.
6. ACCEPTABLE MANUFACTURERS OF FIRE STOP MATERIALS ARE AS FOLLOWS:
   NELSON FLAMESEAL PUTTY
   CROUSE-HINDS CABLE BARRIER SYSTEM
   DOW CORNING FIRE STOP SEALANT/FOAM
   3M FIRE BARRIER
   T&B FLAMESAFE THERMAFIBER BRAND SAFING
   ALL MATERIALS AND METHODS OF INSTALLATION SHALL BE U.L. APPROVED FOR THAT INSTALLATION. SHOP DRAWING SUBMITTALS OF MATERIALS AND METHOD OF INSTALLATION, INCLUDING DRAWINGS, SHALL BE SUBMITTED TO THE ARCHITECT FOR REVIEW.
7. WHEN A PIPE, WIRE, OR DUCT PENETRATES A NON-RATED SMOKETIGHT PARTITION, THE MECHANICAL CONTRACTOR SHALL SEAL AROUND ALL PIPES WIRES AND DUCTS WITH SEALANT MATERIAL TO MAKE IT SMOKETIGHT. SEE ARCHITECTURAL PLANS FOR LOCATION OF THESE PARTITIONS.
8. SEE ARCHITECTURAL PLANS FOR WALL TYPES.
9. ALL RATED WALL PENETRATIONS SHALL BE IN ACCORDANCE WITH UNDERWRTIERS LABORATORIES PENETRATION FIRESTOP SYSTEM REQUIREMENTS. ALL MATERIALS USED IN PENETRATION FIRESTOP SYSTEMS SHALL BE APPROVED BY UNDERWRITERS LABORATORIES AND SHALL BE U.L. LABELED.
10. PENETRATIONS OF NONRATED WALLS, PARTITIONS AND FLOORS OF NON- COMBUSTIBLE CONSTRUCTION SHALL BE FIRESTOPPED WITH NONCOMBUSTIBLE MATERIALS. PENETRATIONS OF NONRATED WALLS, PARTITIONS AND FLOOR OF COMBUSTIBLE CONSTRUCTION SHALL BE FIRESTOPPED WITH MATERIALS EQUIVALENT TO TWO INCHES OF WOOD. FIRESTOPPING SHALL COMPLY WITH ASTM E-814.

PIPE AND DUCTWORK WALL PENETRATION NOTES (MECHANICAL)
NO SCALE

SYSTEM NO. W-L-2098

PVC PIPE THROUGH GYPSUM WALL ASSEMBLY

F RATINGS - 1 AND 2 HR (SEE ITEM 1)
T RATINGS - 1 AND 2 HR (SEE ITEM 1)
L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT
L RATING AT 400 F - 4 CFM/SQ FT



SECTION A-A

1. Wall Assembly -- The fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs -- Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced max 24 in. OC.
   B. Gypsum Board* -- 5/8 in. thick, 4 ft wide with square or tappered edges. The gypsum wallboard type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual Wall and Partition Design. Max diam of opening is 4-3/8 in. the hourly F and T Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. Through Penetrants -- One nonmetallic pipe installed within the firestop system. Pipe to be rigidly supported on both sides of floor or wall assembly. The space between pipe and periphery of opening shall be min 3/4 in. to max 1-1/4 in. Pipe to be rigidly supported on both sides of the floor or wall assembly. The following types and sizes of nonmetallic pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe -- Nom 2 in. diam (or smaller) Schedule 40 PVC pipe for use in closed (process or supply) piping system.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe -- Nom 2 in. diam (or smaller) SDR17 CPVC pipe for use in closed (process or supply) piping systems.
3. Fill, Void or Cavity Materials* -- Sealant -- Installed to completely fill the annular space between the pipes and gypsum wallboard on both sides of wall.

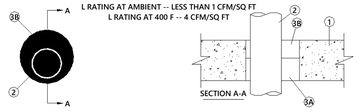
*Bearing the UL Classification Mark

5 U.L SYSTEM NO W-L-2098 DETAIL
NO SCALE

SYSTEM NO. C-AJ-2141

PVC PIPE THROUGH CONCRETE WALL ASSEMBLY

F RATING -- 3 HR
T RATING -- 2 HR
L RATING AT AMBIENT -- LESS THAN 1 CFM/SQ FT
L RATING AT 400 F -- 4 CFM/SQ FT



SECTION A-A

1. FLOOR OR WALL ASSEMBLY — MIN 4-1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF OPENING IS 6 IN. SEE CONCRETE BLOCKS* (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.
2. THROUGH PENETRANTS — ONE NONMETALLIC PIPE OR CONDUIT TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN THE PIPE OR CONDUIT AND THE PERIPHERY OF THE OPENING SHALL BE A MIN 1/2 IN. TO A MAX 2 IN. THE PIPE OR CONDUIT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL. THE FOLLOWING TYPES AND SIZES OF PIPES OR CONDUITS MAY BE USED:
   A. POLYVINYL CHLORIDE (PVC) PIPE — NOM 3 IN. DIAM (OR SMALLER) SCHEDULE 40 PVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEMS.
   B. CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE — NOM 3 IN. DIAM (OR SMALLER) SDR 17 CPVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEMS.
3. FIRESTOP SYSTEM — THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:
   A. FORMING MATERIAL* — MIN 2-1/2 IN. THICKNESS OF FORMING MATERIAL FOAMED INTO OPENING AS A PERMANENT FORM. FORMING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR FROM BOTH SURFACES OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CF810, CF812 OR CFS11 FOAM SEALANT
   B. FILL, VOID OR CAVITY MATERIAL* — SEALANT — MIN 2 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS FLUSH WITH TOP SURFACE OF FLOOR OR WITHIN BOTH SURFACES OF WALL. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE SEALANT

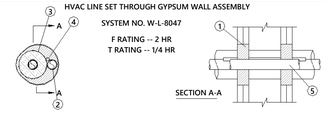
*BEARING THE UL CLASSIFICATION MARK

6 U.L SYSTEM NO C-AJ-2141 DETAIL
NO SCALE

HVAC LINE SET THROUGH GYPSUM WALL ASSEMBLY

SYSTEM NO. W-L-8047

F RATING -- 2 HR
T RATING -- 1/4 HR



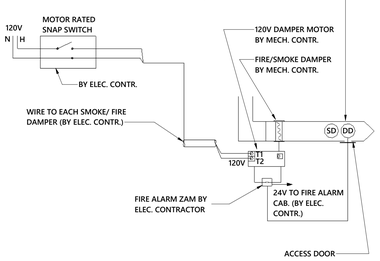
SECTION A-A

1. WALL ASSEMBLY -- THE 2 HR FIRE-RATED GYPSUM BOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL OR PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. STUDS -- WALL FRAMING SHALL CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED MAX 16 IN. OC. STEEL STUDS TO BE MIN 3-1/2 IN. WIDE AND SPACED MAX 24 IN. OC.
   B. GYPSUM BOARD* -- THE GYPSUM BOARD TYPE, THICKNESS NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE SPECIFIED IN THE INDIVIDUAL WALL AND PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 4-1/2 IN.
2. THROUGH PENETRANTS -- ONE OR MORE PIPE OR TUBING TO BE INSTALLED CONCENTRICALLY OR ECCENTRICALLY WITHIN THE OPENING. THE SPACE BETWEEN ANY PENETRANT AND THE PERIPHERY OF THE OPENING SHALL BE MIN 0 IN. (POINT CONTACT) TO MAX 1-1/4 IN. PIPES OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR TUBING MAY BE USED:
   A. COPPER TUBE -- NOM 1 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBE.
   B. COPPER PIPE -- NOM 1 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
3. TUBE INSULATION - PLASTICS+ -- NOM 3/4 IN. THICK ACRYLONITRILE BUTADIENE/POLYVINYL CHLORIDE (AB/PVC) FLEXIBLE FOAM FURNISHED IN THE FORM OF TUBING. TUBE INSULATION TO BE INSTALLED ON ONE OR MORE OF THE METALLIC PIPES OR TUBES. SEE PLASTICS+ (QMFZ2) CATEGORY IN THE PLASTICS RECOGNIZED COMPONENT DIRECTORY FOR NAMES OF MANUFACTURERS. ANY RECOGNIZED COMPONENT TUBE INSULATION MATERIAL MEETING THE ABOVE SPECIFICATIONS AND HAVING A UL 94 FLAMMABILITY CLASSIFICATION OF 94-5VA MAY BE USED.
4. CABLES -- MAX OF ONE 4 PAIR NO. 18 AWG (OR SMALLER) CABLE WITH PVC INSULATION AND JACKET MATERIALS.
5. FILL, VOID OR CAVITY MATERIAL - SEALANT* -- MIN 1-1/4 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS BETWEEN PENETRANTS AND GYPSUM BOARD, FLUSH WITH BOTH SURFACES OF WALL. AT POINT CONTACT, A 1/4 IN. BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE PENETRANT/GYPSUM BOARD INTERFACE ON BOTH SIDES OF WALL.

*BEARING THE UL CLASSIFICATION MARK

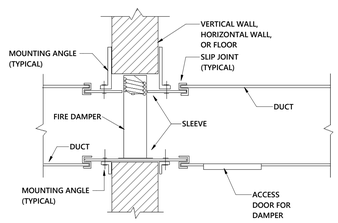
7 U.L SYSTEM NO W-L-8047 DETAIL
NO SCALE

DUCT OR AREA SMOKE DETECTORS PROVIDED BY ELEC. CONTR. INSTALLED BY MECH. CONTR. (INSTALL SMOKE DETECTOR WITHIN 5'-0" OF DAMPER WITH NO OUTLETS BETWEEN DAMPER & DETECTOR)



NOTES:
1. ALL FIRE/SMOKE DAMPERS SUPPLIED AND INSTALLED BY MECHANICAL CONTRACTOR. ALL FIRE ALARM WIRING INSTALLED BY ELECTRICAL CONTRACTOR. 120V WIRING TO DAMPER PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR.
2. DAMPER SHALL BE INSTALLED PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

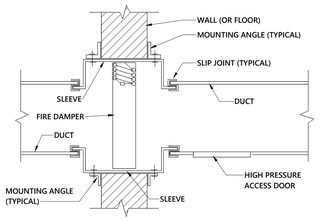
11 SMOKE/FIRE DAMPER WIRING DETAIL
NO SCALE



NOTE: DAMPERS SHALL BE INSTALLED AS PER MFG. INSTRUCTIONS.

FIRE DAMPER SHALL BE RUSKIN TYPE DIBD2 STYLE B 1 1/2 HOUR UL, INSTALLED IN ACCORDANCE WITH NFPA. ACCESS DOOR SHALL BE RUSKIN MODEL ADC2 LOCATED ON ACCESSIBLE CEILING SIDE OF WALL. IF ACCESSIBLE CEILING NOT AVAILABLE, MECHANICAL CONTRACTOR SHALL PROVIDE ACCESS DOOR IN CEILING (OR WALL) TO MATCH FINISH COLOR. DAMPER SHALL BE EQUIPPED FOR HORIZONTAL OR VERTICAL MOUNTING AS REQUIRED. WHERE ROUND DUCTS REQUIRE A DAMPER, AN ENCLOSURE WITH ROUND DUCT CONNECTION WILL BE REQUIRED WITH TYPE B DAMPER INSIDE. ALL MODELS ARE RUSKIN (APPROVED EQUAL ACCEPTABLE).

8 DAMPER - LOW PRESSURE FIRE
NOT TO SCALE



NOTE:
DAMPER SHALL BE INSTALLED PER THE MFG'S RECOMMENDATIONS.

FIRE DAMPER SHALL BE RUSKIN TYPE IBD2

ELECTRICAL ABBREVIATIONS LIST

1P	1 POLE (2P, 3P, 4P, ETC.)
A	AMPERE
AC	ABOVE COUNTER OR AIR CONDITIONER
ACLG	ABOVE CEILING
ADO	AUTOMATIC DOOR OPENER
AF	AMP FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFI	ARC FAULT CIRCUIT INTERRUPTER
AHU	AIR HANDLING UNIT
AL	ALUMINUM
ALT	ALTERNATE
AMP	AMPERE
AMPL	AMPLIFIER
ANNUN	ANNUNCIATOR
APPROX	APPROXIMATELY
AQ-STAT	AQUASTAT
ARCH	ARCHITECT, ARCHITECTURAL
AS	AMP SWITCH
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AV	AUDIO VISUAL
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BD	BOARD
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM
C	CONDUIT
CAB	CABINET
CAT	CATALOG
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
CLG	CEILING
COMB	COMBINATION
CMPR	COMPRESSOR
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUATION OR CONTINUOUS
CONTR	CONTRACTOR
CONV	CONVECTOR
CP	CIRCULATING PUMP
CRT	CATHODE-RAY TUBE
CT	CURRENT TRANSFORMER
CTR	CENTER
CU	COPPER
DCP	DOMESTIC WATER CIRCULATING PUMP
DEPT	DEPARTMENT
DET	DETAIL
DIA	DIAMETER
DISC	DISCONNECT
DIST	DISTRIBUTION
DN	DOWN
DPR	DAMPER
DS	SAFETY DISCONNECT SWITCH
DT	DOUBLE THROW
DWG	DRAWING
EC	ELECTRICAL CONTRACTOR
ELEC	ELECTRIC, ELECTRICAL
ELEV	ELEVATOR
EM	EMERGENCY
EMS	ENERGY MANAGEMENT SYSTEM
EMT	ELECTRICAL METALLIC TUBING
EP	ELECTRIC PNEUMATIC
EQUIP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
EXH	EXHAUST
EXP	EXPLOSION PROOF
FA	FIRE ALARM
FABP	FIRE ALARM BOOSTER POWER SUPPLY PANEL
FACP	FIRE ALARM CONTROL PANEL
FCU	FAN COIL UNIT
FIXT	FIXTURE
FLR	FLOOR
FLUOR	FLUORESCENT
FU	FUSE
FUDS	FUSED SAFETY DISCONNECT SWITCH
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERATOR
GFI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTOR
GND	GROUND
GRS	GALVANIZED RIGID STEEL (CONDUIT)
GYP BD	GYPSUM BOARD
HOA	HANDS-OFF-AUTOMATIC SWITCH
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPF	HIGH POWER FACTOR
HT	HEIGHT
HTG	HEATING
HTR	HEATER
HV	HIGH VOLTAGE
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HWP	HYDRONIC WATER PUMP
IC	INTERRUPTING CAPACITY
IG	ISOLATED GROUND
IMC	INTERMEDIATE METAL CONDUIT
INCAND	INCANDESCENT
IR	INFRARED
I/W	INTERLOCK WITH
J-BOX	JUNCTION BOX
KV	KILOVOLT
KVA	KILOVOLT-AMPERE
KVAR	KILOVOLT-AMPERE REACTIVE
KW	KILOWATT
KWH	KILOWATT HOUR
LOC	LOCATE OR LOCATION
LT	LIGHT
LTG	LIGHTING
LTNG	LIGHTNING
LV	LOW VOLTAGE
MAX	MAXIMUM
MAG.S	MAGNETIC STARTER
M/C	MOMENTARY CONTACT
MC	MECHANICAL CONTRACTOR
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDC	MAIN DISTRIBUTION CENTER
MDP	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MFS	MAIN FUSED DISCONNECT SWITCH
MH	MANHOLE
MIC	MICROPHONE
MIN	MINIMUM
MISC	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MMS	MANUAL MOTOR STARTER
MOA	MULTIOUTLET ASSEMBLY
MSP	MOTOR STARTER PANELBOARD
MSBD	MAIN SWITCHBOARD
MT	MOUNT
MT.C	EMPTY CONDUIT
MTS	MANUAL TRANSFER SWITCH
MTR	MOTOR, MOTORIZED
N.C.	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NFDS	NON-FUSED SAFETY DISCONNECT SWITCH
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
N.O.	NORMALLY OPEN
NPF	NORMAL POWER FACTOR
NTS	NOT TO SCALE
OH	OVERHEAD
OL	OVERLOADS
PA	PUBLIC ADDRESS
PB	PULL BOX OR PUSHBUTTON
PE	PNEUMATIC ELECTRIC
PED	PEDESTAL
PF	POWER FACTOR
PH	PHASE
PIV	POST INDICATING VALVE
PNL	PANEL
PP	POWER POLE
PR	PAIR
PRI	PRIMARY
PROJ	PROJECTION
PRV	POWER ROOF VENTILATOR
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE (CONDUIT)
PWR	POWER
QUAN	QUANTITY
RCPT	RECEPTACLE
REQD	REQUIRED
RM	ROOM
RSC	RIGID STEEL CONDUIT
RTU	ROOF TOP UNIT
SC	SURFACE CONDUIT
SEC	SECONDARY
SHT	SHEET
SIM	SIMILAR
S/N	SOLID NEUTRAL
SPEC	SPECIFICATION
SPKR	SPEAKER
SP	SPARE
SR	SURFACE RACEWAY
SS	STAINLESS STEEL
SSW	SELECTOR SWITCH
S/S	STOP/START PUSHBUTTONS
STA	STATION
STD	STANDARD
SURF	SURFACE MOUNTED
SW	SWITCH
SWBD	SWITCHBOARD
SYM	SYMMETRICAL
SYS	SYSTEM
TEL	TELEPHONE
TEL/DATA	TELEPHONE/DATA
TERM	TERMINAL
TL	TWIST LOCK
TR	TAMPER RESISTANT
T-STAT	THERMOSTAT
TTC	TELEPHONE TERMINAL CABINET
TV	TELEVISION
TVTC	TELEVISION TERMINAL CABINET
TYP	TYPICAL
UC	UNDER COUNTER
UE	UNDERGROUND ELECTRICAL
UG	UNDERGROUND
UH	UNIT HEATER
UT	UNDERGROUND TELEPHONE
UTIL	UTILITY
UV	UNIT VENTILATOR OR ULTRAVIOLET
V	VOLT
VA	VOLT-AMPERES
VDT	VIDEO DISPLAY TERMINAL
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
W	WATT
W/	WITH
WG	WIRE GUARD
WH	WATER HEATER
W/O	WITHOUT
WP	WEATHERPROOF
XFMR	TRANSFORMER
XFR	TRANSFER
∠	ANGLE
@	AT
△	DELTA
'	FEET
"	INCHES
#	NUMBER
Ø	PHASE
C	CENTER LINE
P	PLATE

TELECOM COORDINATION

SEE T-SERIES SHEETS FOR ALL TELECOM REQUIREMENTS, PATHWAYS, BOXES, ETC. INCLUDING RESPONSIBILITY MATRIX

2018 NORTH CAROLINA ENERGY CONSERVATION CODE

COMMERCIAL ENERGY EFFICIENCY - ELECTRICAL SUMMARY

C401 METHOD OF COMPLIANCE

- [x] 2018 NCECC CHAPTER 4
- [ ] N/A BASED ON PROJECT SCOPE
- [ ] NC SPECIFIC COMCHECK PROVIDED
- [ ] ASHRAE 90.1-2013

C406 ADDITIONAL EFFICIENCY PACKAGE OPTIONS

- [ ] C406.2 EFFICIENT MECH EQUIPMENT
- [x] C406.3 REDUCED LTG DENSITY
- [ ] C406.4 ENHANCED DIGITAL LTG CNTLS
- [ ] NOT APPLICABLE BASED ON PROJECT SCOPE
- [ ] C406.5 ON-SITE RENEWABLE ENERGY
- [ ] C406.6 DEDICATED OA SYSTEM
- [ ] C406.7 HI-EFF SERVICE WTR HTG
- [ ] C406.7.1 WTR HTG LOAD FRACTION

C405.2 - LIGHTING CONTROLS (MANDATORY REQUIREMENTS):

- [x] LIGHTING SYSTEMS ARE PROVIDED WITH CONTROLS AS REQUIRED PER SECTION C405.2, EXCEPT WHERE EXEMPT.
- [ ] NOT APPLICABLE

C405.3 - EXIT SIGNS (MANDATORY REQUIREMENTS):

- [x] INTERNALLY ILLUMINATED EXIT SIGNS DO NOT EXCEED 5 WATTS PER SIDE.
- [ ] NOT APPLICABLE

△2

C405.4 - INTERIOR LIGHTING POWER REQUIREMENTS (PRESCRIPTIVE) (NON-EXEMPT):

C405.4.1 - TOTAL CONNECTED INTERIOR LIGHTING POWER:

82,001 WATTS SPECIFIED

44 % REDUCTION OF SPECIFIED VS. ALLOWED (APPLICABLE IF C406.1.2 IS SELECTED)

C405.4.2 - TOTAL ALLOWABLE INTERIOR LIGHTING POWER:

METHOD OF COMPLIANCE:

- [x] BUILDING AREA METHOD
- [ ] SPACE-BY-SPACE METHOD

144,525 WATTS ALLOWED

C405.5.1 - EXTERIOR BUILDING LIGHTING POWER (NON-EXEMPT):

TOTAL CONNECTED EXTERIOR LIGHTING POWER:

8,758 WATTS SPECIFIED

TOTAL ALLOWABLE EXTERIOR LIGHTING POWER:

11,888 WATTS ALLOWED

C405.6 - ELECTRICAL ENERGY CONSUMPTION (DWELLING UNITS):

- [ ] SEPARATE ELECTRICAL METERING HAS BEEN PROVIDED FOR EACH DWELLING UNIT IN GROUP R-2 BUILDINGS.
- [x] NOT APPLICABLE

C405.7 - ELECTRICAL TRANSFORMERS (MANDATORY REQUIREMENTS):

- [x] ELECTRICAL TRANSFORMERS HAVE BEEN SPECIFIED TO MEET MINIMUM EFFICIENCY REQUIREMENTS PER C405.7, EXCEPT WHERE EXEMPT.
- [ ] NOT APPLICABLE

C405.8 - ELECTRICAL MOTORS (MANDATORY REQUIREMENTS):

- [x] ELECTRICAL MOTORS HAVE BEEN SPECIFIED TO MEET MINIMUM EFFICIENCY REQUIREMENTS PER C405.8, EXCEPT WHERE EXEMPT.
- [ ] NOT APPLICABLE

C408 - SYSTEM COMMISSIONING:

- [ ] PROJECT AREA IS LESS THAN 10,000 SQUARE FEET AND IS EXEMPT FROM THE SYSTEM COMMISSIONING REQUIREMENTS OF SECTION C408.
- [x] PROJECT AREA IS GREATER THAN 10,000 SQUARE FEET AND REQUIRES SYSTEM COMMISSIONING PER SECTION C408.

FLR. BOX OUTLETS-FLUSH MOUNT SINGLE DUPLE...

SYMBOL	DESCRIPTION
FB4	FOUR GANG FLUSH MOUNTED FLOOR BOX WITH ACCESSIBLE COVER FOR POWER AND COMMUNICATIONS. PROVIDE TWO NEMA 5-20R DUPLEX RECEPTACLES AND TWO COMMUNICATIONS PLATES FOR SIX RJ45 CAT6 JACKS ON EACH PLATE. EQUAL TO WIREMOLD RFB4-OG-FPBT. ARCHITECT TO SELECT FINISH. STUB FROM BOX ONE CONCEALED 1 1/4"C ROUTED TO WHICHEVER IS NEAREST, BB, J-HOOKS, OR CABLE TRAY.

Note: CONTRACTOR SHALL VERIFY WITH ARCHITECT THE FLOOR FINISH PRIOR TO ORDERING MATERIAL. PROVIDE ALL NECESSARY SHIMS, TRIM PLATES, ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.

ALTERNATES

ELECTRICAL BASED ALTERNATES:
ALT #1B – FIELD LIGHTS
ALT #2B – FIELD LIGHTS
ALT #6 - OWNER PREFERRED VENDOR PACKAGE - BID SQUARE D AS A PREFERRED ALTERNATE

ALLOWANCES

ALLOWANCE - EMERGENCY RESPONSER RADIO ANTENNA/REPEATER SYSTEM - (ERRS) $100,000. (BASE BID TO INCLUDE INITIAL TESTING MAP TO VERIFY IF SYSTEM IS REQUIRED, PATHWAY TO ROOF ANTENNA, AND CIRCUIT FOR BDA. SIGNAL SURVEY REPORT SHALL BE TAKEN TO THE LOCAL FIRE CODE OFFICIAL AND THE LOCAL FIRE CODE OFFICIAL SHALL DETERMINE IF THE SYSTEM NEEDS TO BE INSTALLED. SIGNAL STRENGTH MEASUREMENTS SHALL BE MEASURED IN 95% OF ALL AREAS ON EACH FLOOR (100% OF ALL EGRESS AND CRITICAL AREAS). A MINIMUM SIGNAL STRENGTH OF -95DBM IS REQUIRED. SURVEY REPORT AND INSTALLATION IF REQUIRED SHALL MEET NCFC 510. SEE DETAIL # 9/E-004.

COMMISSIONING NOTE

THIS PROJECT INCLUDES A THIRD PARTY COMMISSIONING AGENT CONTRACTED BY THE OWNER. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH OWNER'S COMMISSIONING AGENT AND PROVIDE ALL NECESSARY TIME, MATERIALS, AND PROCEDURES REQUIRED FOR A FULLY COMMISSIONED PROJECT. SEE COMMISSIONING REQUIREMENTS IN THE PROJECT MANUAL FOR FURTHER INFORMATION.

SPECIAL SYSTEMS LEGEND

SYMBOL	DESCRIPTION
TV	DISPLAY. PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT. REFER TO ELECTRICAL DRAWINGS FOR RECESSED WALL BOX AND CONDUIT REQUIREMENTS.
AV1	DISPLAY. PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT. REFER TO ELECTRICAL DRAWINGS FOR RECESSED WALL BOX AND CONDUIT REQUIREMENTS.
AV2	DISPLAY. PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT. REFER TO ELECTRICAL DRAWINGS FOR RECESSED WALL BOX AND CONDUIT REQUIREMENTS.
M	WALL-MOUNTED MICROPHONE JACK; 1" CONDUIT TO LOCAL SOUND SYSTEM CLOSET
	FLUSH-MOUNTED CEILING SPEAKER.
S	WALL-MOUNTED SPEAKER.3/4" CONDUIT TO LOCAL CABLE TRAY
S WP	EXTERIOR WEATHERPROOF SPEAKER;3/4" CONDUIT TO LOCAL CABLE TRAY PROVIDE WEATHERPROOF J-BOX
S	CEILING-MOUNTED SPEAKER-GYM;3/4" CONDUIT TO LOCAL CABLE TRAY
GA	GENERATOR ANNUNCIATOR PANEL; 3/4" CONDUIT TO ATS. PROVIDE BOX AS REQUIRED PER MANUFACTURER RECOMMENDATION PROVIDE CABLING PER MANUFACTURER RECOMMENDATIONS
N D	ALERT LIGHT - SEE TELECOM PLANS

SECURITY DEVICES SYMBOL LEGEND - ELECTRICAL

SYMBOL	DESCRIPTION
DC	DOOR CONTACT, MINIMUM 1/2" CONDUIT. PROVIDE SINGLE GANG JUNCTION BOX AND PULL STRING. SEE CARD READER DETAIL FOR ADDITIONAL REQUIREMENTS OF PATHWAYS AND CABLING
CR	CARD READER, MINIMUM 1/2" CONDUIT. PROVIDE SINGLE GANG JUNCTION BOX AND PULL STRING. SEE CARD READER DETAIL FOR ADDITIONAL REQUIREMENTS OF PATHWAYS AND CABLING.
MD	SECURITY MOTION DETECTOR. CEILING MOUNTED. REFER TO SPECIFICATIONS AND DETAILS FOR DEVICES AND CABLING REQUIREMENTS. REFER TO ELECTRICAL DRAWINGS FOR JUNCTION BOX AND CONDUIT REQUIREMENTS.
PIR	MOTION DETECTOR, PROVIDE MINIMUM 1/2" CONDUIT TO LOCAL ACCESSIBLE CEILING. PROVIDE SINGLE GANG JUNCTION BOX AND PULL STRING.

SYMBOL SCHEDULE POWER

SYMBOL	DESCRIPTION
	WIRING SYSTEM CONCEALED IN WALL OR CEILING.
	WIRING SYSTEM CONCEALED IN OR UNDER SLAB OR UNDERGROUND.
	CONDUIT TURNED DOWN TO FLOOR BELOW.
	CONDUIT TURNED UP TO FLOOR ABOVE.
	BRANCH CIRCUIT HOMERUN TO PANEL.

ELECTRICAL FIXTURES LEGEND

SYMBOL	DESCRIPTION
	DUPLEX RECEPTACLE, 20 AMP, 120 VOLT COOPER 5362 OR EQUAL.
GFI	GROUND FAULT RECEPTACLE. NEMA 5-20R DUPLEX. ALL RECEPTACLES INSTALLED OUTSIDE, WITHIN 6' OF A SINK OR IN A KITCHEN SHALL BE GFCI.
GFIB	GROUND FAULT RECEPTACLE - BREAKER AT PANEL. NEMA 5-20R DUPLEX. ALL RECEPTACLES INSTALLED OUTSIDE, WITHIN 6' OF A SINK OR IN A KITCHEN SHALL BE GFCI.
	DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER BACKSPLASH, OR AT HEIGHT NOTED.
GFI	GROUND FAULT DUPLEX RECEPTACLE, NEMA 5-20R MOUNTED ABOVE COUNTER BACKSPLASH OR AT HEIGHT NOTED.
50" GFIB	GROUND FAULT DUPLEX RECEPTACLE - BREAKER AT PANEL, NEMA 5-20R MOUNTED ABOVE COUNTER BACKSPLASH OR AT HEIGHT NOTED.
	DUPLEX SWITCHED TAMPER RESISTANT RECEPTACLE, 20AMP, 120VOLT.
GFI WP	WEATHERPROOF GROUND FAULT RECEPTACLE. NEMA 5-20R DUPLEX, CORROSION RESISTANT. COVER SHALL BE INTERMATIC #WP1020 (CLEAR) OR EQUAL.
	QUAD RECEPTACLE. TWO NEMA 5-20R DUPLEX RECEPTACLES.
EWC	GFI NEMA 5-20R QUAD RECEPTACLE FOR ELECTRIC WATER COOLER TO BE SUPPLIED BY GROUND FAULT BREAKER. COORDINATE LOCATION WITH PLUMBING CONTRACTOR.
48"	QUAD RECEPTACLE. TWO NEMA 5-20R DUPLEX RECEPTACLES. AT HEIGHT NOTED.
	QUAD RECEPTACLE. TWO NEMA 5-20R DUPLEX RECEPTACLES ABOVE COUNTER
GFI	GROUND FAULT QUAD RECEPTACLE. TWO NEMA 5-20R DUPLEX RECEPTACLES ABOVE COUNTER.
GFI	QUAD RECEPTACLE. TWO NEMA 5-20R DUPLEX GROUND FAULT RECEPTACLES.

NOTE: ALL 20A RECEPTACLES SHALL BE TAMPER RESISTANT.

SYMBOL SCHEDULE POWER LEGEND

SYMBOL	DESCRIPTION
	JUNCTION BOX WITH CONNECTION TO EQUIPMENT SERVED. 4" SQUARE BOX WITH A SINGLE-GANG OPENING AND PLASTER RING.
	208Y/120V THREE PHASE PANELBOARD. SEE SCHEDULE FOR MOUNTING. TOP OF PANEL AT 6'-6" AFF.
	480Y/277V THREE PHASE PANELBOARD. SEE SCHEDULE FOR MOUNTING. TOP OF PANEL AT 6'-6" AFF.
	480-208Y/120V TRANSFORMER. SEE RISER FOR SIZE. PROVIDE 4" THICK HOUSEKEEPING PAD TO EXTEND 3" ON SIDES, FRONT WITH CHAMFER EDGE AND OSHA COMPLIANT, SAFETY YELLOW, EPOXY PAINT SUITABLE FOR CONCRETE.
SPD	SURGE PROTECTION DEVICE (SPD); SEE DETAIL.
42"HD	JUNCTION BOX FOR HAND DRYER CONNECTION; SEE MOUNTING HEIGHTS DETAIL FOR EXACT HEIGHT; SEE ARCH. SHEETS FOR COORDINATION 4" SQUARE BOX WITH A SINGLE-GANG OPENING AND PLASTER RING.
	SPECIAL OUTLET. SEE PLANS.
	FUSED HEAVY DUTY DISCONNECT SWITCH. NUMERALS INDICATE SWITCH RATING. NEMA 1 ENCLOSURE, UNLESS OTHERWISE NOTED. UNSHADED INDICATES NON-FUSED.
0.3 hp XX-1	CONNECTION TO MOTOR. STARTER PROVIDED BY OTHERS UNLESS OTHERWISE NOTED. NUMBER INDICATES HORSEPOWER.
	DOOR MOTOR CONTROL. MOUNT +40" AFF, CONTROLS SHALL BE UP, DOWN, AND STOP MOUNTED ON 4" SQUARE BOX (FLUSH BOX) NEMA 4
0.0 hp	FRACTIONAL HORSEPOWER MANUAL MOTOR STARTER, WITH OVERLOAD PROTECTION
	ALL THINGS "X" CAN BE: T = TIMER, (0 - 4) HOUR MANUAL TIMER SWITCH, F = FAN SWITCH, VARIABLE SPEED FAN SWITCH
	HANDHOLE
GA	GENERATOR ANNUNCIATOR PANEL; 3/4" CONDUIT TO ATS. PROVIDE BOX AS REQUIRED PER MANUFACTURER RECOMMENDATION PROVIDE CABLING PER MANUFACTURER RECOMMENDATIONS
M	RECTANGULAR DUCT MOUNTED MOTOR OPERATED DAMPER, INTERLOCK WITH FAN AS INDICATED. (DAMPER BY M.C.)
EPO	EMERGENCY POWER OFF BUTTON

NFPA FIRE ALARM LEGEND

SYMBOL	DESCRIPTION
FACP	FIRE ALARM CONTROL PANEL
FAA	FIRE ALARM ANNUNCIATOR
NAC	NOTIFICATION APPLIANCE CIRCUIT POWER EXTENDER
15cd	FIRE ALARM SPEAKER W/STROBE (CANDELAS), WHITE FINISH
15cd	FIRE ALARM STROBE (CANDELAS), WHITE FINISH
15cd	FIRE ALARM SPEAKER W/STROBE (CANDELAS), WHITE FINISH
15cd	FIRE ALARM STROBE (CANDELAS), WHITE FINISH
	FIRE ALARM ASPEAKER ONLY, WHITE FINISH
	SMOKE DETECTOR/SENSOR (DEFAULT PHOTOELECTRIC TYPE)
X	HEAT DETECTOR
X	GAS DETECTOR (TYPE DENOTED) CO - CARBON MONOXIDE
F	F.A. PULLSTATION. PROVIDE WITH CLEAR PROTECTIVE COVER AND LOCAL ALARM SOUNDER
WF	SPRINKLER FLOW SWITCH
VS	VALVE SUPERVISORY SWITCH
DH	FIRE ALARM DOOR HOLDER
RI	FIRE ALARM CEILING MOUNT INDICATOR
BT	SMOKE DETECTOR/SENSOR - BEAM TRANSMITTER
BR	SMOKE DETECTOR/SENSOR - BEAM RECEIVER
A M	TWO WAY COMMUNICATION MASTER STATION. LOCATE AS DIRECTED BY THE AHJ.
A	TWO WAY COMMUNICATION CALL STATION

MECHANICAL/ELEC. FIRE ALARM SYMBOL LEGEND

SYMBOL	DESCRIPTION
DD	RECTANGULAR DUCT MOUNTED DUCT DETECTOR. FURNISHED AND CONNECTED BY ELECTRICAL CONTRACTOR, INSTALLED BY MECHANICAL CONTRACTOR. CUTTING OF DUCT, INSTALLATION OF DETECTOR. AND DETERMINATION OF SAMPLING TUBE LENGTH SHALL BE THE MECHANICAL CONTRACTOR. PROVIDE REMOTE INDICATING LIGHT WITH EACH DETECTOR.

TELECOM LEGEND - ELECTRICAL

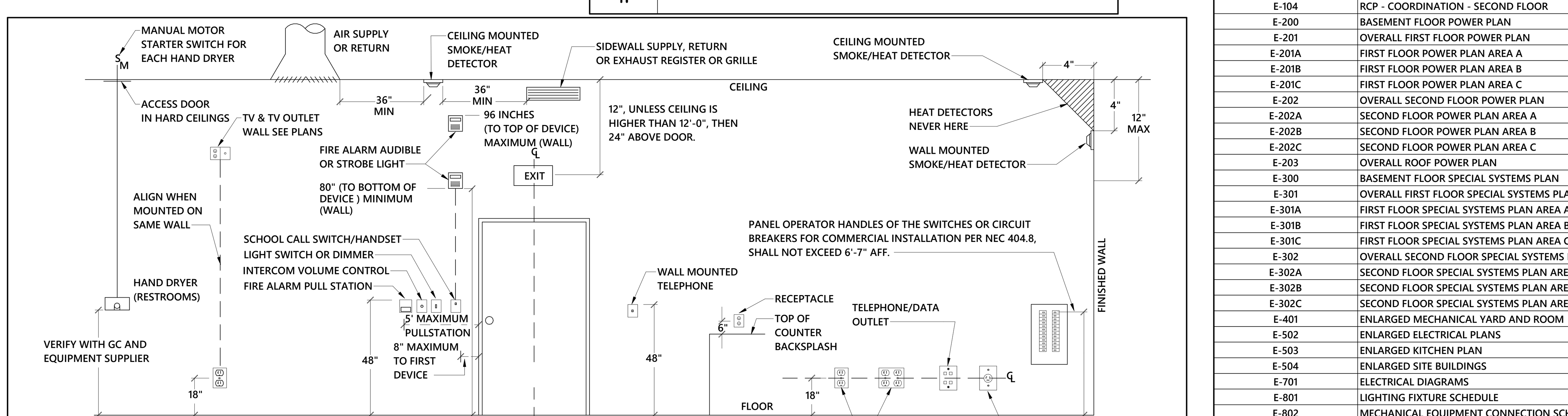
SYMBOL	DESCRIPTION
	PLYWOOD TELEPHONE BACKBOARD. SIZE AS INDICATED ON RISER.
#	DATA OUTLET ABOVE COUNTER OR HEIGHT SPECIFIED. MINIMUM 1 1/4" CONDUIT TO ABOVE NEAREST ACCESSIBLE CEILING FOR J-HOOK SYSTEM OR TO LOCAL CABLE TRAY (WITHIN 6") AS APPLICABLE WITH PULL STRING. 4" SQUARE BOX WITH A SINGLE-GANG OPENING AND PLASTER RING. SUBSCRIPT NEXT TO OUTLET INDICATES HEIGHT OR DATA DROPS. WHERE NO HEIGHT SHOWN, MOUNT 6" ABOVE COUNTER TOP. IF CABLE QUANTITY AND SERVICE ARE NOT IDENTIFIED, THEN PATHWAY ONLY OR REFER TO TO TECHNOLOGY DRAWINGS FOR CABLE AND ACTIVATION TYPE.
#	DATA OUTLET. MINIMUM 1 1/4" CONDUIT TO ABOVE NEAREST ACCESSIBLE CEILING FOR J-HOOK SYSTEM OR TO LOCAL CABLE TRAY (WITHIN 6") AS APPLICABLE WITH PULL STRING. 4" SQUARE BOX WITH A SINGLE-GANG OPENING AND PLASTER RING. SUBSCRIPT NEXT TO OUTLET INDICATES DATA DROPS. IF CABLE QUANTITY AND SERVICE ARE NOT IDENTIFIED, THEN PATHWAY ONLY OR REFER TO TO TECHNOLOGY DRAWINGS FOR CABLE AND ACTIVATION TYPE.
IC	INTERCOM. REFER TO SPECIFICATIONS AND DETAILS FOR DEVICES AND CABLING REQUIREMENTS. REFER TO ELECTRICAL DRAWINGS FOR JUNCTION BOX AND CONDUIT REQUIREMENTS.
WAP	STRUCTURE MOUNTED JUNCTION BOX FOR WIRELESS ACCESS POINT IN OPEN CEILING APPLICATIONS. 4" SQUARE BOX WITH A TWO-GANG OPENING. STUB 1" EC FROM BOX TO J-HOOKS OR CABLE TRAY ABOVE ACCESSIBLE CEILING. PROVIDE CABLING, TERMINATIONS AND FACEPLATE PER SPECIFICATIONS.
WAP	STRUCTURE MOUNTED JUNCTION BOX FOR WIRELESS ACCESS POINT ON WALL MOUNTED APPLICATIONS. 4" SQUARE BOX WITH A TWO-GANG OPENING. STUB 1" EC FROM BOX TO J-HOOKS OR CABLE TRAY ABOVE ACCESSIBLE CEILING. PROVIDE CABLING, TERMINATIONS AND FACEPLATE PER SPECIFICATIONS.
TV	SEE TV DETAIL FOR TYPE AND REQUIREMENTS. MINIMUM 1 1/4" CONDUIT FOR CABLING AND 3/4" CONDUIT FOR POWER. PROVIDE PULL STRING FOR LOW VOLTAGE CABLING TO ACCESSIBLE CEILING.
AV1	SEE TV DETAIL FOR TYPE AND REQUIREMENTS. MINIMUM 1 1/4" CONDUIT FOR CABLING AND 3/4" CONDUIT FOR POWER. PROVIDE PULL STRING FOR LOW VOLTAGE CABLING TO ACCESSIBLE CEILING.
AV2	SEE TV DETAIL FOR TYPE AND REQUIREMENTS. MINIMUM 1 1/4" CONDUIT FOR CABLING AND 3/4" CONDUIT FOR POWER. PROVIDE PULL STRING FOR LOW VOLTAGE CABLING TO ACCESSIBLE CEILING.
	CABLE TRAY - SEE TELECOM PLANS FOR LOCATIONS TYPE AND SIZE
	CABLE TRAY - SEE TELECOM PLANS FOR LOCATIONS TYPE AND SIZE
	TYPICAL EQUIPMENT RACK WITH VERTICAL WIRE MANAGEMENT SECTIONS.
	TYPICAL EQUIPMENT RACK WITH VERTICAL WIRE MANAGEMENT SECTIONS.
TMGB	TELECOMMUNICATIONS MAIN GROUND BAR. (PBB)
TGB	TELECOMMUNICATIONS GROUND BAR. (SBB)

LIGHTING FIXTURES SYMBOLS AND DEVICES...

SYMBOL	DESCRIPTION
	LED LIGHTING FIXTURE. SEE FIXTURE SCHEDULE. SUSPEND FOUR CORNERS WITH WIRE TO STRUCTURE. DO NOT ALLOW GRID ALONE TO SUPPORT FIXTURE.
	LED STRIP LIGHT FIXTURE
	RECESSED LED OR H.I.D. LIGHTING FIXTURE.
	EXIT LIGHT WITH ARROWS AND NUMBERS OF FACES AS INDICATED ON PLANS. 90 MIN BATTERY BACKUP. SEE LIGHTING FIXTURE SCHEDULE.
	EXIT LIGHT WITH ARROWS AND NUMBERS OF FACES AS INDICATED ON PLANS. 90 MIN BATTERY BACKUP. SEE LIGHTING FIXTURE SCHEDULE.
	EMERGENCY BATTERY PACK FIXTURE. 90 MINUTE EMERGENCY INTEGRAL BATTERY. SEE LIGHTING FIXTURE SCHEDULE
	TRACK AND TRACK LIGHT (TYPES DENOTED IN LIGHTING SCHEDULE)
	EMERGENCY BATTERY PACK/EXIT COMBO FIXTURE WITH 90 MINUTE BATTERY BACKUP, SEE FIXTURE SCHEDULE.
	SINGLE HEAD POLE FIXTURE. SEE FIXTURE SCHEDULE.
	DOUBLE HEAD POLE FIXTURE. SEE FIXTURE SCHEDULE.
$	SINGLE POLE SWITCH, 20 AMP, 120/277 VOLT, COOPER AH 1221, OR EQUAL BY HUBBELL, LEVITON AND PASS & SEYMOUR.
$3	THREE WAY SWITCH, 20 AMP, 120/277 VOLT, COOPER 1223, THREE WAY SWITCH, 20 AMP, 120/277 VOLT, COOPER 1223, OR EQUAL BY HUBBELL, LEVITON AND PASS & SEYMOUR.
$4	FOUR WAY SWITCH, 20 AMP, 120/277 VOLT, COOPER 1224 OR EQUAL.
$K	KEY OPERATED SWITCH
$T	2-HR TIMER SWITCH, 20 AMP, 120/277 VOLT, EQUAL TO INTERMATIC FF SERIES
$DLV	LOW VOLTAGE DIMMER SWITCH MOUNTED IN FLUSH JUNCTION BOX.
$VS	WALL MOUNTED VACANCY SENSOR AND SWITCH (MANUAL ON/AUTOMATIC OFF). INFRARED TECHNOLOGY, 120/277 RATED. SENSOR SWITCH WSX, WATT STOPPER PW-301, LEVITON, COOPER OR EQUAL.
OS DT	CEILING MOUNTED OCCUPANCY SENSOR, DUAL TECHNOLOGY. LINE VOLTAGE WITH INTEGRAL RELAY. (NO SUBSCRIPT) LV - SUBSCRIPT INDICATES LOW VOLTAGE WITH POWER PACK
OS DTC	CEILING MOUNTED WIDE VIEW OCCUPANCY SENSOR, DUAL TECHNOLOGY. CONICAL PATTERN, MOUNT AS CLOSE TO CORNER OF ROOM AS POSSIBLE. LINE VOLTAGE WITH INTEGRAL RELAY.
$OC	WALL MOUNTED OCCUPANCY SENSOR AND SWITCH. INFRARED TECHNOLOGY WITH NEUTRAL, 120/277V RATED. WATT STOPPER #WS-250, OR EQUAL BY SENSOR SWITCH, AND LEVITON.
$OC2	WALL MOUNTED OCCUPANCY SENSOR AND SWITCH. INFRARED TECHNOLOGY, WATT STOPPER #PW-200, SENSOR SWITCH, COOPER CONTROLS OR EQUAL. FOR INBOARD/OUTBOARD SWITCHING OR STEP BALLAST. SWITCH SHALL BE INSTALLED IN SINGLE GANG BOX. 120/277V RATED.
$OCD	WALL MOUNTED OCCUPANCY SENSOR AND SWITCH WITH 0-10V DIMMING. INFRARED TECHNOLOGY, WATT STOPPER #PW-311, SENSOR SWITCH, COOPER CONTROLS OR EQUAL. SWITCH SHALL BE INSTALLED IN SINGLE GANG BOX. 120V RATED. OCDL - INDICATES 2 WIRE LINE VOLTAGE DIMMING
PC	PHOTO CONTROL, EXTERIOR, MOUNT FACING NORTH.
1	GENERATOR TRANSFER DEVICE FOR NORMAL LIGHTING CONTROL, SEE EMERG. LTG RELAY DETAIL. CONNECT TO LOCAL LIFE SAFETY BRANCH LIGHTING CIRCUIT. BASED ON BODINE BLCD-20B, EQUALS BY: LEGRAND, ETC, OR APPROVED EQUAL.
LR A	LIGHTING RELAY CONTACTOR
PP	CEILING MOUNTED OCCUPANCY SENSOR POWER PACK. SENSOR SWITCH PP-20, WATT STOPPER #BZ-100, COOPER SP-20, OR EQUAL.

EM./LS LIGHTING FIXTURE SYMBOLS AND DEVICES

SYMBOL	DESCRIPTION
	LED FIXTURE WITH DRIVER ON LIFE SAFETY BRANCH. SEE FIXTURE SCHEDULE FOR FIXTURE TYPE, EMERGENCY DEVICE SHALL SUPPLEMENT FIXTURE.
1	SWITCHING DEVICE INDICATOR;INDICATES SWITCH AND ASSOCIATED FIXTURES CONTROLLED BY DEVICE.



NOTES:
1. LOCATIONS WHERE TV MOUNT IS BACK TO BACK ON SAME WALL, AN OFFSET OF 8-12" WILL BE NEEDED FOR INSTALLATION OF JACK/RECEPTACLE.
2. DEVICES ABOVE COUNTER TOPS SHALL BE A MAXIMUM OF 48" TO TOP OF DEVICE.
3. DEVICES NEXT TO DOOR EXIT SHALL BE WITHIN 8" (MAXIMUM) TYPICAL OF DOOR UNLESS OBSTACLES SUCH AS SIDELITES, ETC.
4. DEVICES REQUIRED TO BE ADA ACCESSIBLE SHALL BE INSTALLED PER ANSI A117.1.
5. ALL METALLIC & NON-METALLIC BOXES INSTALLED IN FRAME WALLS SHALL INCLUDE APPROVED FIRESTOP PUTTY PADS APPPLIED ON THE BACK AND ALL SIDES OF BOX NOT TOUCHING THE STUD.

1 MOUNTING HEIGHTS OF DEVICES - ELEVATION
NOT TO SCALE

ELECTRICAL SHEET INDEX

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E-005	ELECTRICAL DETAILS
E-006	ELECTRICAL DETAILS
E-007	ELECTRICAL DETAILS
E-008	LIGHTING DETAILS
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E-011	EXISTING SITE PLAN
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E-101B	FIRST FLOOR LIGHTING PLAN AREA B
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E-904	PANEL SCHEDULES
E-905	PANEL SCHEDULES
E-906	PANEL SCHEDULES
E-907	PANEL SCHEDULES

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022
2	Permit Revisions	01-11-2023

PROJECT: 9201-218240
DATE: 01-12-2023

ELECTRICAL LEGEND AND NOTES

E-001

Optima # 22-0082

01.12.2023 - BID SET

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1. GENERAL:
   - A. THE WORK COVERED BY THESE SPECIFICATIONS CONSISTS OF FURNISHING ALL LABOR, EQUIPMENT, MATERIALS, AND SUPPLIES AS NECESSARY FOR THE COMPLETE AND SATISFACTORY OPERATING ELECTRICAL SYSTEMS AS SHOWN ON THE PLANS.
   - B. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF THE NATIONAL ELECTRICAL CODE, NFPA, STATE BUILDING CODE, AND ANY OTHER LOCAL REQUIREMENTS THAT MAY APPLY.
   - C. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL ELECTRICAL PERMITS AND INSPECTION FEES.
   - D. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND SHALL BE LISTED BY THE UNDERWRITER'S LABORATORIES, INC. OR BY A STATE APPROVED THIRD PARTY TESTING AGENCY FOR THE USE INTENDED WHERE A STANDARD FOR SUCH MATERIALS AND USE EXISTS. ALL ITEMS OF THE SAME TYPE AND RATING SHALL BE IDENTICAL AND OF THE SAME MANUFACTURER.
   - E. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND CATALOG DATA IN ELECTRONIC FORMAT (PDF) FOR ALL ELECTRICAL ITEMS IN THE SCOPE OF WORK, INCLUDING, BUT NOT LIMITED TO, RACEWAYS, BOXES, FITTINGS, CONDUCTORS, LUMINAIRES, LAMPS, BALLASTS, WIRING DEVICES, SAFETY SWITCHES, DISCONNECTS, TRANSFORMERS, PANELBOARDS, SWITCHBOARDS, SWITCHGEARS, MOTOR CONTROL CENTERS (MCC), BUSWAYS, GENERATORS, AUTOMATIC TRANSFER SWITCHES (ATS), UNINTERRUPTIBLE POWER SUPPLY (UPS), POWER DISTRIBUTION UNITS (PDU), FLOOR/REMOTE DISTRIBUTION CABINETS (FDC/RDC), STATIC TRANSFER SWITCHES (STS), FIRE ALARM, TELECOMMUNICATIONS, ETC. FOR APPROVAL AS APPLICABLE FOR THE PROJECT. ONE COMPLETE SET OF APPROVED SUBMITTALS SHALL BE MAINTAINED AT THE JOB SITE.
   - F. ALL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT TO COMPLY WITH THE BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, CONDUIT, WIRING, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, METHODS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASE BID. NO ADDITIONAL COSTS ASSOCIATED WITH SUBSTITUTED EQUIPMENT WILL BE APPROVED AFTER BIDS HAVE BEEN ACCEPTED AND ALL COSTS WILL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR. CREDITS SHALL BE GIVEN TO THE OWNER WHERE SUCH EQUIPMENT AND METHODS RESULT IN LESS EXPENSE TO THE CONTRACTOR.
   - G. ONE COMPLETE SET OF THE LATEST CONSTRUCTION PLANS OF ALL TRADES SHALL BE MAINTAINED AT THE JOB SITE. IN ADDITION, ALL ADDENDUMS, BULLETINS, AND/OR SKETCHES SHALL BE INCORPORATED INTO THE ON-SITE CONSTRUCTION PLANS AS THE JOB PROGRESSES.
   - H. COMPLETELY ADEQUATE HOUSING SHALL BE PROVIDED FOR ALL MATERIALS STORED ON JOB SITE. ONLY CONDUIT MAY BE STORED OUTSIDE, BUT NOT IN CONTACT WITH THE GROUND.
   - I. THE CONDUIT AND NEUTRAL SYSTEM SHALL BE GROUNDED AT THE MAIN SERVICE EQUIPMENT. GROUNDING ELECTRODE SYSTEM SHALL BE INSTALLED PER NEC 250.
   - J. PROVIDE AN INTERSYSTEM BONDING TERMINATION DEVICE AT THE MAIN ELECTRICAL SERVICE PER NEC 250.94.
   - K. WIRING SHALL BE TESTED FOR CONTINUITY AND GROUNDS BEFORE BEING ENERGIZED. FAULTY WIRING SHALL BE REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER.
   - L. PROVIDE ALL CUTTING AND PATCHING FOR INSTALLATION OF WORK AND REPAIR ANY DAMAGE DONE.
   - M. THE ELECTRICAL CONTRACTOR SHALL CONNECT ALL EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS (UNLESS OTHERWISE NOTED), EXCEPT FOR CONTROL WIRING FOR EQUIPMENT NOT PROVIDED BY THE ELECTRICAL CONTRACTOR. CONTROL WIRING FOR SUCH EQUIPMENT SHALL BE PROVIDED BY THE RESPECTIVE DISCIPLINE.
   - N. ALL ELECTRICAL JUNCTION BOXES, SWITCHGEAR, CABLING, VOICE/DATA OUTLETS, LOW VOLTAGE CABINETS, EMERGENCY RECEPTACLES, ETC. SHALL BE LABELED ACCORDING TO PANEL/RACK AND CIRCUIT NUMBER.
   - O. UPON COMPLETION OF WORK, CONTRACTOR SHALL PRESENT ENGINEER WITH CERTIFICATE OF APPROVAL FROM LOCAL INSPECTOR AND/OR AUTHORITY HAVING JURISDICTION BEFORE WORK WILL BE APPROVED FOR FINAL PAYMENT.
   - P. CONTRACTOR SHALL GUARANTEE ALL WORK AND MATERIALS FOR A PERIOD OF ONE YEAR EFFECTIVE THE DATE THE PROJECT IS ACCEPTED BY THE OWNER. ANY IMPERFECT MATERIALS OR WORKMANSHIP SHALL BE REPLACED WITHOUT ADDED COST TO THE PROJECT.
   - Q. IT SHALL NOT BE THE INTENT OF ISSUED PLANS AND/OR SPECIFICATIONS TO SHOW EVERY MINOR DETAIL OF CONSTRUCTION. THE ELECTRICAL CONTRACTOR IS EXPECTED TO FURNISH AND INSTALL ALL NECESSARY ITEMS FOR A COMPLETE AND OPERATING SYSTEM.
   - R. THE WORD "PROVIDE" MEANS THAT THIS CONTRACTOR SHALL FURNISH, FABRICATE, ERECT, CONNECT, AND COMPLETELY INSTALL SYSTEMS IN PROPER OPERATING CONDITION. ALL LABOR, PRODUCT OPTIONS, ACCESSORIES AND INCIDENTAL MATERIALS REQUIRED SHALL BE INCLUDED AS PART OF THIS WORK TO COMPLETE THE INSTALLATION.
   - S. THE WORD "CONNECT" MEANS THAT THIS CONTRACTOR SHALL PROVIDE (SEE DEFINITION ABOVE) ALL DISCONNECTING MEANS, OVERCURRENT PROTECTION AND WIRING REQUIRED TO PLACE THE EQUIPMENT AND SYSTEMS IN PROPER OPERATING CONDITION AND TO COMPLY WITH CODE REQUIREMENTS.
   - T. CONTRACTOR SHALL COORDINATE THE ROUGH-IN OF ALL OUTLET LOCATIONS WITH ARCHITECTURAL FLOOR PLANS, ELEVATIONS, AND MILLWORK SHOP DRAWINGS PRIOR TO ROUGH-IN.
   - U. ELECTRICAL CONTRACTOR SHALL NOT SCALE PLANS. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS AND ELEVATIONS FOR EXACT LOCATIONS OF ALL EQUIPMENT, UNLESS OTHERWISE NOTED.
   - V. CONTRACTOR SHALL TEST ALL "LIFE SAFETY" EQUIPMENT AND SYSTEMS FOR PROPER FUNCTION AND OPERATION. UPON SUCCESSFUL COMPLETION OF TESTS, CONFIRMATION SHALL BE SENT TO THE ENGINEER OF RECORD IN THE FORM OF A LETTER STATING THE TESTS PERFORMED, THE RESULTS, AND THE DATE TESTS WERE SUCCESSFULLY COMPLETE. "LIFE SAFETY" EQUIPMENT AND SYSTEMS CONSIST OF THOSE AS SPECIFIED IN THE STATE BUILDING CODE, THE NATIONAL ELECTRICAL CODE, NFPA 101, AND ANY OTHER LOCAL REQUIREMENTS THAT MAY APPLY.
   - W. IF DURING THE COURSE OF WORK, THE CONTRACTOR DISCOVERS A PROBLEM WITH THE PERFORMANCE OF THE INSTALLATION RELATIVE TO THE PLANS AND SPECIFICATIONS, THE NEC, OR OTHER CODES OR REQUIREMENTS, THE CONTRACTOR SHALL IMMEDIATELY BRING THE PROBLEM TO THE ATTENTION OF THE ARCHITECT AND/OR ENGINEER FOR RESOLUTION PRIOR TO THE EXECUTION OF THE WORK.
   - X. WHERE THERE ARE CONFLICTS BETWEEN THE PLANS AND SPECIFICATIONS, THE CONTRACTOR SHALL BRING THE ISSUE TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION PRIOR TO THE EXECUTION OF THE WORK OR ORDERING ANY MATERIALS. NO ADDITIONAL COSTS SHALL BE WARRANTED WITHOUT A CHANGE TO THE PROJECT SCOPE.
   - Y. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND PROVIDING TEMPORARY POWER AND LIGHTING FOR ALL TRADES. AT NO TIME SHALL EXISTING BUILDING POWER SYSTEMS BE UTILIZED WITHOUT WRITTEN PERMISSION FROM THE OWNER.
   - Z. COORDINATE LOCATION AND REQUIREMENTS FOR ELECTRICAL SERVICE WITH THE POWER COMPANY. WHERE MORE THAN ONE SERVICE IS SUPPLIED TO A BUILDING, PROVIDE IDENTIFICATION AT EACH SERVICE PER NEC 230-2(E).
   - AA. COORDINATE LOCATION AND REQUIREMENTS FOR TELEPHONE SERVICE WITH THE TELEPHONE COMPANY.

2. RACEWAY:
   - A. CONDUIT SHALL BE MANUFACTURED BY ALLIED, WHEATLAND, REPUBLIC CONDUIT, WESTERN TUBE, OR APPROVED EQUIVALENT.
   - B. FOR INTERIOR WORK, CONDUIT SHALL BE ZINC COATED EMT EXCEPT WHERE NOT PERMITTED BY CODE. USE SCHEDULE 40 PVC BELOW CONCRETE SLAB, IN DUCTBANKS, AND FOR EXTERIOR WORK WHERE NOT SUBJECT TO DAMAGE. USE IMC WHERE SUBJECT TO PHYSICAL DAMAGE.
   - C. EMT FITTINGS SHALL BE COMPRESSION GLAND TYPE, OF MALLEABLE STEEL. CONNECTORS SHALL HAVE INSULATED THROATS. CAST, SET SCREW, OR INDENTER TYPE FITTINGS ARE NOT ACCEPTABLE. ALL FITTINGS FOR EMT SHALL BE MADE OF STEEL.
   - D. ALL RACEWAY SHALL BE RUN CONCEALED, UNLESS OTHERWISE NOTED. FISH ALL NEW OUTLETS IN EXISTING WALLS, WHERE POSSIBLE. ALL RUNS SHALL BE NEAT AND SQUARE.
   - E. LOW VOLTAGE CABLING NOT SPECIFIED TO BE INSTALLED IN CONDUIT, SHALL BE INSTALLED IN A CABLE TRAY SYSTEM OR J-HOOK SYSTEM CONSISTING OF MINIMUM 2" DIAMETER HOOKS LOCATED ON 3'-0" CENTERS IN ALL ACCESSIBLE CEILINGS. WHERE THERE ARE INACCESSIBLE CEILINGS, PROVIDE CONDUIT FOR ENTIRE LENGTH OF INACCESSIBILITY.
   - F. RACEWAYS USED FOR LOW VOLTAGE SYSTEMS SUCH AS TELECOMMUNICATIONS, FIRE ALARM, SECURITY, CCTV, CONTROLS, AND SIMILAR CONDUITS ABOVE THE CEILING AND BACKBOARD(S) SHALL BE PROVIDED WITH INSULATED THROAT BUSHINGS AT EACH CONDUIT TERMINATION. THESE BUSHINGS SHALL BE INSTALLED PRIOR TO PULLING LOW-VOLTAGE CABLES.
   - G. RACEWAY PENETRATIONS THROUGH FLOOR SLABS AND FIRE-RATED WALLS SHALL BE FILLED WITH IMPERVIOUS, NON-SHRINK GROUT SUFFICIENTLY TIGHT TO PREVENT THE TRANSFER OF SMOKE, WATER, AND DUST. ROOF PENETRATIONS SHALL BE WITHIN THE EQUIPMENT ROOF CURB.
   - H. SUPPORT ALL CONDUIT WITH STRAPS AND CLAMPS.
   - I. ALL CONDUIT SHALL BE RUN PARALLEL OR PERPENDICULAR TO BUILDING LINES, WHETHER EXPOSED OR NOT AND SUPPORTED FROM STRUCTURE AND PROPERLY SECURED.
   - J. WHERE CONDUITS PASS THROUGH A BUILDING EXPANSION JOINT, PROVIDE GALVANIZED EXPANSION FITTINGS WITH BONDING JUMPERS.
   - K. MINIMUM CONDUIT SIZE SHALL BE 3/4" FOR INTERIOR WORK, 1" FOR EXTERIOR WORK.
   - L. PROVIDE MINIMUM 210# TEST NYLON PULL CORD AND NYLON BUSHINGS IN ALL EMPTY RACEWAYS.
   - M. LIQUID-TIGHT METAL CONDUIT SHALL ONLY BE USED FOR FINAL CONNECTIONS TO EQUIPMENT AND ALL OTHER ROTATING AND VIBRATING EQUIPMENT, MAXIMUM LENGTH OF 3'-0".
   - N. FLEXIBLE METAL CONDUIT, MINIMUM SIZE 3/8", SHALL ONLY BE USED FOR FINAL CONNECTION TO LIGHTING FIXTURES, MAXIMUM LENGTH OF 6'-0".
   - O. PROVIDE PULL BOXES, SUCH THAT NO SINGLE CONDUIT RUN HAS BENDS IN EXCESS OF 360°. PULL BOXES SHALL BE SUITABLE AND APPROVED FOR THE INTENDED USE. WHERE CONDUITS PASS UNDER PAVED AREAS, THEY SHALL BE RGS.
   - P. ALL CONDUIT BENDS/ELBOWS EMERGING FROM UNDERGROUND SHALL BE IMC AND SHALL EXTEND A MINIMUM OF 18" BELOW GRADE.
   - Q. ALL UNDERGROUND RACEWAYS SHALL BE THOROUGHLY COATED WITH TWO COATS OF ASPHALTUM BITUMASTIC.
   - R. ALL CONDUITS INSTALLED UNDERGROUND OR IN CONCRETE SHALL HAVE JOINTS MADE WATERTIGHT BY USE OF POLYETRA-FLUOROETHYLENE TAPE.
   - S. THE USE OF AC OR NM CABLE IS NOT PERMITTED.
   - T. MC CABLE MAY ONLY BE UTILIZED FOR 6' FIXTURE WHIPS, IN NON-EXPOSED APPLICATIONS.
   - U. EXPOSED CONDUIT MAY ONLY BE IN MECHANICAL, ELECTRICAL, AND GYM STRUCTURE AREAS ONLY.

3. OUTLET BOXES:
   - A. JUNCTION AND PULL BOXES SHALL BE CODE GAUGE GALVANIZED STEEL. ACCEPTED MANUFACTURERS SHALL BE STEEL CITY (THOMAS & BETTS), RACO, CROUSE-HINDS, APPLETON (EMERSON), OR APPROVED EQUIVALENT.
   - B. OUTLET BOXES SHALL NOT BE MOUNTED BACK TO BACK IN COMMON WALLS.
   - C. ATTACH EMT WITH CONNECTORS HAVING INSULATED THROAT.
   - D. ATTACH BOXES TO STUD WORK USING CADDY BAR STRAPS THAT CONNECT TO TWO ADJACENT METAL STUDS TO PREVENT TWISTING OF BOX IN WALL.
   - E. ALL OUTLET BOXES (INCLUDING TELEPHONE, CABLE TV, AND COMPUTER) SHALL HAVE COVER PLATES, BLANK IF NOT USED.
   - F. ALL EXTERIOR BOXES SHALL BE WATER-TIGHT.

4. CONDUCTORS:
   - A. CONDUCTORS SHALL BE MANUFACTURED BY SOUTHWIRE (SIMPULL), ENCORE (SUPERSLICK), UNITED COPPER (SLK), CERRO (SLP), OR APPROVED EQUAL, "PRE-LUBRICATED" BY THE MANUFACTURER.
   - B. ALL CONDUCTORS SHALL BE COPPER, RATED 75° C WET/DRY EXCEPT WHERE OTHERWISE NOTED OR REQUIRED BY U.L. OR OTHER CODES.
   - C. ALL CONDUCTORS SHALL BE SINGLE INSULATED CONDUCTOR, THHN/THWN-2. SIZES #10 AWG AND SMALLER SHALL BE SOLID, SIZES #8 AWG AND LARGER SHALL BE STRANDED.
   - D. BRANCH CIRCUITS SHALL NOT BE SMALLER THAN #12 AWG. CONTROL WIRING MAY BE #14 AWG.
   - E. CONDUCTORS SHALL BE COLOR CODED BLACK/RED/BLUE FOR 120/208 VOLT SYSTEMS AND BROWN/ORANGE/YELLOW FOR 277/480 VOLT SYSTEMS FOR A, B, AND C PHASES, RESPECTIVELY. NEUTRAL SHALL BE WHITE FOR 120/208 VOLT SYSTEMS AND NATURAL GRAY FOR 277/480 VOLT SYSTEMS. GROUND CONDUCTOR SHALL BE GREEN ON ALL SYSTEMS. ALL CONDUCTOR SIZES SHALL HAVE COLOR-CODED INSULATION. THE USE OF COLORED TAPE ON LARGER WIRE SIZES SHALL NOT BE ALLOWED.
   - F. INSULATION SHALL BE DUAL RATED TYPE THHN/THWN-2 FOR FEEDERS AND BRANCH CIRCUITS. FIXTURE TAPS SHALL BE #12 THHN/THWN-2 IN FLEX WITH GREEN #12 AWG GROUNDING CONDUCTOR.
   - G. ALL CONDUCTORS SHALL BE IN CONDUIT.
   - H. WIRING TO LIGHTING FIXTURES SHALL BE AS REQUIRED BY UL LABEL.
   - I. MULTI-WIRE BRANCH CIRCUITS SHALL NOT BE ALLOWED, UNLESS EXPLICITLY INDICATED ON THE DRAWINGS. WHERE EXPLICITLY INDICATED ON THE DRAWINGS:
     - a. ALL 20A MULTI-WIRE RECEPTACLE CIRCUITS SHALL UTILIZE A #10 AWG NEUTRAL CONDUCTOR.
       OR
     - b. ONLY WHERE PERMITTED UNDER "RACEWAYS", MC CABLE ASSEMBLIES CAN BE AFC "SUPER NEUTRAL" OR EQUAL, UNLESS OTHERWISE INDICATED ON THE DRAWINGS. WHERE MULTI-WIRE BRANCH CIRCUITS ARE EXPLICITLY INDICATED ON THE DRAWINGS, THEY SHALL BE INSTALLED PER NEC 210.4. MEANS SHALL BE PROVIDED TO SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE POINT WHERE THE BRANCH CIRCUIT ORIGINATES IN ADDITION TO OTHER REQUIREMENTS PER NEC 210.4.
   - J. JOINTS IN #10 AWG AND SMALLER SHALL BE MADE UP WITH CRIMPED CONNECTORS WITH INSULATING CAPS (NO TAPE) OR WIRENUTS (MAXIMUM OF 3 CONDUCTORS UNDER ANY CONNECTOR OR WIRENUT). LARGER WIRE SHALL USE SPLIT BOLTS OR BOLTED CLAMPS.
   - K. ALL WIRING LUGS THROUGHOUT THE PROJECT, INCLUDING, BUT NOT LIMITED TO, BREAKERS, PANELBOARD/SWITCHBOARD LUGS, SAFETY SWITCH LUGS, MOTOR STARTER LUGS, TRANSFORMERS LUGS, WIRING DEVICE TERMINALS, AND ALL EQUIPMENT LUGS/TERMINALS SHALL BE RATED FOR USE WITH 75 DEGREE INSULATED CONDUCTORS AT THEIR 75 DEGREE AMPACITY AND SHALL BE SIZED AND SELECTED TO MATCH THE CONDUCTOR SIZE AND MATERIAL.
   - L. CIRCUIT JOINTS SHALL NOT BE MADE ON DEVICE TERMINALS.
   - M. WIRE WITHIN PANELBOARDS SHALL BE NEATLY TRAINED, SQUARED, BUNCHED, AND TAGGED.
   - N. ALL SYSTEM FURNITURE CONNECTIONS SHALL COMPLY WITH NEC 605.
   - O. GROUND ALL EQUIPMENT PER NEC ARTICLE 250. BOND WHERE CONDUITS ENTER ENCLOSURES THROUGH CONCENTRIC KNOCKOUTS. ALL FLEX, INCLUDING FIXTURE TAPS, SHALL INCLUDE GREEN GROUNDING CONDUCTOR, #12 AWG MINIMUM. PROVIDE GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR IN EACH CONDUIT AND FOR EACH CIRCUIT, SIZED PER NEC 250-122.
   - P. ALL CONDUCTORS INSTALLED IN VERTICAL RACEWAYS SHALL BE SUPPORTED AT INTERVALS AS REQUIRED PER NEC 300-19.
   - Q. THE ELECTRICAL CONTRACTOR SHALL FOLLOW AND APPLY THE TABLE BELOW, REGARDLESS WHAT THE PANEL SCHEDULE INDICATES, FOR SIZING ALL 120V & 277V, 20 AMP BRANCH CIRCUITS (COPPER CONDUCTORS) TO ALLOW A MAXIMUM OF 3% VOLTAGE DROP FROM THE CIRCUIT BREAKER TO THE FIRST DEVICE ON THE BRANCH CIRCUIT AND ACHIEVE A MAXIMUM OF 5% VOLTAGE DROP ACROSS THE ENTIRE BRANCH CIRCUIT:

VOLTAGE	CONDUCTOR LENGTH *	BRANCH CIRCUIT
120	0' - 50'	#12
120	51' - 90'	#10
120	91' - 140'	#8
120	141' - 255'	#6
277	0' - 125'	#12
277	126' - 200'	#10
277	201' - 330'	#8
277	331' - 525'	#6

* - THE LENGTH IS MEASURED FROM THE CIRCUIT BREAKER TO THE FIRST DEVICE WHICH THE BRANCH CIRCUIT SERVES. WHERE THE DISTANCE EXCEEDS ABOVE, CONSULT WITH THE ENGINEER.

   - R. ALL BRANCH CIRCUIT CONDUCTORS FROM ISOLATED POWER SOURCES SHALL BE INSTALLED IN IMC CONDUIT AND SHALL BE TYPE XHHW-2, COLOR CODED ORANGE FOR CONDUCTOR #1, BROWN FOR CONDUCTOR #2, AND YELLOW FOR CONDUCTOR #3.

5. WIRING DEVICES:
   - A. WIRING DEVICES SHALL BE SPECIFICATION GRADE, MINIMUM, EQUAL TO COOPER QUALITY INDICATED BELOW OR AS MANUFACTURED BY HUBBELL, LEGRAND-PASS & SEYMOUR, LEVITON, OR APPROVED EQUAL, UNLESS OTHERWISE NOTED:

SWITCHES (120/277V) SHALL BE AS FOLLOWS:

SINGLE-POLE 20 AMP	COOPER AH1221
DOUBLE-POLE 20 AMP	COOPER AH1222
THREE-WAY 20 AMP	COOPER AH1223
FOUR-WAY 20 AMP	COOPER AH1224
SINGLE-POLE-KEY 20 AMP	COOPER AH1221L
DOUBLE-POLE-KEY 20 AMP	COOPER AH1222L
THREE-WAY-KEY 20 AMP	COOPER AH1223L
FOUR-WAY-KEY 20 AMP	COOPER AH1224L

DUPLEX RECEPTACLES SHALL HAVE A NYLON FACE AND SHALL BE AS FOLLOWS:

15 AMP DUPLEX	COOPER 5252
20 AMP DUPLEX	COOPER 5352
15 AMP DUPLEX GFCI	COOPER SGF15F
20 AMP DUPLEX GFCI	COOPER SGF20F
15 AMP DUPLEX TAMPER	COOPER TR5262
20 AMP DUPLEX TAMPER	COOPER TR5362
15 AMP DUPLEX GFCI-TAMPER	COOPER TRSGF15F
20 AMP DUPLEX GFCI-TAMPER	COOPER TRSGF20F

THE PART NUMBERS ABOVE ARE FOR WIRING DEVICE TYPE ONLY. SEE BELOW FOR WIRING DEVICE COLOR AND PLATE MATERIAL/COLOR.

   - B. SEE MOUNTING HEIGHT ELEVATION DETAIL FOR STANDARD MOUNTING HEIGHTS OF ALL DEVICES, UNLESS OTHERWISE NOTED.
   - C. ALL WIRING DEVICES (SWITCHES AND RECEPTACLES) SHALL BE GRAY, UNLESS OTHERWISE NOTED. ALL COVER PLATES SHALL BE 302 STAINLESS STEEL. COVER PLATES IN MASONRY WALLS SHALL BE OVERSIZE TYPE.
   - D. ALL WIRING DEVICES FED FROM THE EMERGENCY POWER SYSTEM SHALL BE RED.
   - E. ADJACENT DEVICES SHALL HAVE A COMMON WALL PLATE.
   - F. WEATHERPROOF COVERS SHALL BE "WHILE-IN-USE" SO PLUGS MAY BE INSTALLED WITHOUT COMPROMISING THE WP FUNCTION. COOPER #WIU-2 DOUBLE-GANG WITH CLEAR COVER OR APPROVED EQUAL.
   - G. A MAXIMUM OF 10 GENERAL PURPOSE RECEPTACLES SHALL BE ON EACH BRANCH CIRCUIT.
   - H. DIMMERS SHALL BE LINEAR SLIDE, PRESENT ON/OFF, SQUARE LAW DIMMING, W/RFI FILTERING AND VOLTAGE COMPENSATION CIRCUITING.
   - I. ALL WALL MOUNTED OCCUPANCY/VACANCY SENSORS/SWITCHES SHALL BE INSTALLED WITH AN EQUIPMENT GROUNDING CONDUCTOR.
   - J. GROUND-FAULT CIRCUIT-INTERRUPTER (GFCI) PROTECTION FOR PERSONNEL SHALL BE PROVIDED FOR ALL LOCATIONS PER NEC 210.8, INSTALLED IN A READILY ACCESSIBLE LOCATION. WHERE A DEVICE LOCATION IS NOT ACCESSIBLE, THE GFCI PROTECTION SHALL BE PROVIDED WITH THE BREAKER SERVING THE DEVICE.
   - K. ALL GFCI RECEPTACLES SHALL HAVE AUTO-MONITORING / SELF-TEST FUNCTION AND REVERSE LINE-LOAD MISFIRE FUNCTION AND MEET ALL REQUIREMENTS OF UL 943 (LATEST EDITION).

6. SUPPORTS:
   - A. ALL EQUIPMENT SHALL BE ADEQUATELY SUPPORTED FROM STRUCTURE.
   - B. INSERTS IN MASONRY SHALL BE LEAD OR FIBER IN DRILLED HOLES, OR CAST IN PLACE.
   - C. NAILS OR POWDER ACTUATED FASTENERS SHALL NOT BE USED.
   - D. EMT/IMC/RGS SUPPORTS SHALL BE A MAXIMUM OF 8'-0" APART AND A MAXIMUM OF 3'-0" FROM BOXES.
   - E. LIGHTING FIXTURES MOUNTED IN OR ON CEILING SHALL BE SUPPORTED FROM STRUCTURE VIA 12 GAUGE STEEL WIRE. PROVIDE A MINIMUM OF FOUR WIRES, ONE ATTACHED TO EACH CORNER OF LAY-IN FIXTURES. RECESSED DOWNLIGHT FIXTURES SHALL BE SUPPORTED THE SAME. DO NOT SUPPORT RACEWAY OR FIXTURES FROM CEILING GRID OR DUCT WORK. USE U.L. LISTED GRID CLIPS ON ALL LAY-IN FIXTURES.
   - F. THE USE OF MINERALAC STRAPS SHALL NOT BE USED 8' BELOW FINISHED FLOOR. A SMOOTH ONE-HOLE STRAP SHOULD BE USED AND APPROPRIATE CONDUIT OFFSETS SHOULD BE USED.

7. PAINTING:
   - A. SUITABLE FINISH COAT SHALL BE PROVIDED FOR ALL EQUIPMENT. PANEL TUBS, COVERS, ETC. SHALL BE PRIMED AND ENAMELED TO BLEND WITH ADJACENT SURFACES, OR SHALL BE MANUFACTURER'S STANDARD COLOR BAKED ENAMEL FINISH, OR AS DIRECTED BY THE ARCHITECT.
   - B. CONTRACTOR TO PAINT WHERE EXISTING EXPOSED PANELBOARDS, SURFACE RACEWAY, SURFACE BOXES, ETC. HAVE BEEN REMOVED DURING THE DEMOLITION PHASE, EITHER FOR TEMPORARY WORK OR PERMANENTLY.

8. TELECOMMUNICATIONS:
   - A. FURNISH A COMPLETE CONDUIT SYSTEM AS INDICATED ON THE DRAWINGS.
   - B. PROVIDE RACEWAYS FOR ALL EXTERIOR AND/OR EXPOSED LOCATIONS.
   - C. PROVIDE GROUNDING FOR ALL TELEPHONE/DATA SYSTEMS AND EQUIPMENT PER REQUIREMENTS AND SPECIFICATIONS PROVIDED BY THE OWNERS DESIGNATED VENDOR.
   - D. ALL LOW-VOLTAGE CABLING SHALL BE PLENUM-RATED.
   - E. CONTRACTOR SHALL FURNISH AND INSTALL A #6 AWG GREEN INSULATED COPPER WIRE IN CONDUIT FROM THE MAIN ELECTRICAL GROUNDING BAR TO TELECOMMUNICATIONS GROUNDING BUS BAR.
   - F. PROVIDE MOUNTING BACKBOARDS FOR COMMUNICATIONS EQUIPMENT. BACKBOARDS SHALL BE OF 3/4" TYPE AC, EXTERIOR PLYWOOD, PAINTED BOTH SIDES AND ALL EDGES WITH 2 COATS OF GRAY FLAME RETARDANT PAINT.
   - G. VERIFY SITE LOCATION OF TELEPHONE SERVICES WITH APPROPRIATE VENDOR, PRIOR TO SUBMITTING BID. TELEPHONE SERVICE CONDUITS SHALL BE PROVIDED TO THE PROPERTY LINE OR POINT AS DIRECTED BY THE LOCAL UTILITY.
   - H. SEE TELECOM DRAWINGS FOR ADDITIONAL REQUIREMENTS.

9. LIGHTING FIXTURES:
   - A. TYPES AND MANUFACTURERS ARE SCHEDULED ON THE PLANS. EQUIVALENT FIXTURES BY OTHERS MAY BE SUBMITTED ONLY AS INDICATED ON THE PLANS AND ARE SUBJECT TO THE APPROVAL OF THE OWNER AND ENGINEER.
   - B. ALL FIXTURES SHALL BE U.L. LISTED AND LABELED.
   - C. ALL FIXTURES SHALL BE PROVIDED FOR PROPER VOLTAGE BASED ON THE CIRCUIT ASSIGNMENT INDICATED ON THE PLANS.
   - D. CATALOG NUMBERS ARE FOR GENERAL IDENTIFICATION OF FIXTURES ONLY. ALL RELATED PARTS, SUCH AS PLASTER RINGS, JUNCTION BOXES, LOUVERS, SHIELDS, MOUNTING STEMS, CANOPIES, CONNECTORS, STRAPS, NIPPLES, HARDWARE, ACCESSORIES, ETC., TO FIT THEM PROPERLY TO THE CONSTRUCTION, SHALL BE FURNISHED AND INSTALLED BY THIS CONTRACTOR. CONTRACTOR SHALL PROVIDE SUITABLE TRIM AND APPURTENANCES TO MOUNT FIXTURES IN TYPE OF CEILING OR WALL AS SPECIFIED IN ARCHITECTURAL FINISH SCHEDULES REGARDLESS OF CATALOG NUMBER GIVEN.
   - E. ALL FIXTURES SHALL BE GROUNDED PER THE NEC.
   - F. FIXTURES CONNECTED WITH FLEX TO THE RIGID RACEWAY PORTION OF THE WIRING SYSTEM SHALL CARRY A GREEN BONDING JUMPER WITHIN THE FLEX. THE JUMPER SHALL BE FASTENED TO BOTH THE FIXTURE AND THE RACEWAY SYSTEM WITH A STEEL CITY "G" CLIP OR APPROVED EQUIVALENT. PHASE AND GROUND CONDUCTORS RUN IN FLEX SHALL BE #12 AWG MINIMUM. MAXIMUM FLEX LENGTH SHALL BE 6'-0".
   - G. MOUNT ALL FIXTURES PLUMB AND SQUARE WITH ROWS ALIGNED.
   - H. SEE ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF FIXTURES.
   - I. CONTRACTOR SHALL COORDINATE FIXTURE TYPE AND TRIM WITH CEILING CONSTRUCTION AND ADJUST ACCORDINGLY WITHOUT ADDITIONAL EXPENSE.
   - J. ALL LIGHTING FIXTURES SHALL BE THERMALLY PROTECTED PER THE NEC.
   - K. LAMPS SHALL BE GENERAL ELECTRIC, PHILIPS, OR OSRAM/SYLVANIA EXCEPT WHERE OTHERWISE NOTED IN THE LIGHTING FIXTURE SCHEDULE OR OTHERWISE NOTED. ALL FIXTURES SHALL BE EQUIPPED WITH LAMPS.

10. LIGHTING CONTROLS:
    - A. ALL LIGHTING CONTACTORS SHALL BE ELECTRICALLY HELD AND BE INSTALLED IN A NEMA 1 ENCLOSURE, UNLESS OTHERWISE NOTED.
    - B. LIGHTING CONTACTORS SHALL SWITCH LOADS AT THE VOLTAGE AND AMPERE RATING INDICATED AND SHALL HAVE THE NUMBER OF POLES INIDCATED ON THE DRAWINGS OR AS REQUIRED.
    - C. CONTACTOR AND CONTACTS SHALL BE CONTINUOUSLY RATED FOR THE LOAD SERVED, INCLUDING THE TUNGSTEN FILAMENT, INDUCTIVE, AND HIGH-INRUSH BALLAST LOADS.

11. EQUIPMENT IDENTIFICATION:
    - A. PROVIDE ENGRAVED PHENOLIC NAMEPLATES FOR ALL ELECTRICAL EQUIPMENT SUPPLIED FOR THE PROJECT, INCLUDING BUT NOT LIMITED TO, WIRING TROUGHS, SAFETY SWITCHES, DISCONNECTS, TRANSFORMERS, PANELBOARDS, SWITCHBOARDS, BUSWAYS, GENERATORS, AUTOMATIC TRANSFER SWITCHES (ATS), UNINTERRUPTIBLE POWER SUPPLY (UPS), POWER DISTRIBUTION UNITS (PDU), FLOOR/REMOTE DISTRIBUTION CABINETS (FDC/RDC), STATIC TRANSFER SWITCHES (STS), ETC. NAMEPLATE SHALL INDICATE THE DEVICE NAME, SYSTEM VOLTAGE (VOLTAGE/PHASE/WIRE), AND UPSTREAM DEVICE AND CIRCUIT. PROVIDE NAMEPLATES FOR CIRCUIT BREAKERS IN SWITCHGEARS, SWITCHBOARDS AND DISTRIBUTION PANELS.
    - B. NAMEPLATE COLORS SHALL BE AS FOLLOWS:

120/208V EQUIPMENT	BLUE SURFACE WITH WHITE CORE
277/480V EQUIPMENT	BLACK SURFACE WITH WHITE CORE
EMERGENCY SYSTEMS	GREEN SURFACE WITH WHITE CORE
FIRE ALARM SYSTEMS	BRIGHT RED SURFACE WITH WHITE CORE
SECURITY SYSTEMS	BURGUNDY SURFACE WITH WHITE CORE
TELEPHONE SYSTEMS	ORANGE SURFACE WITH WHITE CORE
DATA SYSTEMS	BROWN SURFACE WITH WHITE CORE
TV SYSTEMS	PURPLE SURFACE WITH WHITE CORE
PAGING SYSTEMS	WHITE SURFACE WITH BLACK CORE

    - C. NAMEPLATES UP TO 8 SQUARE INCHES SHALL NOT BE LESS THAN 1/16" THICK. NAMEPLATES LARGER THAN 8 SQUARE INCHES SHALL NOT LESS THAN 1/8" THICK.
    - D. LETTERING HEIGHT SHALL BE 1/2" MINIMUM.
    - E. NAMEPLATES SHALL BE ATTACHED WITH SELF-DRILLING/SELF-TAPPING SCREWS, EXCEPT RIVETS SHALL BE USED WHERE END OF SCREW IS NOT PROTECTED. QUANTITY AS FOLLOWS:

UP TO 5 SQUARE INCHES:	2 SCREWS
5 TO 12 SQUARE INCHES:	4 SCREWS
ABOVE 12 SQUARE INCHES:	6 SCREWS

12. DISCONNECTS:
    - A. DISCONNECT SWITCHES SHALL BE HEAVY-DUTY TYPE IN NEMA 1 ENCLOSURES, UNLESS OTHERWISE NOTED, FUSED OR NON-FUSED AS INDICATED. SWITCHES SHALL HAVE REJECTION-TYPE FUSE CLIPS. SWITCHES SHALL BE BY EATON, SQUARE-D, GENERAL ELECTRIC, OR APPROVED EQUAL. WHERE FED FROM A LOAD CENTER, GENERAL-DUTY SWITCHES SHALL BE PERMITTED.
    - B. FUSES LESS THAN 60A SHALL BE CLASS RK5, DUAL-ELEMENT, TIME-DELAY WITH INDICATION
    - C. FUSES GREATER THAN 60A SHALL BE CLASS J, DUAL-ELEMENT, TIME-DELAY WITH INDICATION.
    - D. A SET OF 3 SPARE FUSES OF EACH SIZE AND TYPE SHALL BE FURNISHED TO THE OWNER.

13. PANELBOARDS:
    - A. PANELBOARDS SHALL BE PROVIDED AS MANUFACTURED BY EATON, SQUARE-D, GENERAL ELECTRIC, OR APPROVED EQUAL. ALL NEW EQUIPMENT FOR THE PROJECT SHALL BE BY THE SAME MANUFACTURER.
    - B. ALL BUSSING, INCLUDING NEUTRAL AND GROUND, SHALL BE COPPER.
    - C. ALL BREAKERS SHALL BE AUTOMATIC THERMAL-MAGNETIC TYPE MOLDED CASE BOLT-ON TYPE, CALIBRATED FOR 40 DEGREE C, OR AMBIENT COMPENSATION, UNLESS OTHERWISE NOTED.
    - D. PANELS SHALL BE FULLY RATED (AIC). NO SERIES AIC RATINGS ARE ALLOWED.
    - E. PANELS SHALL HAVE FULL SIZE EQUIPMENT GROUNDING BARS AND NEUTRAL BARS, EXCEPT WHERE INDICATED TO BE 200%.
    - F. ALL PANELBOARD AND BREAKER LUGS SHALL BE SIZED AND RATED PER THE CONDUCTOR SIZE AND MATERIAL.
    - G. LIGHTING AND APPLIANCE PANELS (100A-600A) SHALL HAVE FRONT ACCESSIBLE HINGED DOOR-IN-DOOR COVERS WITH DEAD FRONT, SHALL BE 20" WIDE MINIMUM WITH MINIMUM 4" WIDE WIRING GUTTERS.
    - H. DISTRIBUTION PANELS (600A-1200A) SHALL HAVE FRONT ACCESSIBLE DEAD FRONT COVERS.
    - I. GROUND-FAULT CIRCUIT-INTERRUPTER (GFCI) PROTECTION FOR PERSONNEL SHALL BE PROVIDED FOR ALL LOCATIONS PER NEC 210.8, INSTALLED IN A READILY ACCESSIBLE LOCATION. WHERE A DEVICE LOCATION IS NOT ACCESSIBLE, THE GFCI PROTECTION SHALL BE PROVIDED WITH THE BREAKER SERVING THE DEVICE.
    - J. ARC-FAULT CIRCUIT-INTERRUPTER (AFCI) PROTECTION SHALL BE PROVIDED FOR ALL LOCATIONS PER NEC 210.12, INSTALLED IN A READILY ACCESSIBLE LOCATION. THIS INCLUDES ALL 120V, 15A AND 20A BRANCH CIRCUITS IN DWELLING UNITS, DORMITORY/STUDENT HOUSING UNITS AND HOTEL/MOTEL GUEST ROOMS/SUITES AS DEFINED BY THE NEC.

14. DRY-TYPE TRANSFORMERS:
    - A. TRANSFORMER ENCLOSURES SHALL BE VENTILATED AND FABRICATED OF HEAVY GAUGE, SHEET STEEL CONSTRUCTION WITH PERMANENTLY ATTACHED TRANSFORMER DATA LABEL.
    - B. MAXIMUM SOUND LEVEL FOR TRANSFORMERS SHALL NOT EXCEED:
      45 DB FOR 15-50 KVA
      50 DB FOR 51-150 KVA
    - C. TRANSFORMER CONNECTIONS SHALL BE AT SIDES THROUGH LIQUID-TIGHT FLEXIBLE METAL CONDUIT WITH CONNECTIONS SUITABLE FOR CONDUCTOR MATERIAL.
    - D. TRANSFORMER SECONDARY NEUTRAL SHALL BE PROPERLY GROUNDED AS A SERVICE GROUND. THE CORE AND COILS SHALL BE ELECTRICALLY GROUNDED TO THE ENCLOSURE WITH A FLEXIBLE GROUND STRAP.
    - E. PROVIDE MANUFACTURER APPROVED AND LISTED WALL BRACKETS (75 KVA MAX) AND/OR CEILING MOUNTING BRACKETS (150 KVA MAX) WHERE INDICATED ON THE DRAWINGS.

15. FIRE ALARM SYSTEM:
    - A. SPRINKLER SYSTEM TAMPER SWITCHES SHALL BE CONNECTED INTO A COMMON ZONE WHICH SHALL DISTINGUISH BETWEEN A CONDUIT FAULT AND A CLOSED VALVE. A CLOSED VALVE SHALL BE INDICATED AS AN ALARM CONDITION, BUT WILL NOT ACTIVATE THE AUDIO-VISUAL DEVICES AND SHALL CAUSE A SUPERVISORY SIGNAL TO BE TRANSMITTED TO THE CENTRAL STATION.
    - B. CONDUCTORS SHALL BE PLENUM-RATED AND INSTALLED IN CONDUIT AND INSTALLED IN COMPLIANCE WITH NFPA 70, ARTICLE 760; IN ADDITION TO WIRING METHODS 300.4.
    - C. ALL FIRE ALARM WIRING SHALL BE CLASS B.
    - D. PROVIDE ALL REQUIRED MODULES, POWER EXTENDERS, PROGRAMMING, ETC. FOR A COMPLETE AND OPERATIONAL SYSTEM.
    - E. SUBMIT FIRE ALARM SHOP DRAWINGS CONSISTING OF PRODUCT DATA, TO THE ENGINEER AND FOR APPROVAL.
    - F. FILL OUT NFPA 72 CERTIFICATION REPORT AND SUBMIT TO ENGINEER AND AUTHORITY HAVING JURISDICTION.
    - G. WARRANTY - ALL WORK PERFORMED AND ALL MATERIALS AND EQUIPMENT FURNISHED UNDER THIS CONTRACT SHALL BE FREE FROM DEFECTS AND SHALL REMAIN SO FOR A PERIOD OF AT LEAST TWO (2) YEARS FROM THE DATE OF ACCEPTANCE BY THE PROFESSIONAL ENGINEER AND/OR OWNER. THE FULL COST OF MAINTENANCE, LABOR, AND MATERIALS REQUIRED TO CORRECT ANY DEFECT DURING THIS TWO YEAR PERIOD SHALL BE IMMEDIATELY CORRECTED AT NO ADDITIONAL COST TO THE OWNER. ANY DEFECTS THAT RENDER THE SYSTEM INOPERATIVE SHALL BE REPAIRED WITHIN 24 HOURS OF THE OWNER NOTIFYING THE CONTRACTOR. OTHER DEFECTS SHALL BE REPAIRED WITHIN 48 HOURS OF THE OWNER NOTIFYING THE CONTRACTOR.

16. FIRE STOPPING:
    - A. ALL PENETRATIONS OF RATED ASSEMBLIES SHALL BE SEALED WITH RATED MATERIALS MEETING ASTM E-814.
    - B. PROVIDE FIRESTOPPING DEVICE(S) OR SYSTEM(S) WHICH HAVE BEEN TESTED AND LISTED AS COMPLYING WITH ASTM E-814. INSTALL THE DEVICE(S) OR SYSTEM(S) IN ACCORDANCE WITH THE CONDITIONS OF THEIR LISTING. PROVIDE THE APPROPRIATE DEVICE(S) OR SYSTEM(S) WITH AN 'F' RATING EQUAL TO THE RATING OF THE ASSEMBLY BEING PENETRATED.
    - C. DEVICE(S) AND/OR SYSTEM(S) SHALL BE BY HILTI, 3M OR EQUIVALENT.

17. SEISMIC:
    - A. THE ELECTRICAL CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR PROVIDING SEISMIC SUPPORT AND BRACING OF ELECTRICAL COMPONENTS TO RESIST THE EFFECTS OF EARTHQUAKES ON THE ELECTRICAL SYSTEM AS WELL AS ANY REQUIRED SPECIAL INSPECTIONS BASED ON THE SPECIFIC GEOGRAPHIC LOCATION AS REQUIRED. THE SEISMIC RESTRAINTS AND SPECIAL INSPECTIONS SHALL MEET ALL APPLICABLE STATE AND LOCAL BUILDING CODE REQUIREMENTS AS WELL AS ASCE-7 REQUIREMENTS.

18. ELECTRICAL COORDINATION WITH OTHER TRADES:
    - A. THE ELECTRICAL CONTRACTOR SHALL CONNECT AND/OR PROVIDE FINAL CONNECTIONS TO ALL EQUIPMENT SUPPLIED BY OTHERS APPLICABLE TO THE PROJECT, INCLUDING BUT NOT LIMITED TO, MECHANICAL, PLUMBING, FIRE PROTECTION AND SUPPRESSION, OWNER FURNISHED, KITCHEN, LABORATORY, ETC. UNLESS OTHERWISE NOTED.
    - B. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL CONNECTIONS PRIOR TO ROUGH-IN USING APPROVED CATALOG SHEETS AND SHOP DRAWINGS.
    - C. THE ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANUAL MOTOR STARTER SWITCHES, DISCONNECT SWITCHES, RECEPTACLES, ETC. TO MECHANICAL AND PLUMBING EQUIPMENT. ALL STARTERS, OTHER THAN MANUAL STARTER SWITCHES, SHALL BE PROVIDED BY OTHERS, BUT INSTALLED BY THE ELECTRICAL CONTRACTOR.
    - D. ALL DISCONNECT SWITCHES AND FUSE SIZES SHALL BE COORDINATED WITH SHOP DRAWINGS PRIOR TO ORDERING OR INSTALLING. ANY EQUIPMENT INSTALLED INCORRECTLY BECAUSE OF LACK OF COORDINATION WILL BE REMOVED AND INSTALLED CORRECTLY AT THE EXPENSE OF THE ELECTRICAL CONTRACTOR.
    - E. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL CONDUIT RUNS AND LIGHT FIXTURE LOCATIONS ABOVE THE CEILING WITH OTHER TRADES PRIOR TO INSTALLATION.
    - F. ALL DUCT SMOKE DETECTORS SHALL BE PROVIDED AND CONNECTED BY THE ELECTRICAL CONTRACTOR, BUT INSTALLED BY THE MECHANICAL CONTRACTOR.
    - G. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL NECESSARY OUTLETS FOR HEAT TAPE CONNECTIONS FOR MECHANICAL SYSTEMS. PROVIDE CLASS B (30mA) GFCI PROTECTION ON THE BREAKER SUPPLYING THE HEAT TAPE.
    - H. THE ELECTRICAL CONTRACTOR SHALL PROVIDE 120V POWER AT EACH HVAC UNIT HAVING A CONTROLS POWER SUPPLY. CIRCUIT(S) SHALL BE DEDICATED 20A SERVING A MAXIMUM OF 10 HVAC UNITS PER CIRCUIT. COORDINATE ALL LOCATIONS WITH THE MECHANICAL CONTRACTOR.

19. COORDINATION DRAWINGS:
    - A. THE MECHANICAL CONTRACTOR SHALL ORGANIZE COORDINATION MEETINGS TO DEVELOP A SET OF DRAWINGS WITH ALL CONTRACTORS (ELECTRICAL, MECHANICAL, PLUMBING, FIRE PROTECTION, IT/DATA, SECURITY AND GENERAL). THE MECHANICAL CONTRACTOR WILL HAVE THE LEAD RESPONSIBILITY FOR THE COORDINATION DRAWINGS. THE MECHANICAL CONTRACTOR SHALL PRODUCE THE ORIGINAL DRAWINGS AND FORWARD THE DRAWINGS TO EACH OF THE OTHER CONTRACTORS FOR THEM TO ADD THEIR SYSTEMS TO THIS SET OF COORDINATION DRAWINGS. THE CONTRACTORS WILL DEVELOP THE DRAWINGS IN THIS ORDER: MECHANICAL, FIRE PROTECTION, PLUMBING, ELECTRICAL, IT/DATA (INCLUDING CABLE TRAY), SECURITY, AND GENERAL. THIS SHALL ALSO BE THE ORDER OF PRECEDENCE FOR INSTALLATION OF SYSTEMS. ANY RELOCATION OF SYSTEM ROUTINGS WILL BE FOUND IN THE COORDINATION PHASE AND NOTICED BY EACH OF THE CONTRACTORS. THESE DRAWINGS, WHEN COMPLETED, SHALL BE SIGNED OFF BY ALL OF THE ABOVE LISTED PARTIES. DRAWINGS SHALL BE COMPLETED PRIOR TO PURCHASE, FABRICATION OR INSTALLATION OF EQUIPMENT AND/OR SYSTEMS. THE FOLLOWING ITEMS REPRESENT THE MINIMUM REQUIREMENTS FOR SHOP DRAWINGS AND COORDINATION DRAWINGS:
      1. ALL SHOP AND COORDINATION DRAWINGS WILL BE 1/4"=1'-0" SCALE.
      2. DRAWINGS WILL BE ORIGINAL DRAWINGS AND NOT OVERLAYS OF THE CONTRACT/DESIGN DRAWINGS.
      3. COORDINATION DRAWINGS WILL BE DRAWN ON REPRODUCIBLE MATERIAL 48"x36".
      4. COORDINATION DRAWINGS ARE NOT SHOP DRAWINGS AND ARE REQUIRED IN ADDITION TO SHOP DRAWINGS.
      5. ONCE THE COMPLETE COORDINATION DRAWINGS HAVE BEEN COMPILED, THE MECHANICAL CONTRACTOR WILL DISTRIBUTE ONE SIGNED SET TO EACH OF THE FOLLOWING CONTRACTORS: ELECTRICAL, PLUMBING, FIRE PROTECTION, IT/DATA, AND GENERAL. ADDITIONAL SETS WILL BE SENT TO THE OWNER, ARCHITECT, AND ENGINEER.

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23474 BRIAN E. THOMPSON
01-12-2023

MEMBERS OF THE AMERICAN INSTITUTE OF ARCHITECTS

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

ELECTRICAL NOTES

E-002

Optima # 22-0082

01.12.2023 - BID SET

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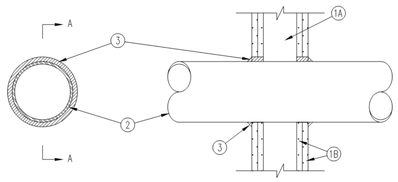
System No. W-L-1085

F Rating – 1 and 2 Hr (See Item 1B)
T Rating – 0 Hr
L Rating At Ambient – Less Than 1 CFM/Sq Ft
L Rating At 400 F – 4 CFM/Sq Ft

WL 1085



SECTION A–A

1. Wall Assembly The 1 or 2 hr fire–rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2–1/2 in. wide and spaced max 24 in. OC.
   B. Gypsum Board* 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum wallboard type, number of layers, fastener type and sheet orientation shall be as specified in the individual Wall and Partition Design. Max diam of opening is 5–1/2 in. (138 mm) when sleeve (Item 2) is employed. Max diam of opening is 4 in. (102 mm) when sleeve (Item 2) is not employed.
   The hourly F Rating of the firestop system is equal to the fire rating of the wall assembly.
2. Metallic Sleeve — (Optional) - Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT) or Schedule 5 (or heavier) steel pipe or min 0.016 in. thick (0.41 mm, No. 28 ga) galv steel sleeve installed flush with wall surfaces. The annular space between steel sleeve and periphery of opening shall be min 0 in. (0 mm, point contact) to max 1 in. (25mm). When Schedule 5 steel pipe or EMT is used, sleeve may extend up to 18 in. (457 mm) beyond the wall surfaces. As an option when Schedule 5 steel pipe or EMT is used, sleeve may extend continuously beyond one wall surfaces. When cable bundle penetrates wall assembly at an angle of 45 degrees, no metallic sleeve is used.

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HILTI FIRESTOP SYSTEMS

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November 24, 1999

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System No. W-L-3065

F Ratings — 1 and 2 Hr (See Item 1)
T Rating — 0 and ¼ Hr (See Item 3)

WL 3065

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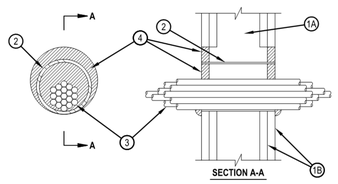

SECTION A-A

1. Wall Assembly — The 1 or 2 fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC.
   B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board, with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300, U400 or V400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 5-1/2 in. (138 mm) when sleeve (Item 2) is employed. Max diam of opening is 4 in. (102 mm) when sleeve (Item 2) is not employed.
   The F Rating of the firestop system is equal to the fire rating of the wall assembly.
2. Metallic Sleeve — (Optional) - Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT) or Schedule 5 (or heavier) steel pipe or min 0.016 in. thick (0.41 mm, No. 28 ga) galv steel sleeve installed flush with wall surfaces. The annular space between steel sleeve and periphery of opening shall be min 0 in. (0 mm, point contact) to max 1 in. (25mm). When Schedule 5 steel pipe or EMT is used, sleeve may extend up to 18 in. (457 mm) beyond the wall surfaces. As an option when Schedule 5 steel pipe or EMT is used, sleeve may extend continuously beyond one wall surfaces. When cable bundle penetrates wall assembly at an angle of 45 degrees, no metallic sleeve is used.

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Hilti Firestop Systems

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March 15, 2012

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3. Cables — Aggregate cross-sectional area of cable in opening to be max 45 percent of the cross-sectional area of the opening. The annular space between the cable bundle and the periphery of the opening to be min 0 in. (0 mm, point contact) to max 1 in. (25 mm) Cables to be rigidly supported on both sides of the wall assembly. Cable bundle, using cables described below, may penetrate the wall at an angle not greater than 45 degrees. Any combination of the following types and sizes of copper conductor cables may be used:
   A. Max T/C No. 12 AWG with polyvinyl chloride (PVC) insulation and jacket.
   B. Max 25 pair No. 24 AWG telephone cable with PVC insulation and jacket.
   B1. Max 4 pr No. 22 AWG Cat 5 or Cat 6 computer cables.
   C. Type RG/U coaxial cable with polyethylene (PE) insulation and PVC jacket having a max outside diameter of ½ in. (13 mm).
   C1. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   D. Multiple fiber optical communication cable jacketed with PVC and having a max OD of 5/8 in. (16 mm).
   E. Through Penetrating Products*— Max three copper conductor No. 8 AWG .Metal-Clad Cable+.
   AFC CABLE SYSTEMS INC
   F. Max 3/C (with ground)(or smaller) No. 8 AWG copper conductor cable with PVC insulation and jacketing.
   G. Max 3/4 in. (19 mm) diam copper ground cable with or without a PVC jacket.
   H. Fire Resistive Cables* - Max 1-1/4 in. (32 mm) diam single conductor or multi conductor Type MI cable. A min 1/8 in. (3 mm) separation shall be maintained between MI cables and any other types of cable.
   I. Max 4/C with ground 300 kcmil (or smaller) aluminum SER cable with PVC insulation and jacket.
   J. Through Penetrating Product* - Any cables, Metal-Clad Cable+ or Armored Cable+ currently Classified under the Through Penetrating Products category.
   K. Maximum 3/C No. 8 AWG metal-clad cable.
   L. Maximum 5/8 diam fiber-optic cable with PVC jacket.
   For cable bundle penetrating the wall assembly at an angle of 45 degrees, the T rating is ¾ hr for a 2 hr wall assembly.
   See Through Penetrating Product (XHLY) category in the Fire Resistance Directory for names of manufacturers.
4. Fill, Void or Cavity Material* — Sealant or Putty — Fill material applied within the annulus, flush with each end of the steel sleeve or wall surface. Fill material installed symmetrically on both sides of the wall. A min 5/8 in. (16 mm) thickness of sealant is required for the 1 or 2 hr F Rating . An additional 1/2 in. (13 mm) diam bead of fill material shall be applied around the perimeter of sleeve on both sides of the wall when sleeve extends beyond surface of wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP601S, CP606, FS-One Sealants or CP618 Putty

*Bearing the UL Classification Mark
+Bearing the UL Listing Mark

Hilti Firestop Systems

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System No. W-L-8013

WL 8013

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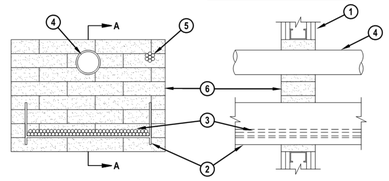
ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings — 1 and 2 Hr (See Item 1)	F Ratings — 1 and 2 Hr (See Item 1)
T Rating — 0 Hr	FT Rating — 0 Hr
L Rating At Ambient — 5 CFM/sq ft	FH Ratings — 1 and 2 Hr (See Item 1)
L Rating At 400 F — 2 CFM/sq ft	FTH Rating — 0 Hr
	L Rating At Ambient — 5 CFM/sq ft
	L Rating At 400 F — 2 CFM/sq ft



SECTION A-A

System tested with a pressure differential of 2.5 Pa between the exposed and the unexposed surfaces with the higher pressure on the exposed side.

1. Wall Assembly — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 in. (51 mm) by 4 in. (102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC. Additional studs installed to completely frame the opening.
   B. Gypsum Board* — 5/8 in. (16 mm) thick, 4 ft (1219 mm) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual Wall and Partition Design. Max area of opening is 352 sq in. (2271 sq cm) with max dimension of 22 in. (559 mm) wide.
   The hourly F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. Cable Tray* — Max 18 in. (457 mm) wide by max 6 in. (152 mm) deep open-ladder or solid-back cable tray with channel-shaped side rails formed of 0.065 in. (1.65 mm) thick aluminum or 0.060 in. (1.52 mm) thick steel and with 1-1/2 in. (38 mm) wide by 1 in. (25 mm) channel shape rungs spaced 9 in. (229 mm) OC or a 0.029 in. (0.74 mm) thick steel solid back, respectively. One cable tray to be installed in the opening. The max annular space between the cable tray and the periphery of the opening shall be min 1 in. (25 mm) to max 7 in. (178 mm) Cable tray to be rigidly supported on both sides of floor or wall assembly.

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Hilti Firestop Systems

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January 13, 2012

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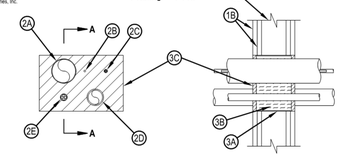
System No. W-L-8004

F Rating — 2 Hr
T Rating — 1/4 Hr

WL 8004

Classified by Underwriters Laboratories, Inc. to UL 1479



SECTION A-A

1. Wall Assembly — The fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. OC. (610 mm) Additional framing (not shown) may be installed around the perimeter of the opening in lieu of the steel wire mesh (Item No. 3A).
   B. Gypsum Board* — Two layers of nom 5/8 in. (16 mm) thick gypsum wallboard, as specified in the individual Wall and Partition Design. Max area of opening is 96 sq in. (692 cm2) with max dimension of 12 in. (305 mm) Max width of opening in wood stud walls is limited to 12 in. (305 mm)
2. Through Penetrants — The following types and sizes of pipes, conduits, tubing or cables may be used:
   A. Nom 3 in. (76 mm) diam (or smaller) electrical metallic tubing (EMT).
   B. Max 25 pair — No. 24 AWG (or smaller) telephone cable with polyvinyl chloride (PVC) insulation and jacket.
   C. Max 3/C with ground — No. 10 AWG (or smaller) Type NM cable with PVC insulation and jacket.
   D. Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVC pipe for use in closed (process or supply) piping systems only.
   E. Max 300 kcmil (or smaller) power cable with PVC insulation and nylon jacket.
   The through penetrating items to be rigidly supported on both sides of wall assembly and located as shown in the table below:

Item No.	Max Distance Between Adjacent Pen. Item In. (mm)	Min Distance Between Adjacent Pen. Item In. (mm)	Max Distance From Through Opening In. (mm)	Min Distance From Through Opening In. (mm)
2A	7-7/16 (189)	1-11/16 (43)	14-1/2(370)	½ (13 mm)
2B	7-7/16 (189)	1-11/1 (43)6	14-1/2(370)	1/2 (13 mm)
2C	7-7/16 (189)	1-11/16 (43)	14-1/2(370)	1/2 (13 mm)
2D	7-7/16 (189)	1-11/16 (43)	14-1/2(370)	1/2 (13 mm)
2E	7-7/16 (189)	1-11/16 (43)	14-1/2(370)	1-1/2 (32 mm)

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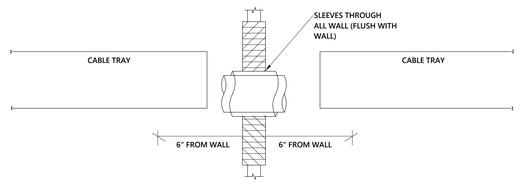
Page: 1 of 2

CABLE TRAY WALL INTERSECTION DETAIL



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GASTON COUNTY SCHOOLS

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

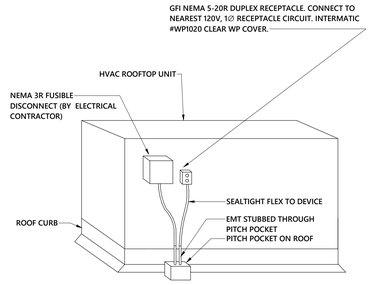
PENETRATION DETAILS

E-003

Optima # 22-0082

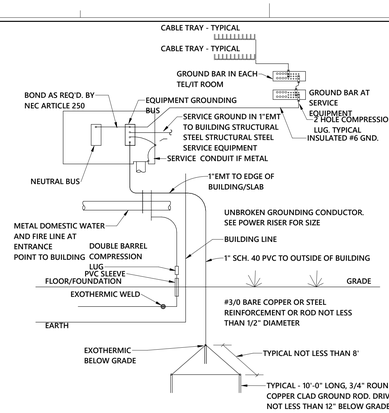
[redacted]

01.12.2023 - BID SET

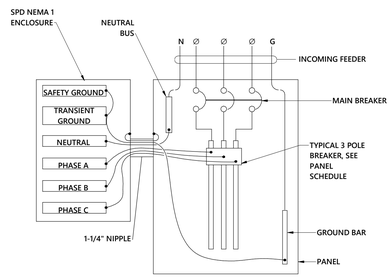


NOTE: TYPICAL FOR ROOF MOUNTED HVAC EQUIPMENT.

1 ROOFTOP RECEPTACLE DETAIL
NOT TO SCALE

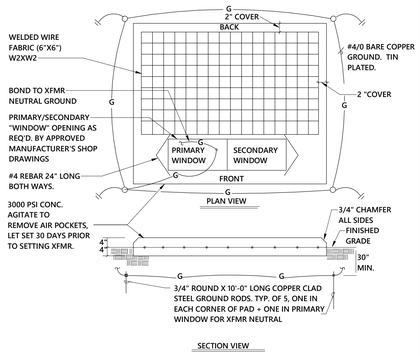


2 SERVICE GROUND DIAGRAM
NOT TO SCALE

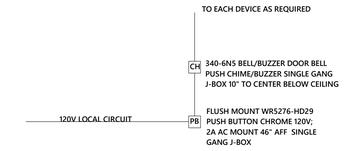


NOTES:
1. ALL WIRING SHALL BE #6 AWG.
2. AVOID SHARP BENDS IN WIRES. ALL WIRE LENGTHS SHALL NOT EXCEED 18" (WHERE POSSIBLE).
3. SEE SPD SPECIFICATION FOR EXACT TYPE FOR LOCATION AS INDICATED ON THE POWER RISER DIAGRAM.

3 SPD CONNECTION DETAIL
NOT TO SCALE

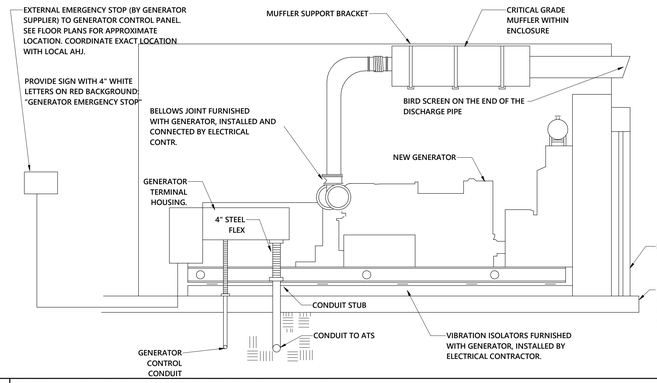


4 TRANSFORMER PAD DETAIL
NOT TO SCALE



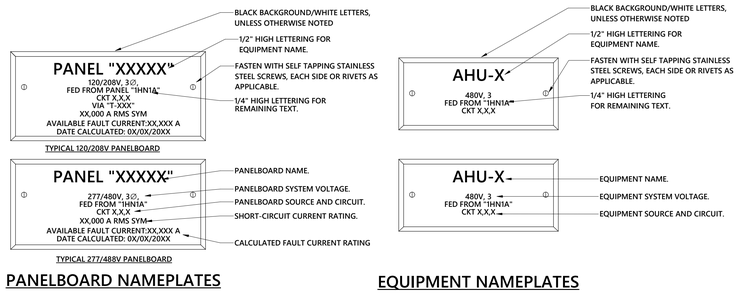
NOTES:
1. DEVICES ARE BASED ON EDWARDS SIGNALING SYSTEMS, DOORTRONICS, OR EATON.

5 DOOR BELL SYSTEM
NOT TO SCALE



NOTES:
1. GENERATOR MUST MEET UL 2200.
2. ENCLOSURE TO SHALL BE LIMITED TO THE FOLLOWING:
   A. 16 GAUGE FORMED STEEL CONSTRUCTION.
   B. AIR INTAKE LOUVERS BASED ON 95° F OUTSIDE AIR.
   C. ALL DOORS TO HAVE "PIANO HINGES" AND KEY LOCK LATCHES.
   D. AN ANGLE IRON FRAME ATTACHED TO THE BOTTOM OF ENCLOSURE ENABLING ENCLOSURE TO BE BOLTED TO THE CONCRETE MOUNTING BASE.
3. SOUND ATTENUATION TO MEET SPECIFICATIONS.

6 SECTION AT WEATHERPROOF GENERATOR HOUSEING
NOT TO SCALE

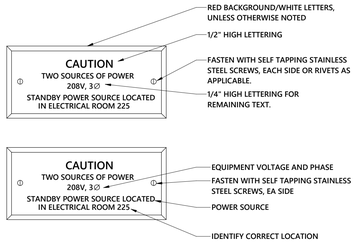


PANELBOARD NAMEPLATES

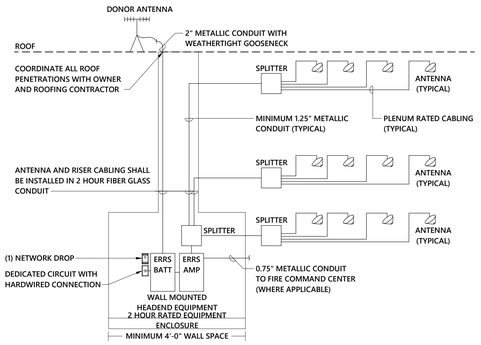
EQUIPMENT NAMEPLATES

NOTES:
1. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS, COLORS, ETC.
2. PROVIDE SHORT-CIRCUIT CURRENT RATING AND AVAILABLE FAULT CURRENT ON EACH NON-DWELLING SERVICE EQUIPMENT NAMEPLATE.

7 TYPICAL NAMEPLATE DIAGRAM
NOT TO SCALE



8 EMERGENCY POWER NAMEPLATE
NOT TO SCALE



GENERAL NOTES:

A. ELECTRICAL CONTRACTOR SHALL PROVIDE THE SYSTEM SURVEY IN THEIR BASE BID. ELECTRICAL CONTRACTOR SHALL PROVIDE AN ADD ALTERNATE FOR THE COMPLETE SYSTEM COVERING 100% OF THE BUILDING. IF ONLY A PARTIAL SYSTEM IS REQUIRED BASED ON THE SYSTEM SURVEY AND AHJ, THEN THE COST OF THE REDUCED SYSTEM SCOPE SHALL BE NEGOTIATED.

B. EMERGENCY RESPONDER RADIO SYSTEM (ERRS) MAY ALSO BE REFERRED TO AS BI-DIRECTIONAL ANTENNA SYSTEM (BDA) OR FIRST RESPONDER DISTRIBUTED ANTENNA SYSTEM.

C. ERRS SYSTEM SURVEY SHALL CONSIST OF TWO PARTS. PART ONE SHALL BE ADMINISTERED AT THE START OF CONSTRUCTION TO DOCUMENT THE AVAILABLE SIGNAL AT THE SITE. PART TWO SHALL BE ADMINISTERED WHEN ALL STEEL, GYPBOARD, AND WINDOWS HAVE BEEN INSTALLED.

D. DETAIL IS DIAGRAMATIC AND ONLY INDICATES MAIN COMPONENTS AND APPROXIMATE LOCATIONS. QUANTITY AND LOCATIONS OF EQUIPMENT ARE DETERMINED BY THE 3RD PARTY DELIGATED DESIGN. SYSTEM DESIGN SHALL BE BASED ON THE ACTUAL CONSTRUCTION OF THE BUILDING. ELECTRICAL CONTRACTOR SHALL COORDINATE ALL REQUIREMENTS WITH VENDOR.

SPECIFICATIONS:

A. ELECTRICAL CONTRACTOR SHALL FURNISH, INSTALL, AND TEST A COMPLETE AND OPERATING EMERGENCY RESPONDER RADIO SYSTEM ("SYSTEM"). THE SYSTEM SHALL BE PROVIDED FOR THE PURPOSE OF ASSURING RELIABLE EMERGENCY COMMUNICATIONS.

B. THE REQUIREMENTS ESTABLISHED BY THE AHJ IN EFFECT AT THE TIME OF SYSTEM INSTALLATION SUPERSEDE THE SPECIFICATIONS IN THIS SECTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ASSURE THE INSTALLED SYSTEM COMPLIES WITH ALL CURRENTLY APPLICABLE LOCAL, NATIONAL AND INDUSTRY CODES AS ADOPTED BY THE AHJ.

C. TWO SETS OF FREQUENCIES ARE TO BE UTILIZED ON THE SYSTEM. THE FOLLOWING FCC-LICENSED FACILITIES ARE TO BE CARRIED ON THE SYSTEM: FCC CALL SIGN, DOWNSTREAM/BASE TO MOBILE FREQUENCY, UPSTREAM/MOBILE TO BASE FREQUENCY AND CHANNEL BANDWIDTH. TRANSMISSIONS ON EACH SET OF FREQUENCIES MUST INDIVIDUALLY MEET THE COVERAGE, MINIMUM SIGNAL AND MINIMUM VOICE QUALITY REQUIREMENTS OF THE AHJ. EQUIPMENT SELECTED FOR THIS SYSTEM MUST BE CAPABLE OF BEING CONFIGURED TO DIFFERENT FREQUENCY PAIRS IN THE 700-800 Mhz PUBLIC SAFETY FREQUENCY BANDS. THESE CHANGES MAY LATER BE NECESSARY DUE TO FUTURE ADDITIONS OR OPTIMIZATION OF RADIO SYSTEMS MAINTAINED BY THE AHJ. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM THE FREQUENCIES IN USE WITH THE AHJ BEFORE PROCEEDING WITH THE SYSTEM INSTALLATION. ALL CABLE AND PASSIVE ELECTRONIC COMPONENTS SHALL HAVE A MINIMUM PASS BAND OF 400-2700 Mhz.

SPECIFICATIONS (CONTINUED):

D. SIGNALS AT OR ABOVE THE MINIMUM LEVELS ARE TO BE RECEIVABLE TO AND FROM 95% OF ALL AREAS WITHIN THE BUILDING. SPACES OR ROOMS DEFINED AS CRITICAL AREAS REQUIRE 99% COVERAGE. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A SYSTEM DESIGN AND INSTALLATION THAT PROVIDES ENHANCEMENT ONLY TO THOSE AREAS OF THE BUILDING WHERE EXISTING OFF-AIR SERVICE DOES NOT MEET THE MINIMUM LEVELS AS DESCRIBED IN THE LATEST VERSIONS OF NFPA 72 AND IFC. CARE MUST BE TAKEN IN ENGINEERING A SYSTEM THAT WILL NOT CAUSE INTERFERENCE TO THE AUTHORITY'S RADIO SYSTEM OUTSIDE THE BUILDING AND SHALL NOT CAUSE HARMFUL INTERFERENCE TO OTHER RF SYSTEMS INSIDE THE BUILDING.

E. THE SYSTEM SHALL BE DESIGNED FOR CONTINUOUS, ALWAYS-ON SERVICE. SIX (6) MALFUNCTION ALARMS FOR THE SYSTEM SHALL BE PROVIDED AND CONNECTED TO THE BUILDING FIRE ALARM SYSTEM. CONTRACTOR SHALL PROVIDE 24 HOUR BATTERY BACKUP. BATTERIES SHALL BE CONTAINED IN A NEMA 4 TYPE WATERPROOF CABINET.

F. ALL CABLING, WITH THE EXCEPTION OF RADIATING CABLE AND ANTENNA JUMPER CABLES MEASURING LESS THAN 2 FEET IN LENGTH, SHALL BE INSTALLED IN CONDUIT. ALL EXPOSED CABLE, INCLUDING FLEXIBLE JUMPER CABLES, SHALL BE PLENUM RATED, UTILIZING A JACKET OF NON-HALOGENATED, FIRE RETARDANT POLYOLEFIN.

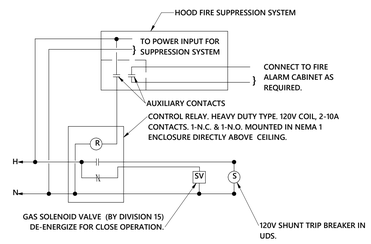
G. GROUND AND BOND CABLE SHIELDS AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS AND LATEST NFPA 70 NEC REQUIREMENTS. THE DONOR ANTENNA MAST SHALL BE GROUNDED PER LATEST NFPA 70 NEC REQUIREMENTS. GROUNDING BLOCKS AND SURGE PROTECTION SHALL BE PROVIDED FOR OUTSIDE CABLING.

H. SHOP DRAWINGS SHALL BE SUBMITTED AND APPROVED BY THE ENGINEER AND AHJ PRIOR TO INSTALLATION. PROVIDE A SYSTEM BLOCK DIAGRAM INDICATING THE DONOR ANTENNA(S), HEADEND EQUIPMENT, PASSIVE COMPONENTS AND IN-BUILDING ANTENNAS. INCLUDE THE RF LINK BUDGET. PROVIDE A OVERLAY OF THE SYSTEM DESIGN ON BUILDING FLOOR PLAN DRAWINGS AND OVERLAY ON FLOOR PLAN DRAWINGS OF THE PREDICTED SIGNAL STRENGTH WITHIN THE COVERAGE AREA INDICATING, AT A MINIMUM, THE –95 DBM DOWNLINK (BASE TO MOBILE) SIGNAL STRENGTH FOR ALL COVERAGE AREAS.

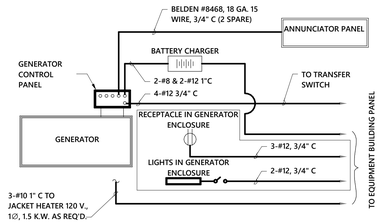
I. CONTRACTOR SHALL PROVIDE THE FOLLOWING DOCUMENTS AT PROJECT CLOSEOUT: AS-BUILT DRAWINGS IN PDF AND AUTOCAD FORMATS, COVERAGE/ACCEPTANCE TEST RESULTS, DONOR ANTENNA ISOLATION, SPECTRUM ANALYSIS DEMONSTRATING ONLY THE INTENDED FREQUENCIES ARE BEING CARRIED ON THE SYSTEM, SPECTRUM ANALYSIS DEMONSTRATING NO SPURIOUS OSCILLATIONS, PIM OR OTHER INTERMODULATION DISTURBANCES ARE BEING CARRIED ON THE SYSTEM, SIGNAL LEVELS RECEIVED AT THE DONOR ANTENNA, SIGNAL LEVELS AT THE INPUT AND OUTPUT OF THE HEADEND EQUIPMENT, GAIN SETTINGS, OPERATION AND MAINTENANCE MANUAL IN HARDCOPY AND PDF FORMAT AND WARRANTY DOCUMENTS.

J. CONTRACTOR SHALL PROVIDE A ONE YEAR WARRANTY ON PARTS AND LABOR AND PROVIDE A ONE YEAR MAINTENANCE AGREEMENT. MAINTENANCE AGREEMENT SHALL INCLUDE 24/7 EMERGENCY RESPONSE WITHIN TWO HOURS OF NOTIFICATION AND ANNUAL TESTING.

9 EMERGENCY RESPONDER RADIO SYSTEM (ERRS) - DIAGRAMATIC ONLY
NOT TO SCALE

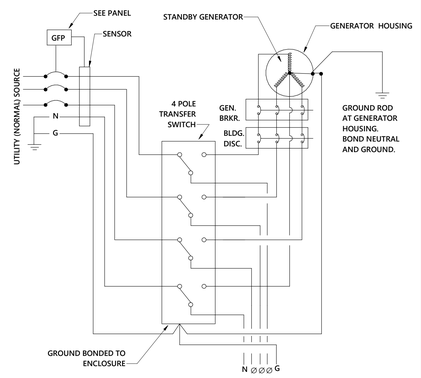


10 HOOD SHUTDOWN WIRE DETAIL
NOT TO SCALE

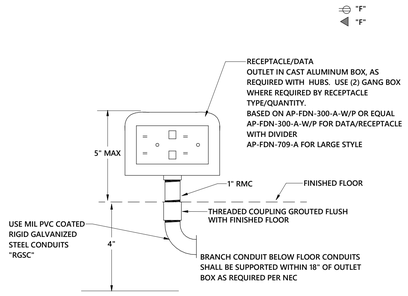


NOTES:
1. ALL CONDUIT ENTERING AND EXIT THE GENERATOR SHALL HAVE CONDUIT SEAL OFFS.

11 STANDBY GENERATOR SYSTEM DIAGRAM
NOT TO SCALE

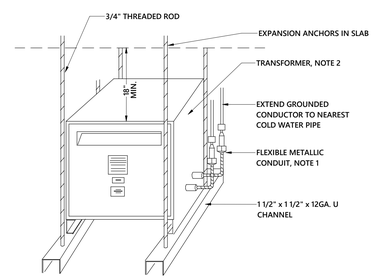


12 GENERATOR GROUNDING DETAIL - 4P ATS
NOT TO SCALE



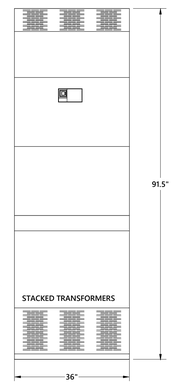
NOTES:
1. COORDINATE HEIGHT OF RECEPTACLE/DATA BOX WITH FOOD SERVICE PLANS PRIOR TO INSTALLATION.
2. SEE PLANS FOR RECEPTACLE TYPE.
3. CAST ALUMINUM HORIZONTALLY MOUNTED FLOOR BOXES.

13 KITCHEN FLOOR BOX DETAIL
NOT TO SCALE



NOTES:
1. TRANSFORMER CONNECTIONS SHALL BE MADE TO SIDES ONLY.
2. MAINTAIN 6" MINIMUM CLEARANCE ALL AROUND.

14 TRANSFORMER SUSPENDED FROM STRUCTURE
NOT TO SCALE



NOTES:
1. STACKED TRANSFORMERS BASED ON SQUARE D IPACS.
2. A STACKED TRANSFORMER WITH STRUCTURAL SUPPORTS MAY BE SUBSTITUTED. PROVIDE FULL SUBMITTALS ON MOUNTING AND STRUCTURAL SUPPORTS.
3. STACKED TRANSFORMERS SHALL BE COORDINATED AND INSTALLED PRIOR TO DOOR OPENING OF ELECTRICAL ROOMS.

15 STACKED TRANSFORMER ENCLOSURE
NOT TO SCALE

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

ELECTRICAL DETAILS

E-004

Optima # 22-0082

01.12.2023 - BID SET

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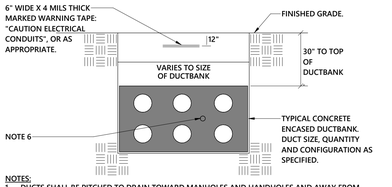
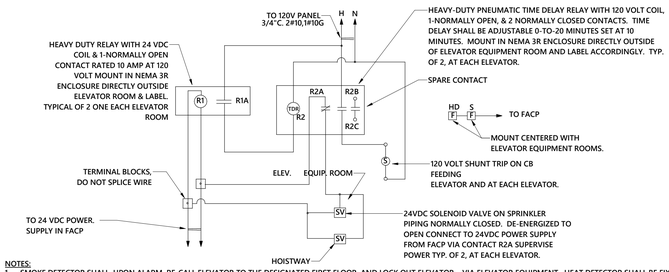


NOTES:
1. DUCTS SHALL BE PITCHED TO DRAIN TOWARD MANHOLES AND HANDHOLES AND AWAY FROM BUILDINGS AND EQUIPMENT AS APPROPRIATE.
2. DUCT SPACERS SHALL BE INSTALLED AND COORDINATED WITH THE DUCT SIZE. SPACING SHALL BE AS REQUIRED BY THE MANUFACTURER AND TO PREVENT SAGGING/DEFORMING OF DUCTS. SPACERS SHALL BE SECURED BY NON-FERROUS MEANS TO PREVENT FLOATING DURING CONCRETE POUR.
3. ALL DUCTS SHALL BE SEALED AT TERMINATIONS WITH APPROVED SEALING COMPOUND AND PLUGS, RATED TO WITHSTAND MINIMUM 15 PSI HYDROSTATIC PRESSURE.
4. ALL DUCTS SHALL BE RODDED, CLEARED AND SWABBED TO REMOVE ALL OBSTRUCTIONS AFTER INSTALLATION AND HAVE A WATERPROOF PULL CORD INSTALLED (130 LB MINIMUM TENSILE TEST). CORD SHALL BE FACTORY MARKED AT MINIMUM ONE FOOT INTERVALS.
5. VIBRATE CONCRETE TO FILL VOIDS.
6. INSTALL 1#2 BARE COPPER GROUND WIRE WITHIN CONCRETE ALONG ENTIRE DUCTBANK LENGTH. EXOTHERMICALLY CONNECT TO GROUND TRIAD RING. THIS GROUND WIRE IS IN ADDITION TO ANY GROUNDED (NEUTRAL) AND GROUNDING CONDUCTORS INDICATED TO BE INSTALLED WITHIN THE CONDUITS. ALTERNATE THE POSITION OF THE GROUND WIRE THROUGH THE DUCT SPACERS TO PREVENT SAG. ELECTRICAL POWER DUCTBANKS ONLY.
7. CONCRETE STRENGTH SHALL BE 3000 PSI @ 28 DAYS MINIMUM.
8. CONCRETE THERMAL RESISTIVITY (RHO) SHALL BE 0.55 m-C/W OR LESS.

1 TYPICAL DUCTWORK TRENCH DETAIL
NOT TO SCALE



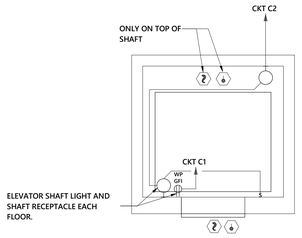
NOTES:
1. SMOKE DETECTOR SHALL, UPON ALARM, RE-CALL ELEVATOR TO THE DESIGNATED FIRST FLOOR, AND LOCK OUT ELEVATOR VIA ELEVATOR EQUIPMENT. HEAT DETECTOR SHALL BE FIXED TYPE WITH 135°F SETTING AND WHEN IN ALARM CAUSES FACP TO ACTIVATE RELAY R1, CLOSING CONTACT R1A, POWERING THE TIME DELAY RELAY R2. R2 STARTS 2 MINUTE COUNTDOWN AND UPON TIMING OUT, DE-ENERGIZES SOLENOID VALVE ALLOWING WATER INTO SPRINKLER PIPING AND ACTIVATED 120 VOLT SHUNT-TRIP TO ELEVATOR FEEDER BREAKER WITHIN PANEL. ALL DISCONNECTS SERVING ELEVATOR MOTOR CONTROLLER AND ELEVATOR CAB LIGHTS SHALL BE NEMA 3R CONSTRUCTION WITH EMBOSSED CONDUIT HUBS.
2. HEAT DETECTOR WITHIN ELEVATOR EQUIPMENT ROOM SHALL BE CONNECTED TO A DEDICATED FIRE ALARM ZONE SERVING THIS ROOM ONLY. THE SMOKE DETECTOR SHALL BE CONNECTED TO A SEPARATE DEDICATED FIRE ALARM ZONE.

2 ELEVATOR FIRE ALARM SHUTDOWN CONTROL SCHEMATIC
NOT TO SCALE

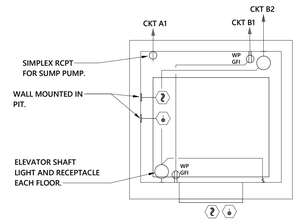
ELEVATOR EQUIPMENT CIRCUIT INFORMATION - 1 CAB

CKT	ITEM	CONNECTION	NOTES
A1	SUMP PUMP	WP NON-GFI SIMPLEX	
A2	SUMP PUMP CONTROL & ALARM	WP NON-GFI SIMPLEX	
B1	ELEVATOR PIT RCPT	WP/GFI DUPLEX	
B2	ELEVATOR PIT LIGHT	LIGHT FIXTURE	
C1	ELEVATOR SHAFT RCPT	WP/GFI DUPLEX	
C2	ELEVATOR SHAFT LIGHT	LIGHT FIXTURE	
D1	ELEV CAB LIGHTING	30-1P DISC	
E1	ELEVATOR CONTROLS	30-1P DISC	
H1	ELEVATOR MOTOR	100/F100-3P DISC	SEE 11 BELOW
K2	ELEV TWO-WAY VIDEO	30-1P DISC	

1 ELEVATOR

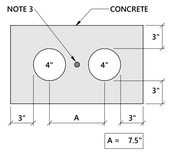


TOP OF SHAFT DETAIL - 1 CAB



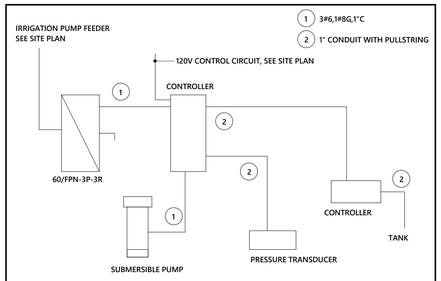
ELEVATOR PIT DETAIL AND FIRST LEVEL DETAIL - 1 CAB

6 MACHINE ROOMLESS ELEVATOR DETAIL - 1 CAB
NO SCALE



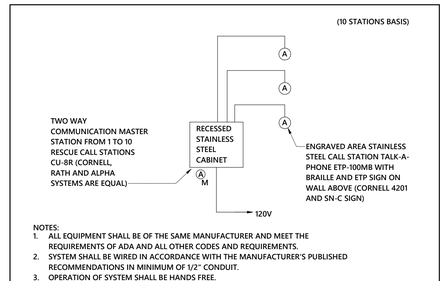
NOTES:
1. SEE "TYPICAL DUCTBANK TRENCH DETAIL" FOR ADDITIONAL REQUIREMENTS.
2. CONDUITS NOT DRAWN TO SCALE.
3. INSTALL 1#2 BARE COPPER GROUND WIRE WITHIN CONCRETE ALONG ENTIRE DUCTBANK LENGTH. EXOTHERMALLY CONNECT TO GROUND TRIAD RING. THIS GROUND WIRE IS IN ADDITION TO ANY GROUNDED (NEUTRAL) AND GROUNDING CONDUCTORS INDICATED TO BE INSTALLED WITHIN THE CONDUITS. ALTERNATE THE POSITION OF THE GROUND WIRE THROUGH THE DUCT SPACERS TO PREVENT SAG. ELECTRICAL POWER DUCTBANKS ONLY.

3 2-WAY (2Hx1V) DUCTBANK SECTION
NOT TO SCALE



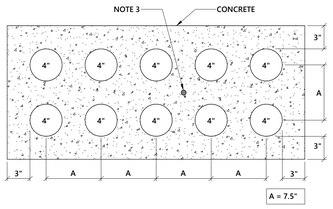
NOTES:
1. PUMP BASED ON 7.5HP 208V 3 PHASE.
2. CIRCUITS, DISCONNECT AND CONDUIT SHOWN ARE BY THE ELECTRICAL CONTRACTOR.
3. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE IRRIGATION CONTRACTOR FOR ALL REQUIREMENTS.
4. PRIOR TO ROUGH-IN VERIFY IRRIGATION PUMP ASSEMBLY WITH IRRIGATION CONTRACTOR.

4 IRRIGATION PUMP ASSEMBLY
NOT TO SCALE



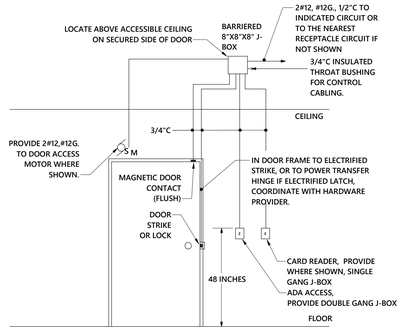
NOTES:
1. ALL EQUIPMENT SHALL BE OF THE SAME MANUFACTURER AND MEET THE REQUIREMENTS OF ADA AND ALL OTHER CODES AND REQUIREMENTS.
2. SYSTEM SHALL BE WIRED IN ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED RECOMMENDATIONS IN MINIMUM OF 1/2" CONDUIT.
3. OPERATION OF SYSTEM SHALL BE HANDS FREE.
4. AREA STATIONS TO HAVE PANIC BUTTONS LABELED "PUSH FOR HELP" MOUNTED AT 44"A.F.F TO CENTER.
5. SEE PLANS FOR EXACT LOCATIONS AND QUANTITY. MASTER STATION LOCATION SHALL BE COORDINATED BEFORE INSTALLATION.
6. PROVIDE (1) RJ11 MODULAR PHONE PORTS FOR MASTER STATION. UNIT SHALL BE PROGRAMMED TO CALL OUT TO 911 IN THE EVENT THE MASTER STATION IS NOT PICKED UP (TIMED).
7. COMMAND UNIT SHALL HAVE BATTERY BACK UP FOR A MINIMUM OF (3) HOURS. ALL BATTERY BACK UP SHALL BE CONCEALED ABOVE LOCAL UNIT OR WITHIN MASTER STATION (FLUSH).
8. PATHWAY SURVIVABILITY OF 2 HOURS, IS REQUIRED FOR ALL CABLING.

5 TWO WAY COMMUNICATION SYSTEM DETAIL
NOT TO SCALE



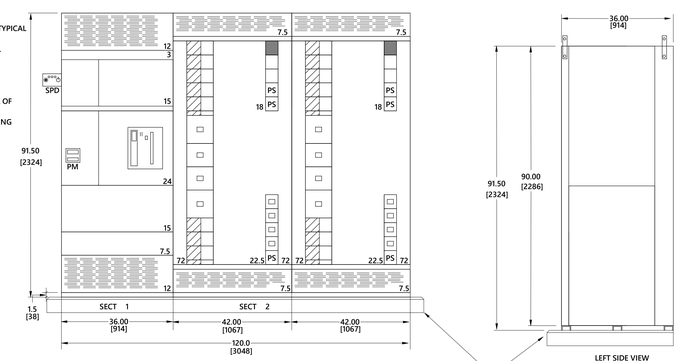
NOTES:
1. SEE "TYPICAL DUCTBANK TRENCH DETAIL" FOR ADDITIONAL REQUIREMENTS.
2. CONDUITS NOT DRAWN TO SCALE.
3. INSTALL 1#2 BARE COPPER GROUND WIRE WITHIN CONCRETE ALONG ENTIRE DUCTBANK LENGTH. EXOTHERMICALLY CONNECT TO GROUND TRIAD RING. THIS GROUND WIRE IS IN ADDITION TO ANY GROUNDED (NEUTRAL) AND GROUNDING CONDUCTORS INDICATED TO BE INSTALLED WITHIN THE CONDUITS. ALTERNATE THE POSITION OF THE GROUND WIRE THROUGH THE DUCT SPACERS TO PREVENT SAG. ELECTRICAL POWER DUCTBANKS ONLY.

7 10-WAY (5Hx2V) DUCTBANK SECTION
NOT TO SCALE



8 DOOR/ADA ACCESS
NOT TO SCALE

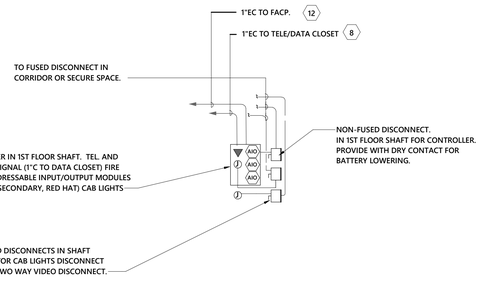
SWITCHBOARD NOTES: (BASED ON QED SWITCHBOARD, CUTLER HAMMER AND GE ARE TYPICAL APPROVED EQUALS)
1. PROVIDE WITH POWER MODULE FOR LOCAL METERING.
2. FRONT ACCESSIBLE ONLY.
3. OPTIONAL INTERNAL SPD OR EXTERNAL MOUNTED.
4. SEE PANEL SCHEDULES FOR EXACT NUMBER OF BREAKERS AND SPACES.
5. REFER TO SPECIFICATIONS FOR HOUSEKEEPING PAD REQUIREMENTS.

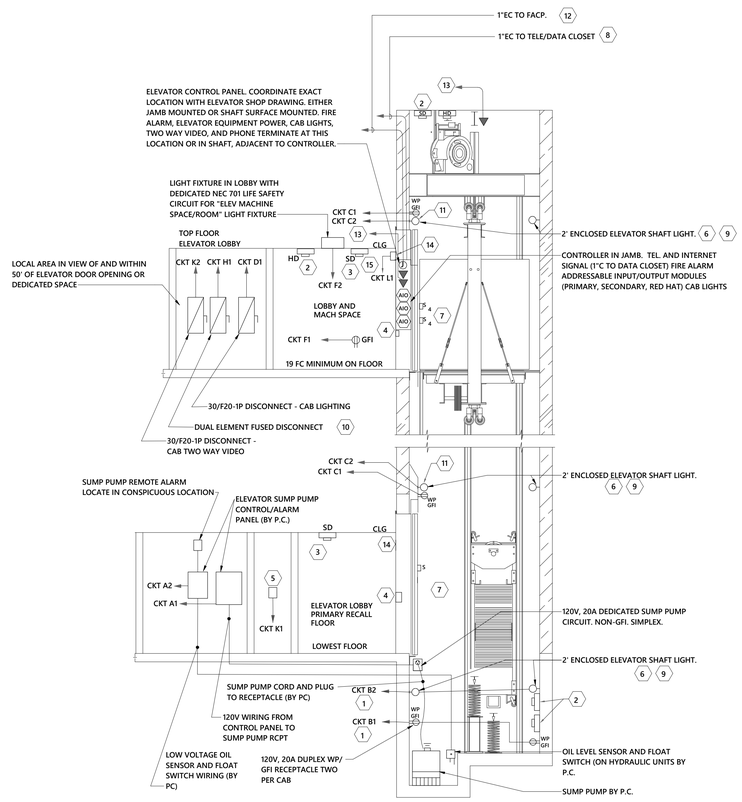


9 TYPICAL 3000A SWITCHBOARD
NOT TO SCALE

GENERAL NOTES:
A. COORDINATE EXACT LOCATION OF ALL DEVICES WITH ELEVATOR SHOP DRAWINGS PRIOR TO INSTALLATION.
B. LOCATE PIT AND SHAFT LIGHT SWITCH ADJACENT TO CAB DOOR ON EACH FLOOR. LOCATE ONE WP/GFI RECEPTACLE PER CAB PER FLOOR IN SHAFT.
C. THE SMOKE DETECTOR(S) LOCATED IN THE DESIGNATED PRIMARY ELEVATOR RECALL LOBBY(S) SHALL ACTUATE THE PRIMARY ELEVATOR RECALL CIRCUIT. THE SMOKE DETECTORS IN THE REMAINING ELEVATOR LOBBIES SHALL ACTUATE THE SECONDARY ELEVATOR RECALL CIRCUIT. THE SMOKE DETECTORS IN THE PIT, SHAFT, AND MACHINE ROOM SHALL ACTUATE THE PRIMARY ELEVATOR RECALL CIRCUIT. COORDINATE SEQUENCE WITH AHJ.

KEYED NOTES:
1. CONNECT TO DEDICATED 120V CIRCUIT. SEE CHART ABOVE FOR CIRCUIT DESIGNATION.
2. MOUNT HEAT DETECTORS WITHIN 24" OF SPRINKLER HEADS. SMOKE DETECTORS SHALL, UPON ALARM, RE-CALL ELEVATOR TO THE APPROPRIATE LEVEL AND LOCK OUT ELEVATOR VIA ELEVATOR EQUIPMENT. HEAT DETECTORS SHALL CONTROL THE OPERATION OF THE SPRINKLER PIPING SOLENOID VALVE(S) AND THE SHUNTING OF THE MAIN ELEVATOR POWER. SEE ELEVATOR ALARM SHUTDOWN MATRIX. HEAT DETECTORS SHALL HAVE A LOWER RESPONSE TIME INDEX (135 DEG) AS COMPARED TO THE SPRINKLER HEADS IN THE MACHINE ROOM, SHAFT OR PIT (155 DEG).
3. MOUNT SMOKE DETECTOR IN ELEVATOR LOBBY AT EACH LEVEL WITHIN 10'-0" OF THE DOOR(S).
4. PROVIDE FLUSH JUNCTION BOX FOR TWO-WAY COMMUNICATION BETWEEN EACH ELEVATOR LOBBY LANDING PER IBC 1009.8. PROVIDE 3/4" EMPTY CONDUIT BETWEEN EACH J-BOX AND TO LOBBY LANDING IN 2 HOUR FIRE RATED CHASE OR CABLE SYSTEM.
5. ELEVATOR LOBBY TWO-WAY COMMUNICATION MASTER STATION. COORDINATE LOCATION WITH AHJ.
6. LIGHTS SHALL BE PROVIDED WITH DEDICATED CIRCUIT. LIGHTS SHALL NOT BE CONNECTED TO THE LOAD SIDE TERMINALS OF THE CONVENIENCE RECEPTACLE. PROVIDE SEPARATE CIRCUITS FOR PIT AND SHAFT, AS INDICATED.
7. PROVIDE BOTH A PIT AND SHAFT LIGHT SWITCH AT EACH LEVEL. PROVIDE SEPARATE SWITCHES, ONE FOR PIT LIGHTING AND ONE FOR SHAFT LIGHTING.
8. PROVIDE THREE (3) CATEGORY 6A CABLES TO EACH ELEVATOR CONTROLLER FROM THE LOCAL TELECOM ROOM FOR NETWORK AND EMERGENCY PHONE INTERFACE. EXTEND INCOMING ANALOG DEMARC TO LOCAL TELECOM ROOM AS REQUIRED. ELEVATOR TRAVELER CABLE SHALL BE PROVIDED BY ELEVATOR INSTALLER. COORDINATE LOCATION AND REQUIREMENT WITH ELEVATOR CONTRACTOR. FOR LOCATIONS WHERE POTS LINE IS NOT AVAILABLE, PROVIDE CELLULAR DIALER WITH 4 HOUR BATTERY BACKUP. RATH 2100 CELLULAR GATEWAY OR SIMILAR DEPARTMENT OF LABOR APPROVED UNIT.
9. 2" ENCLOSED ELEVATOR PIT AND SHAFT LIGHT. TYPICAL OF METALUX 2VT2-LDS-5000-DR-UNV-L850-EL-TEH OR EQUAL BY LITHONIA OR WILLIAMS. MAX OF 6" DEEP FIXTURE WITH CONDUIT HUBBED ENDS.
10. DISCONNECT FOR ELEVATOR POWER. PROVIDE SPD AT SOURCE PANEL. PROVIDE WITH BUSSMAN QUICK-SPEC POWER MODULE WITH SHUNT TRIP FIRE SAFETY INTERFACE RELAY AND VOLTAGE MONITORING RELAY. COORDINATE DISCONNECT AND FUSE SIZE WITH ELEVATOR NAMEPLATE DATA.
11. MOUNT BOTTOM OF LIGHT AND BOTTOM OF RECEPTACLE 12" ABOVE CAB DOOR OPENING ON EACH FLOOR.
12. 1"C WITH INITIATING CIRCUIT FOR HEAT DETECTOR, SMOKE DETECTOR AND RECALL RELAY(S). PROVIDE PRIMARY FLOOR RECALL RELAY, SECONDARY FLOOR RECALL RELAY AND FIREMAN'S RED HAT RELAY FOR USE BY ELEVATOR INSTALLER. PROVIDE PROGRAMMING FOR ALL FIRE ALARM DEVICE FUNCTIONS.
13. EXTEND 1" C WITH CONTROL WIRING TO 701 TRANSFER SWITCH FOR PRE-TRANSFER AND GENERATOR RUN SIGNALS.
14. ELEVATOR SHAFT SMOKE CURTAIN. PROVIDE 120 VOLT BRANCH CIRCUIT WITH MANUAL MOTOR STARTER SWITCH LOCATED ABOVE CEILING FOR LOCAL DISCONNECT. PROVIDE FIRE ALARM RELAY FOR RELEASE OF CURTAIN. COORDINATE ALL WIRING REQUIREMENTS WITH THE EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN.





ELEVATOR SHAFT DETAIL

10 MACHINE ROOMLESS ELEVATOR NOTES
NO SCALE

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-1-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

ELECTRICAL DETAILS

E-005

Optima # 22-0082

01.12.2023 - BID SET

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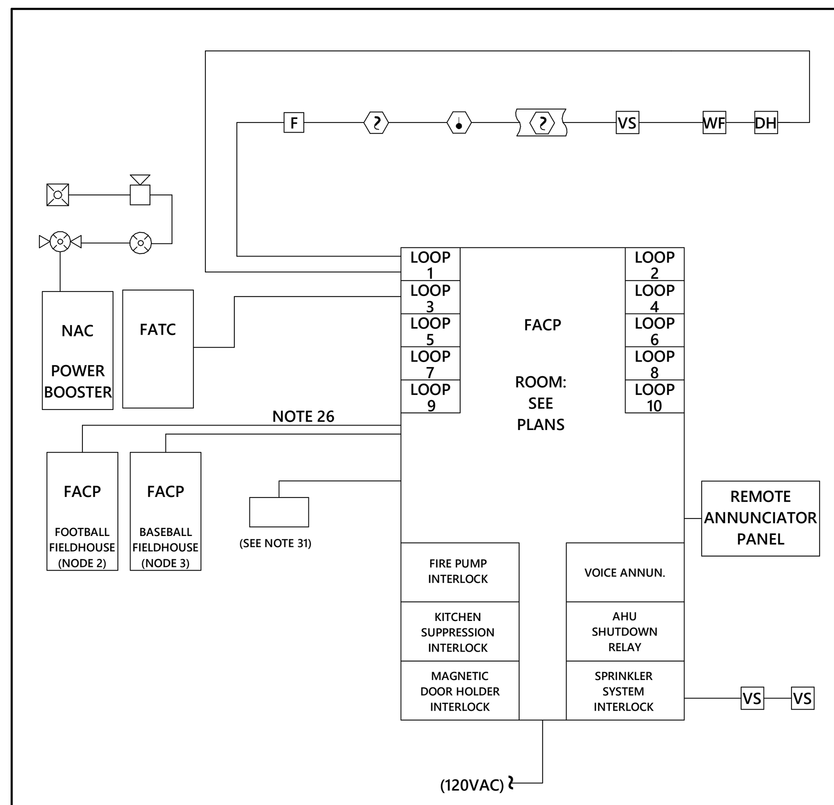


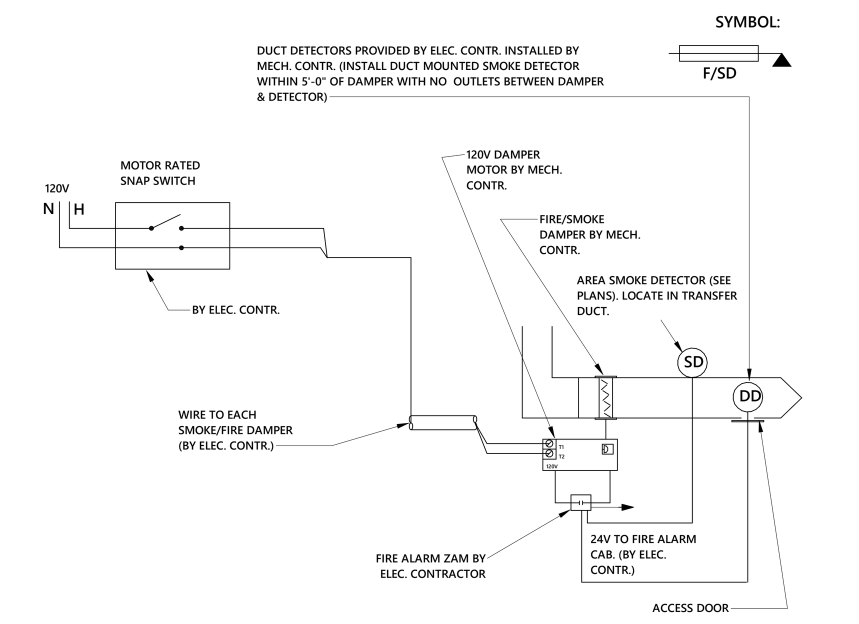
FIRE ALARM NOTES

1. FACP SHALL HAVE A MINIMUM 24HR. BATTERY BACKUP.
2. FACP SHALL BE FULLY ANALOG ADDRESSABLE.
3. FACP SHALL BE CONNECTED TO A UL APPROVED CENTRAL STATION.
4. ZONE PER NFPA 72, 2013 AND MANUFACTURER'S RECOMMENDATIONS WITH NO ONE ZONE EXCEEDING 15,000 S.F. PER FLOOR.
5. COORDINATE QUANTITY AND LOCATIONS OF DEVICES WITH CONTRACT DRAWINGS.
6. LOCATE SMOKE DETECTOR WITHIN 5' OF THE MAGNETIC HOLD OPEN DOORS. (TYPICAL)
7. LOCATE FIRE ALARM PULL STATION WITHIN 5' OF THE EXIT DOOR.
8. LOCATE SMOKE/HEAT DETECTOR WITHIN 5' OF THE FA EQUIPMENT (FACP, FATC, NAC).
9. LOCATION OF CEILING MOUNTED SMOKE/HEAT DETECTOR SHALL BE FIELD COORDINATED PRIOR TO ROUGH IN. THE DETECTOR SHALL BE A MINIMUM OF 2' AWAY FROM LIGHT FIXTURE AND A MINIMUM OF 3' AWAY FROM AIR DISTRIBUTION DEVICES.
10. AUTOMATIC DOOR CLOSING SHALL BE ACCOMPLISHED BY THE ACTIVATION OF THE BUILDING FIRE ALARM SYSTEM. SMOKE DETECTOR ACTIVATION SHALL ALERT THE BUILDING FIRE ALARM SYSTEM. THE FIRE ALARM SYSTEM SHALL CAUSE ALL HOLD OPEN DOORS TO CLOSE UPON ALARM ACTIVATION IN THE BUILDING.
11. ACTIVATION OF AN ALARM ZONE SHALL CAUSE ALL AIR HANDLING EQUIPMENT TO SHUT DOWN (ALL DAMPERS, AIR HANDLERS AND EXHAUST FANS MUST STOP).
12. ACTIVATION OF KITCHEN HOOD SUPPRESSION SYSTEM PROVIDES SIGNAL TO FACP WHICH IN TURN ACTIVATES ALL ANNUNCIATING ZONES & SHUTS DOWN HOOD SUPPLY AIR. HOOD EXHAUST SHALL CONTINUE TO OPERATE.
13. ELECTRICAL CONTRACTOR SHALL COORDINATE EXACT LOCATIONS OF ALL FLOW, PRESSURE, & TAMPER SWITCHES WITH FIRE PROTECTION CONTRACTOR PRIOR TO INSTALLATION.
14. ALL VISUAL DEVICES WITHIN THE SAME AREA SHALL BE SYNCHRONIZED. IT SHALL BE A THREE BEAT TEMPORAL PATTERN.
15. ALL FIRE ALARM WIRING SHALL BE IN RED COLORED CONDUIT./FIRE ALARM CABLING SHALL BE PLENUM RATED.
16. PROVIDE MULTI-TEMPORAL SOUNDING CAPABILITY AT ALL AUDIO DEVICES FOR EMERGENCY NOTIFICATION FOR NON VOICE SYSTEMS COMPONENTS.
17. THE FIRE ALARM SYSTEM MANUFACTURER SHALL PROVIDE NOTIFICATION APPLIANCE CIRCUIT (NAC) POWER EXTENDERS AS REQUIRED.
18. THE DUCT SMOKE DETECTORS SHALL COMPLY WITH IFC 907.2.12.1.2 AND 907.3.1.
19. THE CIRCUIT FEEDING THE FIRE ALARM IS DEDICATED FOR THE FIRE ALARM ONLY.
20. CONTRACTOR SHALL INCLUDE IN BID LABOR TO RE-LOCATE UP TO 5 DEVICES UP TO 30' FROM EXISTING LOCATION.
21. PROVIDE REMOTE LIGHT WITH TEST SWITCH FOR DUCT SMOKE DETECTOR ON CEILING WHERE UNIT IS ABOVE CEILING.
22. CONTRACTOR SHALL INCLUDE IN BID LABOR AND MATERIAL FOR UP TO (2) DUCT DETECTORS. (5) ANNUNCIATION DEVICES, (2) SMOKE DETECTORS AND (2) PULL STATIONS 100' FROM LOCAL PANEL (IN WALL) AS REQUIRED BY LOCAL AHJ/ENGINEER. INCLUDE ALL PROGRAMMING COSTS.
23. CONTRACTOR RESPONSIBLE FOR SHOP DRAWINGS AS REQUIRED BY LOCAL AHJ.
24. DUCT DETECTORS SHALL BE VERIFIED WITH THE MECHANICAL DRAWINGS FOR QUANTITY AND LOCATION. TOTAL QUANTITY MINIMUM SHALL BE BASED ON BOTH MECHANICAL SCHEDULES AND MECHANICAL PLAN LOCATIONS AND ELECTRICAL PLANS. WHEN DEVICE QUANTITIES (ELECTRICAL VS. MECHANICAL) ARE IN CONFLICT, PROVIDE THE GREATER QUANTITY OF DETECTORS.
25. FIRE ALARM SYSTEM SHALL BE VOICE ANNUNCIATION FOR AUDIBLE DEVICES.
26. FIELD HOUSE SUB-FACP'S SHALL BE INTERLINKED BY FIBER OPTIC CABLE, PER FIRE ALARM MANUFACTURER REQUIREMENTS. NO COPPER SHALL BE PERMITTED BETWEEN BUILDINGS, EXCEPT TO PRESSBOX. ONLY ONE DIAL OUT LOCATION VIA CELL PHONE(MAIN BUILDING).
27. PROVIDE DITEK #DTK-TSS4D SERIES OR EQUAL FOR 120V SUPPLY TO FIRE ALARM CONTROL PANELS. CONNECT DRY CONTACT TO BE MONITORED BY FACP.
28. PROVIDE DITEK DTK-2MHLP24F-WB OR EQUAL FOR ALL LOOPS THAT EXIT THE PHYSICAL BUILDING INCLUDING TAMPER SWITCHES, AND EACH SUB/EXTENDER FIRE ALARM PANEL.
29. NAC, PIV, IDC SURGE: DTK-2MHLP24B-WB OR EQUAL.
30. DIALER SURGE: DTK-2MHTPWB OR EQUAL.
31. DIGITAL ALARM COMMUNICATOR TRANSMITTER SHALL BE ACCEPTABLE TO THE REMOTE CENTRAL STATION AND SHALL COMPLY WITH UL 632. CELLULAR LINE - SINGLE MAIN SOURCE. PROVIDE NAPCO STARLINK (SLD-CMDA-FIRE) FIRE ALARM COMMUNICATOR AND SLE-ANTEXT50 EXTERNAL ANTENNA OR EQUAL AND COORDINATE WITH THE CELLULAR DIAL OUT SERVICE. CELLULAR DIAL OUT SHALL BE BACKED UP AS PART OF BATTERY BACKUP AS WELL AS GENERATOR BACKED UP WHERE AVAILABLE. FUNCTIONAL PERFORMANCE: UNIT SHALL RECEIVE AN ALARM, SUPRVISORY, OR TROUBLE SIGNAL FROM FIRE-ALARM CONTROL UNIT AND AUTOMATICALLY CAPTURE A PRESET NUMBER FOR A REMOTE CENTRAL STATION. WHEN CONTACT IS MADE WITH CENTRAL STATION, SIGNALS SHALL BE TRANSMITTED. IF SERVICE ON THE CELLULAR LINE IS INTERRUPTED FOR LONGER THAN 45 SECONDS, TRANSMITTER SHALL INDICATE A LOCAL TROUBLE SIGNAL. TRANSMITTER SHALL AUTOMATICALLY REPORT CELLULAR SERVICE RESTORATION TO THE CENTRAL STATION. IF SERVICE IS LOST, TRANSMITTER SHALL INITIATE THE LOCAL TROUBLE SIGNAL.

1 FIRE ALARM RISER DIAGRAM
NOT TO SCALE

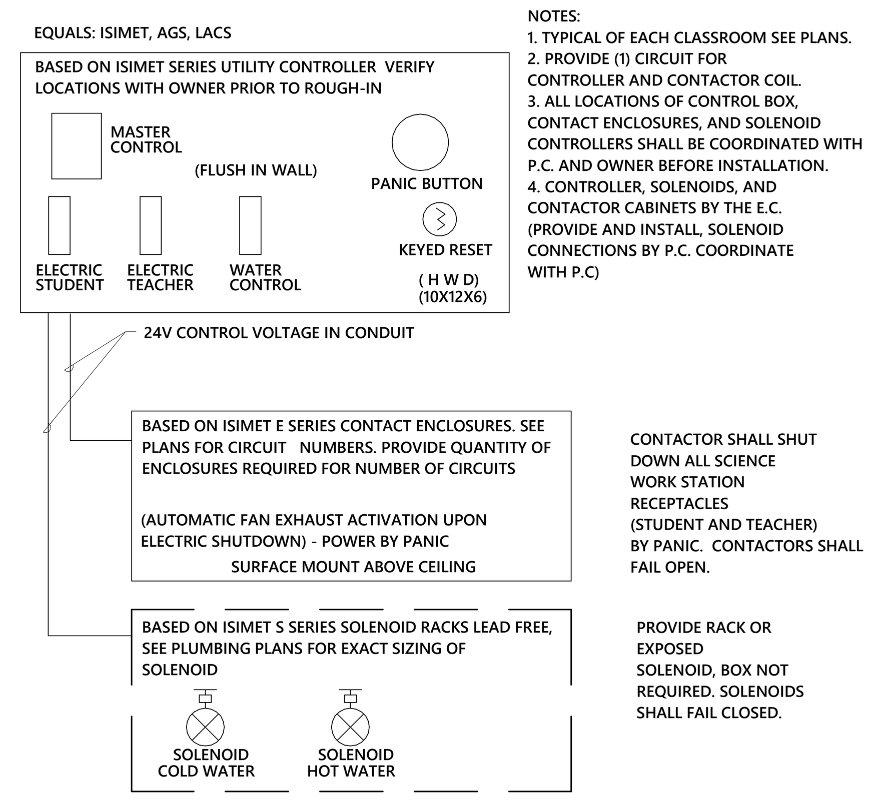
FIRE ALARM SYSTEM MATRIX / BUILDING SYSTEM OUTPUTS

	ACTIVATE COMMON ALARM SIGNAL INDICATOR	ACTIVATE AUDIBLE ALARM SIGNAL	ACTIVATE COMMON SUPERVISORY SIGNAL INDICATOR	ACTIVATE AUDIBLE SUPERVISORY INDICATOR	ACTIVATE COMMON TROUBLE SIGNAL INDICATOR	ACTIVATE AUDIBLE TROUBLE SIGNAL	ACTUATE GENERAL EVACUATION SIGNAL	DISPLAY CHANGE OF STATUS	ACTUATE EXTERNAL HORNS/STROBES	TRANSMIT FIRE ALARM SIGNAL TO CENTRAL STATION	TRANSMIT SUPERVISORY SIGNAL TO CENTRAL STATION	TRANSMIT TROUBLE SIGNAL TO CENTRAL STATION	RETURN ELEVATOR TO ALTERNATE FLOOR	RETURN ELEVATOR TO FIRST FLOOR	SHUNT TRIP AFTER ELEV. REACHES DESIGNATED FLOOR	SHUT DOWN RESPECTIVE HVAC	SHOW CHANGE OF STATUS ON ANNUNCIATOR	SHOW CHANGE OF STATUS ON CENTRAL PANEL
MANUAL FIRE ALARM PULL BOXES	X	X					X	X	X	X							X	X
BUILDING SMOKE DETECTOR	X	X					X	X	X	X							X	X
BUILDING CO DETECTOR	X	X					X	X	X	X							X	X
DUCT SMOKE DETECTOR			X	X				X			X					X	X	X
SPRINKLER WATER FLOW	X	X					X	X	X	X							X	X
SPRINKLER TAMPER			X	X				X			X							
ELEV. EQ. ROOM SMOKE DETECTOR	X	X					X	X	X	X				X			X	X
ELEV. EQ. ROOM HEAT DETECTOR	X	X					X	X	X	X				X	X		X	X
ELEV. SHAFT HEAT DETECTOR	X	X					X	X	X	X					X		X	X
1ST FLOOR ELEV. LOBBY SMOKE DET.	X	X					X	X	X	X			X				X	X
UPPER FLR. ELEV. LOBBY SMOKE DET.	X	X					X	X	X	X				X			X	X
HOOD SUPPRESSION SYSTEM	X	X					X	X	X	X							X	X
NOTIFICATION DEVICE SHORT CIRCUIT					X	X		X				X					X	X
OPEN CIRCUIT					X	X		X				X					X	X
GROUND FAULT					X	X		X				X					X	X
FIRE ALARM A.C. POWER FAILURE					X	X		X				X					X	X
FIRE ALARM SYSTEM LOW BATTERY					X			X				X					X	X
GENERATOR NFPA 110 ALARM ACTIVE			X	X														
GENERATOR SYSTEM LOW FUEL			X	X														



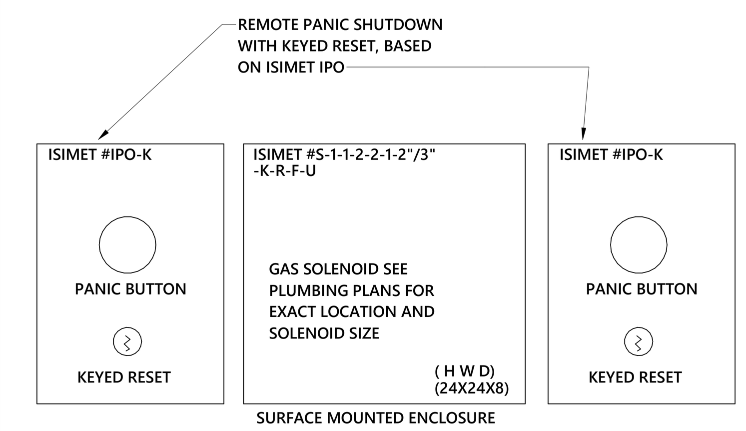
NOTES:
1. ALL FIRE/SMOKE DAMPERS SUPPLIED AND INSTALLED BY MECHANICAL CONTRACTOR. ALL FIRE ALARM WIRING INSTALLED BY ELECTRICAL CONTRACTOR. 120V WIRING TO DAMPER PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR.

2 SMOKE/FIRE DAMPER WIRING DETAIL
NO SCALE



NOTES:
1. TYPICAL OF EACH CLASSROOM SEE PLANS.
2. PROVIDE (1) CIRCUIT FOR CONTROLLER AND CONTACTOR COIL.
3. ALL LOCATIONS OF CONTROL BOX, CONTACT ENCLOSURES, AND SOLENOID CONTROLLERS SHALL BE COORDINATED WITH P.C. AND OWNER BEFORE INSTALLATION.
4. CONTROLLER, SOLENOIDS, AND CONTACTOR CABINETS BY THE E.C. (PROVIDE AND INSTALL, SOLENOID CONNECTIONS BY P.C. COORDINATE WITH P.C)

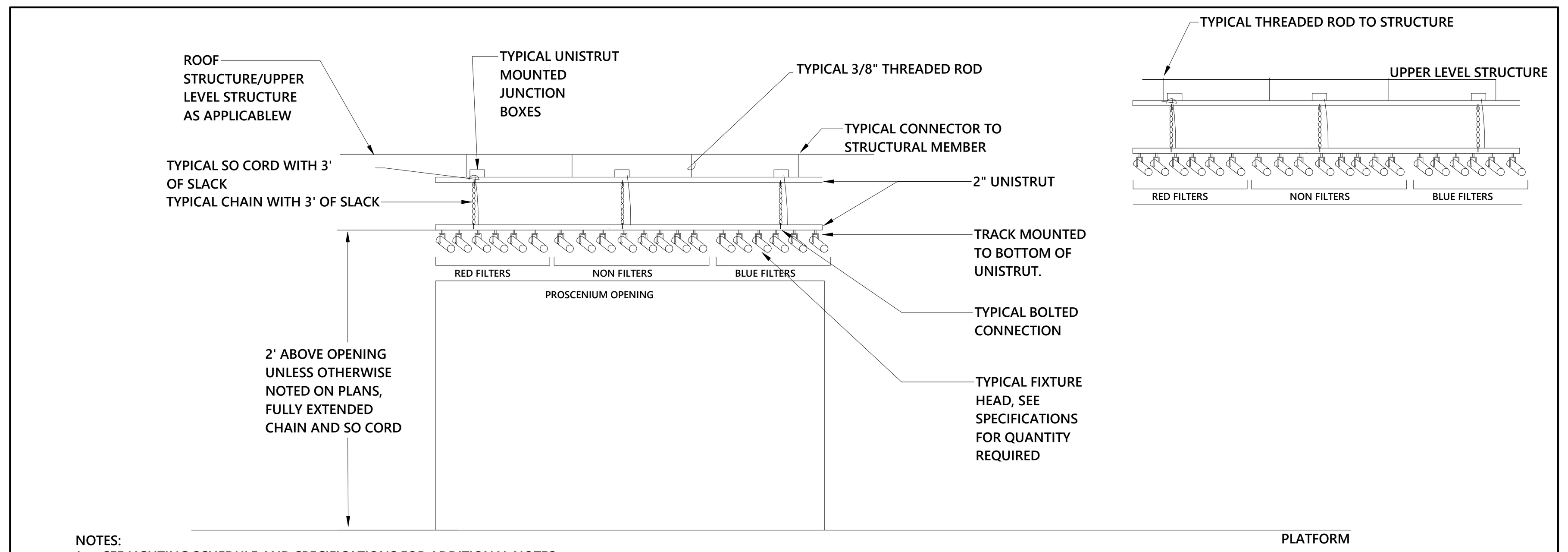
3 SCIENCE CLASSROOM SHUT OFF
NOT TO SCALE



NOTES:
1. PROVIDE PHENOLIC LABEL ABOVE PUSH BUTTON: EMERGENCY BOILER SHUT-OFF
2. PROVIDE REMOTE PANIC ASSEMBLY IPO-K-C WITH OPTION "C", PANIC BUTTON COVER.
3. CONNECT TO LOCAL 120V CIRCUIT FOR CONTROLLER.
4. SEE PLUMBING PLANS FOR EXACT SOLENOID SIZE REQUIREMENT.
5. 3/4" CONDUIT FROM EACH PANIC BUTTON TO SOLENOID ENCLOSURE. SEE PLANS FOR QUANTITY AND LOCATION.

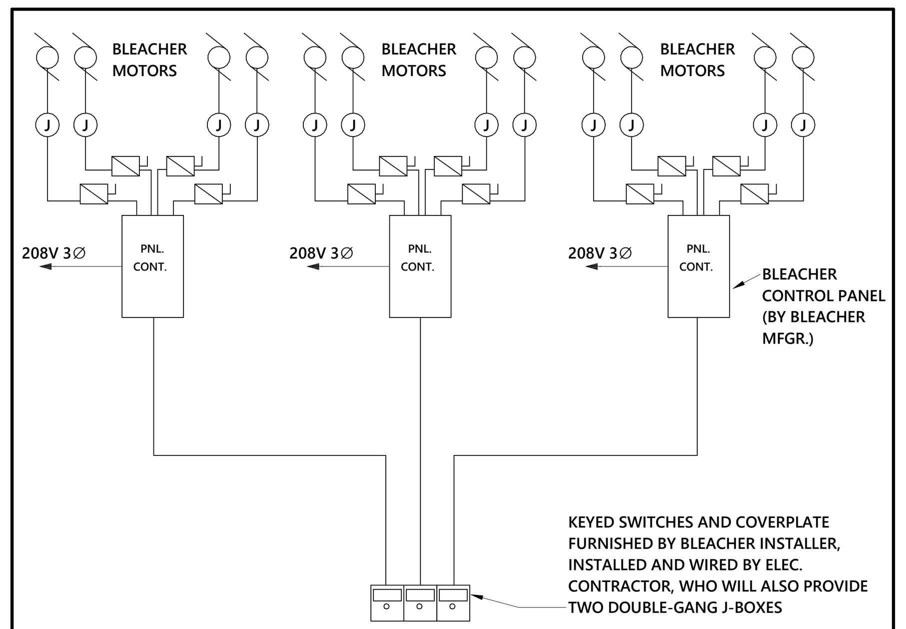
EQUALS: JOHNSON CONTROLS, EATON CUTLER HAMMER, AGS

4 EMERG. GAS SHUT OFF CONTROL DETAIL
NOT TO SCALE



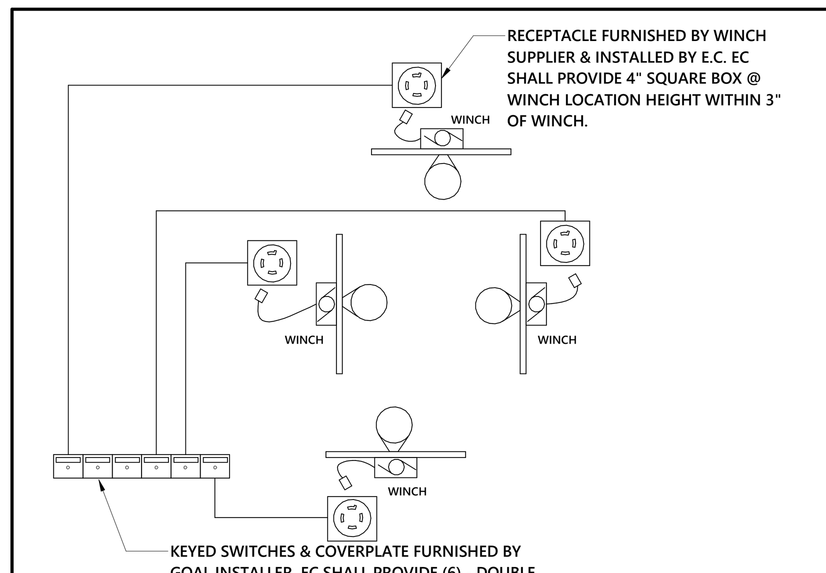
NOTES:
1. SEE LIGHTING SCHEDULE AND SPECIFICATIONS FOR ADDITIONAL NOTES.
2. FIXTURES SHALL BE AIMED TO EVENLY COVER STAGE.
3. REFLECTORS AND FILTERS SHALL BE ATTACHED.
4. THE SECOND CIRCUIT IN EACH TRACK SECTION (DUAL CIRCUIT) SHALL BE LEFT AS SPARE FOR FUTURE.
5. TRACK SECTION (1)- SIX RED FILTER FIXTURES, (2)- EIGHT NON FILTER, (3)- SIX BLUE FILTER FIXTURES.
6. NON FILTER FIXTURES SHALL HAVE (4) SPOT REFLECTORS AND (4) FLOOD REFLECTORS. EVENLY PLACE REMAINING REFLECTORS ON RED AND BLUE FILTER FIXTURES. MULTIPLE FIXTURES WILL HAVE NO REFLECTOR.
7. SECOND LEVEL TRACK SECTIONS SHALL BE MOUNTED LEVEL WITH LOCAL CLOUD.

5 THEATRICAL LIGHTING DETAIL
NO SCALE



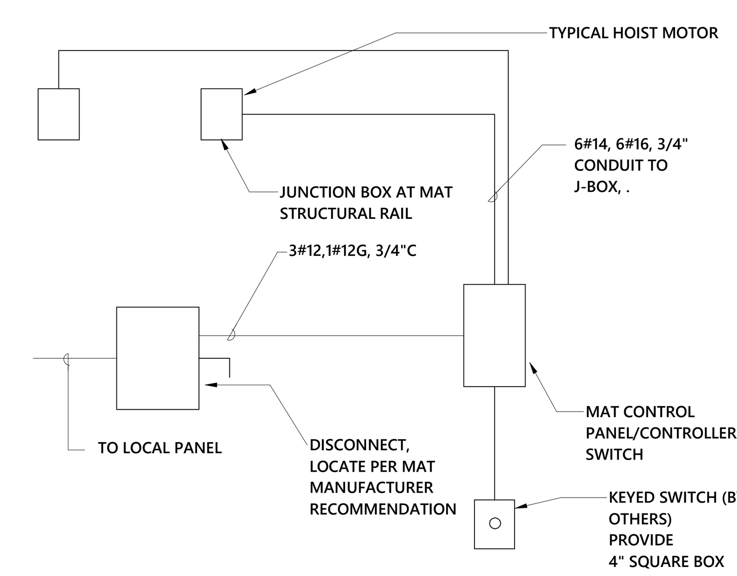
NOTES:
1. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL ROUGH-IN J-BOXES, CONDUIT AND WIRING TO CONNECT THE BLEACHER CONTROL PANELS AND KEYED SWITCHES. PROVIDE A 16"X16"X4" MINIMUM J-BOX AT MAIN ROUGH-IN.
2. MINIMUM WIRE SIZE SHALL BE #12 AWG.
3. PROVIDE 3 PHASE DISCONNECT AT EACH PANEL CONTROLLER, 30A/3P.

6 BLEACHER CONNECTION RISER
NO SCALE



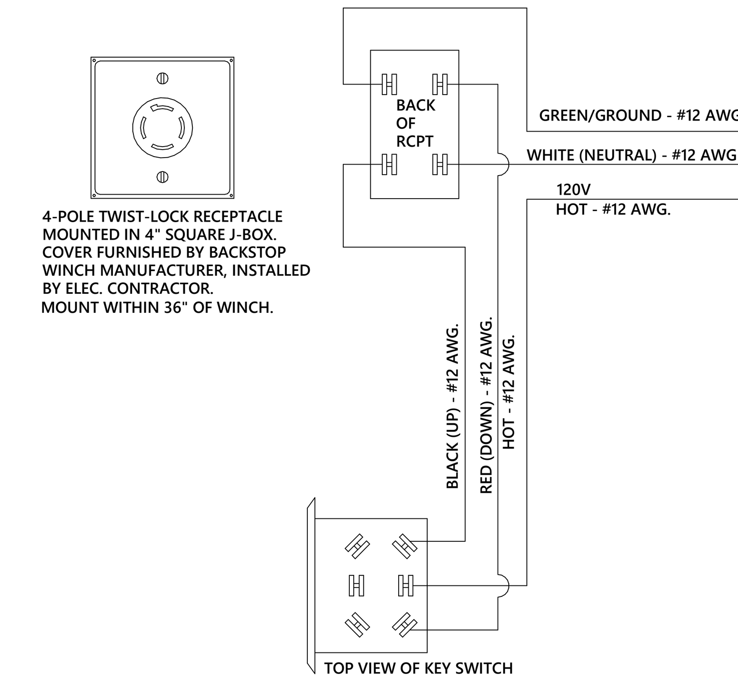
NOTES:
1. EC SHALL PROVIDE ALL ROUGH-IN BOXES CONDUITS & WIRING TO CONNECT THE WINCH RECEPTACLES & KEYED SWITCHES.
2. MINIMUM WIRE SIZE #12 AWG
3. SEE PLANS FOR NUMBER OF GOALS THAT REQUIRE ELECTRIC WINCH CONTROL.
4. PROVIDE 120V CIRCUIT FOR EACH (2) SHOT CLOCKS/LIGHT PROVIDED. SEE PLANS FOR GOAL LOCATIONS. SHOT CLOCKS ARE AT EACH MAIN BASKETBALL GOAL.
5. PROVIDE INTERLOCKING SWITCH SO THAT GOALS LOCATED NEAR BLEACHERS ARE NOT EXTENDED WHEN BLEACHERS ARE EXTENDED. COORDINATE WITH BLEACHER AND BASKETBALL GOAL MANUFACTURER.

7 BASKETBALL GOAL SWITCH RISER
NO SCALE



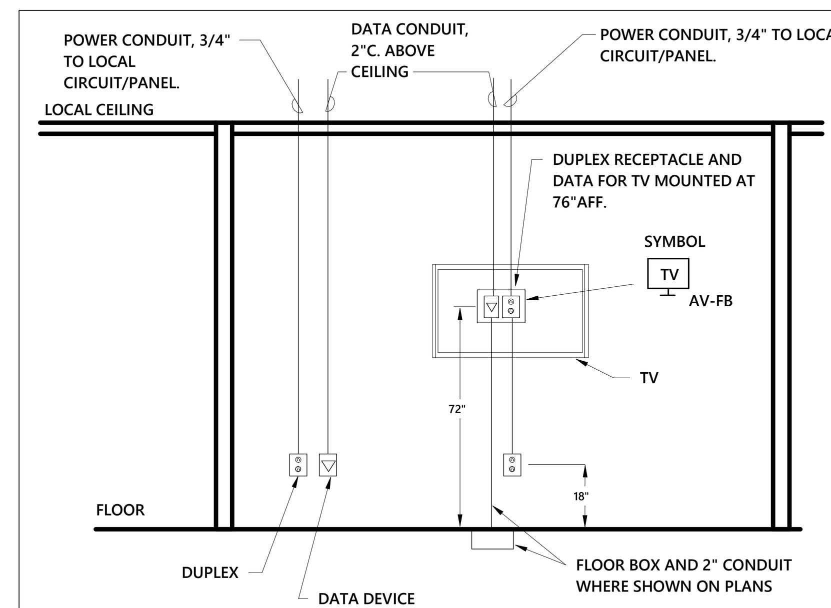
NOTES:
1. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL ROUGH-IN J-BOXES, CONDUIT AND WIRING TO CONNECT THE CONTROL PANELS AND CONTROL SWITCHES. PROVIDE A 8"X8"X4" MINIMUM J-BOX AT MAIN ROUGH-IN.
2. MINIMUM WIRE SIZE SHALL BE #12 AWG, IN 3/4" CONDUIT, UNLESS OTHERWISE NOTED.
3. PROVIDE 3 PHASE DISCONNECT AT EACH PANEL CONTROLLER, 30/F15/3P (480V) OR 30/F20/3P (208V). DUAL ELEMENT TIME DELAY FUSE.

8 POWERED MAT RISER
NO SCALE



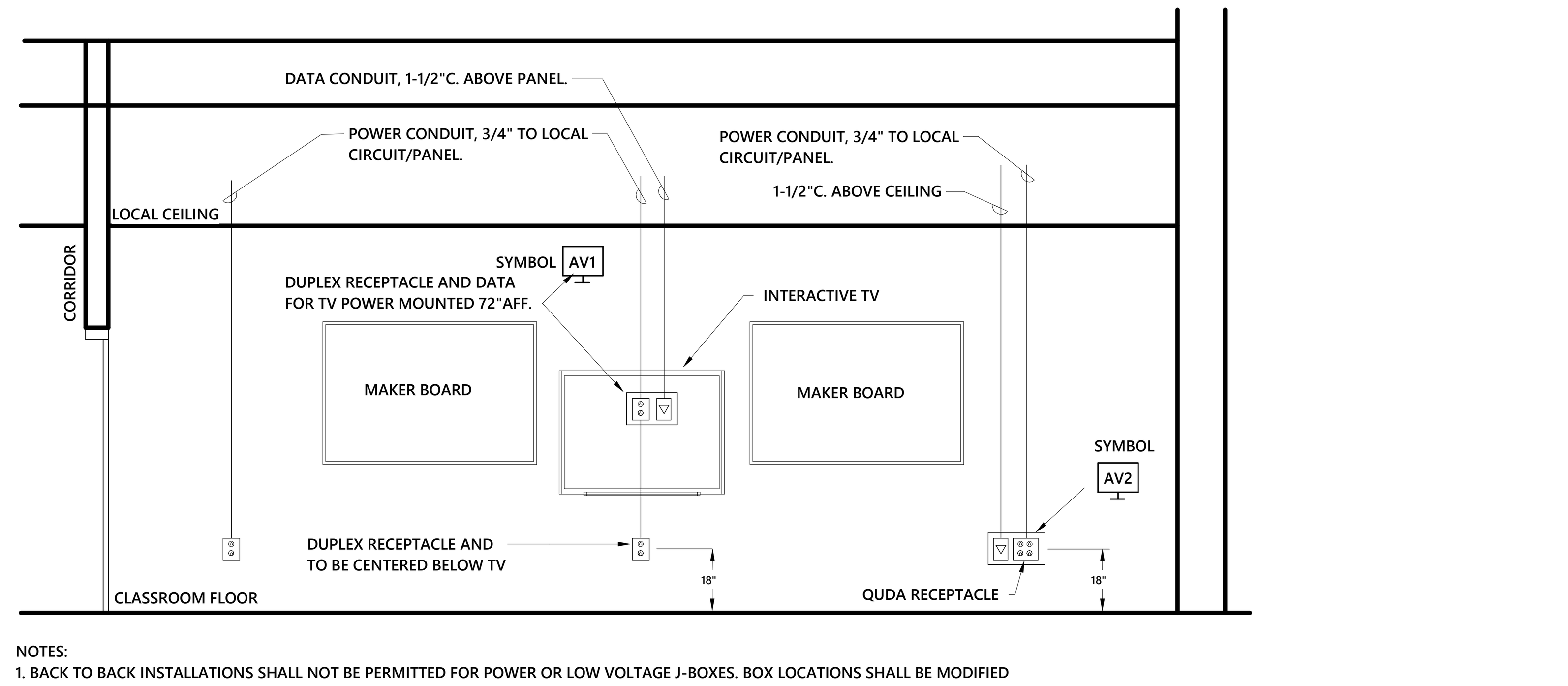
NOTES:
1. KEY SWITCHES AND COVERPLATE SHALL BE FURNISHED BY GOAL INSTALLER. ELEC. CONTRACTOR SHALL PROVIDE AND INSTALL ALL J-BOXES, CONDUIT, AND WIRING.
2. MINIMUM WIRE SIZE SHALL BE #12 AWG.

9 ELECT. BASKETBALL WINCH WIRING DETAIL
NO SCALE



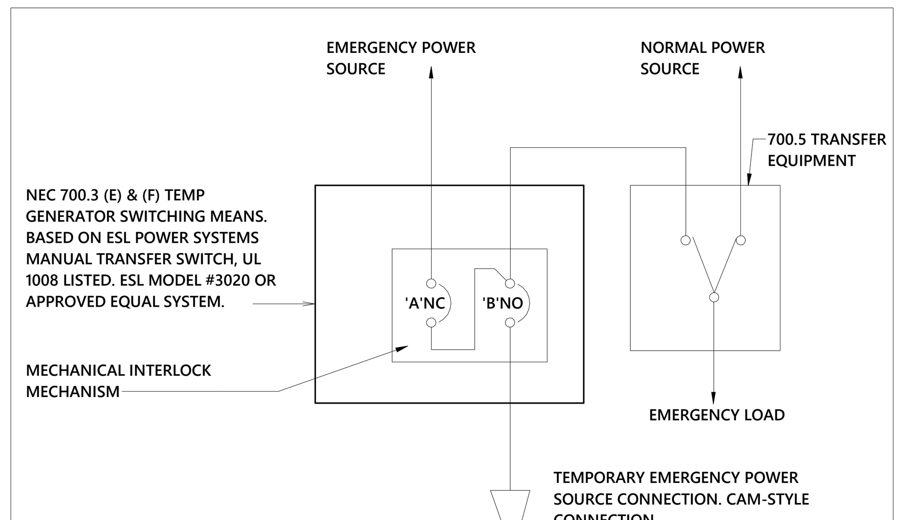
NOTES:
1. BACK TO BACK INSTALLATIONS SHALL NOT BE PERMITTED FOR POWER OR LOW VOLTAGE J-BOXES. BOX LOCATIONS SHALL BE MODIFIED AS REQUIRED PRIOR TO INSTALLATION.
2. EXACT LOCATION SHALL BE COORDINATED IN FIELD.

10 CONFERENCE ROOM TV LAYOUT DETAIL
NO SCALE



NOTES:
1. BACK TO BACK INSTALLATIONS SHALL NOT BE PERMITTED FOR POWER OR LOW VOLTAGE J-BOXES. BOX LOCATIONS SHALL BE MODIFIED AS REQUIRED PRIOR TO INSTALLATION.
2. EXACT LOCATION SHALL BE COORDINATED IN FIELD.

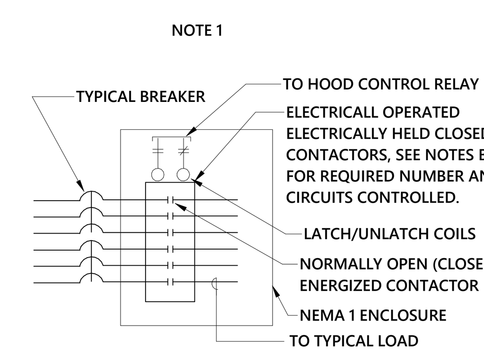
11 CLASSROOM TEACHING WALL DETAIL
NO SCALE



SWITCH FUNCTIONS:
1. NORMAL OPERATION; EMERGENCY POWER SOURCE IS AVAILABLE AND CONNECTED TO THE 'ATS' SWITCH VIA NORMAL CLOSED BREAKER 'A'. BREAKER 'B' ARE NORMALLY OPEN.
2. CONNECTION OF TEMPORARY EMERGENCY POWER SOURCE; BREAKER 'B' IS CLOSED WHICH IS CONNECTION OF TEMPORARY EMERGENCY POWER SOURCE
3. MODEL #'S ARE BASED ON 480V AND 100A C/B'S

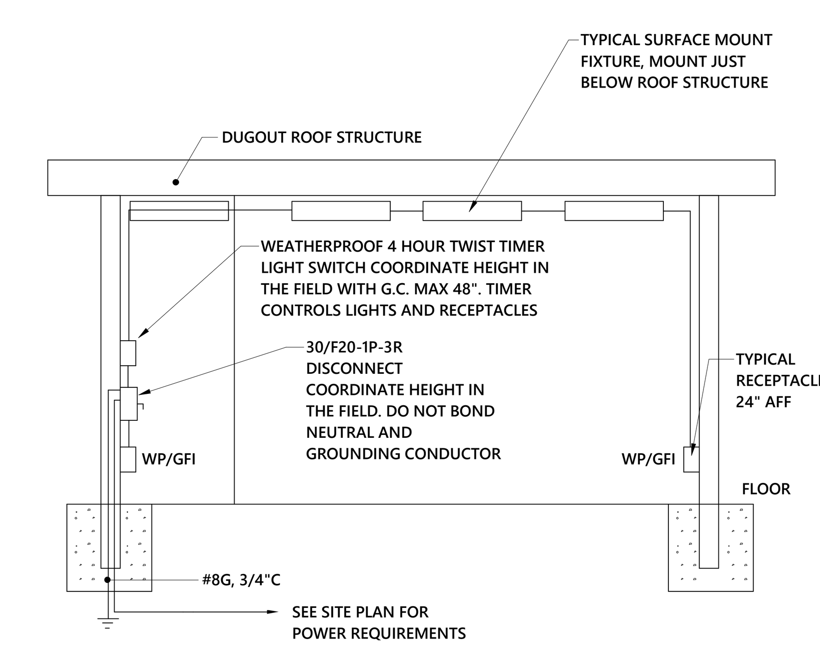
12 TRANSFER EQUIPMENT - ALTERNATE POWER & LOAD BANK
NO SCALE

NOTE 1



1. PROVIDE (2) 3-POLE 15A CONTACTOR RATED FOR 480V 3 PHASE FOR FAN F-1 AND F-2. CONTACTOR SHALL BE NORMALLY OPEN (UPON LOSS OF POWER, CONTACTOR OPENS) CONTACTOR SHALL BE LOCATED ABOVE RESPECTIVE PANEL AND INTERCEPT CIRCUIT IN LOCAL AREA. CONTACTOR SOURCE VOLTAGE SHALL BE FED FROM SPARE BREAKERS LOCATED IN RESPECTIVE PANEL. CONTACTORS SHALL BE OPENED UPON HOOD SHUT DOWN OR HOOD ACTIVATION.

13 KITCHEN FAN CONTACTOR DETAIL
NO SCALE



NOTES:
1. PROVIDE (1) GFCI/WP RECEPTACLE AT EACH END OF THE DUGOUT.
2. PROVIDE (4) SURFACE MOUNTED LED VANDAL PROOF TYPE STL2, WEATHERPROOF FIXTURES.
3. SURFACE MOUNT CONDUIT, PAINT TO MATCH LOCAL AREA. PROVIDE UNISTRUT "H" FRAME FOR RECEPTACLE, LIGHT SWITCH, AND DISCONNECT SWITCH MOUNTING AT FENCE WALL.

14 DUGOUT CONNECTIONS - EACH OCCURENCE
NO SCALE

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23154 BRIAN E. THOMPSON
01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

ELECTRICAL DETAILS

E-006

Optima # 22-0082

01.12.2023 - BID SET

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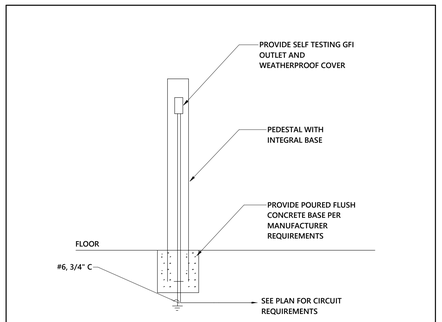
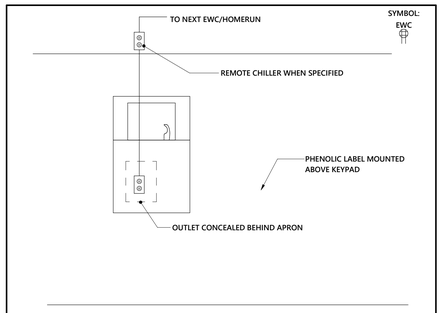


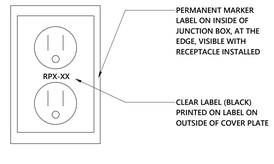
NOTES:
1. BASED ON PEDOC OUTLET BOX, INTEGRAL BASE AND PEDESTAL. APPROVE EQUALS SHALL BE UL LISTED.
2. STAINLESS STEEL WITH POWER COATING. NEMA 3R RATED. COLOR BASED ON GRAY, 30" HEIGHT.
3. DIMENSION BASED ON 30" HIGH, 5" WIDE AND 2.5" DEEP.
4. LOCATE BEHIND HOMEPLATE FENCING. COORDINATE EXACT LOCATION IN THE FIELD WITH THE OWNER.

1 RECEPTACLE PEDESTAL
NO SCALE



NOTES:
1. COORDINATE EXACT ROUGH-IN LOCATION WITH SPECIFIC MANUFACTURER SUPPLIED UNIT AND PLUMBING CONTRACTOR.
2. PROVIDE MINIMUM DUPLEX RECEPTACLE ROUGHED IN AT LOCATION SPECIFIED BY EQUIPMENT CUTSHEET.
3. PROVIDE DUPLEX FOR REMOTE CHILLER AS REQUIRED PER SPECIFIC UNIT. ONLY WHEN SPECIFIED PER PLUMBING EQUIPMENT CUT SHEET.
4. EWC OUTLET TO BE PROTECTED BY REMOTE GFCI PERSONNEL BREAKER. PROVIDE FOR EACH.

2 EWC - ELECTRICAL DETAIL
NOT TO SCALE



NOTES:
1. LABEL SHALL HAVE PANEL NAME AND CIRCUIT NUMBER.

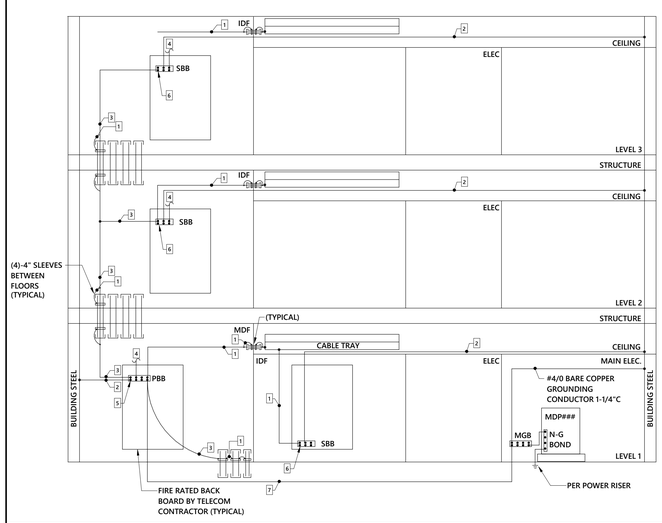
3 RECEPTACLE LABELING DETAIL - GASTON COUNTY
NOT TO SCALE

KEYED NOTES: #
1. INSTALL #6 AWG GREEN JACKET, THHN TYPE COPPER TELECOM EQUIPMENT BONDING CONDUTOR WITH 2-HOLE LONG BARREL IRREVERSIBLE CRIMP CONNECTOR ON ONE END AND A IRREVERSIBLE CRIMP TYPE CONNECTION.
2. INSTALL #6 AWG GREEN JACKET, THHN TYPE COPPER BONDING CONDUCTOR WITH 2-HOLE LONG BARREL IRREVERSIBLE CRIMP CONNECTORS ON BOTH ENDS, FROM THE PBB OR SBB TO THE STRUCTURAL STEEL.
3. INSTALL GREEN JACKET, THHN TYPE COPPER TELECOM BONDING BACKBONE CONDUCTOR. USE 2-HOLE LONG BARREL IRREVERSIBLE CRIMP CONNECTORS AND IRREVERSIBLE CABLE CRIMP CONNECTORS ON ENDS OF CONDUCTORS. SIZE CONDUCTOR IAW TIA-607-D TBB CHART.
4. SEE TELECOM DRAWINGS.
5. INSTALL PRIMARY BONDING BUSBAR (PBB) NEAR THE BACKBONE CABLING AND ASSOCIATED TERMINATIONS. PRIMARY BONDING BUSBAR SHALL BE MOUNTED AT 80" TO THE TTB PLYWOOD WITH MINIMUM 2" STANDOFFS. SEE TELECOMMUNICATIONS GROUNDING BAR DETAIL.
6. INSTALL SECONDARY BONDING BUSBAR (SBB) NEAR THE BACKBONE CABLING AND ASSOCIATED TERMINATIONS. BONDING BUSBAR SHALL BE MOUNTED AT 80" TO THE TTB PLYWOOD WITH MINIMUM 2" STANDOFFS. SEE TELECOMMUNICATIONS GROUNDING BAR DETAIL.
7. INSTALL #3/0 AWG, GREEN JACKET, THHN TYPE COPPER BONDING CONDUCTOR WITH 2-HOLE LONG BARREL IRREVERSIBLE CRIMP CONNECTOR ON ONE END, FROM THE MGB IN THE MAIN ELECTRICAL ROOM TO THE PRIMARY BUS BAR (PBB).

TELECOMMUNICATIONS MAIN GROUNDING BUSBAR (PBB), 24"Lx2"Wx1/4"T CU. PROVIDE 1#6G (INSULATED), 1/2"C AND BOND TO BUILDING STEEL AND MAIN GROUNDING ELECTRODE SYSTEM AT SERVICE ENTRANCE EQUIPMENT.
SBB AT EACH IDF/DATA ROOM 12"XX2"WX1/4"T CU.

MAIN GROUND BAR (MGB) SHALL BE THE SAME DIMENSIONS AS THE PBB.

GENERAL NOTES:
1. FLOOR PLANS INDICATE THE EXACT QUANTITY AND LOCATION OF ALL COMPONENTS.
2. SEE PLANS FOR HEAD END LOCATION, AND DISTRIBUTION CLOSETS.
3. METALLIC CONDUIT TO AND FROM CABLE TRAY SHALL BE GROUNDED PER NEC 392.
4. SEE SITE PLAN FOR ALL SERVICE ENTRANCE CONDUIT.



TELECOM BACKBONE BONDING CONDUCTOR SIZE VS LENGTH TABLE	
TBB/GE LINEAR LENGTH	TBB/GE SIZE (AWG) (CU)
13	6
14-20	4
21-26	3
27-33	2
34-41	1
42-52	1/0
53-66	2/0
67-84	3/0
85-105	4/0
106-125	250 KCMIL
126-150	300 KCMIL
151-175	350 KCMIL
176-250	500 KCMIL
251-300	600 KCMIL
GREATER THAN 301	750 KCMIL

NOTES:
A. TBB SIZING PER LATEST EDITION OF TIA-607-D
B. THE MINIMUM TBB CONDUCTOR SIZE SHALL BE A NO.6 AMERICAN WIRE GAUGE (AWG)

4 TELECOMMUNICATIONS GROUNDING AND PATHWAY RISER DIAGRAM
NO SCALE

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

ELECTRICAL DETAILS

E-007

Optima # 22-0082

01.12.2023 - BID SET

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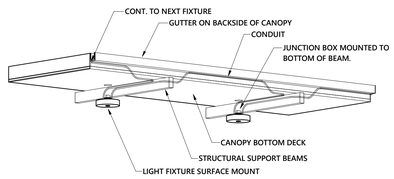
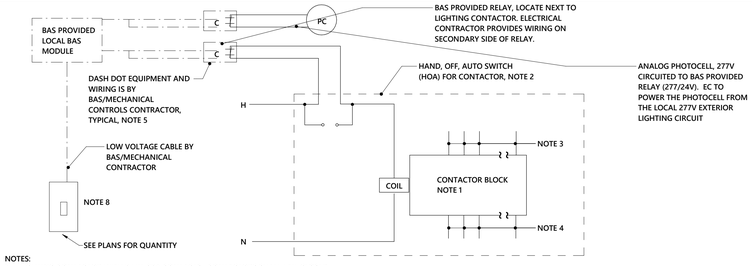


NOTES:
1. CONDUIT SHALL BE RAN ALONG ADJACENT TO BOTTOM DECK AND STRUCTURAL BEAM, THEN UP AND ALONG THE BACKSIDE OR TOP OF THE CANOPY TO CONCEAL CONDUIT FOR SPANNING SECTIONS.

1 CANOPY CONDUIT
NOT TO SCALE



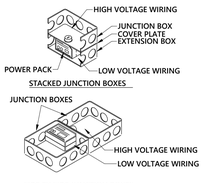
NOTES:
1. LIGHTING CONTACTOR WITH 277V, 30A CONTACTS. CONTACTORS SHALL FAIL CLOSED.
2. PROVIDE A NEMA 1 ENCLOSURE FOR HOA SWITCH AND LIGHTING CONTACTOR. ENCLOSURE SHALL BE PROVIDED WITH HINGED DOOR AND KEY OPERATED LOCK. INSTALL HOA SWITCH ON FRONT COVER. SEE PLANS FOR QUANTITY.
3. TYPICAL LIGHTING CIRCUITS FROM PANELBOARDS.
4. TYPICAL LIGHTING CIRCUITS TO BLDG/SITE, SEE PLANS.
5. COORDINATE CONTROL CIRCUIT, RELAYS, AND OVERRIDE SWITCH WITH BAS CONTRACTOR.
6. PROVIDE INTERFACE BETWEEN INTRUSION DETECTION AND LIGHTING RELAY CONTROLS. ARMING OF INTRUSION DETECTION SHALL TURN LIGHTING OFF. DISARMING SHALL TURN LIGHTING ON TO NORMAL SCHEDULE.
7. ALL COMPONENTS ARE PROVIDED BY ELECTRICAL CONTRACTOR UNLESS OTHERWISE NOTED.
8. LOW VOLTAGE OVERRIDE SWITCH (ON/OFF) OVERRIDE IN ADMIN BUILDING, KITCHEN (RESPECTIVELY) COORDINATE TYPE WITH BAS CONTRACTOR. BASED ON 24V LOW VOLTAGE SWITCH, TOGGLE TYPE. COORDINATE ROUGH-IN LOCATION WITH OWNER PREFERENCE. PROVIDE PHENOLIC LABEL ABOVE SWITCH "BUILDING INTERIOR LIGHT OVERRIDE" AND "BUILDING EXTERIOR LIGHTING OVERRIDE" RESPECTIVELY.

CONTACTOR SCHEDULE

RELAY ID	PANEL-CIRCUIT	PHASE (Ø)	VOLTAGE	REMARKS
EX1-1	LPD1-2	1	277 V	EXTERIOR LIGHTING - ROADWAY
EX1-2	LPD1-3	1	277 V	EXTERIOR LIGHTING - GYM PARKING
EX1-3	LS-6	1	277 V	EXTERIOR LIGHTING - WALL PACKS
EX2-1	LPA1-7	1	277 V	EXTERIOR LIGHTING - ROADWAY
EX3-1	LPA1-9	1	277 V	EXTERIOR LIGHTING - ROADWAY
EX4-1	LPB1-7	1	277 V	EXTERIOR LIGHTING - FLAG POLE/SIGN FLOOD LIGHT
I1-1	LPA1-1	1	277 V	INTERIOR LIGHTING - 1ST FLOOR CORRIDOR AREA A
I2-1	LPD1-8	1	277 V	GYM LIGHTING
I2-2	LPD1-6	1	277 V	GYM LIGHTING
I2-3	LPD1-7	1	277 V	GYM LIGHTING
I2-4	LPD1-4	1	277 V	INTERIOR LIGHTING - 1ST FLOOR GYM CORRIDOR AREA C
I4-1	LPB2-1	1	277 V	INTERIOR LIGHTING - 2ND FLOOR CORRIDOR AREA B
I5-1	LPA2-2	1	277 V	INTERIOR LIGHTING - 2ND FLOOR CORRIDOR AREA A
I6-1	LPB1-1	1	277 V	INTERIOR LIGHTING - 1ST FLOOR CORRIDOR AREA B
I6-2	LPB1-3	1	277 V	INTERIOR LIGHTING - 1ST FLOOR CORRIDOR AREA B
IC-1	LPB2-7	1	277 V	INTERIOR LIGHTING - CAFETERIA - LOWER
IC-2	LPB2-7	1	277 V	INTERIOR LIGHTING - CAFETERIA - UPPER
IC-3	LPB2-5	1	277 V	INTERIOR LIGHTING - CAFETERIA - UPPER
IM-1	LPA2-6	1	277 V	INTERIOR LIGHTING - MEDIA CENTER
IM-2	LPA2-6	1	277 V	INTERIOR LIGHTING - MEDIA CENTER
IP-1	RPB1-66	1	120 V	THEATER LIGHTING - PLATFORM AREA B
IP-2	RPB1-77	1	120 V	THEATER LIGHTING - PLATFORM AREA B
IP-3	RPB1-81	1	120 V	THEATER LIGHTING - PLATFORM AREA B
IP-4	RPB1-83	1	120 V	THEATER LIGHTING - PLATFORM AREA B

CONTACTOR NOTES:
1. CONTACTORS SHALL FAIL CLOSED.
2. CONTACTORS WITH THE SAME NUMBER INDICATE AN ADDITIONAL POLE FOR THE RESPECTIVE CONTACTOR.
3. SEE EMERGENCY RELAY DETAIL. CONTACTOR IS THE SWITCHED OPERATION FOR THE EMERGENCY FIXTURES ZONED FOR THAT CONTACTOR.

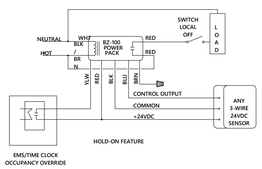
2 INTERIOR LIGHTING CONTROL DIAGRAM
NO SCALE

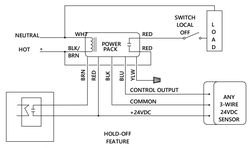


NOTE:
DO NOT MOUNT POWER PACKS CLOSER THAN 6-12 INCHES FROM SENSOR. PROVIDE DOUBLE STACKED JUNCTION BOX FOR MAXIMUM VENTILATION OF POWER PACK. PROVIDE BLANK COVER. WHERE PERMITTED BY CODE AND AHJ, LEAVE (2) OPENINGS IN CONDUIT KNOCKOUT FOR VENTING OF POWER PACK. VERIFY WITH AHJ PRIOR TO KNOCKOUT REMOVAL.

POWER PACK INSTALLED IN J-BOX

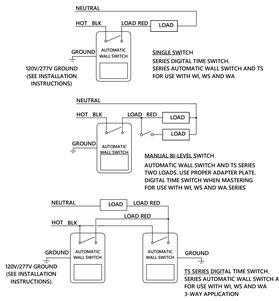
3 POWER PACK INSTALLATION
NOT TO SCALE





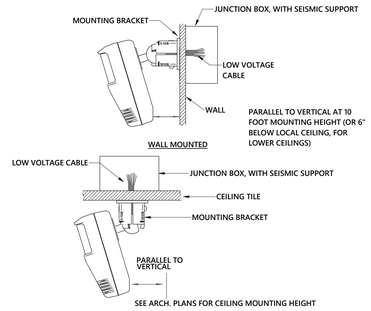
NOTE: CONNECT ONLY THE SUPPLY FOR THE VOLTAGE BEING USED. CAP UNUSED POWER SUPPLY WIRE.

4 POWER PACK WIRING DIAGRAM
NOT TO SCALE



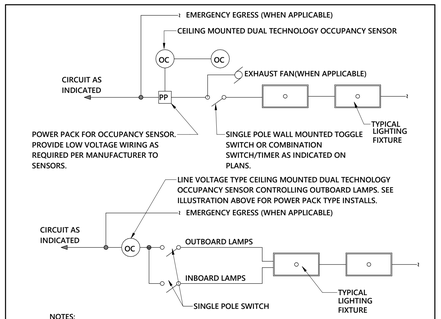
*WHEN THESE SWITCHES ARE WIRED IN A THREE-WAY WIRING CONFIGURATION THEY WILL ONLY OPERATE AS THREE-WAY SWITCHES IF THEY ARE LEFT IN AUTOMATIC MODE. IF ONE SWITCH IS TURNED OFF, THE LIGHTS WILL NOT COME AUTOMATICALLY ON UNTIL THAT SWITCH IS TURN BACK TO THE AUTOMATIC POSITION.

5 SINGLE POLE OCC. SENSOR SWITCH
NOT TO SCALE



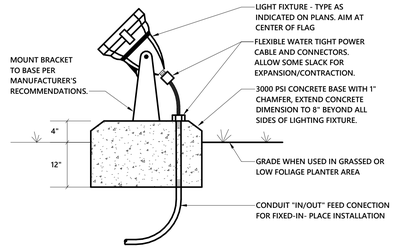
NOTES:
1. TILT SENSOR TOWARD CENTER OF ROOM FOR MAXIMUM EFFECTIVENESS.
2. CALIBRATE SENSITIVITY AND DIRECTION AFTER INSTALLATION.
3. PROVIDE WALL MOUNT BRACKET AND INSTALL AT CORNER MOST SECTION OF ROOM. PATTERN IS BASED ON CONICAL SHAPE.

6 CORNER MOUNT SENSOR
NOT TO SCALE



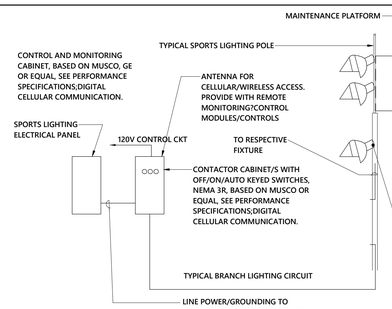
NOTES:
1. OCCUPANCY SENSORS SHALL BE SET TO TIME OUT AFTER 15 MINUTES AND THE TRIM POTENTIOMETER IS SET TO 90% FOR SENSITIVITY.
2. OCCUPANCY SENSORS SHALL BE PLACED AS TO NOT FUNCTION UPON SOMEONE JUST PASSING BY THE ROOM DOOR BUT BY ACTUALLY ENTERING THE ROOM IN AS MUCH AS POSSIBLE.

7 TYPICAL CEILING MOUNTED OCCUPANCY SENSOR WIRING DIAGRAMS
NOT TO SCALE



NOTES:
1. PRE-CAST ASSEMBLY OR CAST-IN-PLACE OPTIONS BOTH ARE ACCEPTABLE.
2. IF THE CAST-IN-PLACE OPTION IS CHOSEN, ALLOW 30 DAYS FOR CONCRETE BASE TO CURE BEFORE INSTALLING POLE.
3. REINFORCING STEEL TO BE GRADE 60.

8 FLOOD LIGHT DETAIL
NOT TO SCALE



ALTERNATE SPORTS LIGHTING:
BASEBALL AND SOFTBALL
- CONTROL CABINET
- CONDUCTORS TO POLES
- LUMINAIRES (LED)
- CELLULAR CONTROL SYSTEM
- POLE AND BASE

FOOTBALL
- CONTROL CABINET
- CONDUCTORS TO POLES
- LUMINAIRES (LED)
- CELLULAR CONTROL SYSTEM
- POLE AND BASE
- EMERGENCY LUMINAIRE

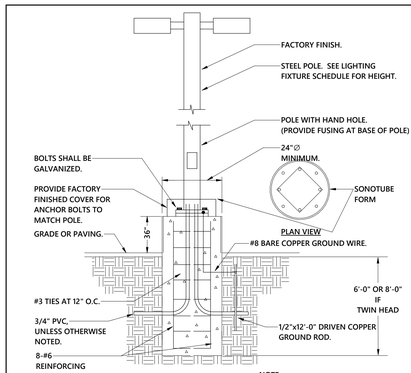
SOFTBALL:
S1: 3.7KW - 15A/3P BREAKER 480V 3 PHASE, 60' POLE, (5) TSL-720 OR EQUAL
S2: 5.2KW - 15A/3P BREAKER 480V 3 PHASE, 60' POLE (7) TSL-720 OR EQUAL
S3: 5.2KW - 15A/3P BREAKER 480V 3 PHASE, 60' POLE (7) TSL-720 OR EQUAL
S4: 3.7KW - 15A/3P BREAKER 480V 3 PHASE, 60' POLE, (5) TSL-720 OR EQUAL

BASEBALL:
B1: 5.9KW - 15A/3P BREAKER 480V 3 PHASE, 70' POLE, (8) TSL-720 OR EQUAL
B2: 7.4KW - 15A/3P BREAKER 480V 3 PHASE, 70' POLE, (10) TSL-720 OR EQUAL
B3: 7.4KW - 15A/3P BREAKER 480V 3 PHASE, 70' POLE, (10) TSL-720 OR EQUAL
B4: 7.4KW - 15A/3P BREAKER 480V 3 PHASE, 70' POLE, (10) TSL-720 OR EQUAL
B5: 7.4KW - 15A/3P BREAKER 480V 3 PHASE, 70' POLE, (10) TSL-720 OR EQUAL
B6: 5.9KW - 15A/3P BREAKER 480V 3 PHASE, 70' POLE, (8) TSL-720 OR EQUAL

FOOTBALL:
F1: 16.3KW - 25A/3P BREAKER 480V 3 PHASE, 80' POLE, (22) TSL-720 OR EQUAL
(1) - .74KW FOR EMERGENCY USE 277V 1 PHASE, ON SAME POLE (1) TSL-720 OR EQUAL
F2: 16.3KW - 25A/3P BREAKER 480V 3 PHASE, 80' POLE, (22) TSL-720 OR EQUAL
(1) - .74KW FOR EMERGENCY USE 277V 1 PHASE, ON SAME POLE (1) TSL-720 OR EQUAL
F3: 16.3KW - 25A/3P BREAKER 480V 3 PHASE, 80' POLE, (22) TSL-720 OR EQUAL
F4: 16.3KW - 25A/3P BREAKER 480V 3 PHASE, 80' POLE, (22) TSL-720 OR EQUAL

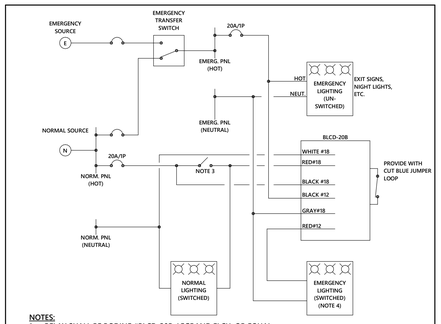
NOTES:
1. CONTRACTOR SHALL INCLUDE $6,000 ALLOWANCE FOR DESIGN FEES FOR ALTERNATE ACCEPTANCE, FOR SEALED DRAWINGS.
2. EMERGENCY LIGHTING FIXTURES SHALL BE BATTERY BACKED UP WITH POLE MOUNTED INVERTERS SIZED FOR 90 MINUTE OPERATION.
3. CONDUIT AND HANDHOLES SHALL BE CONSIDERED BASE BID AS SHOWN ON THE SITE PLAN.

9 SPORTS LIGHTING
NO SCALE



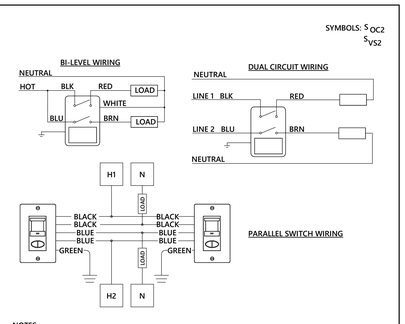
NOTE:
CONTRACTOR SHALL COORDINATE POLE BOLT TEMPLATE PRIOR TO FORMING BASE.

10 POLE BASE DETAIL
NOT TO SCALE



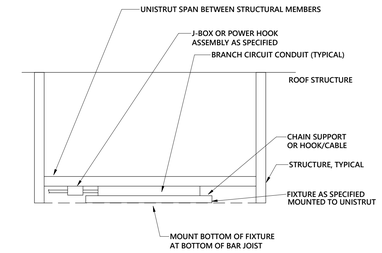
NOTES:
1. RELAY SHALL BE BODINE #BLCD-20B, LEGRAND ELCU, OR EQUAL.
2. PROVIDE ONE RELAY PER LIFE SAFETY SWITCH LEG / CIRCUIT SHOWN ON PLANS.
3. LOCAL LIGHTING CONTROL (WALL SWITCH, OCCUPANCY SENSOR, RELAY, CONTACT, ETC.).
4. SWITCHED EMERGENCY FIXTURE SHALL BE POWERED VIA THE EMERGENCY PANEL. SWITCHED EMERGENCY FIXTURE SHALL BE CONTROLLED WITH NORMAL LOCAL LIGHTING FIXTURES ONLY WHEN NORMAL POWER IS AVAILABLE. UPON LOSS OF NORMAL POWER, SWITCHED EMERGENCY LIGHTING FIXTURE CONTROL SHALL BE BYPASSED AND THE FIXTURE SHALL BE FULLY ENERGIZED. RELAY SHALL NOT BE UTILIZED AS A POWER TRANSFER DEVICE.

11 EMERGENCY LIGHTING RELAY CONTROL CIRCUIT
NOT TO SCALE



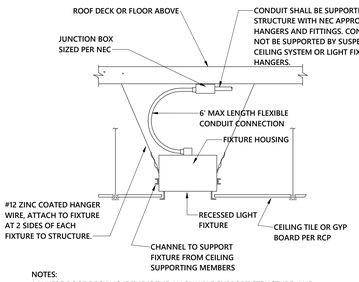
NOTES:
1. COLOR CODING AND WIRING MAY VARY PER MANUFACTURER.
2. IF SEQUENCE OF OPERATION PROVIDED, SEE SEQUENCE FOR SETTING REQUIREMENTS. OTHERWISE SET TIME AFTER NO OCCUPANCY DETECTED FOR 15 MINUTES.
3. OCCUPANCY AND/OR VACANCY SENSORS APPLY.
4. BOTH SENSORS MUST TIME OUT FOR LIGHTS TO TURN OFF.
5. SWITCHING IS LINE VOLTAGE.
6. WHEN REQUIRED CONNECT NEUTRAL TO WHITE LEAD (NEUTRAL OF SWITCH).

12 DUAL RELAY WALL SWITCH SENSORS
NOT TO SCALE



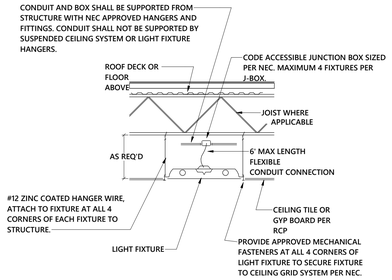
NOTES:
1. ORIENTATION SHOWN IS FOR PERPENDICULAR TO FLOOR APPLICATIONS. FOR SLOPED JOIST INSTALLATION, MATCH SLOPE OF JOIST AND MOUNT FLUSH WITH JOIST. ADJUST UNISTRUT AS REQUIRED.

13 HI-BAY FIXTURE 2X4
NOT TO SCALE



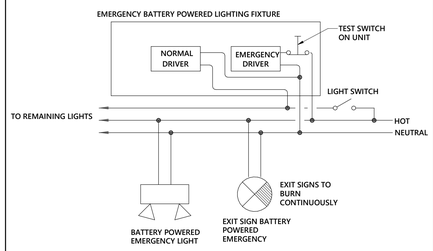
NOTES:
1. WHERE ROOF DECKING IS THE IS THE ALLOWABLE SUPPORT STRUCTURE, AND PATHWAY SYSTEM IS NOT IMC OR RMC, THE MINIMUM DISTANCE FROM ROOF DECKING SHALL BE 1.5" FOR ALL BOXES AND CONDUIT.

14 TYPICAL RECESSED DOWN LIGHT FIXTURE INSTALLATION DIAGRAM
NOT TO SCALE

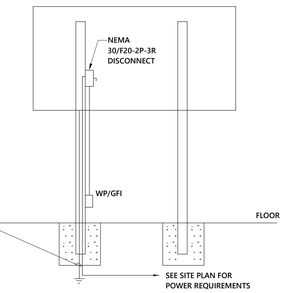


NOTES:
1. WHERE ROOF DECKING IS THE IS THE ALLOWABLE SUPPORT STRUCTURE, AND PATHWAY SYSTEM IS NOT IMC OR RMC, THE MINIMUM DISTANCE FROM ROOF DECKING SHALL BE 1.5" FOR ALL BOXES AND CONDUIT.

15 TYPICAL LAY-IN FIXTURE DIAGRAM
NOT TO SCALE



16 ATHLETIC BUILDING SWITCHED EMER. LIGHTING WIRING
NOT TO SCALE



NOTES:
1. SCOREBOARD AND STRUCTURE BY OTHERS.
2. PROVIDE WP GFCI OUTLET UPSTREAM OF DISCONNECT FOR MAINTENANCE.

17 SCOREBOARD
NO SCALE

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REVISIONS:

No.	Description	Date
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PROJECT: 9201-218240
DATE: 01-12-2023

LIGHTING DETAILS

E-008

Optima # 22-0082
[redacted]

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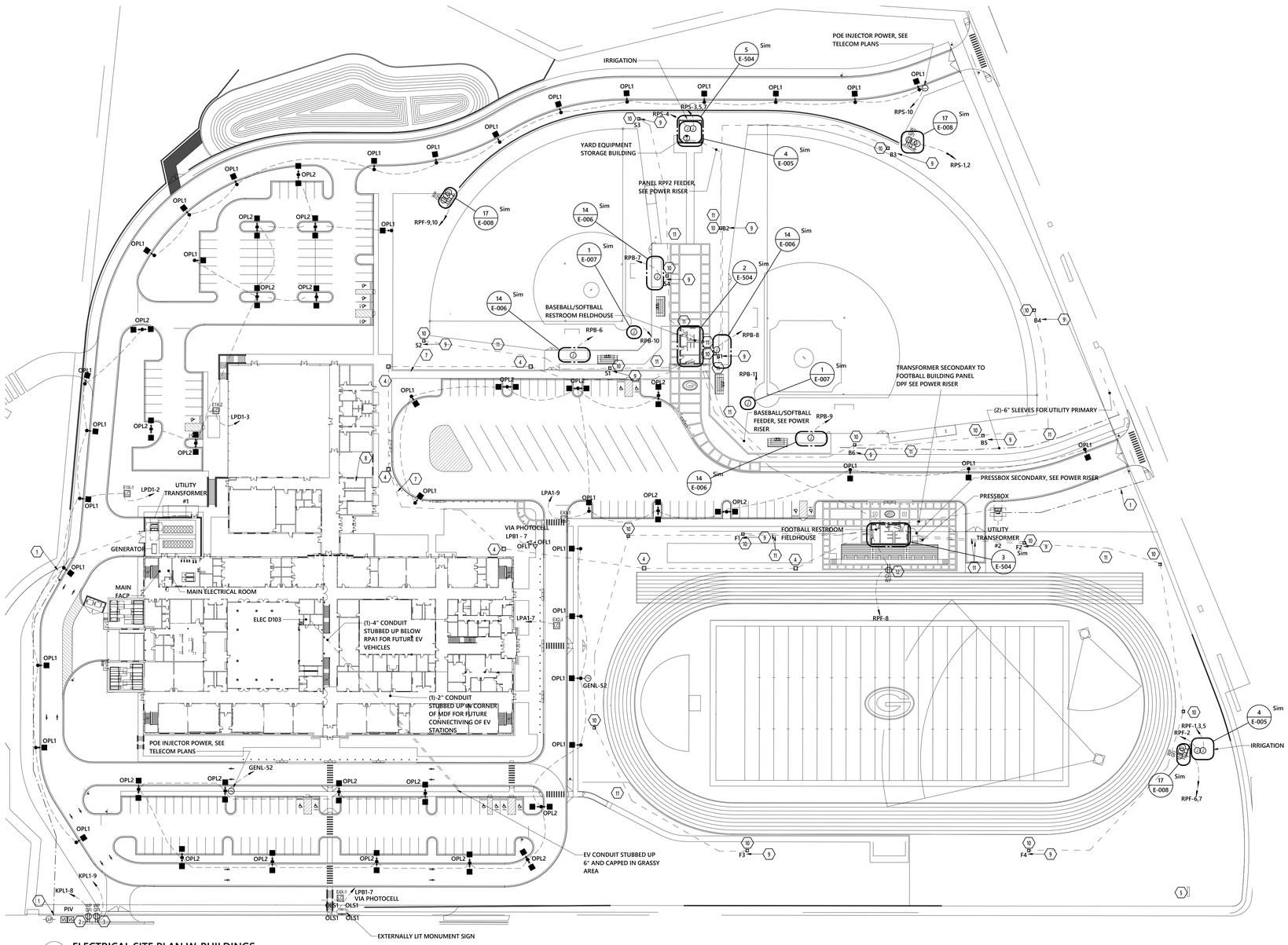
KEYED NOTES:

1. (2)-4" SCHEDULE 40 PVC CONDUITS FOR PRIMARY FEEDERS FROM PAD MOUNTED TRANSFORMER TO DESIGNATED POINT AT EDGE OF PROPERTY FOR LOCAL POWER UTILITY USE. PROVIDE UP TO 150' OF ADDITIONAL (2)-4" CONDUIT AND COMPLETE INSTALLATION BASED ON UTILITY COORDINATION.
2. FIRE SERVICE BACKFLOW, PROVIDE 1" CONDUIT TO FACP FOR TAMPER SWITCHES. COORDINATE EXACT QUANTITY AND LOCATION WITH CIVIL PLANS.
3. DOMESTIC SERVICE BACKFLOW, COORDINATE EXACT LOCATION WITH CIVIL PLANS.
4. 36" X 36" HANDHOLE.
5. EXISTING DIGITAL SCHOOL SIGNAGE TO REMAIN.
6. POST INDICATOR VALVE, 3/4" TO FACP. COORDINATE EXACT LOCATION WITH CIVIL PLANS.
7. (1)-2"C FOR FACP FIBER. ROUTE FROM FOOTBALL FIELDHOUSE FACP NODE 2 TO BASEBALL FIELDHOUSE FACP NODE 3.
8. (1)-4"C FOR FACP FIBER BOTH NODE 2 AND 3.
9. FIXTURE, CONDUCTORS, AND POLE IS AN ALTERNATE, SEE E-001 FOR LISTING.
10. 24"X24" HANDHOLE FOR SPORTS LIGHTING.
11. 2" CONDUIT FOR SPORTS LIGHTING.
12. PROVIDE (1)-2" CONDUIT TO WEATHERPROOF JUNCTION BOX TERMINATED AT WALL OF BLEACHERS. PROVIDE WP DUPLEX RECEPTACLE AT WALL. COORDINATE EXACT LOCATION WITH OWNER PRIOR TO ROUGH-IN.



1 ELECTRICAL SITE PLAN W-BUILDINGS
1" = 50'-0"

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PROJECT: 9201-218240
DATE: 01-12-2023

ELECTRICAL SITE PLAN

E-010

Optima # 22-0082

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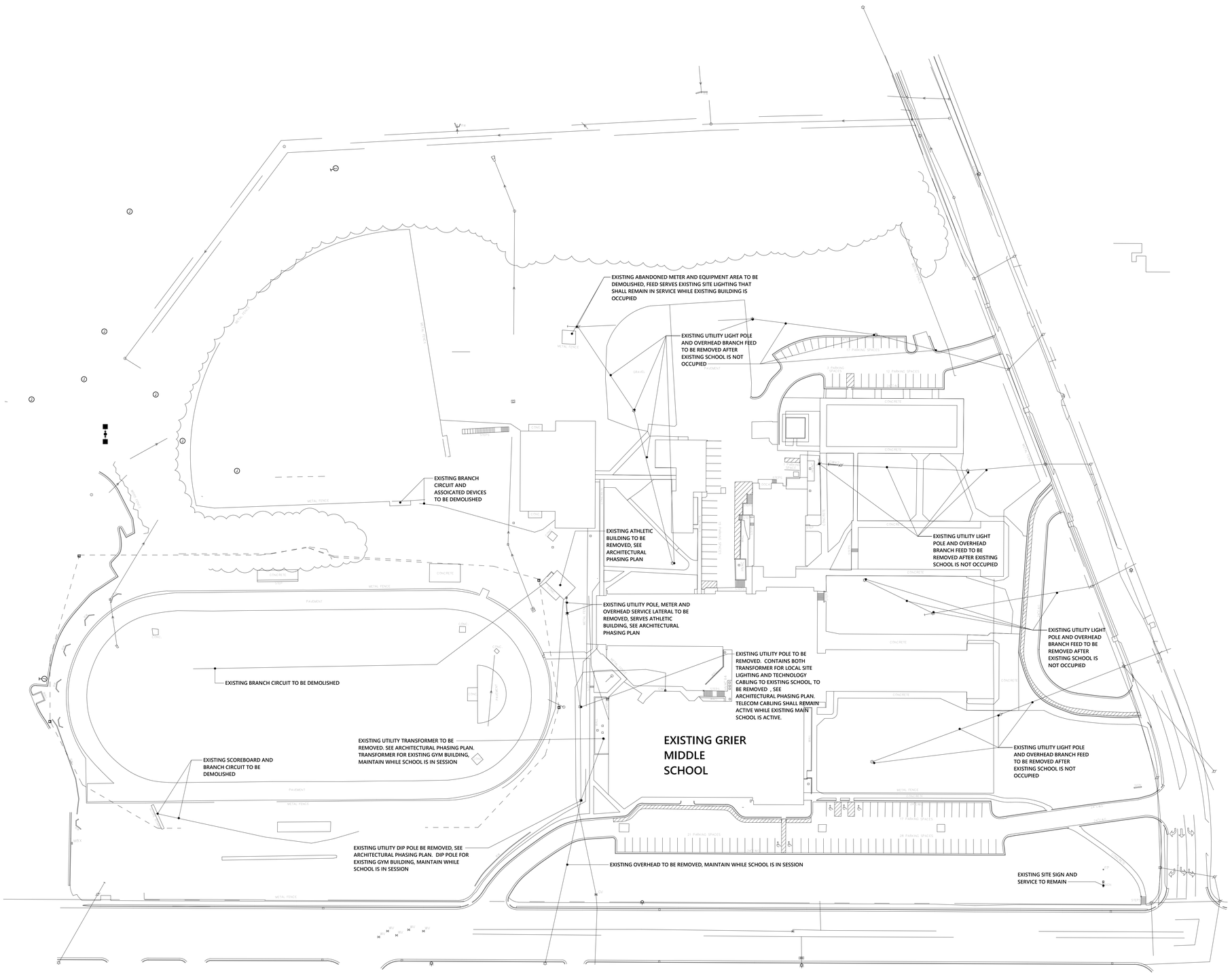

1 ELECTRICAL SITE PLAN-EXISTING
1" = 50'-0"

GENERAL NOTES:
1. COORDINATE ALL RELOCATION/REMOVAL OF UTILITY POLES/FEEDS WITH UTILITY.
2. EXISTING MIDDLE SCHOOL AND ALL ELECTRICAL EQUIPMENT AND COMPONENTS TO BE DEMOLISHED, SEE ARCHITECTURAL PHASING PLAN.

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PROJECT: 9201-218240
DATE: 01-12-2023

EXISTING SITE PLAN

E-011

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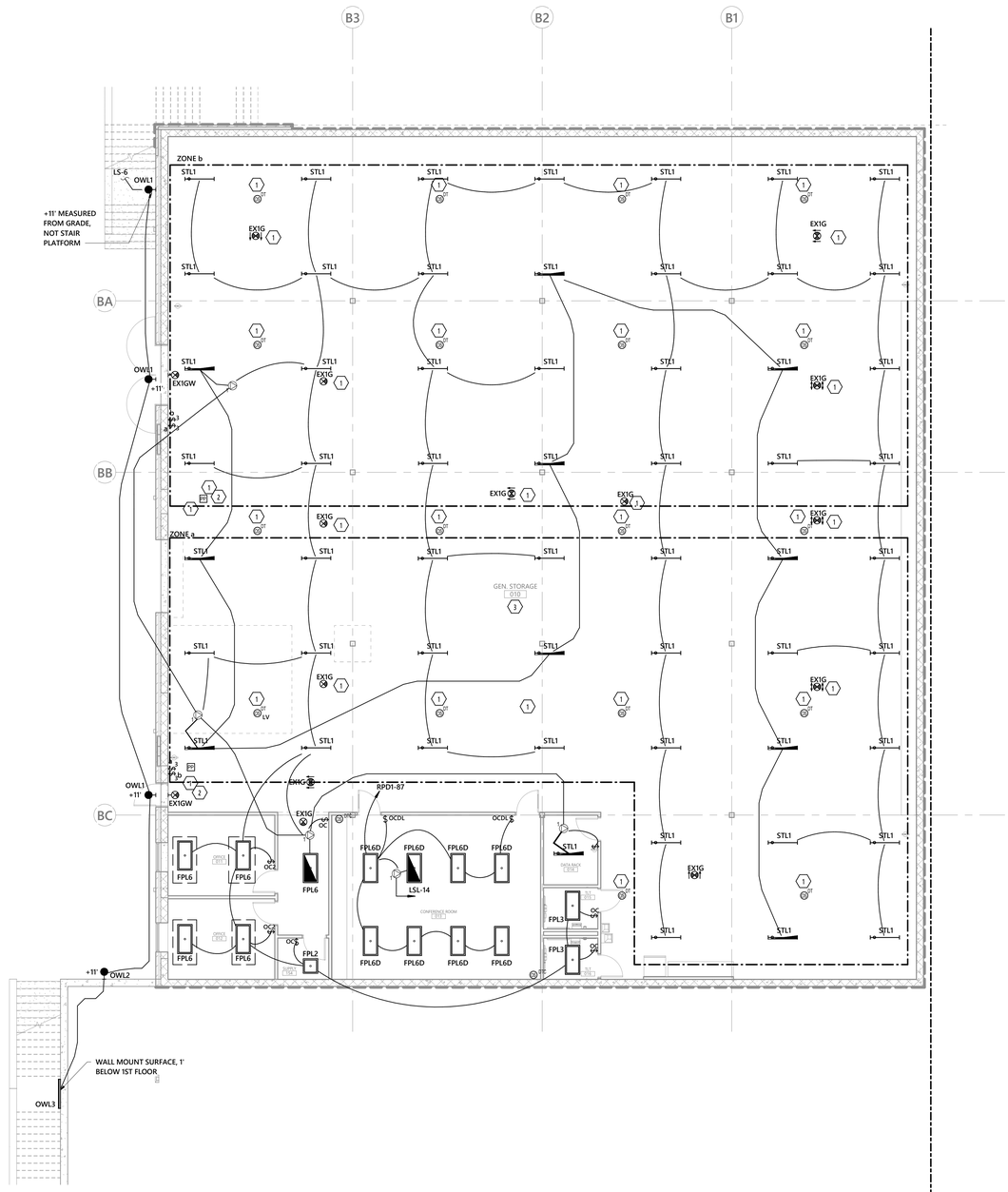


1 BASEMENT LIGHTING PLAN
1/8" = 1'-0"

GENERAL NOTES:

A. SUPPLEMENT UNISTRUT BETWEEN STRUCTURAL MEMBERS TO SUPPORT FIXTURES AND DEVICES BETWEEN JOISTS.
B. POWERPACKS AND EMERGENCY RELAYS SHALL BE MOUNTED AT ENTRY DOOR OF ROOM, UNLESS NOTED OTHERWISE.
C. EMERGENCY RELAYS AND EXIT LIGHTS SHALL BE POWERED VIA NEAREST EMERGENCY LIGHTING CIRCUIT, UNLESS NOTED OTHERWISE REFER TO DETAIL FOR RELAY WIRING INFORMATION. EXIT SIGNS SHALL BE UNSWITCHED.
D. COORDINATE ALL POWERPACKS ABOVE ACCESSIBLE CEILING. LOCATE CHAIN-HUNG INDUSTRIAL FIXTURES IN MECHANICAL ROOMS TO AVOID DUCTWORK AND PIPING, TO MAXIMIZE AVAILABLE LIGHT. SPACE AROUND EQUIPMENT, AIR HANDLERS, ETC. TO PROVIDE ADEQUATE LIGHTING TO ALL AREAS OF ROOM.
E. LOCATE EXIT SIGNS FOR MAXIMUM VIEWING AREA TO IDENTIFY EGRESS PATHS AS INDICATED ON PLANS. COORDINATE LOCATIONS SUCH THAT ARCHITECTURAL FEATURES OR EQUIPMENT FROM OTHERTRADES DO NOT OBSTRUCT VIEW.
F. POWER PACKS AND EMERGENCY RELAYS LOCATED ON FLOOR PLANS TO ILLUSTRATE DESIGN INTENT. INSTALL DEVICES IN EQUIPMENT ROOMS OR ABOVE ACCESSIBLE CEILINGS. DO NOT INSTALL DEVICES EXPOSED IN FINISHED SPACES.
G. SEE ARCH. CEILING PLANS FOR MOUNTING HEIGHTS OF ALL CABLE HUNG FIXTURES.

KEYED NOTES:

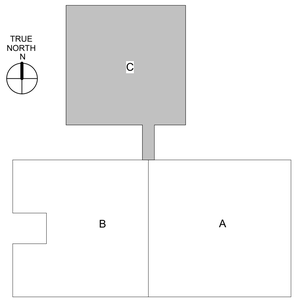
1. PENDANT MOUNT FLUSH WITH STRUCTURAL STEEL.
2. POWERPACK ARE WIRED IN PARALLEL. ANY OPERATION OF A SENSOR WILL CLOSE BOTH POWERPACK RELAYS.
3. TIME SETTING FOR SENSOR IN GEN STORAGE SHALL BE 30 MINUTES.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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REVISIONS:

No.	Description	Date
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PROJECT: 9201-218240
DATE: 01-12-2023

BASEMENT FLOOR LIGHTING PLAN

E-100

Optima # 22-0082

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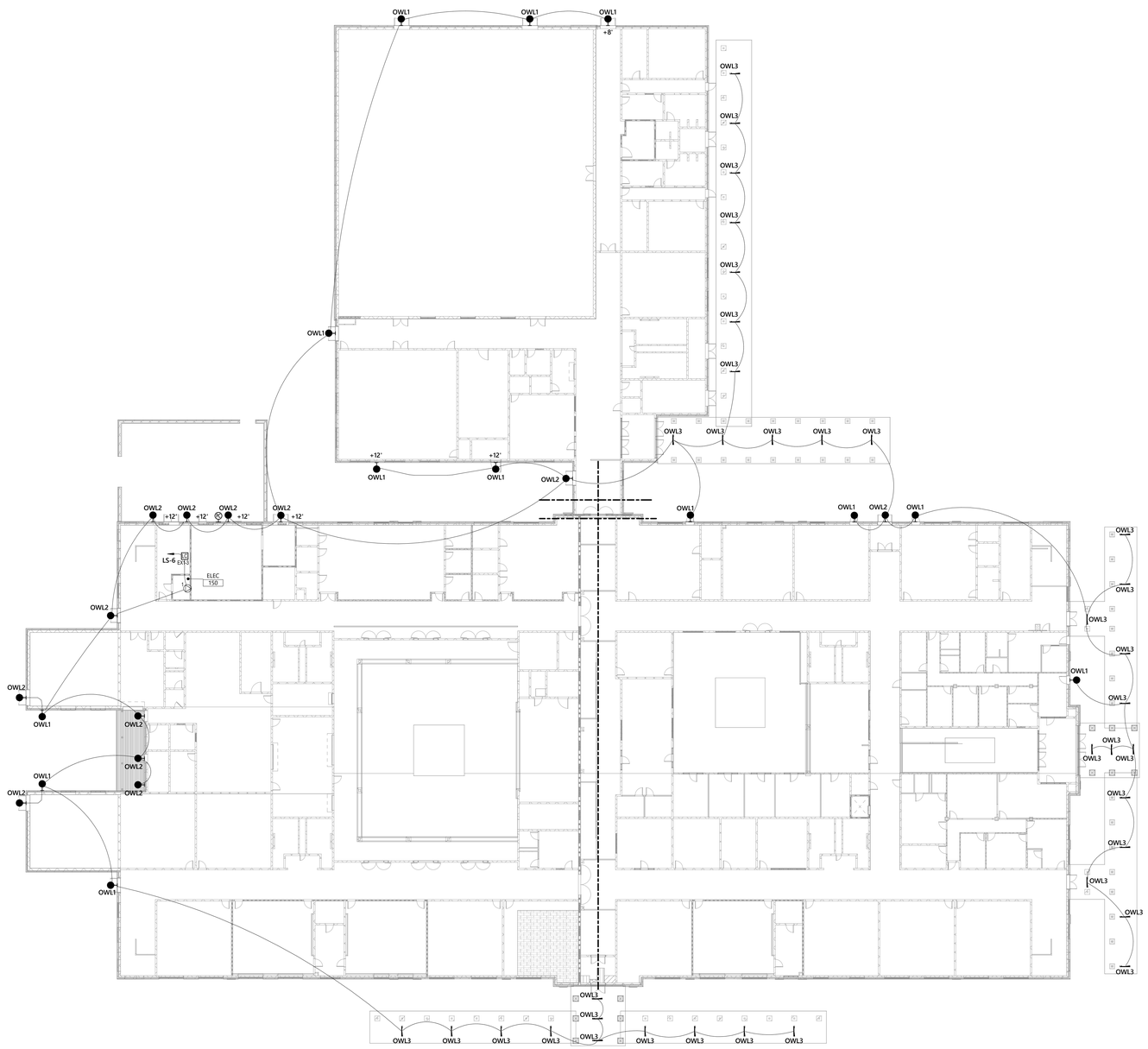


2 OVERALL FIRST FLOOR LIGHTING PLAN
3/64" = 1'-0"

GENERAL NOTES:

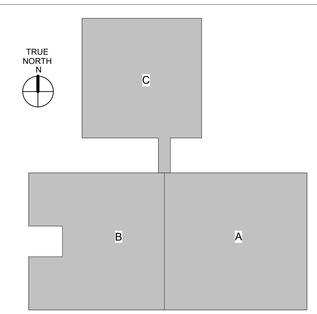
A. OWL3 CANOPY FIXTURES ARE TO BE MOUNTED ON TUBE STEEL. CONDUIT SHALL BE SURFACED MOUNTED, CONCEAL ALONG BEAMS.
B. OWL1 AND OWL2 FIXTURES ARE 11' AFF UNLESS OTHERWISE NOTED.
C. EXTERIOR LIGHTING IS CONTROLLED VIA PHOTOCELL WITH INPUT TO AN H.O.A CONTACTOR. EMERGENCY RELAY INSTALLED ON LOAD SIDE.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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PROJECT: 9201-218240
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OVERALL FIRST FLOOR LIGHTING PLAN - EXTERIOR

E-101

Optima # 22-0082

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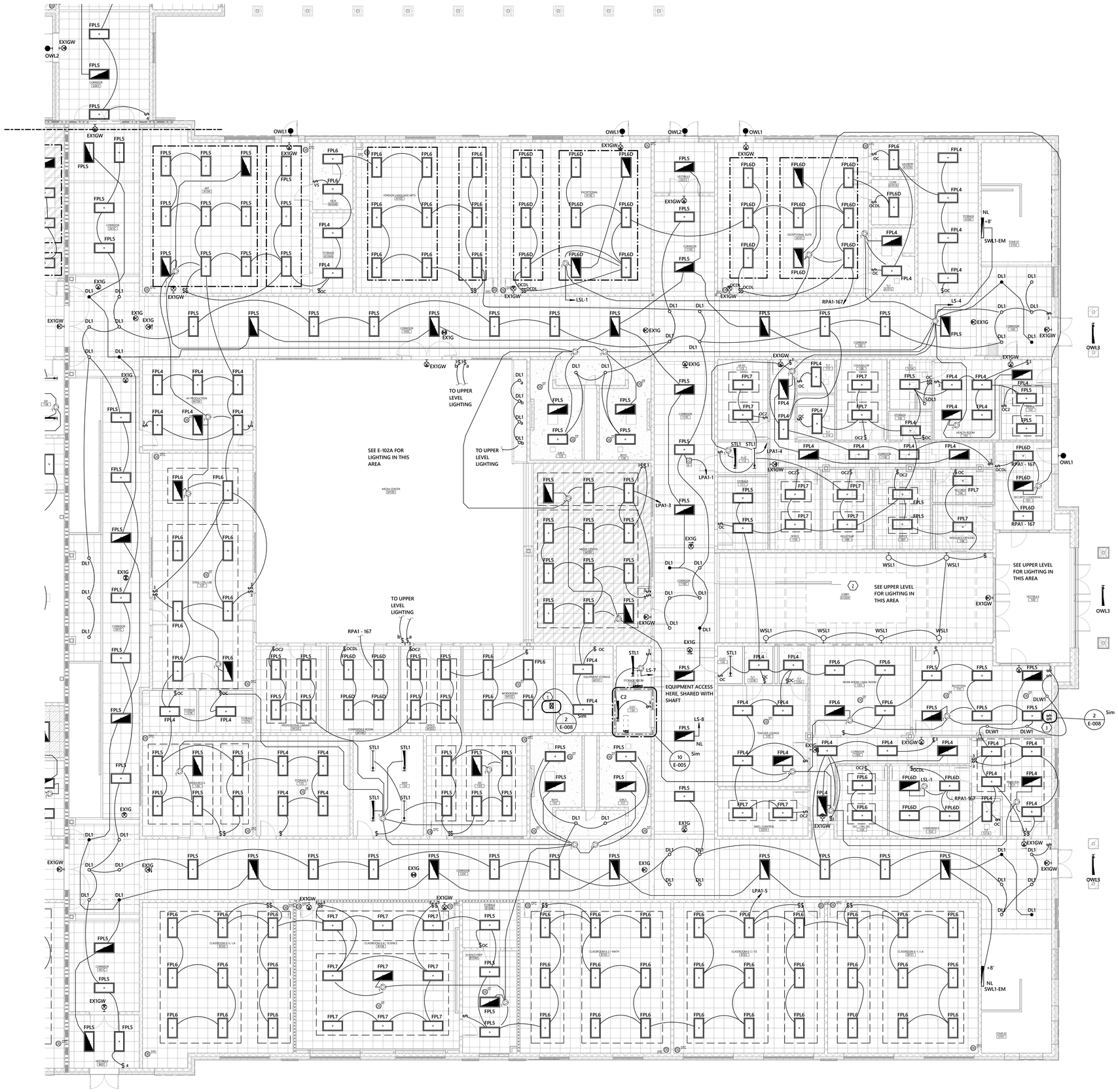


2 FIRST FLOOR LIGHTING PLAN - AREA A
1/8" = 1'-0"

GENERAL NOTES:

A. SEE E101 FOR EXTERIOR LIGHTING LAYOUT AND CIRCUITING.
B. POWERPACKS AND EMERGENCY RELAYS SHALL BE MOUNTED AT ENTRY DOOR OF ROOM, UNLESS NOTED OTHERWISE.
C. EMERGENCY RELAYS AND EXIT LIGHTS SHALL BE POWERED VIA NEAREST EMERGENCY LIGHTING CIRCUIT, UNLESS NOTED OTHERWISE REFER TO DETAIL FOR RELAY WIRING INFORMATION. EXIT SIGNS SHALL BE UNSWITCHED.
D. COORDINATE ALL POWERPACKS ABOVE ACCESSIBLE CEILING. LOCATE CHAIN-HUNG INDUSTRIAL FIXTURES IN MECHANICAL ROOMS TO AVOID DUCTWORK AND PIPING, TO MAXIMIZE AVAILABLE LIGHT. SPACE AROUND EQUIPMENT, AIR HANDLERS, ETC. TO PROVIDE ADEQUATE LIGHTING TO ALL AREAS OF ROOM.
E. LOCATE EXIT SIGNS FOR MAXIMUM VIEWING AREA TO IDENTIFY EGRESS PATHS AS INDICATED ON PLANS. COORDINATE LOCATIONS SUCH THAT ARCHITECTURAL FEATURES OR EQUIPMENT FROM OTHER TRADES DO NOT OBSTRUCT VIEW.
F. POWERPACKS AND EMERGENCY RELAYS LOCATED ON FLOOR PLANS TO ILLUSTRATE DESIGN INTENT. INSTALL DEVICES IN EQUIPMENT ROOMS OR ABOVE ACCESSIBLE CEILINGS. DO NOT INSTALL DEVICES EXPOSED IN FINISHED SPACES.
G. SEE ARCH. CEILING PLANS FOR MOUNTING HEIGHTS OF ALL CABLE HUNG FIXTURES.
H. SUPPLEMENT UNISTRUT BETWEEN STRUCTURAL MEMBERS TO SUPPORT FIXTURES AND DEVICES BETWEEN JOISTS.

KEYED NOTES:

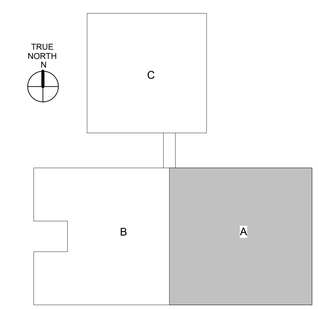
1. HOA OVERRIDE FOR LIGHTING CONTACTOR ZONED FOR MEDIA CENTER. MOUNT ABOVE COUNTERTOP. PROVIDE PHENOLIC LABEL ON ENCLOSURE "MEDIA CENTER LIGHTING".
2. COORDINATE WSL1 FIXTURES WITH ARCHITECTURAL PANELS AND ARTWORK. HEIGHT IS BASED ON 16'-4" TO THE CENTER.
3. OVERRIDE ALL INTERIOR CONTACTOR ZONES, AND ALL EXTERIOR CONTACTOR ZONES RESPECTIVELY.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

FIRST FLOOR LIGHTING PLAN AREA A

E-101A

Optima # 22-0082

01.12.2023 - BID SET

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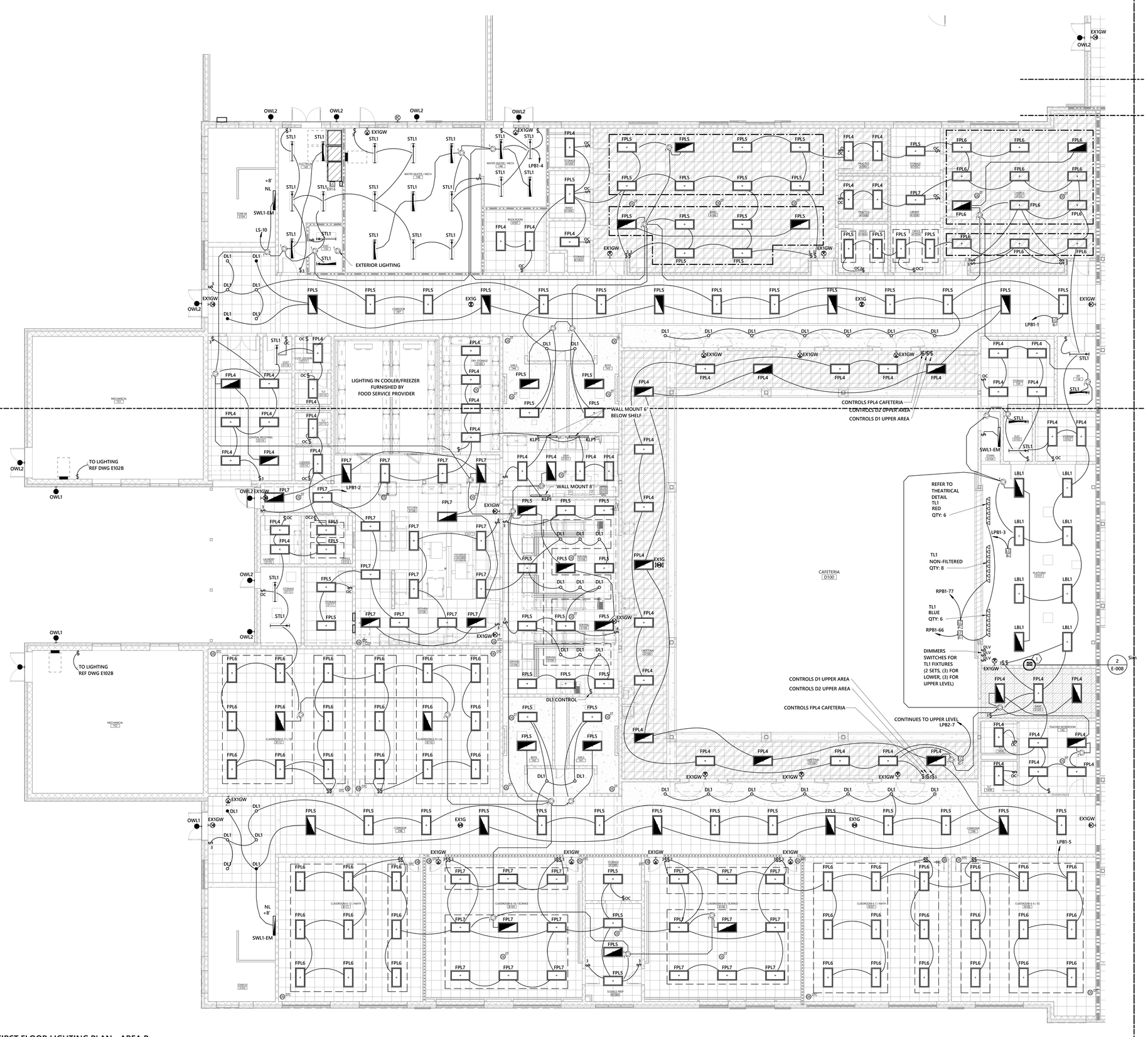


2 FIRST FLOOR LIGHTING PLAN - AREA B

1/8" = 1'-0"

GENERAL NOTES:

A. SEE E101 FOR EXTERIOR LIGHTING LAYOUT AND CIRCUITING.
B. POWERPACKS AND EMERGENCY RELAYS SHALL BE MOUNTED AT ENTRY DOOR OF ROOM, UNLESS NOTED OTHERWISE.
C. EMERGENCY RELAYS AND EXIT LIGHTS SHALL BE POWERED VIA NEAREST EMERGENCY LIGHTING CIRCUIT, UNLESS NOTED OTHERWISE REFER TO DETAIL FOR RELAY WIRING INFORMATION. EXIT SIGNS SHALL BE UNSWITCHED.
D. COORDINATE ALL POWERPACKS ABOVE ACCESSIBLE CEILING. LOCATE CHAIN-HUNG INDUSTRIAL FIXTURES IN MECHANICAL ROOMS TO AVOID DUCTWORK AND PIPING, TO MAXIMIZE AVAILABLE LIGHT. SPACE AROUND EQUIPMENT, AIR HANDLERS, ETC. TO PROVIDE ADEQUATE LIGHTING TO ALL AREAS OF ROOM.
E. LOCATE EXIT SIGNS FOR MAXIMUM VIEWING AREA TO IDENTIFY EGRESS PATHS AS INDICATED ON PLANS. COORDINATE LOCATIONS SUCH THAT ARCHITECTURAL FEATURES OR EQUIPMENT FROM OTHER TRADES DO NOT OBSTRUCT VIEW.
F. POWERPACKS AND EMERGENCY RELAYS LOCATED ON FLOOR PLANS TO ILLUSTRATE DESIGN INTENT. INSTALL DEVICES IN EQUIPMENT ROOMS OR ABOVE ACCESSIBLE CEILINGS. DO NOT INSTALL DEVICES EXPOSED IN FINISHED SPACES.
G. SEE ARCH. CEILING PLANS FOR MOUNTING HEIGHTS OF ALL CABLE HUNG FIXTURES.
H. SUPPLEMENT UNISTRUT BETWEEN STRUCTURAL MEMBERS TO SUPPORT FIXTURES AND DEVICES BETWEEN JOISTS.

KEYED NOTES:

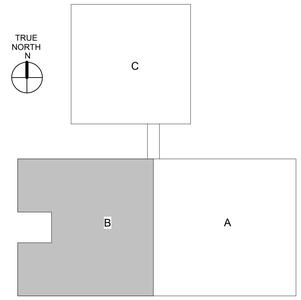
1. HOA OVERRIDE FOR LIGHTING CONTACTOR ZONED FOR PLATFORM/CAFETERIA. PROVIDE PHENOLIC LABEL ON RESPECTIVE ENCLOSURE "PLATFORM TRACK LIGHTING", "CORRIDOR LIGHTING", AND "DINING AREA LIGHTING" .

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
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FIRST FLOOR LIGHTING PLAN AREA B

E-101B

Optima # 22-0082

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2 FIRST FLOOR LIGHTING PLAN - AREA C
1/8" = 1'-0"

GENERAL NOTES:
A. SEE E101 FOR EXTERIOR LIGHTING LAYOUT AND CIRCUITING.
B. POWERPACKS AND EMERGENCY RELAYS SHALL BE MOUNTED AT ENTRY DOOR OF ROOM, UNLESS NOTED OTHERWISE.
C. EMERGENCY RELAYS AND EXIT LIGHTS SHALL BE POWERED VIA NEAREST EMERGENCY LIGHTING CIRCUIT, UNLESS NOTED OTHERWISE REFER TO DETAIL FOR RELAY WIRING INFORMATION. EXIT SIGNS SHALL BE UNSWITCHED.
D. COORDINATE ALL POWERPACKS ABOVE ACCESSIBLE CEILING. LOCATE CHAIN-HUNG INDUSTRIAL FIXTURES IN MECHANICAL ROOMS TO AVOID DUCTWORK AND PIPING, TO MAXIMIZE AVAILABLE LIGHT. SPACE AROUND EQUIPMENT, AIR HANDLERS, ETC. TO PROVIDE ADEQUATE LIGHTING TO ALL AREAS OF ROOM.
E. LOCATE EXIT SIGNS FOR MAXIMUM VIEWING AREA TO IDENTIFY EGRESS PATHS AS INDICATED ON PLANS. COORDINATE LOCATIONS SUCH THAT ARCHITECTURAL FEATURES OR EQUIPMENT FROM OTHER TRADES DO NOT OBSTRUCT VIEW.
F. POWERPACKS AND EMERGENCY RELAYS LOCATED ON FLOOR PLANS TO ILLUSTRATE DESIGN INTENT. INSTALL DEVICES IN EQUIPMENT ROOMS OR ABOVE ACCESSIBLE CEILINGS. DO NOT INSTALL DEVICES EXPOSED IN FINISHED SPACES.
G. SEE ARCH. CEILING PLANS FOR MOUNTING HEIGHTS OF ALL CABLE HUNG FIXTURES.
H. SUPPLEMENT UNISTRUT BETWEEN STRUCTURAL MEMBERS TO SUPPORT FIXTURES AND DEVICES BETWEEN JOISTS.

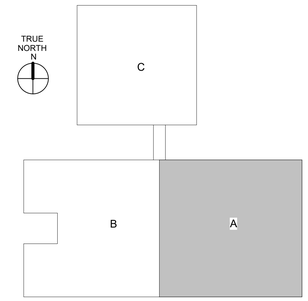
KEYED NOTES:
1. HOA OVERRIDE FOR LIGHTING CONTACTOR ZONED FOR GYMNASIUM. PROVIDE PHENOLIC LABEL ON ENCLOSURE "GYM LIGHTING OVERRIDE". HOA OVERRIDE FOR LIGHTING CONTACTOR ZONED FOR GYM CORRIDOR. PROVIDE PHENOLIC LABEL ON ENCLOSURE "GYM CORRIDOR LIGHTING OVERRIDE".

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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No.	Description	Date
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PROJECT: 9201-218240
DATE: 01-12-2023

FIRST FLOOR LIGHTING PLAN AREA C

E-101C

Optima # 22-0082

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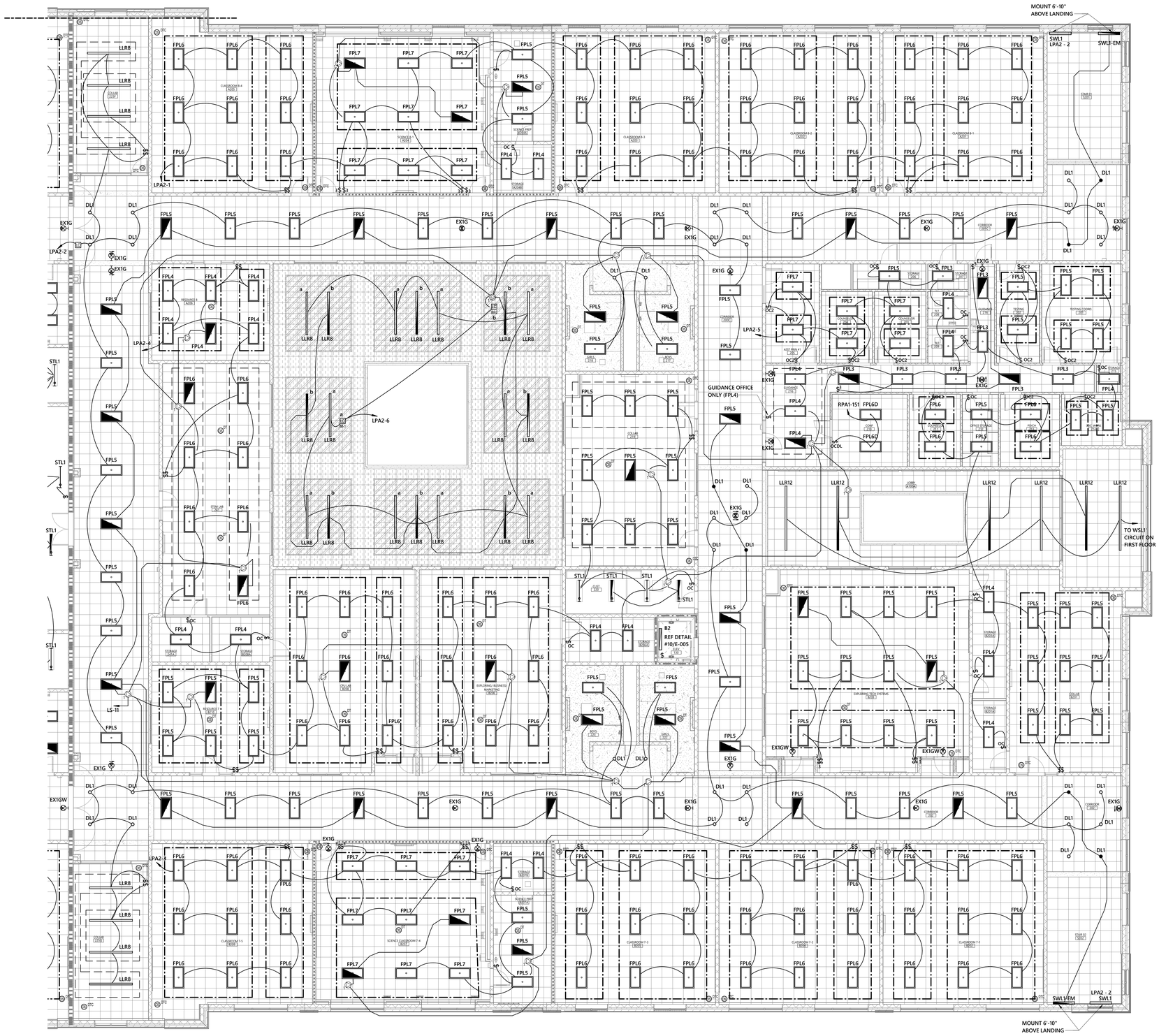

2 SECOND FLOOR LIGHTING PLAN - AREA A

1/8" = 1'-0"

GENERAL NOTES:

A. SEE E101 FOR EXTERIOR LIGHTING LAYOUT AND CIRCUITING.
B. POWERPACKS AND EMERGENCY RELAYS SHALL BE MOUNTED AT ENTRY DOOR OF ROOM, UNLESS NOTED OTHERWISE.
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D. COORDINATE ALL POWERPACKS ABOVE ACCESSIBLE CEILING. LOCATE CHAIN-HUNG INDUSTRIAL FIXTURES IN MECHANICAL ROOMS TO AVOID DUCTWORK AND PIPING, TO MAXIMIZE AVAILABLE LIGHT. SPACE AROUND EQUIPMENT, AIR HANDLERS, ETC. TO PROVIDE ADEQUATE LIGHTING TO ALL AREAS OF ROOM.
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G. SEE ARCH. CEILING PLANS FOR MOUNTING HEIGHTS OF ALL CABLE HUNG FIXTURES.
H. SUPPLEMENT UNISTRUT BETWEEN STRUCTURAL MEMBERS TO SUPPORT FIXTURES AND DEVICES BETWEEN JOISTS.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
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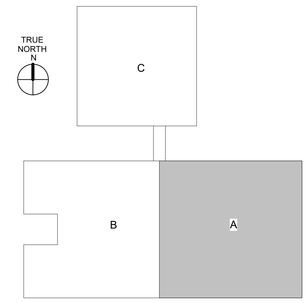
KEY PLAN



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PROJECT: 9201-218240
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SECOND FLOOR LIGHTING PLAN AREA A

E-102A

Optima # 22-0082

[redacted]

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2 SECOND FLOOR LIGHTING PLAN - AREA B

1/8" = 1'-0"

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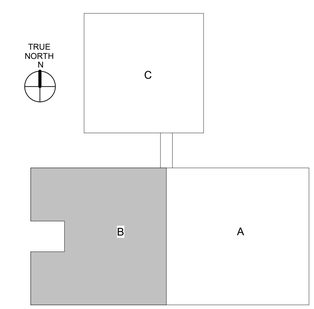

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SECOND FLOOR LIGHTING PLAN AREA B

E-102B

Optima # 22-0082

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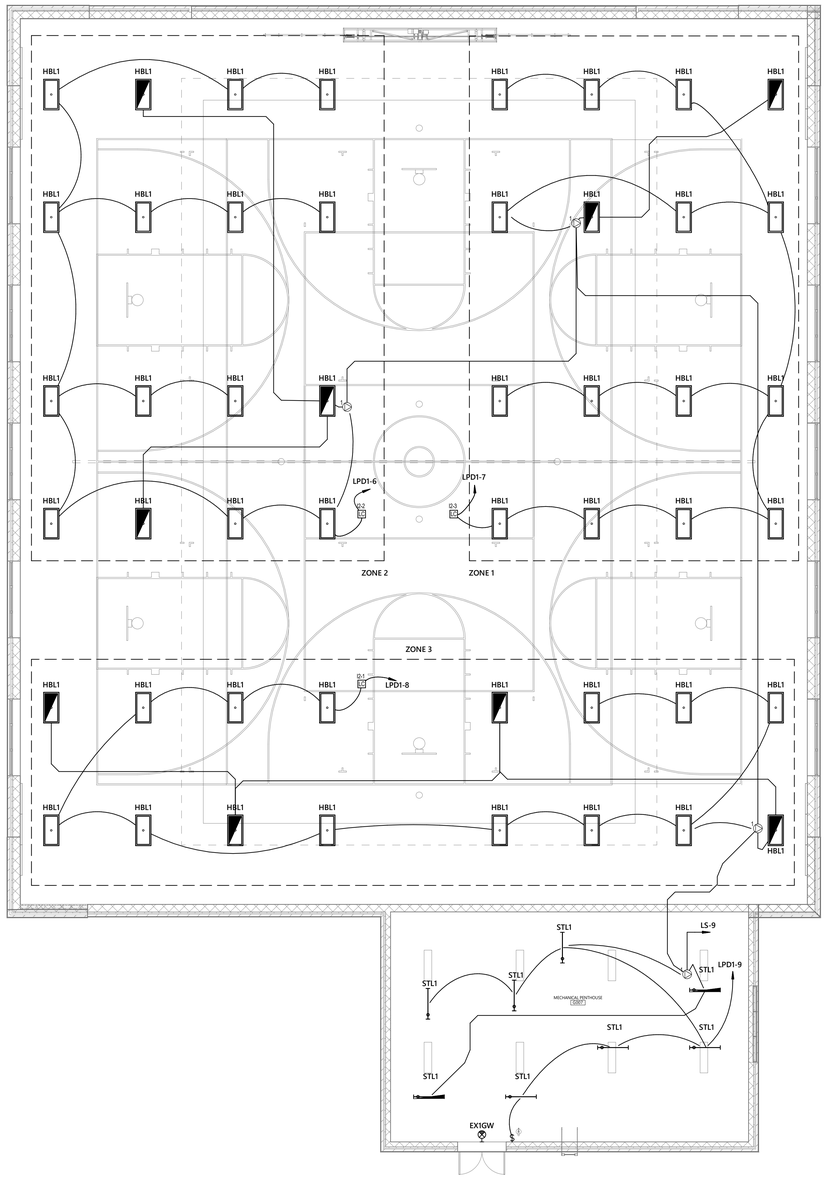

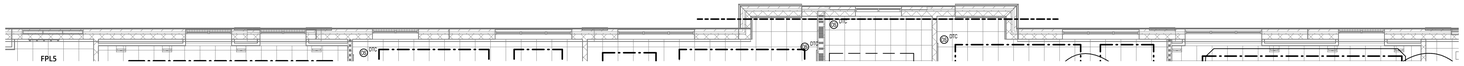

2 SECOND FLOOR LIGHTING PLAN - AREA C
1/8" = 1'-0"

GENERAL NOTES:

A. SEE E101 FOR EXTERIOR LIGHTING LAYOUT AND CIRCUITING.
B. POWERPACKS AND EMERGENCY RELAYS SHALL BE MOUNTED AT ENTRY DOOR OF ROOM, UNLESS NOTED OTHERWISE.
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PARTITION LEGEND

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2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

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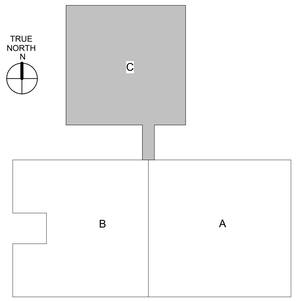
KEY PLAN



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SECOND FLOOR LIGHTING PLAN AREA C

E-102C

Optima # 22-0082

[redacted]

01.12.2023 - BID SET

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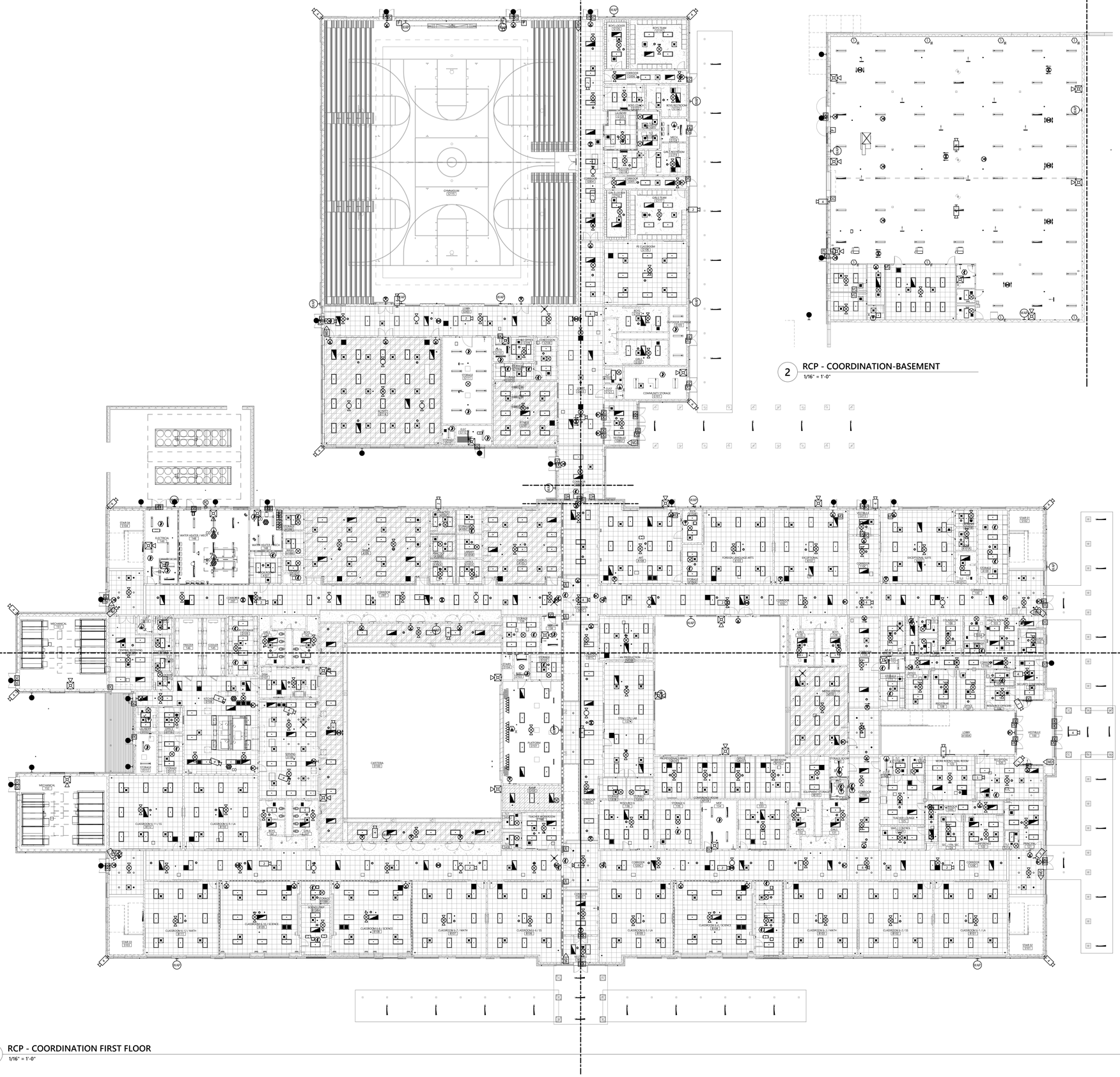

2 RCP - COORDINATION-BASEMENT
1/16" = 1'-0"

1 RCP - COORDINATION FIRST FLOOR
1/16" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
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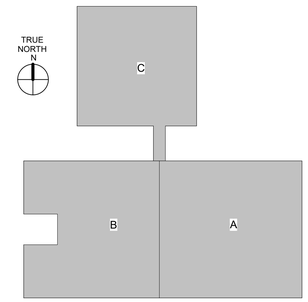

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RCP - COORDINATION - FIRST FLOOR

E-103

Optima # 22-0082

01.12.2023 - BID SET

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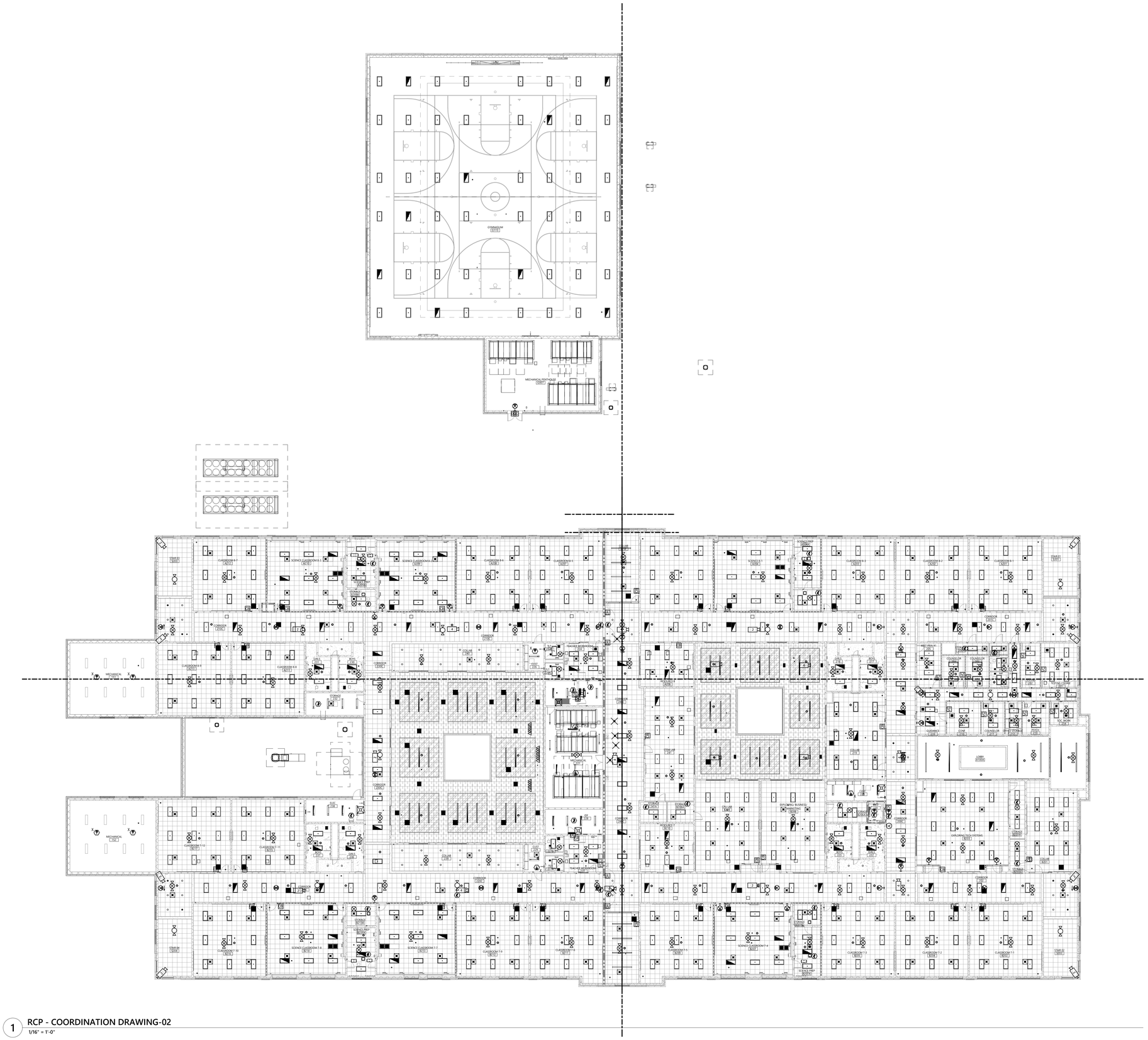

1 RCP - COORDINATION DRAWING-02
1/16" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
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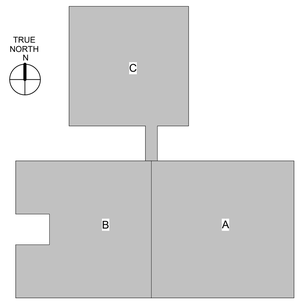
KEY PLAN



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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

RCP - COORDINATION - SECOND FLOOR

E-104

Optima # 22-0082

[redacted]

01.12.2023 - BID SET

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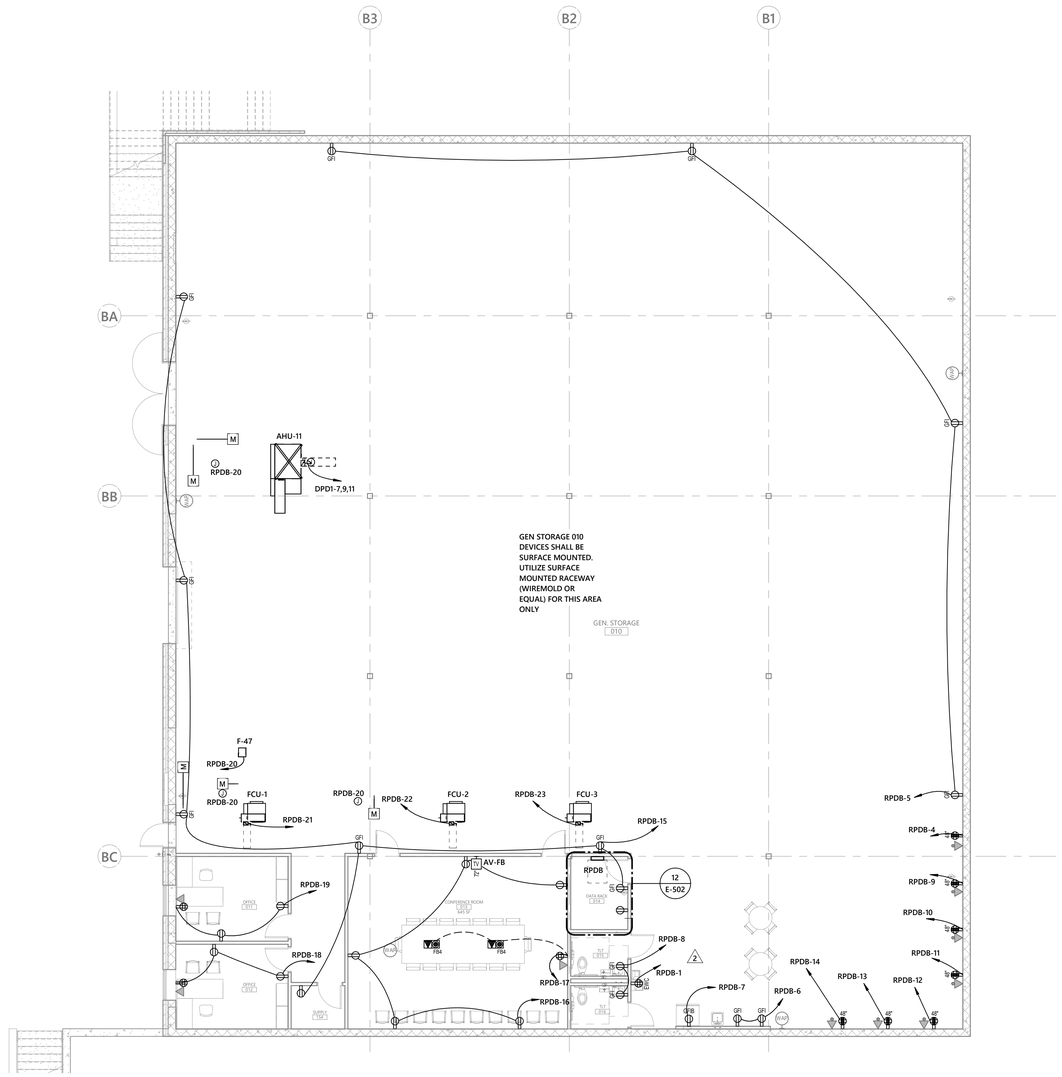

1 BASEMENT POWER PLAN
1/8" = 1'-0"

General Notes - Power

A WHERE CONNECTED TO A 20A. BRANCH CIRCUIT SUPPLYING AN INDIVIDUAL RECEPTACLE (SIMPLEX OR DUPLEX), THE RECEPTACLE SHALL BE RATED AT 20A.

B PROVIDE HOUSEKEEPING PADS FOR ALL FLOOR MOUNTED AND GRADE MOUNTED ELECTRICAL EQUIPMENT. MINIMUM REQUIREMENTS: 4" HIGH, 4% AIR ENTRAINED, POLYFIBER REINFORCED CONCRETE, 4" WIDER AND 4" LONGER THAN EQUIPMENT TO BE PLACED ON IT. REFER TO ELECTRICAL DETAIL DRAWINGS FOR TRANSFORMER, GENERATOR, OR SWITCHGEAR PADS THAT MAY EXCEED THESE REQUIREMENTS.

C REFER TO SECTION 26 0519 FOR MINIMUM CONDUCTOR SIZE ADJUSTMENTS FOR VOLTAGE DROP.

E WIRE COUNTS FOR CIRCUIT CONDUCTORS ARE NOT SHOWN. PROVIDE PROPER NUMBER OF CONDUCTORS TO ACHIEVE CIRCUIT AND SWITCHING CONNECTIONS SHOWN.

F MODIFICATIONS TO NUMBER OF CONDUCTORS IN HOME RUNS IN ADDITION TO CIRCUITS INDICATED ON THIS DRAWING ARE PROHIBITED.

J CIRCUIT NUMBERS AT DEVICES CORRESPOND TO PANELBOARD BREAKERS (SEE PANELBOARD SCHEDULE). BRANCH CIRCUITS SHALL BE SIZED ACCORDING TO THE CIRCUIT BREAKER RATING, UNLESS INDICATED OTHERWISE ON THE ELECTRICAL EQUIPMENT SCHEDULE.

K ALL VAV'S TO BE SUPPLIED WITH JUNCTION BOX FOR CONTROL WIRE. SEE DRAWING FOR CIRCUITING SPECIFICS.

L EACH "BUILDING" SEPARATION SHALL MAINTAIN CONTINUOUS BONDING OF STRUCTURAL STEEL. BONDING SHALL BE MADE SUCH THAT FIRE WALL BREAKS CAN BE MADE WITHOUT FORCING GROUNDING CONDUCTORS TO BREAK. MAINTAIN GROUNDING BOND BETWEEN LOW AND HIGH ROOFS AS WELL.

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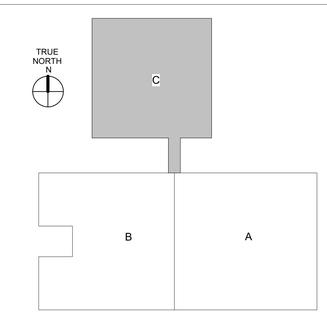
PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022
2	Permit Revisions	01-11-2023

PROJECT: 9201-218240
DATE: 01-12-2023

BASEMENT FLOOR POWER PLAN

E-200

Optima # 22-0082

01.12.2023 - BID SET

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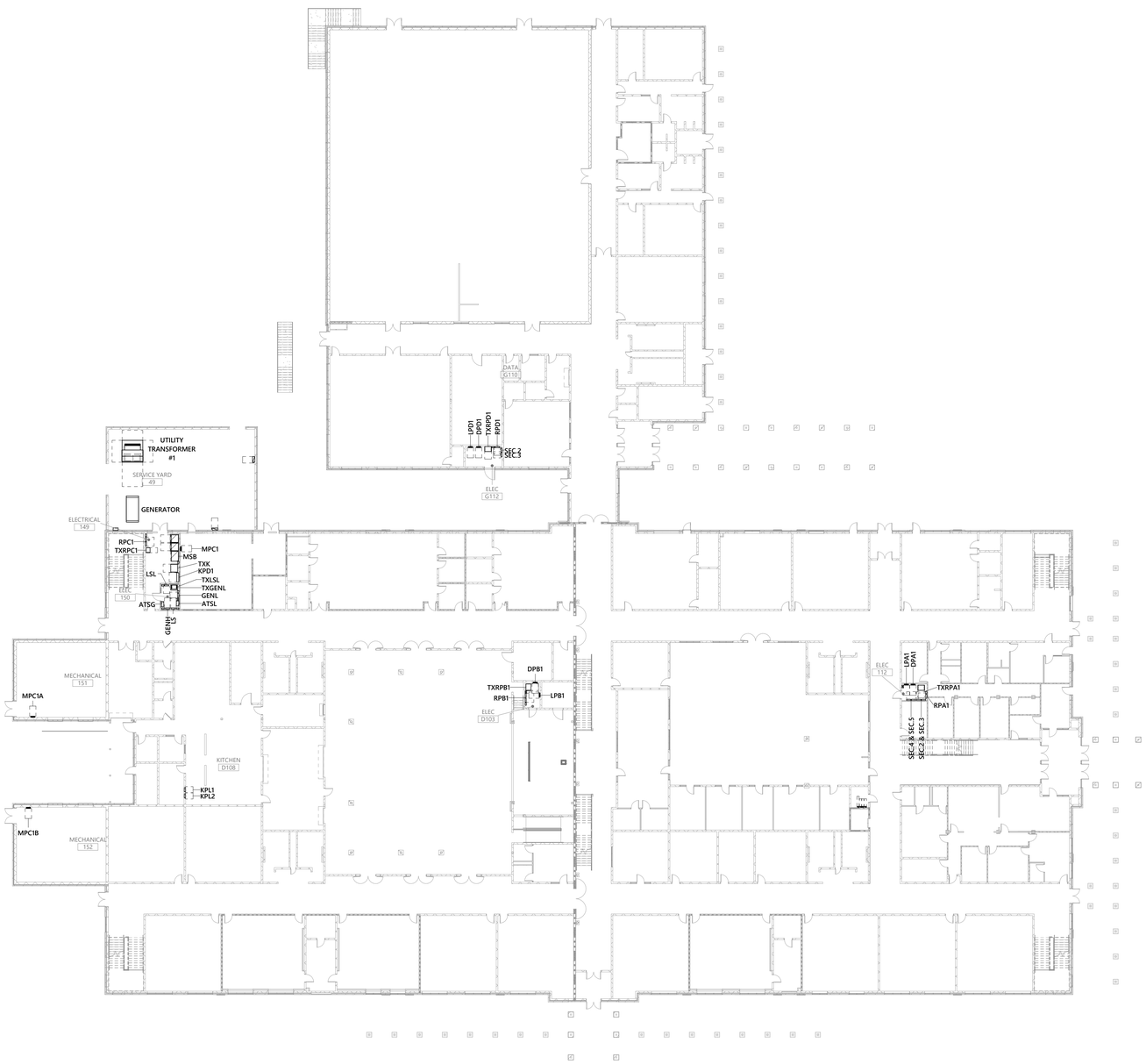

1 OVERALL FIRST FLOOR POWER PLAN
3/64" = 1'-0"

General Notes - Power

A WHERE CONNECTED TO A 20A. BRANCH CIRCUIT SUPPLYING AN INDIVIDUAL RECEPTACLE (SIMPLEX OR DUPLEX), THE RECEPTACLE SHALL BE RATED AT 20A.

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PARTITION LEGEND

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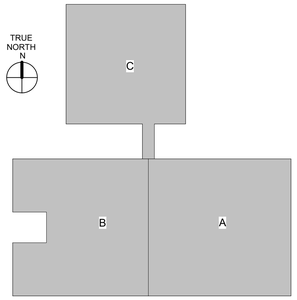
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

OVERALL FIRST FLOOR POWER PLAN

E-201

Optima # 22-0082

01.12.2023 - BID SET

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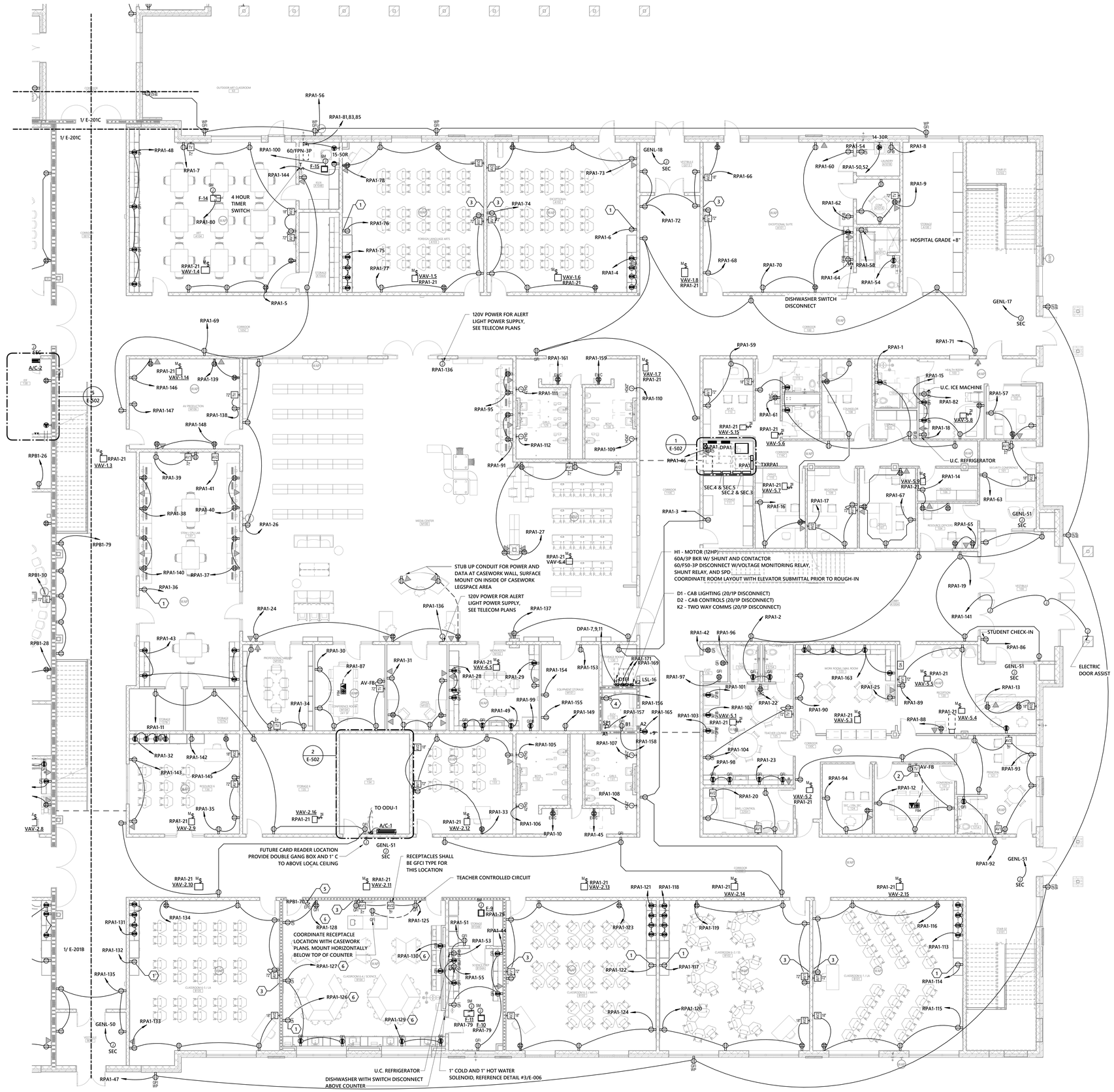

1 FIRST FLOOR POWER PLAN - AREA A

1/8" = 1'-0"

General Notes - Power

A	WHERE CONNECTED TO A 20A. BRANCH CIRCUIT SUPPLYING AN INDIVIDUAL RECEPTACLE (SIMPLEX OR DUPLEX), THE RECEPTACLE SHALL BE RATED AT 20A.
B	PROVIDE HOUSEKEEPING PADS FOR ALL FLOOR MOUNTED AND GRADE MOUNTED ELECTRICAL EQUIPMENT. MINIMUM REQUIREMENTS: 4" HIGH, 4% AIR ENTRAINED, POLYFIBER REINFORCED CONCRETE, 4" WIDER AND 4" LONGER THAN EQUIPMENT TO BE PLACED ON IT. REFER TO ELECTRICAL DETAIL DRAWINGS FOR TRANSFORMER, GENERATOR, OR SWITCHGEAR PADS THAT MAY EXCEED THESE REQUIREMENTS.
C	REFER TO SECTION 26 0519 FOR MINIMUM CONDUCTOR SIZE ADJUSTMENTS FOR VOLTAGE DROP.
E	WIRE COUNTS FOR CIRCUIT CONDUCTORS ARE NOT SHOWN. PROVIDE PROPER NUMBER OF CONDUCTORS TO ACHIEVE CIRCUIT AND SWITCHING CONNECTIONS SHOWN.
F	MODIFICATIONS TO NUMBER OF CONDUCTORS IN HOME RUNS IN ADDITION TO CIRCUITS INDICATED ON THIS DRAWING ARE PROHIBITED.
J	CIRCUIT NUMBERS AT DEVICES CORRESPOND TO PANELBOARD BREAKERS (SEE PANELBOARD SCHEDULE). BRANCH CIRCUITS SHALL BE SIZED ACCORDING TO THE CIRCUIT BREAKER RATING, UNLESS INDICATED OTHERWISE ON THE ELECTRICAL EQUIPMENT SCHEDULE.
K	ALL VAV'S TO BE SUPPLIED WITH JUNCTION BOX FOR CONTROL WIRE. SEE DRAWING FOR CIRCUITING SPECIFICS.
L	EACH "BUILDING" SEPARATION SHALL MAINTAIN CONTINUOUS BONDING OF STRUCTURAL STEEL. BONDING SHALL BE MADE SUCH THAT FIRE WALL BREAKS CAN BE MADE WITHOUT FORCING GROUNDING CONDUCTORS TO BREAK. MAINTAIN GROUNDING BOND BETWEEN LOW AND HIGH ROOFS AS WELL.
M	CONDUIT ROUTED OVERHEAD BETWEEN EXPANSION JOINTS SHALL BE PROVIDED WITH A FOOT OF FLEXIBLE METALLIC CONDUIT BETWEEN EMT/RIGID CONDUIT RUNS.
N	TELECOM OUTLETS LOCATED IN MECHANICAL ROOMS AND ELECTRICAL ROOMS SHALL HAVE CONTINOUS CONDUIT FROM THE OUTLET BOX TO THE NEAREST CABLE TRAY, TELECOM ROOM, OR ACCESSIBLE CEILING. NO FREE RUN CABLING IS PERMITTED IN THESE ROOMS.

KEYNOTES

1	DEDICATED CHARGING STATION CIRCUIT, RECEPTACLE SHALL BE BLUE COLORED AND LABELED CLEARLY ON FACEPLATE. WALL MOUNTED, BEHIND CABINET. COORDINATE HEIGHT WITH ARCHITECT PRIOR TO INSTALL. SEE A-718.
2	REFERENCE DETAIL #10/E-006 FOR MEETING ROOM TV WALL LAYOUT.
3	REFERENCE DETAIL #11/E-006 FOR TEACHING WALL LAYOUT. REFER TO TECHNOLOGY DRAWING SET FOR TEACHING WALL RECEPTACLE DETAILS.
4	REFERENCE DETAIL #6,10/E-005 FOR MACHINE ROOM-LESS ELEVATOR DETAILS.
5	REFERENCE DETAIL #3/E-006 FOR SCIENCE CLASSROOM SHUTOFF DETAILS.
6	STUDENT CONTROLLED CONTACTOR

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

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- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
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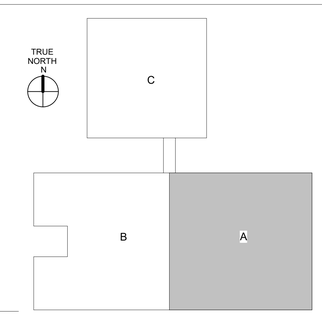
KEY PLAN



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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

FIRST FLOOR POWER PLAN AREA A

E-201A

Optima # 22-0082

[redacted]

01.12.2023 - BID SET

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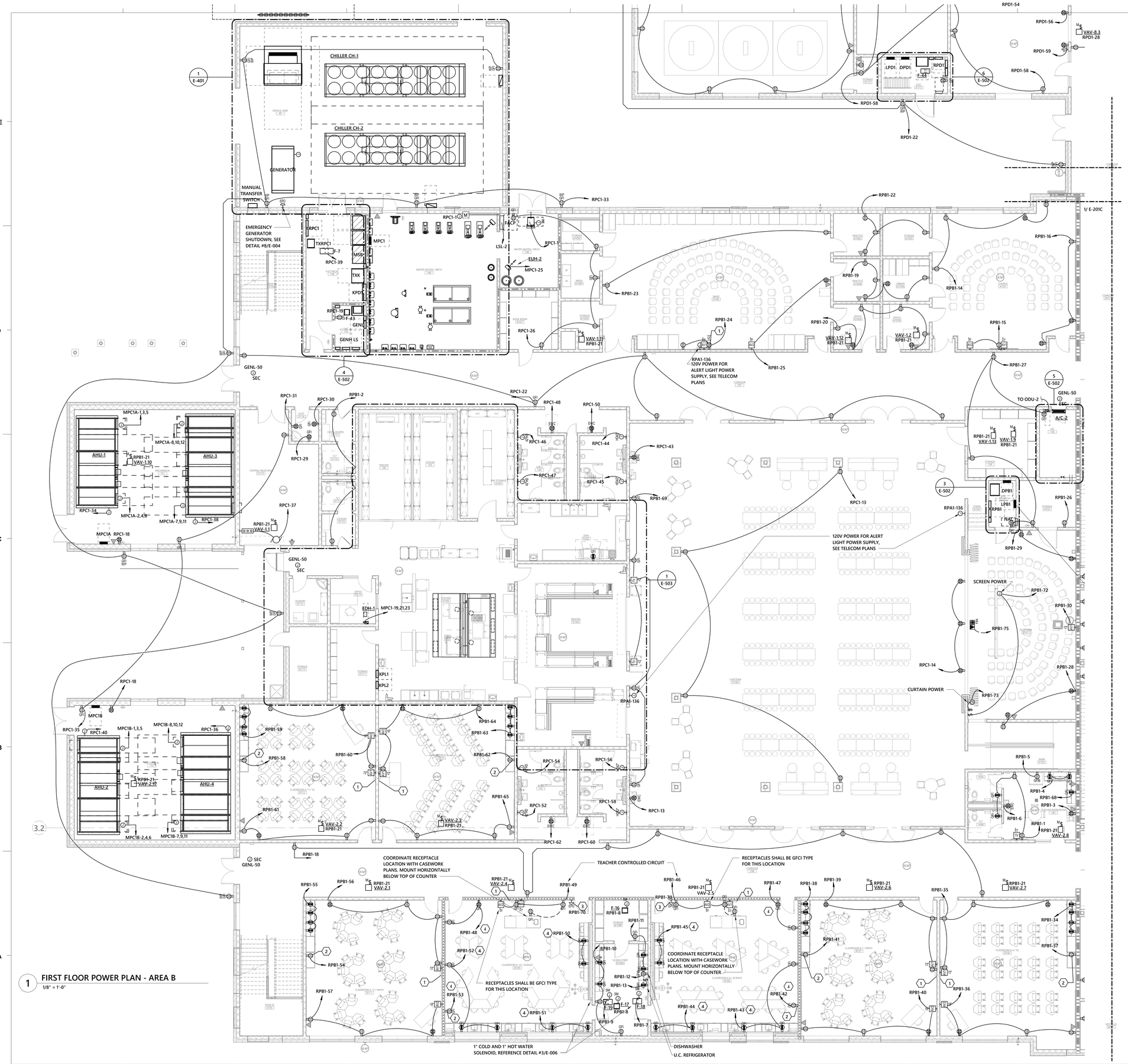

1 FIRST FLOOR POWER PLAN - AREA B
1/8" = 1'-0"

General Notes - Power

A WHERE CONNECTED TO A 20A. BRANCH CIRCUIT SUPPLYING AN INDIVIDUAL RECEPTACLE (SIMPLEX OR DUPLEX), THE RECEPTACLE SHALL BE RATED AT 20A.

B PROVIDE HOUSEKEEPING PADS FOR ALL FLOOR MOUNTED AND GRADE MOUNTED ELECTRICAL EQUIPMENT. MINIMUM REQUIREMENTS: 4" HIGH, 4% AIR ENTRAINED, POLYFIBER REINFORCED CONCRETE, 4" WIDER AND 4" LONGER THAN EQUIPMENT TO BE PLACED ON IT. REFER TO ELECTRICAL DETAIL DRAWINGS FOR TRANSFORMER, GENERATOR, OR SWITCHGEAR PADS THAT MAY EXCEED THESE REQUIREMENTS.

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KEYNOTES

1 REFERENCE DETAIL #11/E-006 FOR TEACHING WALL LAYOUT. REFER TO TECHNOLOGY DRAWING SET FOR TEACHING WALL RECEPTACLE DETAILS.

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3 REFERENCE DETAIL #3/E-006 FOR SCIENCE CLASSROOM SHUTOFF DETAILS.

4 STUDENT CONTROLLED CONTACTOR

PARTITION LEGEND

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3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

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- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
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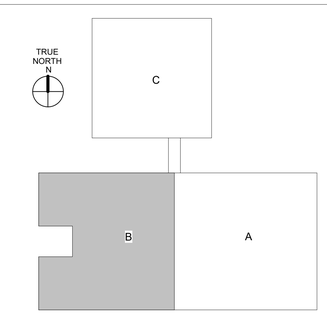
KEY PLAN



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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

FIRST FLOOR POWER PLAN AREA B

E-201B

Optima # 22-0082

01.12.2023 - BID SET

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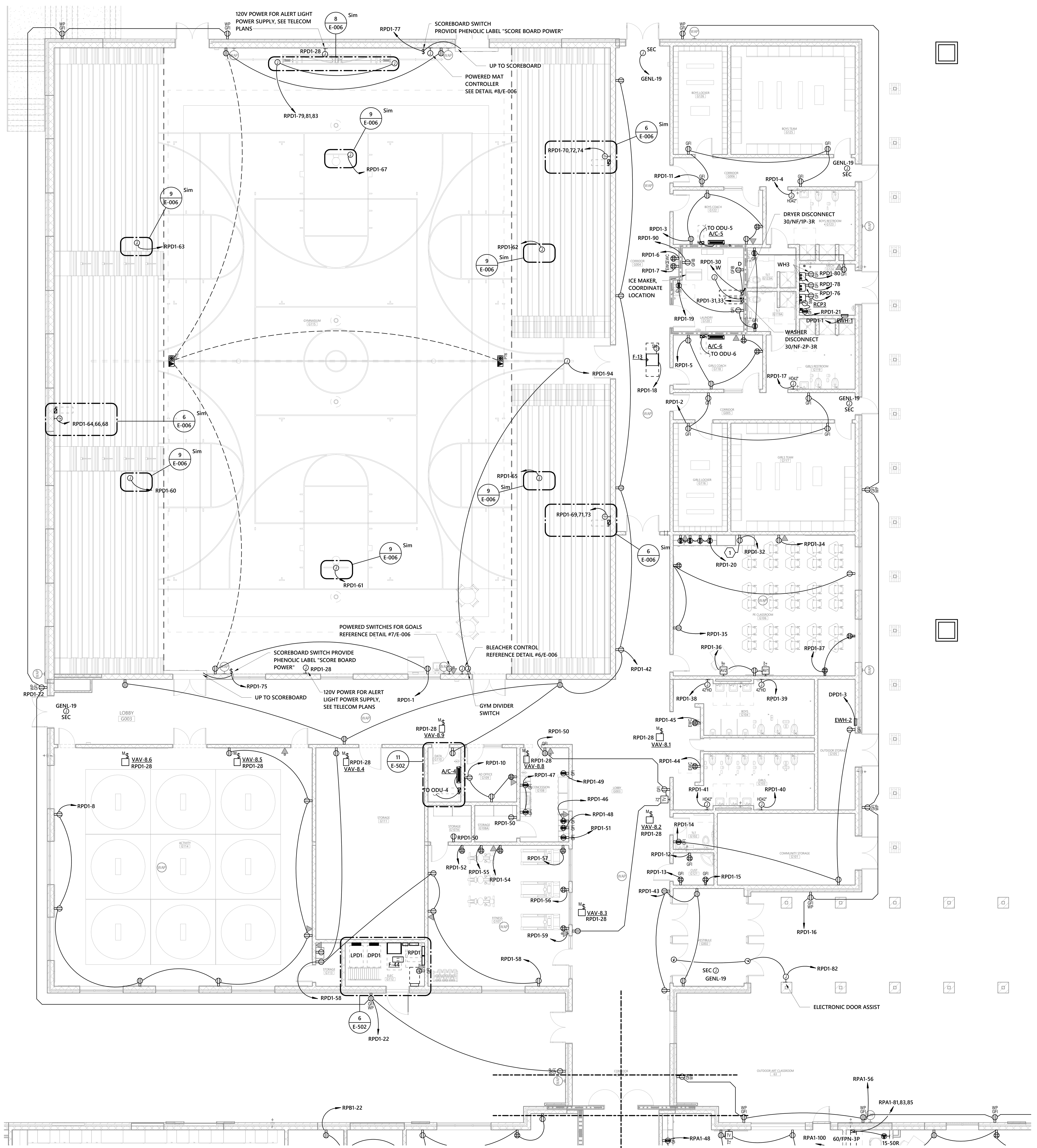

1 FIRST FLOOR POWER PLAN - AREA C
1/8" = 1'-0"

General Notes - Power

A WHERE CONNECTED TO A 20A. BRANCH CIRCUIT SUPPLYING AN INDIVIDUAL RECEPTACLE (SIMPLEX OR DUPLEX), THE RECEPTACLE SHALL BE RATED AT 20A.

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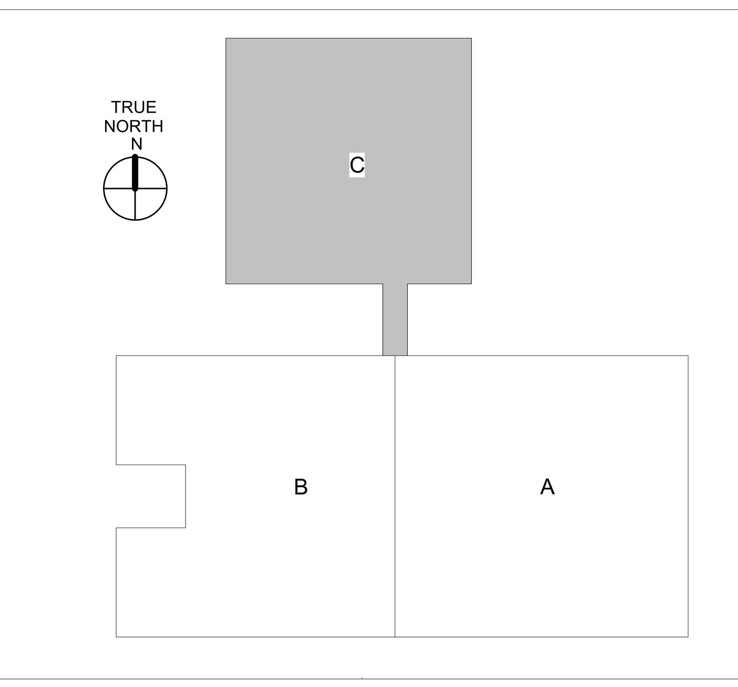
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23474 BRIAN E. THOMPSON
01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

FIRST FLOOR POWER PLAN AREA C

E-201C

Optima # 22-0082

01.12.2023 - BID SET

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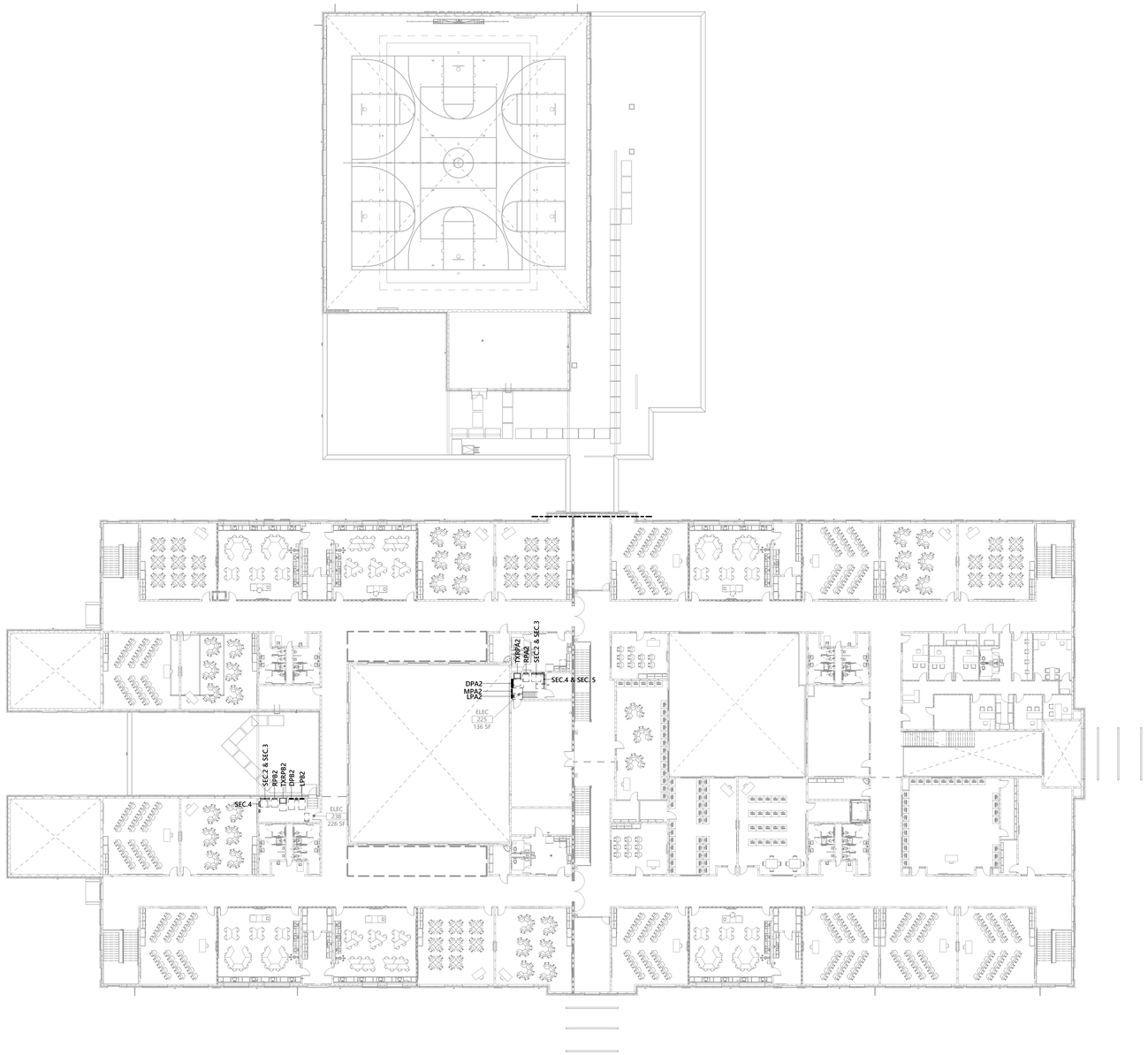

1 OVERALL SECOND FLOOR POWER PLAN
3/64" = 1'-0"

General Notes - Power

A WHERE CONNECTED TO A 20A. BRANCH CIRCUIT SUPPLYING AN INDIVIDUAL RECEPTACLE (SIMPLEX OR DUPLEX), THE RECEPTACLE SHALL BE RATED AT 20A.

B PROVIDE HOUSEKEEPING PADS FOR ALL FLOOR MOUNTED AND GRADE MOUNTED ELECTRICAL EQUIPMENT. MINIMUM REQUIREMENTS: 4" HIGH, 4% AIR ENTRAINED, POLYFIBER REINFORCED CONCRETE, 4" WIDER AND 4" LONGER THAN EQUIPMENT TO BE PLACED ON IT. REFER TO ELECTRICAL DETAIL DRAWINGS FOR TRANSFORMER, GENERATOR, OR SWITCHGEAR PADS THAT MAY EXCEED THESE REQUIREMENTS.

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F MODIFICATIONS TO NUMBER OF CONDUCTORS IN HOME RUNS IN ADDITION TO CIRCUITS INDICATED ON THIS DRAWING ARE PROHIBITED.

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PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
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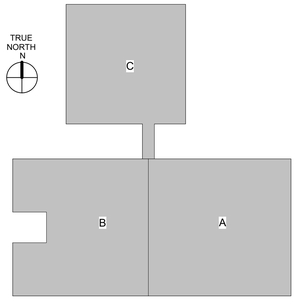
KEY PLAN



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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
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OVERALL SECOND FLOOR POWER PLAN

E-202

Optima # 22-0082

01.12.2023 - BID SET

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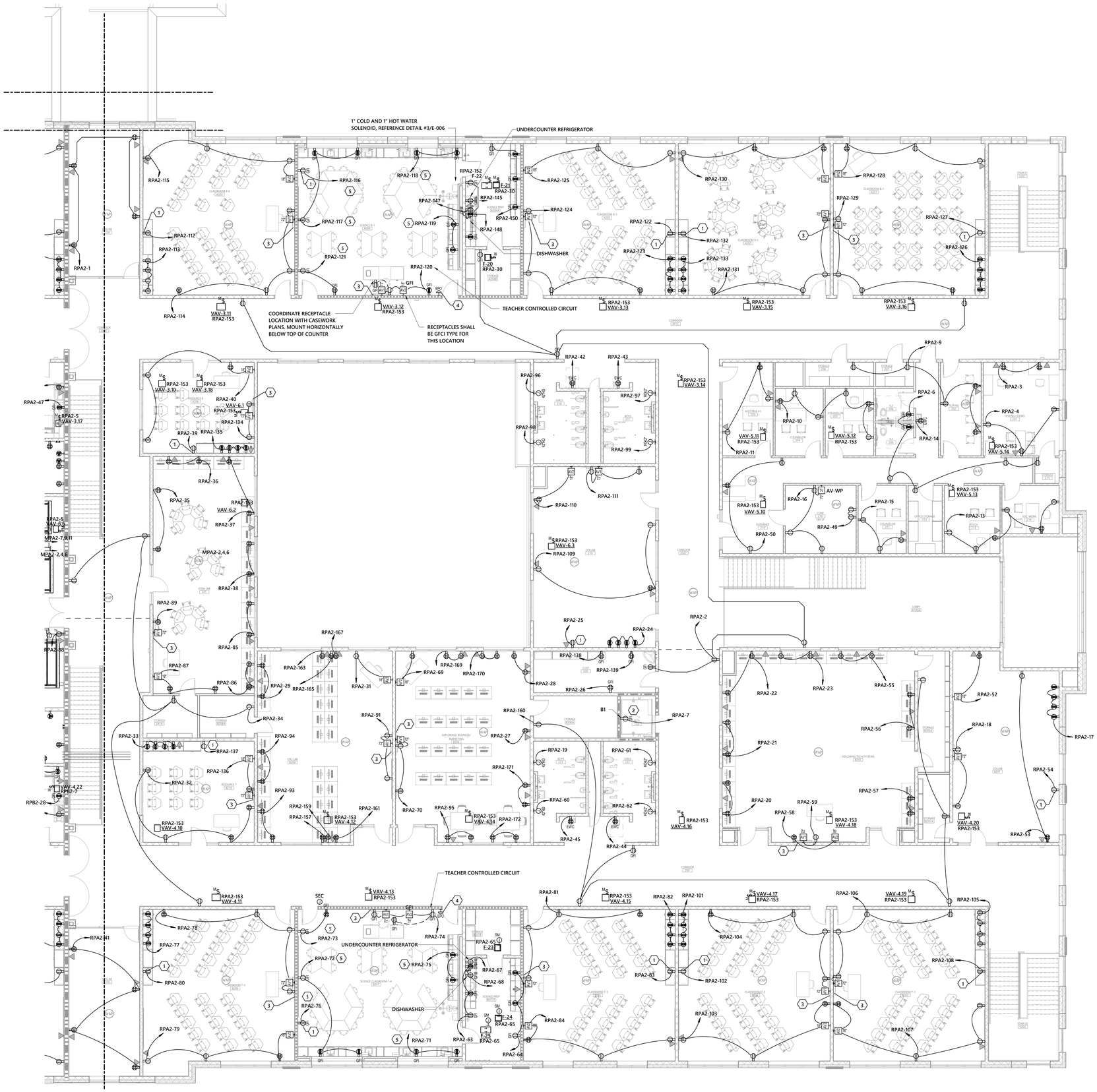

1 SECOND FLOOR POWER PLAN - AREA A

1/8" = 1'-0"

General Notes - Power

A WHERE CONNECTED TO A 20A. BRANCH CIRCUIT SUPPLYING AN INDIVIDUAL RECEPTACLE (SIMPLEX OR DUPLEX), THE RECEPTACLE SHALL BE RATED AT 20A.

B PROVIDE HOUSEKEEPING PADS FOR ALL FLOOR MOUNTED AND GRADE MOUNTED ELECTRICAL EQUIPMENT. MINIMUM REQUIREMENTS: 4" HIGH, 4% AIR ENTRAINED, POLYFIBER REINFORCED CONCRETE, 4" WIDER AND 4" LONGER THAN EQUIPMENT TO BE PLACED ON IT. REFER TO ELECTRICAL DETAIL DRAWINGS FOR TRANSFORMER, GENERATOR, OR SWITCHGEAR PADS THAT MAY EXCEED THESE REQUIREMENTS.

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KEYNOTES

1 DEDICATED CHARGING STATION CIRCUIT. RECEPTACLE SHALL BE BLUE COLORED AND LABELED CLEARLY ON FACEPLATE. WALL MOUNTED, BEHIND CABINET. COORDINATE HEIGHT WITH ARCHITECT PRIOR TO INSTALL. SEE A-718.

2 REFERENCE DETAIL #6,10/E-005 FOR MACHINE ROOM-LESS ELEVATOR DETAILS.

3 REFERENCE DETAIL #11/E-006 FOR TEACHING WALL LAYOUT. REFER TO TECHNOLOGY DRAWING SET FOR TEACHING WALL RECEPTACLE DETAILS.

4 REFERENCE DETAIL #3/E-006 FOR SCIENCE CLASSROOM SHUTOFF DETAILS.

5 STUDENT CONTROLLED CONTACTOR

PARTITION LEGEND

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2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

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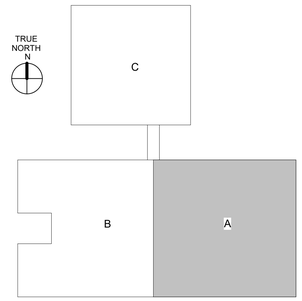
KEY PLAN



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No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

SECOND FLOOR POWER PLAN AREA A

E-202A

Optima # 22-0082

[redacted]

01.12.2023 - BID SET

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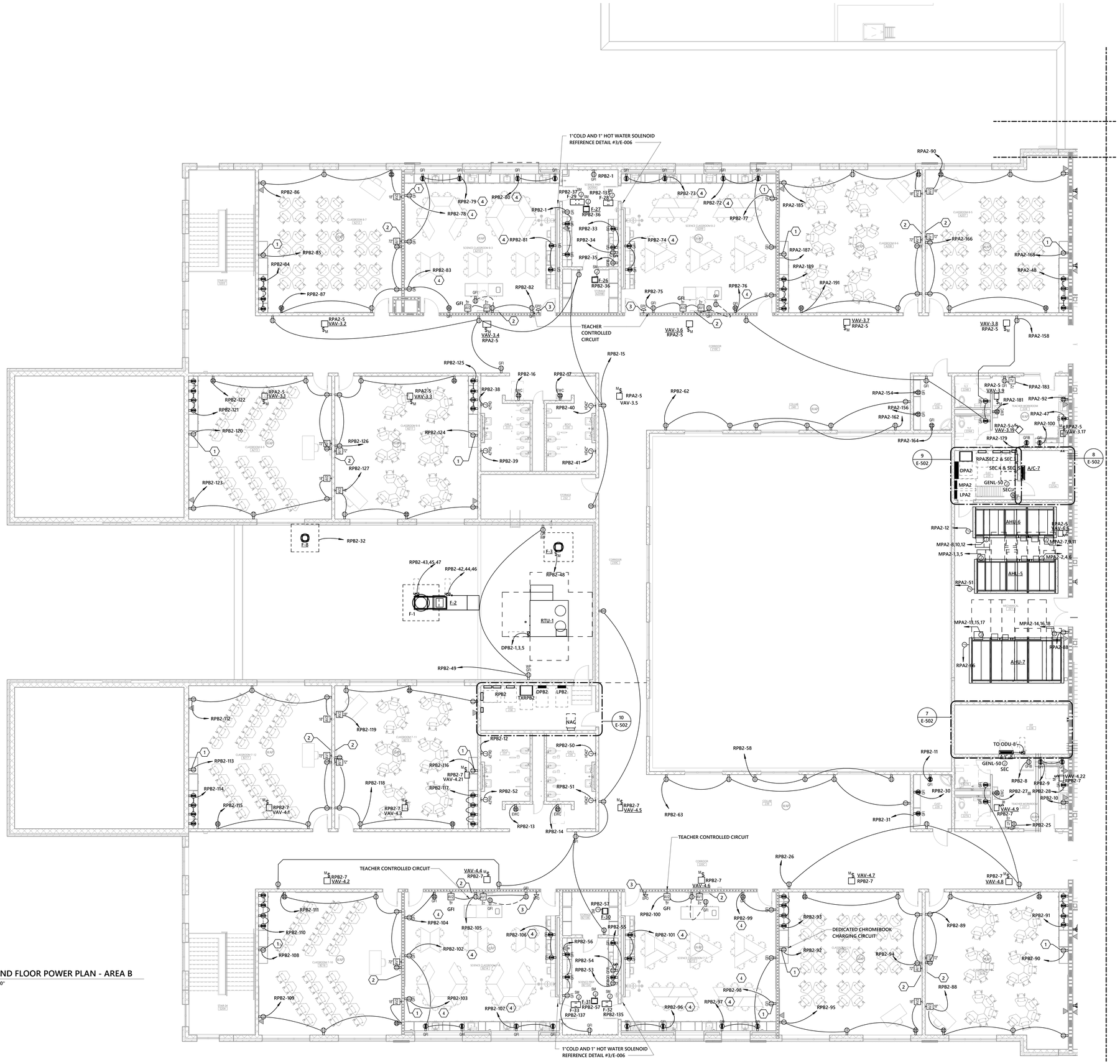

1 SECOND FLOOR POWER PLAN - AREA B
1/8" = 1'-0"

General Notes - Power

A WHERE CONNECTED TO A 20A. BRANCH CIRCUIT SUPPLYING AN INDIVIDUAL RECEPTACLE (SIMPLEX OR DUPLEX), THE RECEPTACLE SHALL BE RATED AT 20A.

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3 REFERENCE DETAIL #3/E-006 FOR SCIENCE CLASSROOM SHUTOFF DETAILS.

4 STUDENT CONTROLLED CONTACTOR

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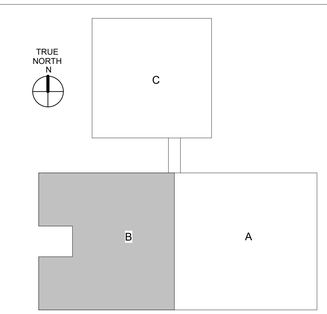
KEY PLAN



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PROJECT: 9201-218240
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SECOND FLOOR POWER PLAN AREA B

E-202B

Optima # 22-0082

01.12.2023 - BID SET

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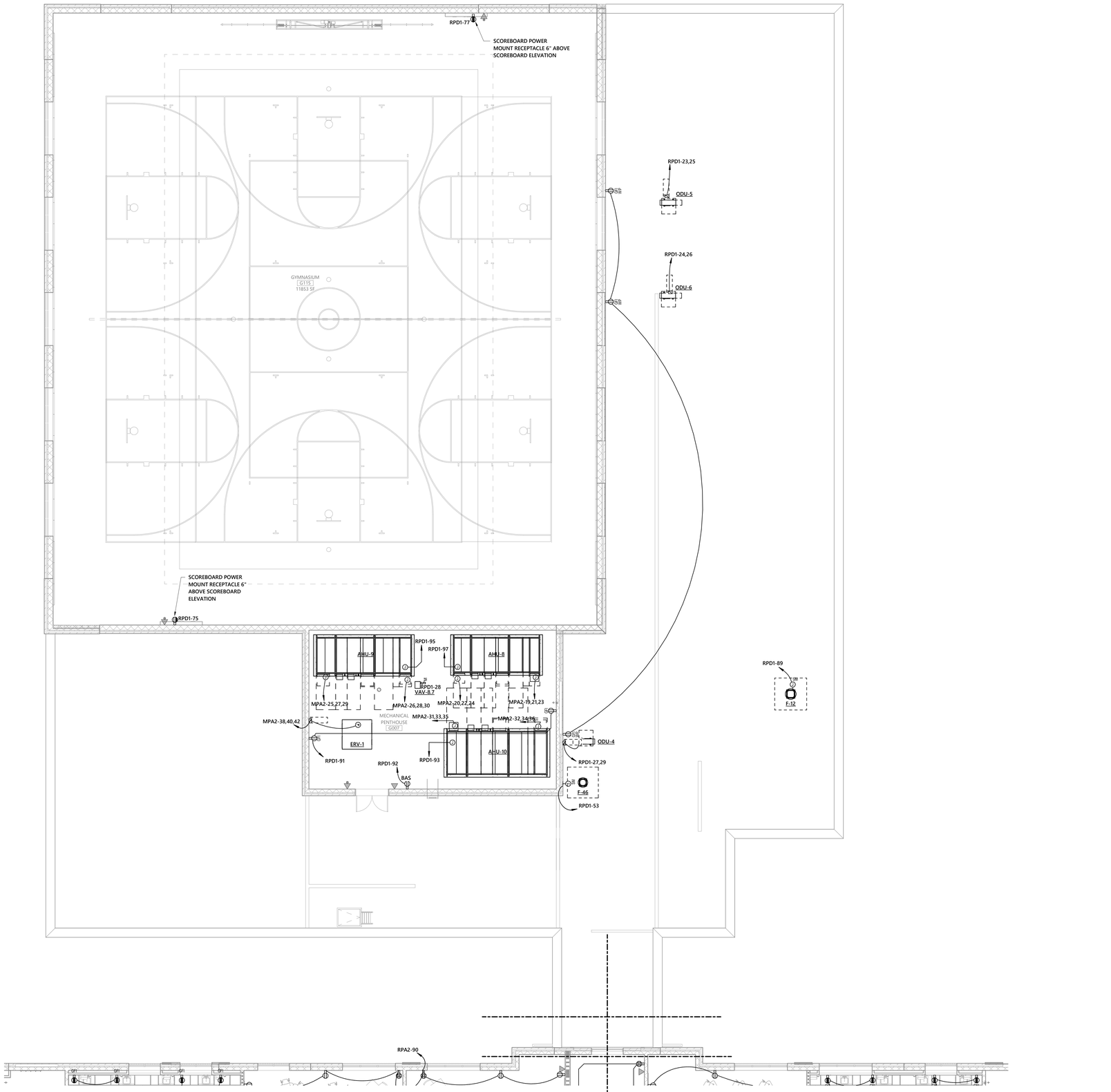

1 SECOND FLOOR POWER PLAN - AREA C

1/8" = 1'-0"

General Notes - Power

A WHERE CONNECTED TO A 20A. BRANCH CIRCUIT SUPPLYING AN INDIVIDUAL RECEPTACLE (SIMPLEX OR DUPLEX), THE RECEPTACLE SHALL BE RATED AT 20A.

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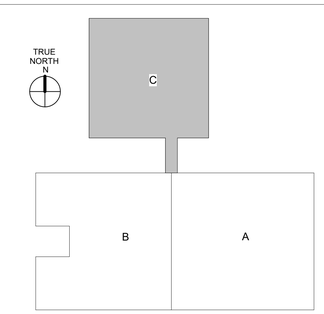

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SECOND FLOOR POWER PLAN AREA C

E-202C

Optima # 22-0082

[redacted]

01.12.2023 - BID SET

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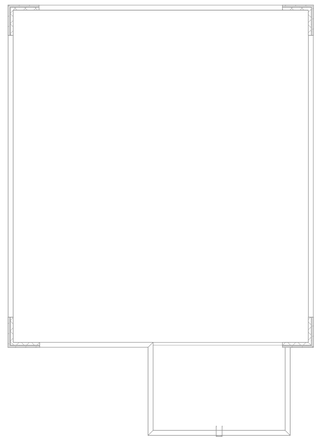

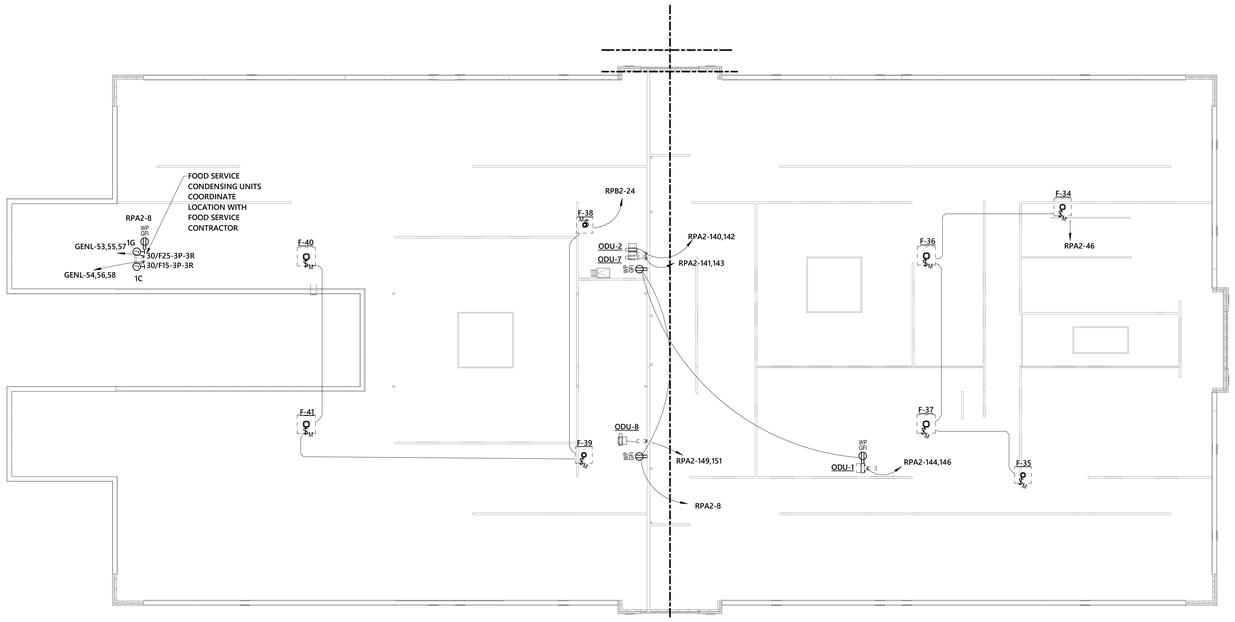

1 OVERALL ROOF POWER PLAN
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A WHERE CONNECTED TO A 20A. BRANCH CIRCUIT SUPPLYING AN INDIVIDUAL RECEPTACLE (SIMPLEX OR DUPLEX), THE RECEPTACLE SHALL BE RATED AT 20A.

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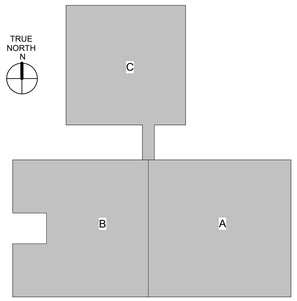
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

OVERALL ROOF POWER PLAN

E-203

Optima # 22-0082

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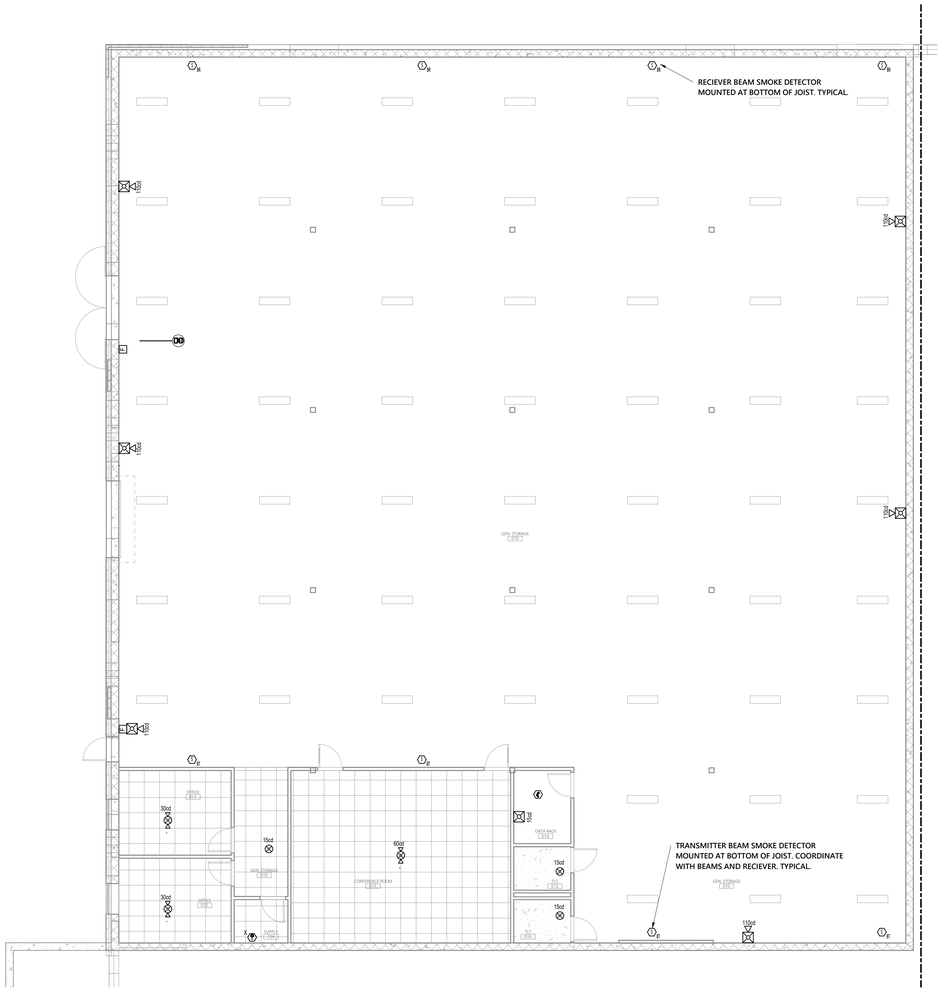

2 BASEMENT FLOOR SPECIAL SYSTEMS PLAN
1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
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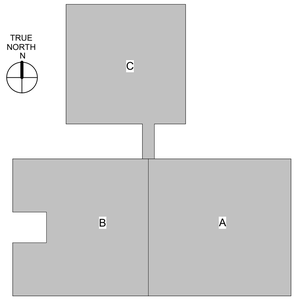
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

BASEMENT FLOOR SPECIAL SYSTEMS PLAN

E-300

Optima # 22-0082

[redacted]

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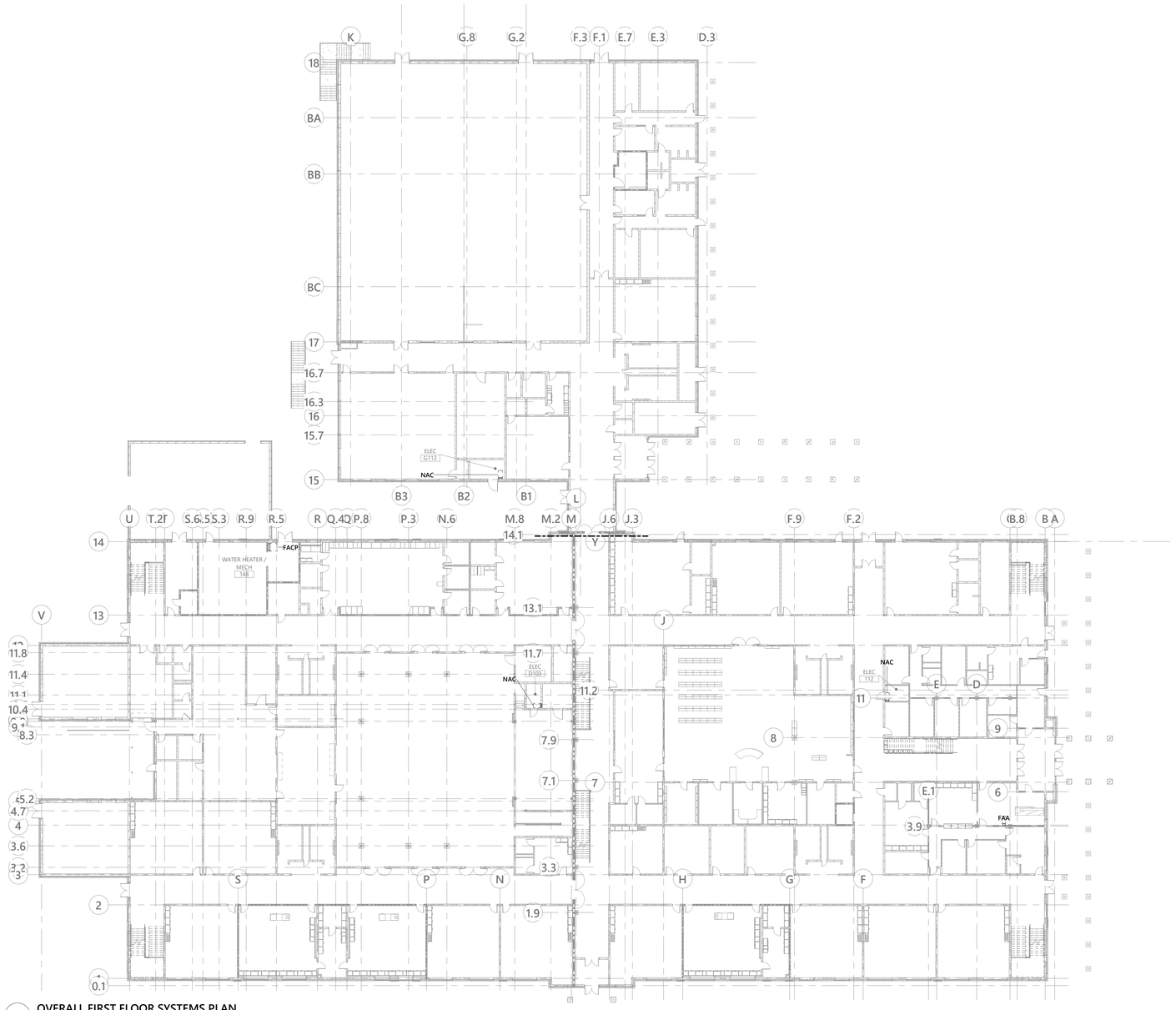

1 OVERALL FIRST FLOOR SYSTEMS PLAN
3/64" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

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- SMOKE PARTITION TO DECK
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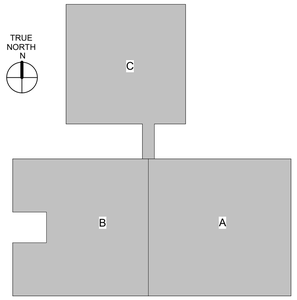
KEY PLAN



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No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

OVERALL FIRST FLOOR SPECIAL SYSTEMS PLAN

E-301

Optima # 22-0082

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2 FIRST FLOOR SYSTEMS PLAN - AREA A
1/8" = 1'-0"

PARTITION LEGEND

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2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

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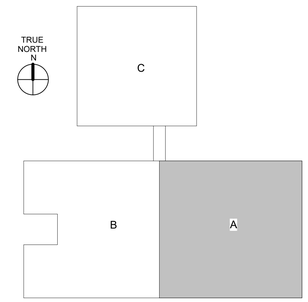
KEY PLAN



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No.	Description	Date
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PROJECT: 9201-218240
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FIRST FLOOR SPECIAL SYSTEMS PLAN AREA A

E-301A

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2 FIRST FLOOR SYSTEMS PLAN - AREA B

1/8" = 1'-0"

PARTITION LEGEND

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3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

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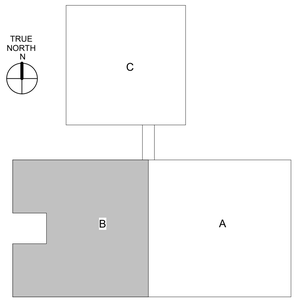
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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PROJECT: 9201-218240
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FIRST FLOOR SPECIAL SYSTEMS PLAN AREA B

E-301B

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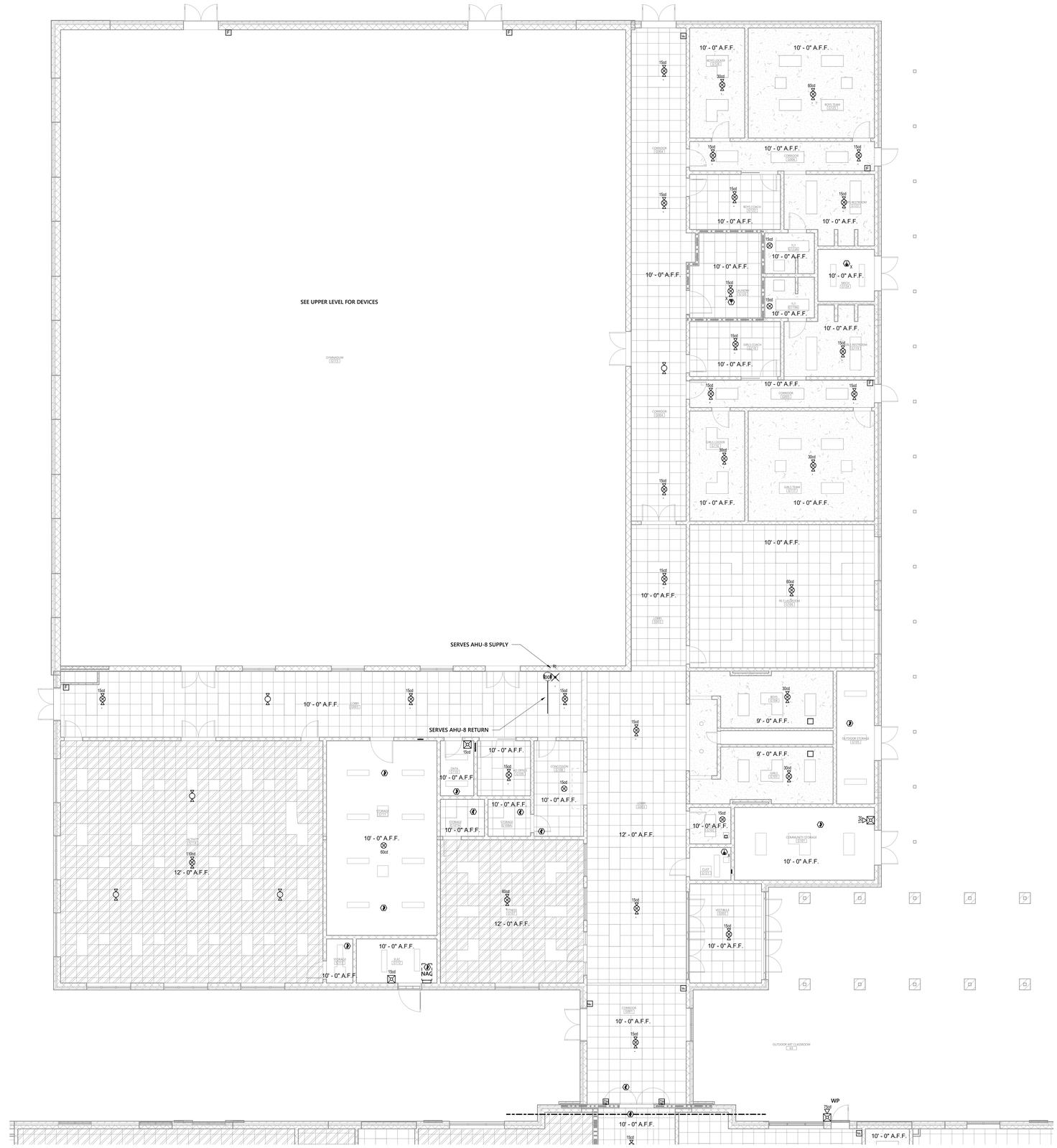

2 FIRST FLOOR SYSTEMS PLAN - AREA C

1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

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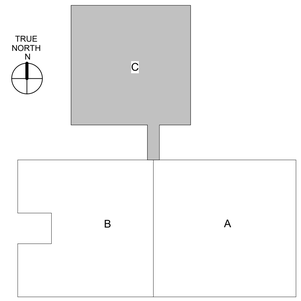
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

FIRST FLOOR SPECIAL SYSTEMS PLAN AREA C

E-301C

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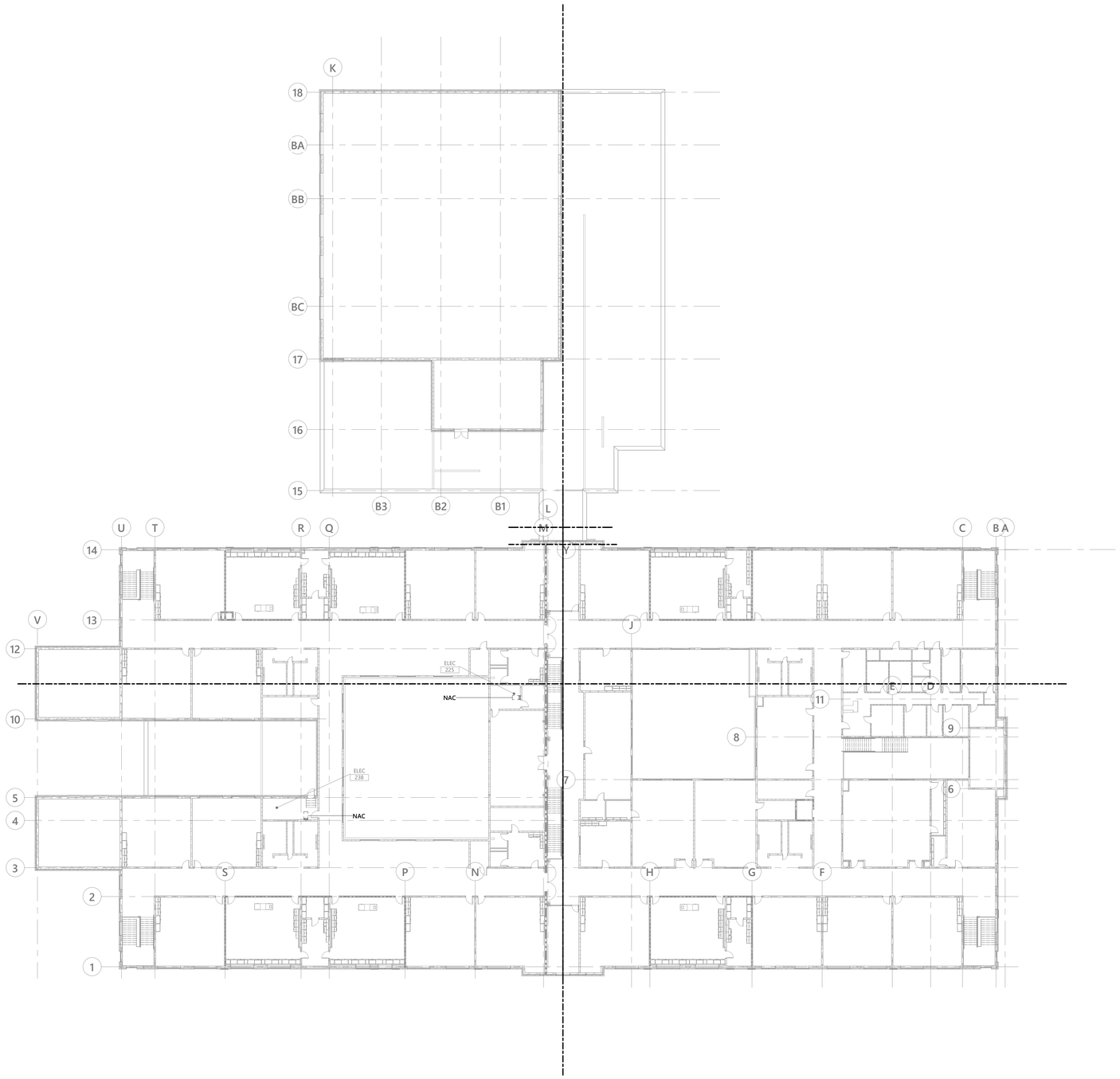

1 OVERALL SECOND FLOOR SYSTEMS PLAN
3/64" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

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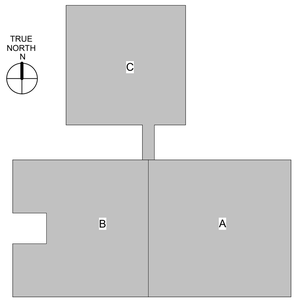
KEY PLAN



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No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

OVERALL SECOND FLOOR SPECIAL SYSTEMS PLAN

E-302

Optima # 22-0082

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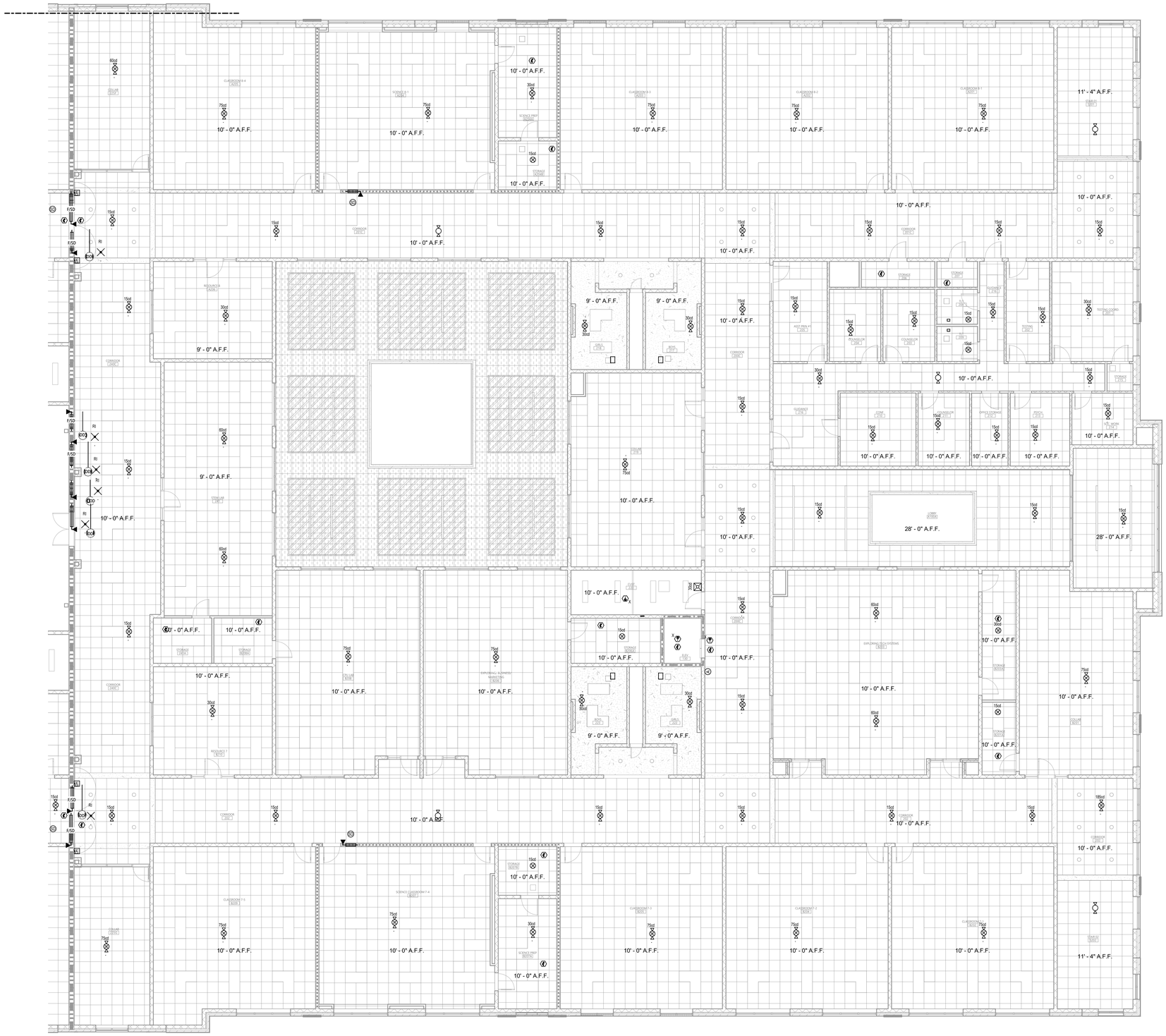

2 SECOND FLOOR SYSTEMS PLAN - AREA A

1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

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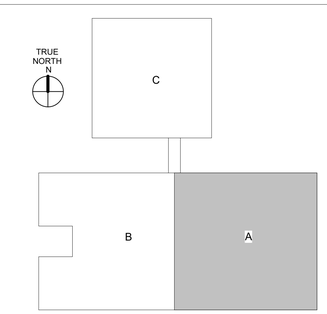
KEY PLAN



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No.	Description	Date
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PROJECT: 9201-218240

DATE: 01-12-2023

SECOND FLOOR SPECIAL SYSTEMS PLAN AREA A

E-302A

Optima # 22-0082

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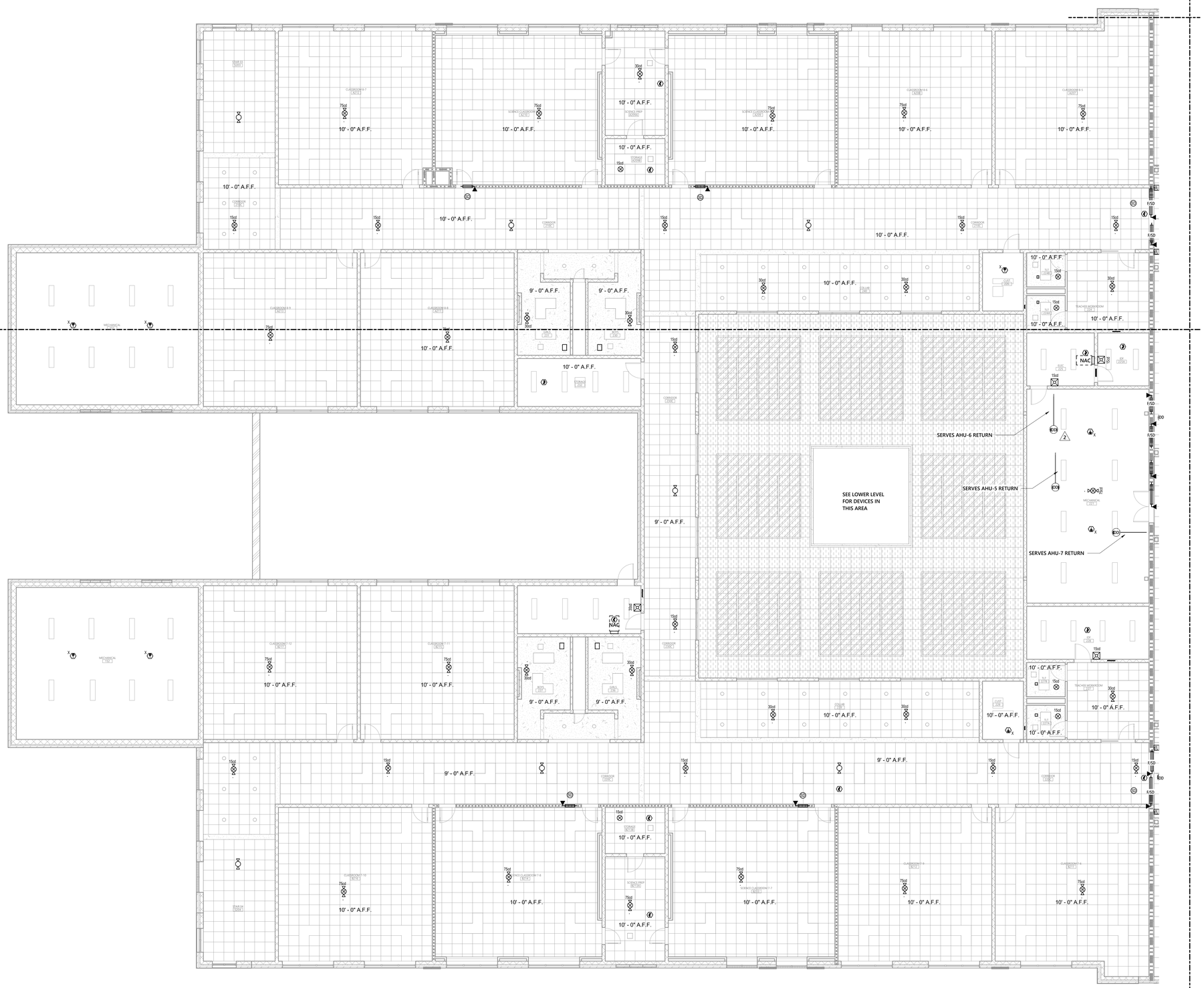

2 SECOND FLOOR SYSTEMS PLAN - AREA B
1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
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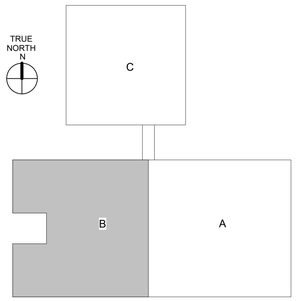

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DATE: 01-12-2023

SECOND FLOOR SPECIAL SYSTEMS PLAN AREA B

E-302B

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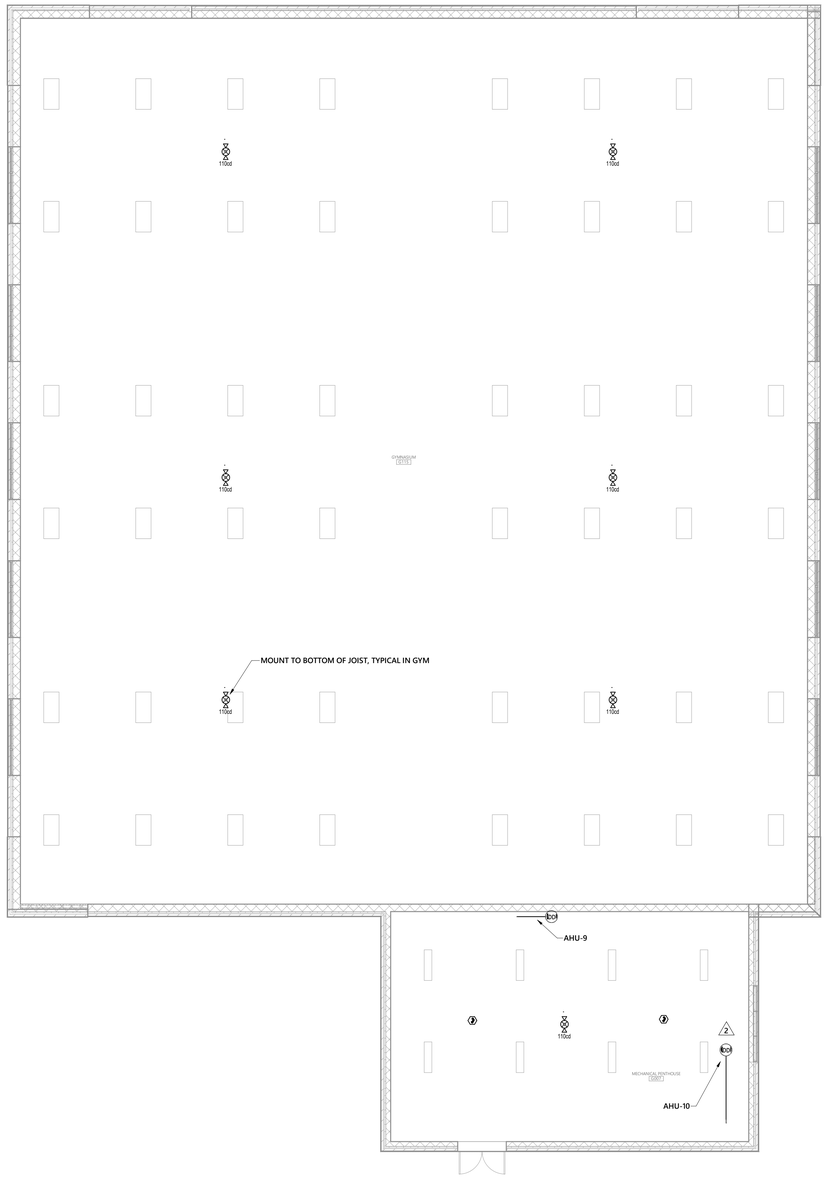

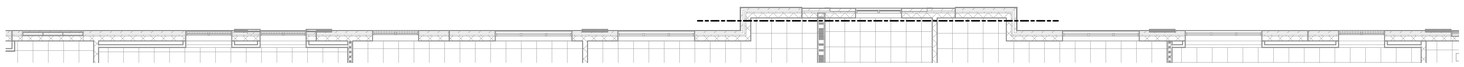

2 SECOND FLOOR SYSTEMS PLAN - AREA C

1/8" = 1'-0"

10' - 0" A.F.F.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
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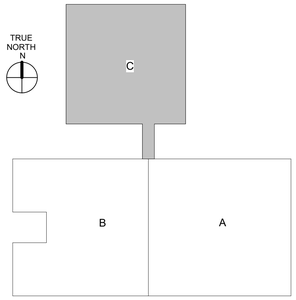
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022
2	Permit Revisions	01-11-2023

PROJECT: 9201-218240
DATE: 01-12-2023

SECOND FLOOR SPECIAL SYSTEMS PLAN AREA C

E-302C

Optima # 22-0082

[redacted]

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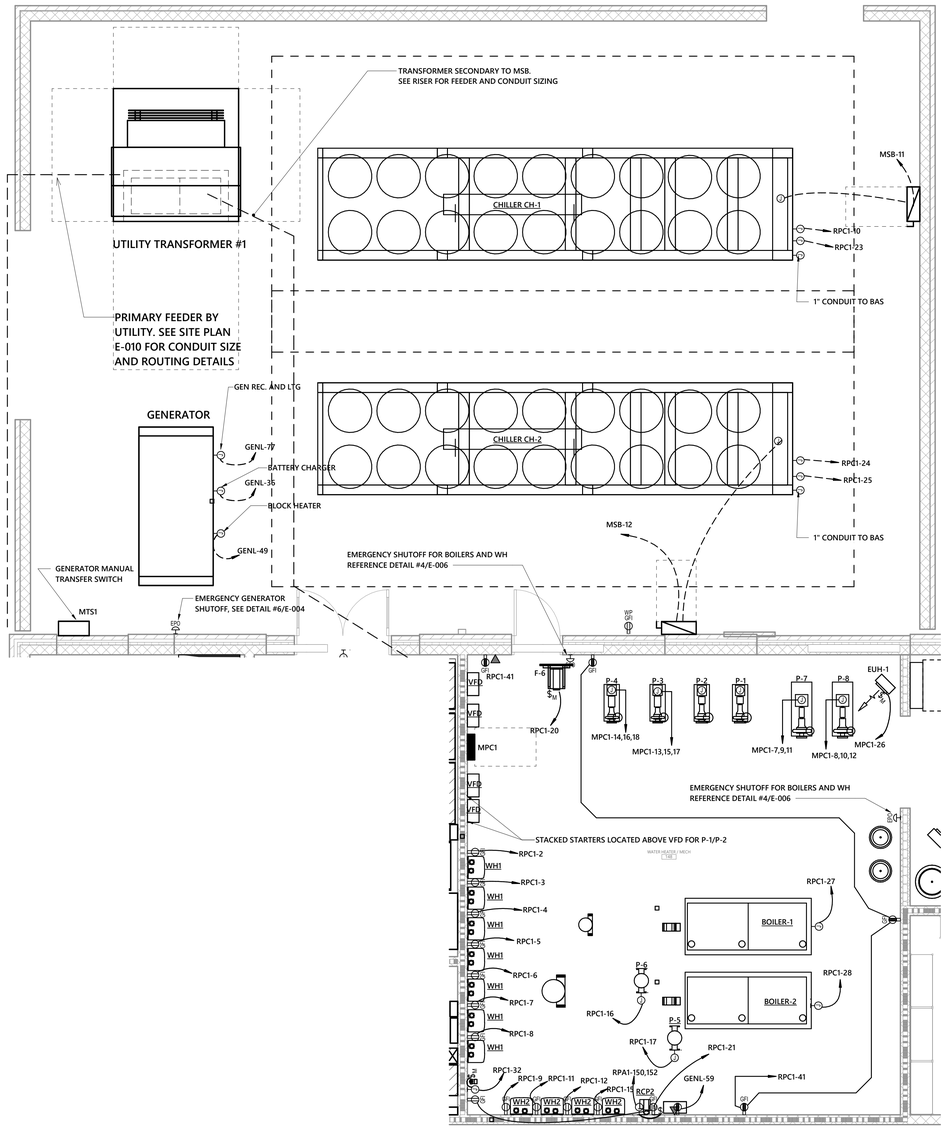


1 ENLARGED MECHANICAL YARD AND ROOM

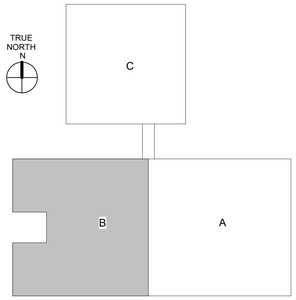
1/4" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

ENLARGED MECHANICAL YARD AND ROOM

E-401

Optima # 22-0082

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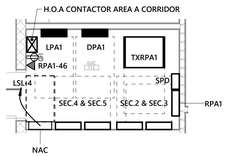
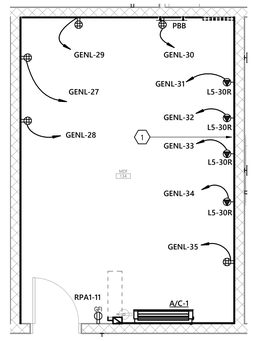
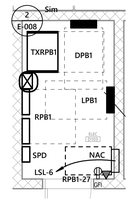


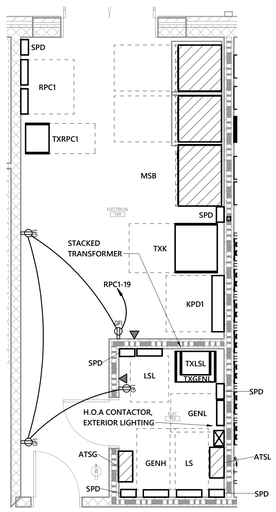
1 FIRST FLOOR POWER PLAN - AREA A - ENLARGED ELEC 112
1/4" = 1'-0"



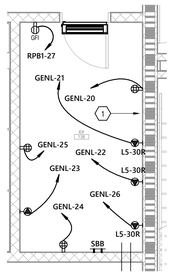
2 FIRST FLOOR POWER PLAN - AREA A - ENLARGED MDF 134
1/4" = 1'-0"



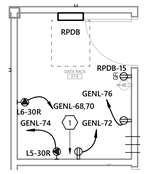
3 FIRST FLOOR POWER PLAN - AREA B - ENLARGED ELEC D103
1/4" = 1'-0"



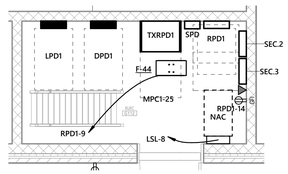
4 FIRST FLOOR POWER PLAN - AREA B - ENLARGED ELEC 149 & 150
1/4" = 1'-0"



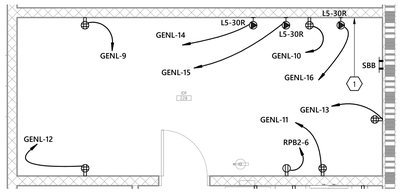
5 FIRST FLOOR POWER PLAN - IDF 138
1/4" = 1'-0"



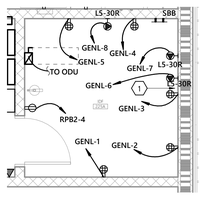
12 BASEMENT POWER PLAN - AREA C - BASEMENT
1/4" = 1'-0"



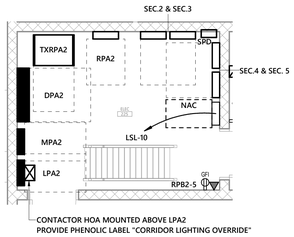
6 FIRST FLOOR POWER PLAN - AREA C - ENLARGED ELEC G112
1/4" = 1'-0"



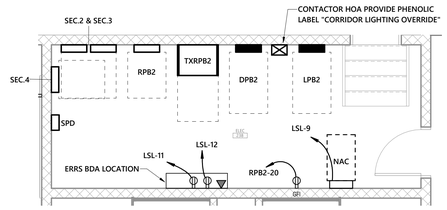
7 SECOND FLOOR POWER PLAN - AREA B - ENLARGED IDF 228
1/4" = 1'-0"



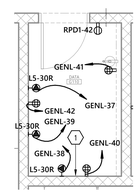
8 SECOND FLOOR POWER PLAN - AREA B - ENLARGED IDF 225A
1/4" = 1'-0"



9 SECOND FLOOR POWER PLAN - AREA B - ENLARGED ELEC ROOM 225
1/4" = 1'-0"



10 SECOND FLOOR POWER PLAN - AREA B - ENLARGED ELEC ROOM 238
1/4" = 1'-0"



11 FIRST FLOOR POWER PLAN - AREA C - ENLARGED DATA G110
1/4" = 1'-0"

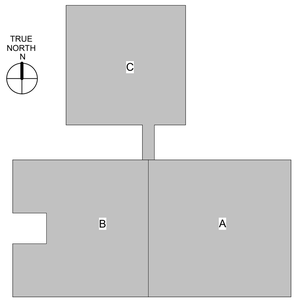
KEYED NOTES:
1. COORDINATE INSTALLATION OF OUTLETS TO BE DIRECTLY BEHIND RESPECTIVE RACK. COORDINATE ROUGH-IN LOCATION WITH GASTON TSS DEPARTMENT.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

ENLARGED ELECTRICAL PLANS

E-502

Optima # 22-0082

01.12.2023 - BID SET

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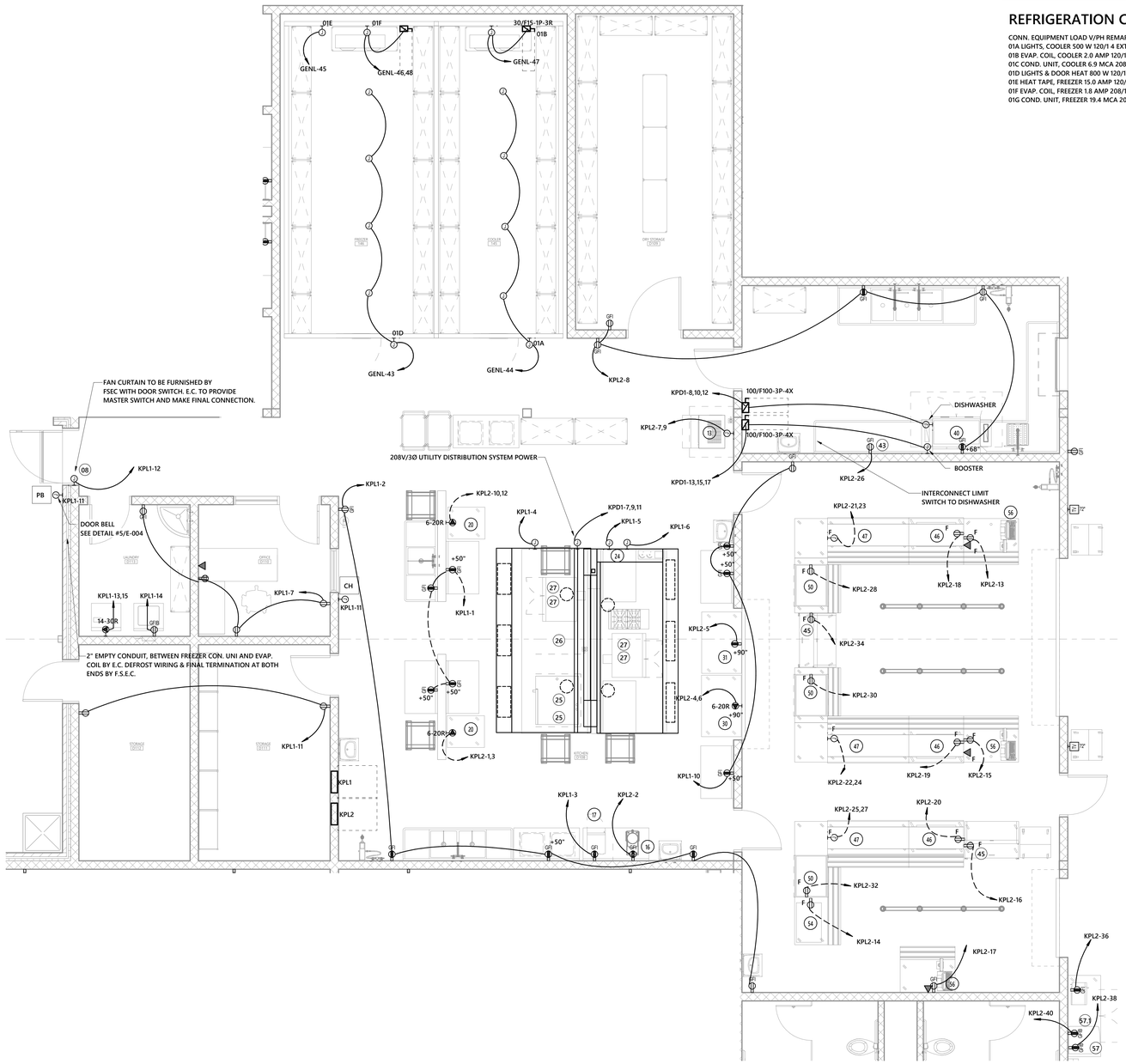
FOOD SERVICE EQUIPMENT SCHEDULE

ITEM	DESCRIPTION	ELECTRICAL					REMARKS
		HT. (AFF)	HP	AMPS	VOLTS	CIRCUIT	
08	AIR CURTAIN INSECT FAN	OVERHEAD	1/2	5	120/1Ø	DIRECT	MICROSWITCH AT DOOR.
13	ICE MAKER	64"		10	208/1Ø	DIRECT	
16	TEA BREWER	48"		14	120/1Ø	NEMA 5-15	
17	MICROWAVE OVEN	48"		17	120/1Ø	NEMA 5-20	
20	REACH-IN HEATED CABINET	24"		9	208/1Ø	NEMA 6-20	
25	COMBI STEAMER, ELEC	U.C.		44.1	208/3Ø		UTILITY CHASE
26	CONVECTION STEAMER	U.C.		2	120/1Ø		UTILITY CHASE
27	CONVECTION OVEN	(2) U.C.	1/2		120/1Ø		UTILITY CHASE
28	COMBI OVEN	U.C.		7	208/3Ø	DIRECT	
30	PASS-THRU HEATED CABINET	90"		9	208/1Ø	NEMA 6-20	
31	PASS-THRU REFRIGERATOR	90"		7	120/1Ø	NEMA 5-20	
40	DISHWASHER (CONVEYOR-TYPE)	64"		80	208/3Ø	DIRECT	30KW BOOSTER HEATER
43	TRAY DRYER			4.3	120/1Ø		
45	MILK COOLER	STUB		5	120/1Ø	NEMA 5-15	
46	COLD FOOD COUNTER	STUB		7	120/1Ø	NEMA 5-15	
47	HOT FOOD COUNTER	STUB		28	208/1Ø	DIRECT	
50	DROP IN REFRIGERATOR	STUB		16	120/1Ø	NEMA 5-15	
52	CASHIER'S COUNTER			15	120/1Ø	NEMA 5-20	SEE #56
54	HEATED DISPLAY MERCHANDISER	STUB		15	120/1Ø	NEMA 5-20	
56	CASH REGISTER	STUB/24"		10	120/1Ø	CORD & PLUG	
57	ICE/WATER DISPENSER	64"		4	120/1Ø	CORD & PLUG	
57.1	ICE MAKER	48"		10.5	120/1Ø	CORD & PLUG	
58	COMMERCIAL MICROWAVE	48"		13.4	120/1Ø	CORD & PLUG	

REFRIGERATION CONNECTION SCHEDULE

CONN. EQUIPMENT LOAD V/PH REMARKS
01A LIGHTS, COOLER 500 W 120/1 4 EXTRA LIGHTS
01B EVAP. COIL, COOLER 2.0 AMP 120/1
01C COND. UNIT, COOLER 6.9 MCA 208/3
01D LIGHTS & DOOR HEAT 800 W 120/1 4 EXTRA LIGHTS
01E HEAT TAPE, FREEZER 15.0 AMP 120/1 DRAINLINE HEAT TAPE
01F EVAP. COIL, FREEZER 1.8 AMP 208/1
01G COND. UNIT, FREEZER 19.4 MCA 208/3



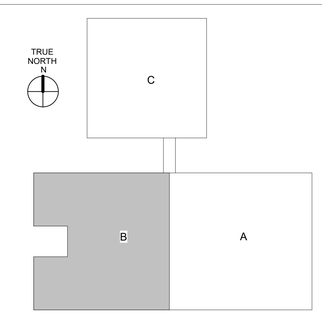
1 FIRST FLOOR POWER PLAN - ENLARGED KITCHEN
1/4" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

ENLARGED KITCHEN PLAN

E-503

Optima # 22-0082

01.12.2023 - BID SET

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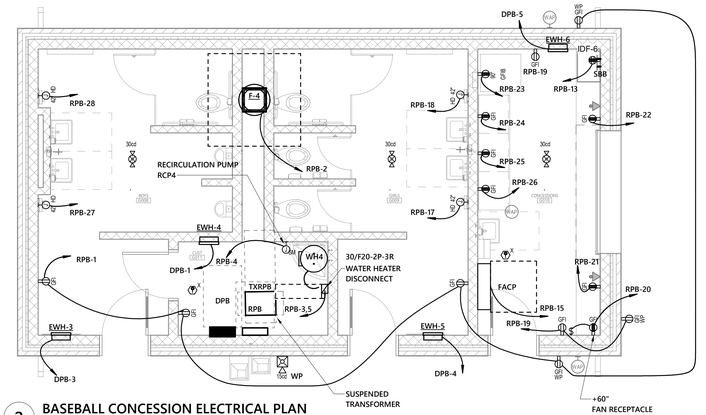
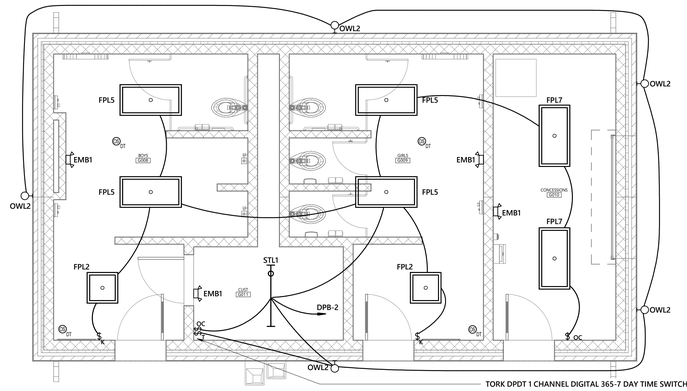
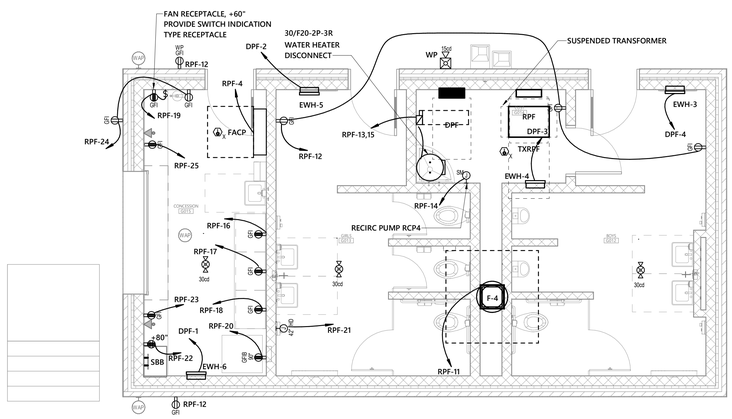


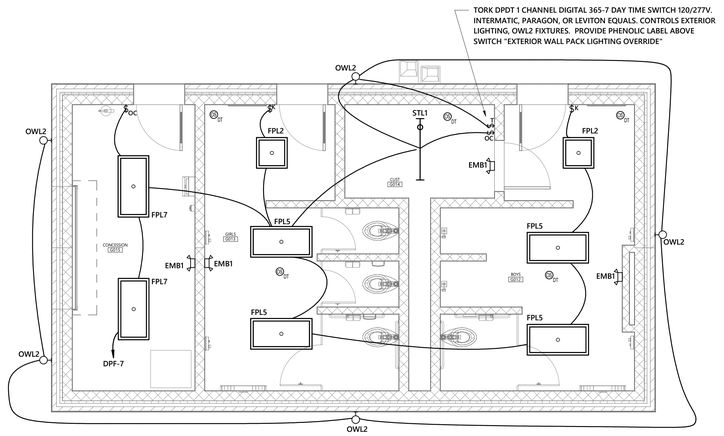
2 BASEBALL CONCESSION ELECTRICAL PLAN
1/4" = 1'-0"



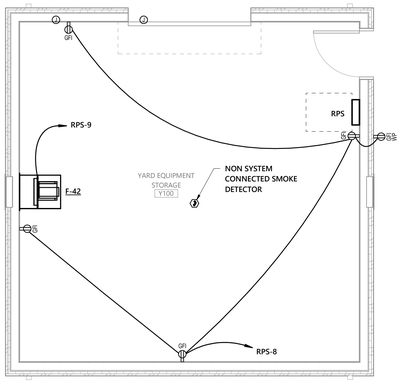
1 BASEBALL CONCESSION LIGHTING PLAN
1/4" = 1'-0"



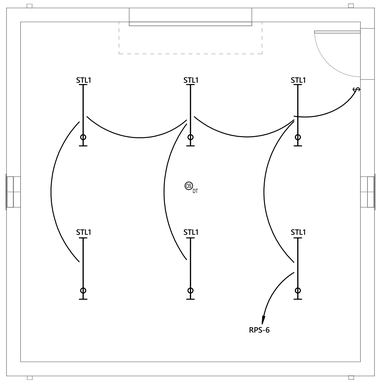
3 FOOTBALL CONCESSION ELECTRICAL PLAN
1/4" = 1'-0"



4 FOOTBALL CONCESSION LIGHTING PLAN
1/4" = 1'-0"



5 YARD EQUIPMENT STORAGE - ELECTRICAL PLAN
1/4" = 1'-0"



6 YARD EQUIPMENT STORAGE - LIGHTING PLAN
1/4" = 1'-0"

GENERAL NOTES:

1. CONNECT ALL EMERGENCY BATTERY FIXTURES AHEAD OF LOCAL CIRCUITING. BATTERY SHALL BE RATED FOR 90 MINUTES.
2. LINE VOLTAGE SENSORS IN THE SAME LOCAL AREA SHALL BE WIRED IN PARALLEL.
3. EXTERIOR LIGHTING BASED ON 9' AFF.
4. EMB1 FIXTURES BASED ON 8' AFF.
5. PRESSBOX IS A PRE-FABRICATED UNIT. PROVIDE (2) SMOKE DETECTORS, (2) SPEAKER/STROBE DEVICES BASED ON 30CD. ROUTE DEVICES VIA 1" CONDUIT TO FACP IN FOOTBALL CONCESSION BUILDING. SEE RISER FOR POWER REQUIREMENTS.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
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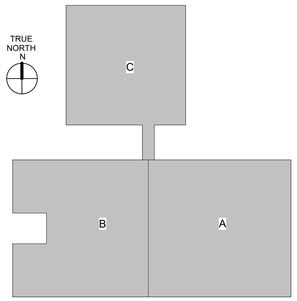

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

ENLARGED SITE BUILDINGS

E-504

Optima # 22-0082

[redacted]

01.12.2023 - BID SET

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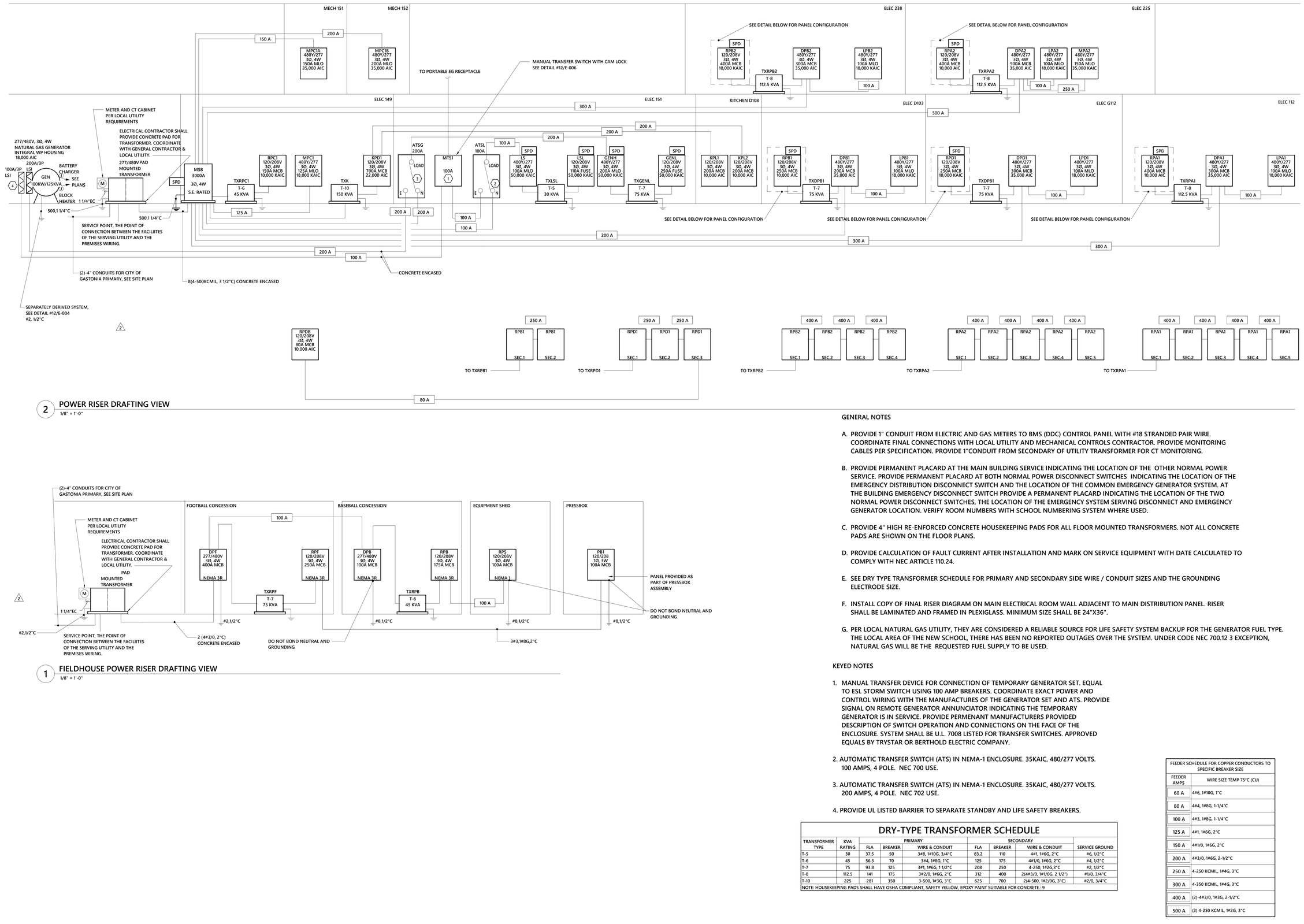

2 POWER RISER DRAFTING VIEW

1/8" = 1'-0"

1 FIELDHOUSE POWER RISER DRAFTING VIEW

1/8" = 1'-0"

GENERAL NOTES

A. PROVIDE 1" CONDUIT FROM ELECTRIC AND GAS METERS TO BMS (DDC) CONTROL PANEL WITH #18 STRANDED PAIR WIRE. COORDINATE FINAL CONNECTIONS WITH LOCAL UTILITY AND MECHANICAL CONTROLS CONTRACTOR. PROVIDE MONITORING CABLES PER SPECIFICATION. PROVIDE 1"CONDUIT FROM SECONDARY OF UTILITY TRANSFORMER FOR CT MONITORING.

B. PROVIDE PERMANENT PLACARD AT THE MAIN BUILDING SERVICE INDICATING THE LOCATION OF THE OTHER NORMAL POWER SERVICE. PROVIDE PERMANENT PLACARD AT BOTH NORMAL POWER DISCONNECT SWITCHES INDICATING THE LOCATION OF THE EMERGENCY DISTRIBUTION DISCONNECT SWITCH AND THE LOCATION OF THE COMMON EMERGENCY GENERATOR SYSTEM. AT THE BUILDING EMERGENCY DISCONNECT SWITCH PROVIDE A PERMANENT PLACARD INDICATING THE LOCATION OF THE TWO NORMAL POWER DISCONNECT SWITCHES, THE LOCATION OF THE EMERGENCY SYSTEM SERVING DISCONNECT AND EMERGENCY GENERATOR LOCATION. VERIFY ROOM NUMBERS WITH SCHOOL NUMBERING SYSTEM WHERE USED.

C. PROVIDE 4" HIGH RE-ENFORCED CONCRETE HOUSEKEEPING PADS FOR ALL FLOOR MOUNTED TRANSFORMERS. NOT ALL CONCRETE PADS ARE SHOWN ON THE FLOOR PLANS.

D. PROVIDE CALCULATION OF FAULT CURRENT AFTER INSTALLATION AND MARK ON SERVICE EQUIPMENT WITH DATE CALCULATED TO COMPLY WITH NEC ARTICLE 110.24.

E. SEE DRY TYPE TRANSFORMER SCHEDULE FOR PRIMARY AND SECONDARY SIDE WIRE / CONDUIT SIZES AND THE GROUNDING ELECTRODE SIZE.

F. INSTALL COPY OF FINAL RISER DIAGRAM ON MAIN ELECTRICAL ROOM WALL ADJACENT TO MAIN DISTRIBUTION PANEL. RISER SHALL BE LAMINATED AND FRAMED IN PLEXIGLASS. MINIMUM SIZE SHALL BE 24"X36".

G. PER LOCAL NATURAL GAS UTILITY, THEY ARE CONSIDERED A RELIABLE SOURCE FOR LIFE SAFETY SYSTEM BACKUP FOR THE GENERATOR FUEL TYPE. THE LOCAL AREA OF THE NEW SCHOOL, THERE HAS BEEN NO REPORTED OUTAGES OVER THE SYSTEM. UNDER CODE NEC 700.12 3 EXCEPTION, NATURAL GAS WILL BE THE REQUESTED FUEL SUPPLY TO BE USED.

KEYED NOTES

1. MANUAL TRANSFER DEVICE FOR CONNECTION OF TEMPORARY GENERATOR SET. EQUAL TO ESL STORM SWITCH USING 100 AMP BREAKERS. COORDINATE EXACT POWER AND CONTROL WIRING WITH THE MANUFACTURES OF THE GENERATOR SET AND ATS. PROVIDE SIGNAL ON REMOTE GENERATOR ANNUNCIATOR INDICATING THE TEMPORARY GENERATOR IS IN SERVICE. PROVIDE PERMENANT MANUFACTURERS PROVIDED DESCRIPTION OF SWITCH OPERATION AND CONNECTIONS ON THE FACE OF THE ENCLOSURE. SYSTEM SHALL BE U.L. 7008 LISTED FOR TRANSFER SWITCHES. APPROVED EQUALS BY TRYSTAR OR BERTHOLD ELECTRIC COMPANY.

2. AUTOMATIC TRANSFER SWITCH (ATS) IN NEMA-1 ENCLOSURE. 35KAIC, 480/277 VOLTS. 100 AMPS, 4 POLE. NEC 700 USE.

3. AUTOMATIC TRANSFER SWITCH (ATS) IN NEMA-1 ENCLOSURE. 35KAIC, 480/277 VOLTS. 200 AMPS, 4 POLE. NEC 702 USE.

4. PROVIDE UL LISTED BARRIER TO SEPARATE STANDBY AND LIFE SAFETY BREAKERS.

DRY-TYPE TRANSFORMER SCHEDULE

TRANSFORMER TYPE	KVA RATING	PRIMARY			SECONDARY			
		FLA	BREAKER	WIRE & CONDUIT	FLA	BREAKER	WIRE & CONDUIT	SERVICE GROUND
T-5	30	37.5	50	3#8, 1#10G, 3/4"C	83.2	110	4#1, 1#6G, 2"C	#6, 1/2"C
T-6	45	56.3	70	3#4, 1#8G, 1"C	125	175	4#1/0, 1#6G, 2"C	#4, 1/2"C
T-7	75	93.8	125	3#1, 1#6G, 1 1/2"C	208	250	4-250, 1#2G,3"C	#2, 1/2"C
T-8	112.5	141	175	3#2/0, 1#6G, 2"C	312	400	2(4#3/0, 1#1/0G, 2 1/2")	#1/0, 3/4"C
T-10	225	281	350	3-500, 1#3G, 3"C	625	700	2(4-500, 1#2/0G, 3"C)	#2/0, 3/4"C

NOTE: HOUSEKEEPING PADS SHALL HAVE OSHA COMPLIANT, SAFETY YELLOW, EPOXY PAINT SUITABLE FOR CONCRETE.: 9

FEEDER SCHEDULE FOR COPPER CONDUCTORS TO SPECIFIC BREAKER SIZE

FEEDER AMPS	WIRE SIZE TEMP 75°C (CU)
60 A	4#6, 1#10G, 1"C
80 A	4#4, 1#8G, 1-1/4"C
100 A	4#3, 1#8G, 1-1/4"C
125 A	4#1, 1#6G, 2"C
150 A	4#1/0, 1#6G, 2"C
200 A	4#3/0, 1#6G, 2-1/2"C
250 A	4-250 KCMIL, 1#4G, 3"C
300 A	4-350 KCMIL, 1#4G, 3"C
400 A	(2)-4#3/0, 1#3G, 2-1/2"C
500 A	(2) 4-250 KCMIL, 1#2G, 3"C

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022
2	Permit Revisions	01-11-2023

PROJECT: 9201-218240
DATE: 01-12-2023

ELECTRICAL DIAGRAMS

E-701

Optima # 22-0082

01.12.2023 - BID SET

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LIGHTING SEQUENCE OF OPERATIONS

A COMPLETE AND OPERATIONAL LIGHTING CONTROL SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE SPECIFICATIONS AND AS INTENDED ON THESE PLANS. ALL CONTROL POINTS AND EQUIPMENT SEQUENCES OF OPERATION LISTED IN SPECIFICATION SHALL BE CONSIDERED IN ADDITION TO THOSE LISTED HERE. IN THE EVENT THAT THE VERBIAGE IS IN CONFLICT OR CONTRADICTS THE REQUIREMENTS LISTED HEREIN, THE QUESTION SHALL BE ASKED PRIOR TO BIDDING, OR THE MORE STRINGENT SHALL APPLY.

SYSTEM DESCRIPTION:
LIGHTING CONTROLS ARE BASED ON FREE TOPOLOGY. CONTACTORS SHALL BE INTEGRATED WITH THE BAS SYSTEM. INDEPENDENT OF THE LIGHTING CONTROLS SYSTEM ARE WALL MOUNTED SENSORS. THESE SHALL BE INDEPENDENT AND NOT TIED INTO THE FACILITY BUILDING AUTOMATION SYSTEM (BAS) SOFTWARE.
(NOTE: BAS IS PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR.)

OCCUPANCY SENSORS:
A. WALL MOUNTED OCCUPANCY SENSORS SHALL OPERATE INDEPENDENT OF THE LIGHTING CONTROLS SYSTEM.
B. ALL OCCUPANCY SENSORS SHALL BE PROGRAMMED FOR AUTOMATIC ON (AT FULL LEVEL) AND AUTOMATIC OFF.

TIMER SETTINGS:
A. WALL MOUNTED PASSIVE INFRARED: 2 MINUTES INDIVIDUAL RESTROOMS AND STORAGE ROOMS.
B. CLASSROOM OCCUPANCY: 15 MINUTES
C. WALL SWITCH OCCUPANCY SENSORS OFFICES: 5 MINUTES
D. WALL SWITCH OCCUPANCY SENSORS CONFERENCE: 10 MINUTES

BAS INTEGRATION:
A. EXTERIOR LIGHTING ZONE, TIME SCHEDULE CONTROL AND PHOTOCELL
- MONUMENT SIGN/FLAGPOLE - PHOTOCELL CONTROLLED
- AREA WALL LIGHTING AND POLE LIGHTING - TIME SCHEDULE WITH OPTIONAL PHOTOCELL CONTROL
B. INTERIOR LIGHTING:
-CORRIDORS/GROUP RESTROOMS
-CAFETERIA
-MEDIA CENTER
-GYMNASIUM

COMMISSIONING AND COORDINATION OF BAS:
A. BAS CONTROL SHALL BE THE PRIORITY SYSTEM.
B. LIGHTING CAN OVERRIDE BY HOA CONTACTOR CONTROL.
C. LIGHTING SYSTEM IS CONNECTED TO THE BAS VIA BACNET PROTOCOL OR EQUAL. COORDINATE LANGUAGE REQUIREMENTS WITH MECHANICAL CONTROLS CONTRACTOR SUPPLYING BUILDING AUTOMATION SYSTEM.

LIGHTING COORDINATION AND QUALITY CONTROL:
A. ELECTRICAL CONTRACTOR SHALL HAVE A PRE-CONSTRUCTION MEETING WITH MECHANICAL CONTROLS SUPPLIER PRIOR TO CONDUIT ROUGH-IN TO VERIFY BOXES, CONDUIT PATHS, AND GENERAL LIGHTING CONTROLS STRATEGY FOR INSTALLATION.
B. ELECTRICAL CONTRACTOR SHALL HAVE A POST-SUBMITTAL MEETING WITH CONTROLS SUPPLIER TO IDENTIFY LINE AND LOW VOLTAGE ROUTING, INTENT OF LIGHTING CONTROL DESIGN, AND GENERAL CONSTRUCTION STRATEGIES.

EXTERIOR LIGHTING CONTROL:
A. EXTERIOR LIGHTING CONTROL IS VIA SCHEDULED TIME CONTROL WITH OPTIONAL PHOTOCELL CONTROL.

EMERGENCY LIGHTING CONTROL:
A. EXTERIOR LIGHTING IS VIA SCHEDULE TIME CONTROL.
B. EXTERIOR EMERGENCY LIGHTING IS VIA RELAY (ENTIRE CIRCUIT). UPON LOSS OF NORMAL POWER, RELAY WILL SWITCH TO NON-CONTROLLED CONSTANTLY HOT GENERATOR BACKED SOURCE.
C. MULTIPLE FIXTURES ARE USED TO MEET REQUIRED EGRESS PATH ILLUMINATION.
D. INDIVIDUAL BATTERY BACKUP IS NOT USED IN THE MAIN BUILDING. SPORTS BUILDINGS ONLY.
E. INTERIOR EMERGENCY LIGHTING IS VIA GENERATOR RELAY DEVICES THAT ARE BACKED UP BY A GENERATOR LIFE SAFETY CIRCUIT. DURING NORMAL CONDITIONS THE FIXTURE IS ABLE TO BE COMPLETELY TURNED OFF BY LOCAL SWITCHING. IN EMERGENCY CONDITIONS, THE RELAY BYPASSES ALL SWITCHING AND PROVIDES A CONSTANTLY HOT SOURCES VIA GENERATOR.
F. FOOTBALL AND BASEBALL FIELDHOUSE EMERGENCY LIGHTING (VIA BATTERY BACKUP)
1. PROVIDE FIXTURE WITH 90-MINUTE, 1100 LUMEN MIN. BATTERY BACKUP
2. UPON LOSS OF NORMAL POWER, FIXTURE SHALL TRANSFER TO INTERNAL BATTERY SOURCE.

TIME SCHEDULES:
A. TIME SCHEDULES ARE TO BE DETERMINED BY THE OWNER. THIS SHALL BE COORDINATED AND DIRECTED BY OWNER AND INPUT BY THE LIGHTING PROGRAMMER AND THE BAS PROGRAMMER.
B. INITIAL SETTING SHALL BE 5AM ON, TO 6PM OFF. MODIFY BASED ON OWNER INPUT.

INDIVIDUAL AREAS INTENT OF CONTROL:
A. CORRIDORS/GROUP RESTROOMS/STAIRWELLS:
- TIME SCHEDULE ZONED WITH CORRIDOR CONTROL. EMERGENCY LIGHTING SHALL SUPPLEMENT THIS AREA VIA RELAY CONTROL.
- MANUAL LOW VOLTAGE OVERRIDE IN LOCAL CORRIDOR.
B. INDIVIDUAL RESTROOMS:
- ON/OFF OCCUPANCY SENSOR WALL SWITCH (PASSIVE INFRARED).
C. ELECTRICAL/MECHANICAL/DATA ROOMS:
- MANUAL ON/OFF TOGGLE SWITCH ONLY FOR PERSONNEL SAFETY.
D. STORAGE ROOMS:
- ON/OFF OCCUPANCY SENSOR WALL SWITCH (PASSIVE INFRARED).
E. OFFICES/WORKROOMS:
- ZONED FIXTURES, TYPICALL VIA ON/OFF SWITCHES WITH INTEGRAL OCCUPANCY SENSORS.
F. CLASSROOMS/RESOURCE ROOMS:
- QTY (2) SINGLE POLE SWITCHES FOR QTY (2) SWITCHING ZONES
ZONE 1: TEACHING WALL ZONE (ON/OFF)
ZONE 2: CLASSROOM ZONE (ON/OFF)
G. GYMNASIUM
- QTY (3) SWITCHING ZONES CONTROLLED VIA TIME SCHEDULE. ZONING AS INDICATED ON PLANS. MANUAL TOGGLE SWITCHES. HOA OVERRIDE.
H. CLASSROOMS (EXCEPTIONAL CHILDREN)/CONFERENCE ROOMS
- LINE VOLTAGE DIMMING WITH DIMMER CONTROL.

OTHER SYSTEM INTEGRATION:
A. UPON LOSS OF POWER OR FIRE ALARM, EMERGENCY RATED RELAYS SHALL DEFAULT TO ON (HIGHEST PRIORITY).
B. UPON A FIRE ALARM EVENT, ALL CORRIDOR ZONES SHALL SWEEP ON.

SECURITY SEQUENCE:
A. LIGHTING SHALL SWEEP OFF AFTER SECURITY SYSTEM IS ARMED.
B. LIGHTING SHALL SWEEP ON FOR A SECURITY EVENT (ALL ZONES).
C. LIGHTING SHALL DEFAULT TO PROGRAM SETTINGS FOR SECURITY DISARM.

FIXTURES NOTES:

ADDITIONAL, ALL DEVICES AND INSTALLATION BELOW SHALL NOT BE SUPPLIED OR INSTALLED UNTIL DIRECTION IS RECEIVED FROM OWNER OR ENGINEER. THE BELOW NOTES SHALL BE APART OF THE BASE BID

1. E.C. TO PROVIDE QTY (2) ADDITIONAL SWITCHES OF EACH TYPE AND RELOCATE QTY (2) SWITCHES A TOTAL DISTANCE OF 10' (EACH) FROM EXISTING LOCATION, POST INSTALLATION, AS REQUIRED BY OWNER.
2. ARCHITECT TO APPROVE ALL EXTERIOR FIXTURE LOCATIONS. E.C. TO MARK LOCATIONS WITH TEMPORARY CHALK OUTLINE AND PLAN FOR ARCHITECT ON-SITE APPROVAL OF LOCATIONS. THIS SHOULD BE DONE BEFORE INSTALLATION AND E.C. IS TO CONTACT ARCHITECT WITH MINIMUM (1) WEEK PRIOR NOTICE.
3. E.C. TO PROVIDE QTY (5) ADDITIONAL DL1 FIXTURES AND INSTALLATION UP TO 200' (EACH) FROM LOCAL PANEL.
4. E.C. TO PROVIDE QTY (5) ADDITIONAL RTL5 FIXTURES AND INSTALLATION OF UP TO 100' (EACH) FROM LOCAL PANEL.
5. E.C. TO PROVIDE QTY (5) ADDITIONAL POWER PACKS AND INSTALLATION OF UP TO 200' (EACH) FROM LOCAL PANEL.

1. ALL FIXTURES SHALL BE LED UNLESS OTHERWISE SPECIFIED. COLOR TEMPERATURE SHALL BE 4000K UNLESS OTHERWISE NOTED.
2. LED DRIVERS SHALL BE PROVIDED FROM PER MANUFACTURER RECOMMENDATION. AS PART OF THIS RECOMMENDATION COORDINATE THE REQUIRED WAVE OUTPUT SO THEY ARE COMPATIBLE. THIS INCLUDES EMERGENCY DRIVERS.
3. SEE ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT FIXTURE LOCATIONS.
4. FIXTURES IN FIRE RATED CEILING SHALL BE PROVIDED WITH FIRE RATED TENTS AS REQUIRED.
5. SUSPEND ALL FOUR CORNERS WITH WIRE TO STRUCTURE. DO NOT ALLOW GRID ALONE TO SUPPORT FIXTURE.
6. PROVIDE EMERGENCY RELAY BASED ON MINIMUM BODINE GLCD-20B OR EQUAL. SEE PLANS FOR INTENT. PROVIDE EMERGENCY GENERATOR/INVERTER CIRCUIT AND SWITCH LEG NORMAL CIRCUIT. SEE DETAIL.
7. PROVIDE INTEGRAL SURGE PROTECTION ON ALL EXTERIOR LED DRIVER FIXTURE TYPES.
8. DIMMING OF FIXTURES SHALL BE WITH A SWITCH AS RECOMMENDED BY THE DRIVER MANUFACTURER.
9. THE CONTRACTOR SHALL VERIFY THE LEAD TIME OF ALL PRODUCTS SPECIFIED IN THIS SCHEDULE AT THE TIME OF PACKAGE QUOTE.
10. DURING THE BID PROCESS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER OF ANY DELIVERY/SCHEDULING ISSUES.
11. NO SUBSTITUTIONS WILL BE ALLOWED DUE TO LACK OF COORDINATION OF DELIVERY DATES AND CONSTRUCTION SCHEDULE AFTER BID.
12. ALL EXPEDITED EXPENSES SHALL BE THE RESPONSIBILTY OF THE CONTRACTOR.
13. FIXTURES TO BE INSTALLED IN CEILINGS, INDICATED ON ARCHITECTURAL PLANS AS HAVING INSULATION IN CONTACT WITH CEILING SURFACE, SHALL BE IC RATED BY MANUFACTURER.
14. LED DRIVERS LOCATED IN UNCONDITIONED SPACES SHALL BE RATED FOR 90 DEGREES F.

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	MINIMUM LUMENS	CCT	TOTAL FIXURE WATTAGE	DRIVER	VOLT	VOLTAGE	MANUFACTURER	MODEL	REMARKS
DL1	6" RECESSED LED DOWNLIGHT	1,500	4000K	15.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	277 V	UNIV	GOTHAM RAYON PRESCOLITE ELITE PORTFOLIO	EVO6 RPA6 LTR-6RD HH6 LD6B	CLEAR REFLECTOR MINIMUM 10% DIMMING DLC/ENERGY STAR LISTED FINISH BY ARCHITECT
DLW1	6" LENSED RECESSED DOWNLIGHT WALL WASH	2,000	4000K	20.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	277 V	UNIV	LITHONIA CHLORIDE DUAL-LITE MULE SURE-LITES	EVO6LW 6RN LTR-6RD HH6 LD6B	WALL WASH LENS DLC/ENERGY STAR LISTED
EMB1	INTERIOR EMERGENCY BATTERY EGRESS LIGHT AIMABLE			2.0 W	INTEGRAL LED DRIVER	277 V	277V	LITHONIA LIGHTALARMS DUAL-LITE MULE SURE-LITES	ELM2L LCA-WRHL EV2I M5 SEL25	TEST SWITCH PROVIDED SEALED 90 MINUTE BATTERY 20' (ON CENTER) X 6'W DESIGN PATH SELF TEST SDRT WITH RTKIT
EX1G	THERMOPLASTIC EXIT SIGN - CEILING MOUNT			1.0 W	INTEGRAL LED DRIVER	277 V	UNIV	LITHONIA LIGHTALARMS DUAL-LITE MULE SURE-LITES	LQM QLX WPREM MX LPX	NON-BATTERY; SEE PLANS FOR FACE STYLE AND CHEVRON LOCATIONS UL LISTED FOR DAMP LOCATIONS
EX1GW	THERMOPLASTIC EXIT SIGN - WALL MOUNT	5	4000K	1.0 W	INTEGRAL LED DRIVER	277 V	UNIV	LITHONIA LIGHTALARMS DUAL-LITE MULE SURE-LITES	LQM QLX WPREM MX LPX	NON-BATTERY; SEE PLANS FOR FACE STYLE AND CHEVRON LOCATIONS UL LISTED FOR DAMP LOCATIONS
FPL2	2X2 LED LAY-IN FLAT PANEL	2,000	4000K	30.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	277 V	UNIV	LITHONIA DAYBRITE H.E. WILLIAMS COOPER	EPANL 2X2 2FPZ 22FPSLSCT3	UL LISTED DAMP LOCATIONS DLC LISTED
FPL3	2X4 LED LAY-IN FLAT PANEL	3,000	4000K	35.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	277 V	UNIV	LITHONIA DAYBRITE COOPER	EPANL 2X4 2FPZ 24FPSLSCT3	UL LISTED DAMP LOCATIONS DLC LISTED PROVIDE FLANGE KIT FOR GYP. LOCATIONS SEE ARCHITECTURAL PLANS FOR LOCATIONS
FPL4	2X4 LED LAY-IN FLAT PANEL	4,000	4000K	38.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	277 V	UNIV	LITHONIA DAYBRITE COOPER	EPANL 2X4 2FPZ 24FPSLSCT5	UL LISTED DAMP LOCATIONS DLC LISTED PROVIDE FLANGE KIT FOR GYP. LOCATIONS SEE ARCHITECTURAL PLANS FOR LOCATIONS
FPL5	2X4 LED LAY-IN FLAT PANEL	5,400	4000K	42.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	277 V	UNIV	LITHONIA DAYBRITE COOPER	EPANL 2X4 2FPZ 24FPSLSCT9	UL LISTED DAMP LOCATIONS DLC LISTED PROVIDE FLANGE KIT FOR GYP. LOCATIONS SEE ARCHITECTURAL PLANS FOR LOCATIONS
FPL6	2X4 LED LAY-IN FLAT PANEL	6,000	4000K	52.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	277 V	UNIV	LITHONIA DAYBRITE COOPER	EPANL 2X4 2FPZ 24FPSLSCT9	UL LISTED DAMP LOCATIONS DLC LISTED PROVIDE FLANGE KIT FOR GYP. LOCATIONS SEE ARCHITECTURAL PLANS FOR LOCATIONS
FPL6D	2X4 LED LAY-IN TROFFER	6,000	4000K	52.0 W	LUTRON OR EQUAL LUT2W 2 WIRE LED (120V FORWARD PHASE DIMMING) - NOT 0-10V	120 V	UNIV	LITHONIA DAYBRITE COOPER	EPANL 2X4 2FPZ 24FPSLSCT9	DLC LISTED UL LISTED DAMP LOCATIONS LINE VOLTAGE DIMMING FIXTURE
FPL7	2X4 LED LAY-IN FLAT PANEL	7,200	4000K	65.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	277 V	UNIV	LITHONIA DAYBRITE COOPER	EPANL 2X4 2FPZ 24FPSLSCT9	DLC LISTED UL LISTED DAMP LOCATIONS
HBL1	HIGH-BAY LED LAY-IN TROFFER	18,000	4000K	142.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	277 V	UNIV	LITHONIA WILLIAMS CORONET	IBHST 18000LM SD080 MD MVOLT 80CRI APPROVED EQUAL APPROVED EQUAL	PROVIDE WIRE GUARD;WHITE FINISH AIRCRAFT CABLE FOR SAFETY AND CONDUIT STEM, PROVIDE UNISTRUT BETWEEN STRUCTURAL BRACING SEE HIGHBAY MOUNTING DETAIL;DLC LISTED
KLP1	LINEAR ADJUSTABLE WALL MOUNTED	5,500	4000K	56.0 W	REMOTE MOUNTED ABOVE CEILING DAMP LISTED	277 V	UNIV	SPI BARTCO OR EQUAL	SEW12146	IP66 RATED;ROTATE UP TO 330 DEGREES (ROTATE TOWARD SINK) 4000K;MINI CANOPY AND STEM MOUNT 4' LENGTH, 5500 MINIMUM LUMEN OUTPUT UNIVERAL VOLTAGE;SMA 60 DEGREE BEAM LUMENS LISTED PER 4' SECTION
LBL1	SURFACE MOUNT LOW BAY LED	8,000	4000K	75.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	277 V	UNIV	LITHONIA DAYBRITE COOPER	MSL 8000LM SBL 277 GZ10 40K 80CRI APPROVED EQUAL APPROVED EQUAL	CHAIN PENDANT HUNG - 6" ABOVE STAGE OPENING
LLR8	LINEAR LED - RECESSED	8,000	4000K	80.0 W	INTEGRAL LED DRIVER	277 V	UNIV	LUMENWERX LEDALITE FOCAL POINT FINELITE	VIA4R TRUGROOVE 29 SEEM4	DLC LISTED;FINISH SELECTED BY ARCHITECT WIDE DISTRIBUTION 1000 LUMENS PER 1';8000 TOTAL LUMENS FLUSH LENS;80CRI;STATIC WHITE;8' TOTAL LENGTH
LLR12	LINEAR LED - RECESSED	12,000	4000K	120.0 W	INTEGRAL LED DRIVER	277 V	UNIV	LUMENWERX LEDALITE FOCAL POINT FINELITE	VIA4R TRUGROOVE 29 SEEM4	DLC LISTED;FINISH SELECTED BY ARCHITECT 1000 LUMENS UP PER1;12000 TOTAL LUMENS FLUSH LENS;80CRI;STATIC WHITE;12' TOTAL LENGTH
OFL1	TRACK LIGHTING HEAD	2,700	4000K	33.0 W	INTEGRAL LED DRIVER	277 V	UNIV	HYDREL FC CREE ECOSENSE	SAFF7 LED P1 80CRI MVOLT 20DEG CWL KM CPM ZT GS BL	IP68 RATED PROVIDE 6" DEEP CONCRETE SLAB BY 8" SQUARE SURFACE MOUNT ON SLAB, MOUNT 1' FROM FLAG POLE BASE ORIENT ANGLE TO MAXIMIZE WALL FLAG ON RESPECTIVE SIDE BLACK FINISH LUMENS LISTED PER 4' SECTION
OLS1	4 FT. LED STRIP	2,000	4000K	20.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	277 V	UNIV	HYDREL FC ECOSENSE	4750L 4FT 500LMF MVOLT WWD KMS90 PSSA HVSR4750L ZT CR	IP67 RATED PROVIDE 6" DEEP CONCRETE SLAB BY 8" WIDE BY 8' LONG SURFACE MOUNT ON SLAB, MOUNT 1' FROM SIGN ORIENT ANGLE TO MAXIMIZE WALL WASHING MATCH COLOR TO MOUNUMENT SIGN COLOR LUMENS LISTED PER 4' SECTION
OPL1	LED POLE MOUNT AREA LIGHTING	15,000	4000K	131.0 W	INTEGRAL LED DRIVER (2)	277 V	UNIV	US ARCHITECTURAL LITHONIA HUBBELL NLS LIGHTING LUMARK	VLLLED-PLEDVSQM DSX1LED RAR2 NV-1-ASA PRV	30' SQUARE STEEL POLE PROVIDE MOUNTING TYPE BASED ON MANUF. RECOMMENDATION FINISH CHOSEN BY ARCHITECT
OPL2	LED POLE MOUNT AREA LIGHTING	30,000	4000K	260.0 W	INTEGRAL LED DRIVER	277 V	UNIV	US ARCHITECTURAL LITHONIA HUBBELL NLS LIGHTING LUMARK	VLLLED-PLEDVSQM DSX1LED RAR2 NV-1-ASA PRV	30' SQUARE STEEL POLE PROVIDE MOUNTING TYPE BASED ON MANUF. RECOMMENDATION FINISH CHOSEN BY ARCHITECT
OWL1	WALL PACK TRAPEZOID LED	3,900	4000K	47.0 W	INTEGRAL LED DRIVERS (2)	277 V	UNIV	RAYON LITHONIA HUBBELL BROWNLEE MCGRAW-EDISON	T630LEDB WST LED TRP1 7039-C49 IST	COLOR CHOSEN BY ARCHITECT LS 101 EMERGENCY COMPLIANT 7"HX16"WX9"D 3900 LUMENS (WIDE ANGLE)
OWL2	WALL PACK TRAPEZOID LED	3,900	4000K	47.0 W	INTEGRAL LED DRIVERS (2)	277 V	277V	RAYON LITHONIA HUBBELL BROWNLEE MCGRAW-EDISON	T630LEDB WST LED TRP1 7039-C49 IST	COLOR CHOSEN BY ARCHITECT LS 101 EMERGENCY COMPLIANT 7"HX16"WX9"D 3900 LUMENS FORWARD THROW
OWL3	4 FT. LED STRIP	4,800	4000K	40.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	277 V	UNIV	ATG LITHONIA COLUMBIA COOPER DAY-BRITE	VP 4FT F N	VAPOR PROOF FROSTED LENS DLC LISTED 4000K LUMENS LISTED PER 4' SECTION
SDL1	6" LENSED RECESSED DOWNLIGHT SHOWER	2,000	4000K	20.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	277 V	UNIV	LITHONIA CHLORIDE DUAL-LITE MULE SURE-LITES	EVO6 6RN LTR-6RD HH6 LD6B	WET LOCATION LISTED LENSED DLC/ENERGY STAR LISTED
STL1	4 FT. LED STRIP	5,000	4000K	42.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)		UNIV	LITHONIA COLUMBIA CREE COOPER DAY-BRITE	CLX LED FSS LCL 4-OC1 SNLED	PROVIDE CHAIN FOR PENDANT MOUNTING PROVIDE WIRE GUARD LENSED;LUMENS LISTED PER 4' SECTION DLC LISTED;MULTI VOLTAGE REQUIRED (120/277V) WHITE FINISH
STL2	4 FT. LED STRIP	4,900	4000K	40.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	120 V	UNIV	ATG LITHONIA COLUMBIA COOPER DAY-BRITE	VP 4FT F N	SURFACE MOUNTED VAPOR PROOF LENSED;4000K DLC LISTED;4900 LUMENS PER 4'
SWL1	4' RECESSED LINEAR LED	3,000	4000K	34.0 W	INTEGRAL LED DRIVER	277 V	UNIV	METALUX LITHONIA COOPER	4BCLED-LD4-24HL-F-UNV-CD APPROVED EQUAL APPROVED EQUAL	LENGTH TO BE 4' UNLESS OTHER WISE NOTED. DLC LISTED LUMENS LISTED PER 4' SECTION
SWL1-EM	4' RECESSED LINEAR LED	3,000	4000K	34.0 W	INTEGRAL LED DRIVER	277 V	UNIV	METALUX LITHONIA COOPER	4BCLED-LD4-24HL-F-UNV-CD APPROVED EQUAL APPROVED EQUAL	LENGTH TO BE 4' UNLESS OTHER WISE NOTED. DLC LISTED LUMENS LISTED PER 4' SECTION
TL1	TRACK LIGHTING HEAD	1,700	4000K	35.0 W	INTEGRAL LED DRIVER	120 V	UNIV	HALO CON-TECH PRESCOLITE SPECTRUM	SEE SPECIFICATION APPROVED EQUAL APPROVED EQUAL	4' TRACK HEAD SEE SPECIFICATION 265561 THEATRICAL LIGHTING FIXTURES SHALL BE SUPPLIED WITH BARN DOORS AND SELECTION OF FILTERS. SEE THEATRICAL COMMENTS PROVIDE ALL ASSOCIATED CANOPY PLATES, MOUNTING BOXES, LENSES, ETC. WITH OPTIONAL WIRE GUARDS.
WSL1	UP/DOWN WALL MOUNTED CYLINDER	3,900	4000K	40.0 W	INTEGRAL LED DRIVERS (2)	277 V	UNIV	INSIGHT LITHONIA COOPER	SSM UD MO ASY WM 277 NO CC	2000 LUMENS UP;2000 LUMENS DOWN COLOR CHOSEN BY ARCHITECT ASYMMETRIC DISTRIBUTION WET LOCATION RATED

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

LIGHTING FIXTURE SCHEDULE

E-801

Optima # 22-0082

01.12.2023 - BID SET

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AIR HANDLING UNIT SCHEDULE (WATER COOLING WITH HOT WATER PRE-HEAT/REHEAT)

SYMBOL	LOCATION	SUPPLY FAN AIR FLOW (CFM)	SUPPLY FAN QTY	SUPPLY FAN HP	RELIEF FAN QTY	RELIEF FAN HP	ELECTRICAL DATA VOLTS	PH	HZ	Load Classification	DISCONNECT	RETURN FAN CIRCUIT	SUPPLY FAN CIRCUIT
AHU-1	MECH 151	14,800	1	15.0	1	10.0	480 V	3	60	VENTILATION	VFD PROVIDED WITH EQUIPMENT	MPC1A - 2,4,6	MPC1A - 1,3,5
AHU-2	MECH 152	16,600	2	10.0	1	10.0	480 V	3	60	VENTILATION	VFD PROVIDED WITH EQUIPMENT	MPC1B - 2,4,6	MPC1B - 1,3,5
AHU-3	MECH 151	19,900	2	10.0	2	10.0	480 V	3	60	VENTILATION	VFD PROVIDED WITH EQUIPMENT	MPC1A - 8,10,12	MPC1A - 7,9,11
AHU-4	MECH 152	24,800	1	25.0	1	20.0	480 V	3	60	VENTILATION	VFD PROVIDED WITH EQUIPMENT	MPC1B - 8,10,12	MPC1B - 7,9,11
AHU-5	MECH 221	6,400	1	5.0	1	5.0	480 V	3	60	VENTILATION	VFD PROVIDED WITH EQUIPMENT	MPA2 - 2,4,6	MPA2 - 1,3,5
AHU-6	MECH 221	5,900	1	7.5	1	5.0	480 V	3	60	VENTILATION	VFD PROVIDED WITH EQUIPMENT	MPA2 - 8,10,12	MPA2 - 7,9,11
AHU-7	MECH 221	15,460	1	15.0	1	10.0	480 V	3	60	VENTILATION	VFD PROVIDED WITH EQUIPMENT	MPA2 - 14,16,18	MPA2 - 13,15,17
AHU-8	MECH PENT G007	7,800	1	10.0	2	5.0	480 V	3	60	VENTILATION	VFD PROVIDED WITH EQUIPMENT	MPA2 - 20,22,24	MPA2 - 19,21,23
AHU-9	MECH PENT G007	9,000	1	10.0	1	5.0	480 V	3	60	VENTILATION	VFD PROVIDED WITH EQUIPMENT	MPA2 - 26,28,30	MPA2 - 25,27,29
AHU-10	MECH PENT G007	13,600	1	15.0	1	10.0	480 V	3	60	VENTILATION	VFD PROVIDED WITH EQUIPMENT	MPA2 - 32,34,36	MPA2 - 32,34,36

BLOWER COIL UNIT SCHEDULE (WATER COOLING / HOT WATER REHEAT)

SYMBOL	LOCATION Space: Name	SUPPLY FAN QTY	SUPPLY FAN HP	ELECTRICAL DATA VOLTS	PH	HZ	Load Classification	DISCONNECT	ELECTRICAL CIRCUIT
AHU-11	GEN. STORAGE	1	3.0	480 V	3	60	COOLING	30/F15-3P - NO VFD	DPD1-7,9,11

AHU NOTES:
1. VFD PROVIDED WITH DISCONNECT BY MECHANICAL CONTRACTOR.

ROOFTOP UNIT SCHEDULE (DX COOLING, GAS HEAT)

SYMBOL	COMPRESSOR (EA) QTY	RLA	LRA	OFM QTY	FLA	SUPPLY FAN HP	COMB. FAN FLA	POWER SUPPLY MCA	MOCP	VOTAGE	PH	DISCONNECT
RTU-1	2	12.8	0.0	2	1.8	4.0	4.0	0.0	29.7	40.0	480	3	60/F40-3P-3R

FAN COIL UNIT SCHEDULE

SYMBOL	ELECTRICAL DATA MOTOR HP	FLA	MCA	MOCP	VOLTAGE	PH	PANEL - CIRCUIT NUMBER	DISCONNECT
FCU-1	0.25	3.5	4.4	15.0	120	1	RPDB - 21	MMS
FCU-2	0.25	3.5	4.4	15.0	120	1	RPDB - 22	MMS
FCU-3	0.25	3.5	4.4	15.0	120	1	RPDB - 23	MMS

PUMP SCHEDULE

SYMBOL	SERVICE	MOTOR RPM	H.P.	VOLT	PH	Panel - Circuit Number
P-1	CHILLER #1	1800	5.0	460	3	MPC1 - 1,3,5
P-2	CHILLER #2	1800	5.0	460	3	MPC1 - 2,4,6
P-3	CHILLED WATER SECONDARY	1800	10.0	460	3	MPC1 - 13,15,17
P-4	CHILLED WATER SECONDARY	1800	10.0	460	3	MPC1 - 14,16,18
P-5	BOILER #1 PRIMARY	1800	1.5	120	3	RPC1 - 17
P-6	BOILER #2 PRIMARY	1800	1.5	120	3	RPC1 - 16
P-7	HOT WATER SECONDARY	1750	7.5	460	3	MPC1 - 7,9,11
P-8	HOT WATER SECONDARY	1750	7.5	460	3	MPC1 - 8,10,12

NOTES:
1. PUMPS P-1 THRU P-4 AND P-7/P-8 DISCONNECTS ARE THE PANEL LOCATED IN SIGHT.
2. P-5 AND P-6 PUMPS, PROVIDE WITH MANUAL MOTOR STARTER WITH DISCONNECT.

ELECTRIC UNIT & WALL HEATER SCHEDULE

SYMBOL	LOCATION	KW	MOTOR RPM	H.P.	VOLT	PH	PANEL - CIRCUIT NUMBER
EUH-1	MECH 148	3.3	1500	0.01	277 V	1	MPC1 - 26
EUH-2	ELEC G112	3.3	1500	0.01	277 V	1	MPC1 - 25
EWH-1	MECH G124	2	600	0.01	277 V	1	DPD1 - 1
EWH-2	OUTDOOR STORAGE G105	2	600	0.01	277 V	1	DPD1 - 3
EWH-3	BOYS G008	2	600	0.01	277 V	1	DPB - 3
EWH-4	CUST G011	2	600	0.01	277 V	1	DPB - 1
EWH-5	GIRLS G009	2	600	0.01	277 V	1	DPB - 4
EWH-6	CONCESSIONS G010	2	600	0.01	277 V	1	DPB - 5

NOTES:
1. WALL AND UNIT HEATER DISCONNECTS ARE PROVIDED BY M.C.

CHILLER SCHEDULE

CHILLER #1
275 TONS (MIN.); ELEC. DATA: 460V-3∅, COMPRESSORS (2): COMPR. CIRCUIT A: 196 RLA; COMPR. CIRCUIT B: 196 RLA; FANS: 18 TOTAL, 3.3 FLA (EA); UNIT ELECTRICAL DATA: (SINGLE POINT ELECTRICAL CONNECTION) 502 MCA, 600 MOCP; 20 AMP, 120V CIRCUIT FOR CONTROLS AND HEATERS

DISCONNECT: 600/NF-3P-3R

CHILLER #2 275 TONS (MIN.); 95° F. AMBIENT; EVAPORATOR: 550 GPM, 44° F. L.W.T., 56° F. E.W.T., 13' MAX. P.D., ELEC. DATA: 460V-3∅, COMPRESSORS (2): COMPR. CIRCUIT A: 196 RLA; COMPR. CIRCUIT B: 196 RLA; FANS: 18 TOTAL, 3.3 FLA (EA); UNIT ELECTRICAL DATA: (SINGLE POINT ELECTRICAL CONNECTION) 502 MCA, 600 MOCP; 20 AMP, 120V CIRCUIT FOR CONTROLS AND HEATERS

DISCONNECT: 600/NF-3P-3R

BOILER SCHEDULE

BOILER #1
1 1/2 H.P., 120V-1∅, PROVIDE MANUAL MOTOR STARTER WITH DISCONNECTING MEANS.

BOILER #2
1 1/2 H.P., 120V-1∅, PROVIDE MANUAL MOTOR STARTER WITH DISCONNECTING MEANS.

PLUMBING PUMP SCHEDULE

RCP1 - 70W, 120V PLUG AND CORD
RCP2 - 1/2HP 208V SINGLE PHASE, MANUAL MOTOR STARTER
RCP3 - 70W, 120V PLUG AND CORD
RCP4 - 70W, 120V PLUG AND CORD

SP1 - 3/4 HP, SEE ELEVATOR DETAIL

GENERAL SCHEDULE NOTES:
1. MECHANICAL EQUIPMENT CONNECTIONS SHOWN ARE DIAGRAMMATIC. CONNECTIONS SHALL BE COORDINATED IN THE FIELD WITH THE ACTUAL EQUIPMENT CONNECTION LOCATIONS. I.E. DISCONNECT TO EQUIPMENT, VFD TO EQUIPMENT, ETC.

FAN SCHEDULE

SYMBOL	LOCATION	ELECTRICAL DATA WATTS	VOLT - Ø	CONTROL TYPE	Panel - Circuit Number
F-1	KITCHEN HOOD	1470	208 V-3Ø	7	RPB2 - 43,45,47
F-2	KITCHEN HOOD	2206	208 V-3Ø	7	RPB2 - 42,44,46
F-3	DISHWASHER	183	120 V-1Ø	8	RPB2 - 48
F-4	CONCESSION BLDG (TYP FOR 2)	630	120 V-1Ø	2	
F-5	NOT USED	0	120 V-1Ø		
F-6	BOILER ROOM	1100	120 V-1Ø	1	RPC1 - 20
F-7	MAIN ELEC ROOM	1285	120 V-1Ø	1	RPC1 - 39
F-8	KITCHEN TLT/LCKR	36	120 V-1Ø	5	RPB2 - 32
F-9	SCIENCE STORAGE	128	120 V-1Ø	6	RPA1 - 79
F-10	SCIENCE PREP	81	120 V-1Ø	6	RPA1 - 79
F-11	SCIENCE LAB	934	120 V-1Ø	4	RPA1 - 79
F-12	GYM TLTS	367	120 V-1Ø	5	RPD1 - 89
F-13	GYM LOCKER RMS	367	120 V-1Ø	5	RPD1 - 18
F-14	ART ROOM	934	120 V-1Ø	4	RPA1 - 80
F-15	KILN	128	120 V-1Ø	1	RPA1 - 100
F-16	SCIENCE STORAGE	128	120 V-1Ø	6	RPB1 - 8
F-17	SCIENCE PREP	81	120 V-1Ø	6	RPB1 - 8
F-18	SCIENCE LAB	934	120 V-1Ø	4	RPB1 - 7
F-19	SCIENCE LAB	934	120 V-1Ø	4	RPB1 - 9
F-20	SCIENCE STORAGE	128	120 V-1Ø	6	RPA2 - 30
F-21	SCIENCE PREP	81	120 V-1Ø	6	RPA2 - 30
F-22	SCIENCE LAB	934	120 V-1Ø	4	RPA2 - 152
F-23	SCIENCE STORAGE	128	120 V-1Ø	6	RPA2 - 65
F-24	SCIENCE PREP	81	120 V-1Ø	6	RPA2 - 65
F-25	SCIENCE LAB	934	120 V-1Ø	4	RPA2 - 65
F-26	SCIENCE STORAGE	128	120 V-1Ø	6	RPB2 - 36
F-27	SCIENCE PREP	81	120 V-1Ø	6	RPB2 - 36
F-28	SCIENCE LAB	934	120 V-1Ø	4	RPB2 - 133
F-29	SCIENCE LAB	1153	120 V-1Ø	4	RPB2 - 37
F-30	SCIENCE STORAGE	128	120 V-1Ø	6	RPB2 - 57
F-31	SCIENCE PREP	81	120 V-1Ø	6	RPB2 - 57
F-32	SCIENCE LAB	934	120 V-1Ø	4	RPB2 - 135
F-33	SCIENCE LAB	934	120 V-1Ø	4	RPB2 - 137
F-34	HEALTH TLTS	36	120 V-1Ø	5	RPA2 - 46
F-35	ADMIN TLTS	51	120 V-1Ø	5	RPA2 - 46
F-36	CLASSROOM CORE	183	120 V-1Ø	5	RPA2 - 46
F-37	CLASSROOM CORE	183	120 V-1Ø	5	RPA2 - 46
F-38	WORKRM TLTS	36	120 V-1Ø	5	RPB2 - 24
F-39	WORKRM TLTS	51	120 V-1Ø	5	RPB2 - 24
F-40	CLASSROOM CORE	183	120 V-1Ø	5	RPB2 - 24
F-41	CLASSROOM CORE	183	120 V-1Ø	5	RPB2 - 24
F-42	YARD STORAGE	183	120 V-1Ø	6	RPS - 9
F-43	EMER ELEC	83	120 V-1Ø	1	RPC1 - 19
F-44	ELEC G112	368	120 V-1Ø	1	RPD1 - 9
F-45	WATER ENTRANCE RM	183	120 V-1Ø	1	RPC1 - 1
F-46	GYM CONCESSION	179	120 V-1Ø	3	RPD1 - 53
F-47	BASEMENT TLTS	179	120 V-1Ø	2	RPDB - 20

FAN CONTROL TYPES:
1. WALL MOUNTED THERMOSTAT - BY M.C.
2. INTERLOCK WITH ROOM LIGHT SWITCH (FAN SHALL OPERATE WHEN LIGHT IS ON IF ANY ROOM IS SERVED BY FAN) - PROVIDE INTEPOSING RELAY FOR 120V TO 277V CONTROL.
3. WALL MOUNTED ON/OFF SWITCH WITH IDENTIFICATION LABEL - BY M.C.
4. WALL MOUNTED TWIST TIMER WITH 0-3 HOUR RANGE WITH IDENTIFICATION LABEL - BY M.C. PROVIDE CONTACTOR CONTROL PER DETAIL #3/E-006, CONTROL OF FAN EXHAUST.
5. CONTROLLED BY BUILDING AUTOMATION SYSTEM - BY M.C.
6. CONTINUOUS OPERATION
7. INTERLOCK WITH KITCHEN HOOD CONTROLS - SEE FOOD SERVICE PLANS - POWER SHALL BE ROUTED THROUGH HOOD TO FAN.
8. INTERLOCK WITH DISHWASHER - SEE FOOD SERVICE PLANS

FAN DISCONNECTS ARE PROVIDED BY M.C. FAN F-4 AND F-5 SEE PLANS.

ELECTRIC DUCT HEATER SCHEDULE

SYMBOL	K.W.	STEPS	VOLT	PH	PANEL - CIRCUIT NUMBER
EDH-1	6	2	460 V	3	MPC1 - 19,21,23

EDH-1: DISCONNECT BY M.C.

STARTER TYPES:

FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
2-SPD	TWO SPEED
VFD	VARIABLE FREQUENCY DRIVE
RVS	REDUCED VOLTAGE

COMBINATION DISCONNECT TYPES:

FS	FUSED SWITCH
NFS	NON-FUSED SWITCH
MCP	MOTOR CIRCUIT PROTECTOR
CB	CIRCUIT BREAKER

CONTROL DEVICES:

HOA	HAND-OFF-AUTO SWITCH
RP	RED (RUN) PILOT LIGHT
GP	GREEN (POWER) PILOT LIGHT
O/O	ON-OFF SELECTOR SWITCH
S/S	STOP-START PUSHBUTTONS

ABBREVIATIONS:

E.C.	ELECTRICAL CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
G.C.	GENERAL CONTRACTOR
TC	TEMPERATURE CONTROL
OWN	OWNER

NOTES:
1. INPUT AND OUTPUT CONDUCTORS TO AND FROM VFD'S SHALL BE INSTALLED IN SEPARATE RACEWAYS, INDEPENDENT FROM ANY OTHER CONDUCTORS, AND SHALL NOT PASS THRU ANY COMMON WIREWAY OR RACEWAY.
2. PROVIDE VFD CABLE FOR VFD TO MOTOR CONNECTIONS.
3. MMS - MANUAL MOTOR STARTER WITH DISCONNECTING MEANS.

DUCTLESS SPLIT SYSTEMS (DX COOLING ONLY)

SYMBOL	LOCATION	INDOOR UNIT ELECTRICAL DATA FAN FLA	MCA	VOLT	PH	DISCONNECT	OUTDOOR UNIT COMPRESSOR ELECTRICAL DATA LRA	RLA	FAN FLA	MCA	FUSE	VOLT	PH	DISCONNECT	Panel - Circuit Number	Apparent Load
A/C-1	MDF	0.36	1.0	208 V	1	30/F15-2P	ODU-1	ROOF	17.5	12	0.75	25.0	40	208 V	1	60/F40-2P-3R	RPA2 - 144,146	3.95 kVA
A/C-2	IDF ROOM	0.33	1.0	208 V	1	30/F15-2P	ODU-2	ROOF	14.0	12	0.35	13.0	15	208 V	1	30/F15-2P-3R	RPA2 - 140,142	2.29 kVA
A/C-4	DATA ROOM	0.33	1.0	208 V	1	30/F15-2P	ODU-4	ROOF	14.0	12	0.35	13.0	15	208 V	1	30/F15-2P-3R	RPD1 - 27,29	2.29 kVA
A/C-5	COACH OFFICE	0.33	1.0	208 V	1	30/F15-2P	ODU-5	ROOF	14.0	12	0.35	13.0	20	208 V	1	30/F20-2P-3R	RPD1 - 23,25	2.29 kVA
A/C-6	COACH OFFICE	0.33	1.0	208 V	1	30/F15-2P	ODU-6	ROOF	14.0	12	0.35	13.0	20	208 V	1	30/F20-2P-3R	RPD1 - 24,26	2.29 kVA
A/C-7	IDF ROOM	0.33	1.0	208 V	1	30/F15-2P	ODU-7	ROOF	14.0	12	0.35	13.0	15	208 V	1	30/F15-2P-3R	RPA2 - 141,143	2.29 kVA
A/C-8	IDF ROOM	0.33	1.0	208 V	1	30/F15-2P	ODU-8	ROOF	14.0	12	0.35	13.0	15	208 V	1	30/F15-2P-3R	RPA2 - 149,151	2.29 kVA

DUCTLESS SPLIT NOTES:
1. A/C UNITS ARE FED FROM ODU UNITS. PROVIDE 3#12,1#12G,1"C FROM A/C UNIT TO ODU.

E - ENERGY RECOVERY VENTILATOR...

SYMBOL	PH	Voltage Nominal	MCA	MOCP	DISCONNECT
ERV-1	3	480 V	7.9 A	15.0 A	30/F15-2P-3R

VAV BOX SCHEDULE

SYMBOL	VOLT	PH	Apparent Load	Apparent Load Input	NO. OF POLES	ELECTRICAL CIRCUIT
VAV-1.1	120 V	1	0.02 kVA	0.02 kVA	1	RPB1 - 21
VAV-1.2	120 V	1	0.02 kVA	0.02 kVA	1	RPB1 - 21
VAV-1.3	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-1.4	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-1.5	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-1.6	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-1.7	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-1.8	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-1.9	120 V	1	0.00 kVA	0.00 kVA	1	RPB1 - 21
VAV-1.10	120 V	1	0.02 kVA	0.02 kVA	1	RPB1 - 21
VAV-1.11	120 V	1	0.02 kVA	0.02 kVA	1	RPB1 - 21
VAV-1.12	120 V	1	0.02 kVA	0.02 kVA	1	RPB1 - 21
VAV-1.13	120 V	1	0.01 kVA	0.01 kVA	1	RPB1 - 21
VAV-1.14	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-2.1	120 V	1	0.02 kVA	0.02 kVA	1	RPB1 - 21
VAV-2.2	120 V	1	0.02 kVA	0.02 kVA	1	RPB1 - 21
VAV-2.3	120 V	1	0.02 kVA	0.02 kVA	1	RPB1 - 21
VAV-2.4	120 V	1	0.02 kVA	0.02 kVA	1	RPB1 - 21
VAV-2.5	120 V	1	0.02 kVA	0.02 kVA	1	RPB1 - 21
VAV-2.6	120 V	1	0.02 kVA	0.02 kVA	1	RPB1 - 21
VAV-2.7	120 V	1	0.02 kVA	0.02 kVA	1	RPB1 - 21
VAV-2.8	120 V	1	0.02 kVA	0.02 kVA	1	RPB1 - 21
VAV-2.9	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-2.10	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-2.11	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-2.12	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-2.13	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-2.14	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-2.15	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-2.16	120 V	1	0.00 kVA	0.00 kVA	1	RPA1 - 21
VAV-2.17	120 V	1	0.02 kVA	0.02 kVA	1	RPB1 - 21
VAV-3.1	120 V	1	0.00 kVA	0.00 kVA	1	RPA2 - 5
VAV-3.2	120 V	1	0.00 kVA	0.00 kVA	1	RPA2 - 5
VAV-3.3	120 V	1	0.00 kVA	0.00 kVA	1	RPA2 - 5
VAV-3.4	120 V	1	0.00 kVA	0.00 kVA	1	RPA2 - 5
VAV-3.5	120 V	1	0.00 kVA	0.00 kVA	1	RPA2 - 5
VAV-3.6	120 V	1	0.00 kVA	0.00 kVA	1	RPA2 - 5
VAV-3.7	120 V	1	0.00 kVA	0.00 kVA	1	RPA2 - 5
VAV-3.8	120 V	1	0.00 kVA	0.00 kVA	1	RPA2 - 5
VAV-3.9	120 V	1	0.00 kVA	0.00 kVA	1	RPA2 - 5
VAV-3.10	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-3.11	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-3.12	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-3.13	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-3.14	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-3.15	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-3.16	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-3.17	120 V	1	0.00 kVA	0.00 kVA	1	RPA2 - 5
VAV-3.18	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-3.19	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 5
VAV-4.1	120 V	1	0.00 kVA	0.00 kVA	1	RPB2 - 7
VAV-4.2	120 V	1	0.00 kVA	0.00 kVA	1	RPB2 - 7
VAV-4.3	120 V	1	0.00 kVA	0.00 kVA	1	RPB2 - 7
VAV-4.4	120 V	1	0.00 kVA	0.00 kVA	1	RPB2 - 7
VAV-4.5	120 V	1	0.00 kVA	0.00 kVA	1	RPB2 - 7
VAV-4.6	120 V	1	0.00 kVA	0.00 kVA	1	RPB2 - 7
VAV-4.7	120 V	1	0.00 kVA	0.00 kVA	1	RPB2 - 7
VAV-4.8	120 V	1	0.00 kVA	0.00 kVA	1	RPB2 - 7
VAV-4.9	120 V	1	0.00 kVA	0.00 kVA	1	RPB2 - 7
VAV-4.10	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-4.11	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-4.12	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-4.13	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-4.14	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-4.15	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-4.16	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-4.17	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-4.18	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-4.19	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-4.20	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-4.21	120 V	1	0.00 kVA	0.00 kVA	1	RPB2 - 7
VAV-4.22	120 V	1	0.00 kVA	0.00 kVA	1	RPB2 - 7
VAV-5.1	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-5.2	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-5.3	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-5.4	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-5.5	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-5.6	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-5.7	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-5.8	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-5.9	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-5.10	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-5.11	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-5.12	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-5.13	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-5.14	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-5.15	120 V	1	0.00 kVA	0.00 kVA	1	RPA1 - 21
VAV-6.1	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-6.2	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-6.3	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 153
VAV-6.4	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-6.5	120 V	1	0.02 kVA	0.02 kVA	1	RPA1 - 21
VAV-6.6	120 V	1	0.01 kVA	0.01 kVA	1	RPA2 - 5
VAV-8.1	120 V	1	0.02 kVA	0.02 kVA	1	RPD1 - 28
VAV-8.2	120 V	1	0.02 kVA	0.02 kVA	1	RPD1 - 28
VAV-8.3	120 V	1	0.02 kVA	0.02 kVA	1	RPD1 - 28
VAV-8.4	120 V	1	0.02 kVA	0.02 kVA	1	RPD1 - 28
VAV-8.5	120 V	1	0.02 kVA	0.02 kVA	1	RPD1 - 28
VAV-8.6	120 V	1	0.02 kVA	0.02 kVA	1	RPD1 - 28
VAV-8.7	120 V	1	0.02 kVA	0.02 kVA	1	RPD1 - 28
VAV-8.8	120 V	1	0.02 kVA	0.02 kVA	1	RPD1 - 28
VAV-8.9	120 V	1	0.00 kVA	0.00 kVA	1	RPD1 - 28

VAV BOX SCHEDULE...

SYMBOL	VOLT	PH	Apparent Load
VAV-1.9	120 V	1	0.00 kVA
VAV-1.13	120 V	1	0.01 kVA
VAV-2.16	120 V	1	0.00 kVA
VAV-3.17	120 V	1	0.00 kVA
VAV-3.19	120 V	1	0.01 kVA
VAV-4.21	120 V	1	0.00 kVA
VAV-4.22	120 V	1	0.00 kVA
VAV-5.15	120 V	1	0.00 kVA
VAV-8.9	120 V	1	0.00 kVA

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

MECHANICAL EQUIPMENT CONNECTION SCHEDULE

E-802

Optima # 22-0082

01.12.2023 - BID SET

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PANEL: DPA1

VOLTAGE: 480Y/277 3Ø | **FED FROM:** MSB
MOUNTING: SURFACE | **MAIN TYPE:** MCB | **MFR:**
ENCLOSURE: NEMA1 | **PHASE:** 3 | **TYPE:**
MAIN: 300 A | **WIRE:** 4 | **AIC:** 35 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
				1		6.19	44.51						2				
LIG HTS	PANEL LPA1	SR	100 A	3	3			5.97	38.95			3	4	175 A	SR	PANEL RPA1 (VIA TXRPA1)	Oth er: R...
:--				5						4.82	35.30		6				
				7		0.01	0.00					--	8	--	--	SPACE ONLY	--
M	ELEVATOR (12HP)	6	60 A	9	3			0.01	0.00			--	10	--	--	SPACE ONLY	--
				11						0.01	0.00	--	12	--	--	SPACE ONLY	--
--	SHUNT WITH AUX CONTACT	--	20 A	13	1	0.00	0.00					--	14	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	15	--			0.00	0.00			--	16	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	17	--					0.00	0.00	--	18	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	19	--	0.00	0.00					--	20	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	21	--			0.00	0.00			--	22	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	23	--					0.00	0.00	--	24	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	12.56 kVA	125.00%	15.70 kVA
LE	LIGHTING - EXTERIOR	5.79 kVA	125.00%	7.24 kVA
H	HEATING	0.50 kVA	100.00%	0.50 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	1.00 kVA	100.00%	1.00 kVA
M	MOTORS	0.70 kVA	100.00%	0.70 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	73.12 kVA	56.84%	41.56 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	39.81 kVA	100.00%	39.81 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

TOTAL KVA...	135.75 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	108.78 kVA	185.7 A	164.9 A	144.8 A
TOTAL AMP....	163 A			
TOTAL AMP. (DEMAND):	131 A			

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)

F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

SR - SEE RISER DIAGRAM

PANEL: DPB1

VOLTAGE: 480Y/277 3Ø | **FED FROM:** MSB
MOUNTING: SURFACE | **MAIN TYPE:** MCB | **MFR:**
ENCLOSURE: NEMA1 | **PHASE:** 3 | **TYPE:**
MAIN: 200 A | **WIRE:** 4 | **AIC:** 35 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
				1		16.92	4.15						2				
F	PANEL RPB1 (VIA TXRPB1)	SR	125 A	3	3			16.80	4.83			3	4	100 A	SR	PANEL LPB1	F
				5						13.52	2.77		6				
--	SPACE ONLY	--	--	7	--	0.00	0.00					--	8	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	9	--			0.00	0.00			--	10	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	11	--					0.00	0.00	--	12	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	13	--	0.00	0.00					--	14	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	15	--			0.00	0.00			--	16	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	17	--					0.00	0.00	--	18	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	19	--	0.00	0.00					--	20	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	21	--			0.00	0.00			--	22	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	23	--					0.00	0.00	--	24	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	13.16 kVA	125.00%	16.45 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.29 kVA	100.00%	0.29 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	1.86 kVA	100.00%	1.86 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	34.74 kVA	64.39%	22.37 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	6.85 kVA	100.00%	6.85 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

TOTAL KVA...	58.99 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	49.91 kVA	78.7 A	80.8 A	58.8 A
TOTAL AMP....	71 A			
TOTAL AMP. (DEMAND):	60 A			

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)

F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

SR - SEE RISER DIAGRAM

SWITCHBOARD: MSB

VOLTAGE: 480Y/277 3Ø | **MAIN TYPE:** MCB | **MANUFACTUR...**
MOUNTING: FLOOR | **PHASE:** 3 | **TYPE:**
MAIN: 3000 A | **WIRE:** 4 | **AIC:** 65KAIC

MAIN CB NOTES: 5,9,11

CKT/ID	LOAD SERVED	FRAME	TRIP	POLE	FEEDER	NOTES	Load
1	PANEL DPA1	400 A	300 A	3	SEE RISER		135.8 kVA
2	PANEL DPB1	200 A	200 A	3	SEE RISER		59.0 kVA
3	PANEL DPD1	400 A	300 A	3	SEE RISER		101.9 kVA
4	PANEL LS (VIA ATSL)	100 A	100 A	3	SEE RISER	LSI TRIP	17.6 kVA
5	PANEL GENH (VIA ATSG)	200 A	200 A	3	SEE RISER	LSI TRIP	56.7 kVA
6	PANEL KPD1 (VIA TXK)	400 A	350 A	3	SEE RISER		154.8 kVA
7	SPD	100 A	60 A	3		SEE DETAIL	0.0 kVA
8	PANEL MPC1	200 A	125 A	3	SEE RISER		68.8 kVA
9	PANEL MPC1A	200 A	150 A	3	SEE RISER		71.8 kVA
10	PANEL MPC1B	200 A	200 A	3	SEE RISER		82.8 kVA
11	CHILLER 1	600 A	600 A	3	2(3#350,1#1G,3"C)	LSI TRIP	417.0 kVA
12	CHILLER 2	600 A	600 A	3	2(3#350,1#1G,3"C)	LSI TRIP	417.0 kVA
13	PANEL DPB2	400 A	300 A	3	SEE RISER		103.5 kVA
14	PANEL DPA2	600 A	500 A	3	SEE RISER		261.5 kVA
15	PANEL RPC1 VIA TXRPC1	100 A	70 A	3	SEE RISER		44.3 kVA
16	SPARE	--	200 A	3			0.0 kVA
17	SPARE	--	100 A	3			0.0 kVA
18	SPACE ONLY	--	100 A	1			0.0 kVA
19	SPACE ONLY	--	400 A	1			0.0 kVA
20	SPACE ONLY	--	200 A	1			0.0 kVA
21	SPACE ONLY	--	200 A	1			0.0 kVA
22	SPACE ONLY	--	200 A	1			0.0 kVA

Load Classification	Connected Load	Demand Factor	Estimated Demand
LIGHTS	81.41 kVA	125.00%	101.77 kVA
LIGHTING - EXTERIOR	11.41 kVA	125.00%	14.27 kVA
HEATING	26.44 kVA	100.00%	26.44 kVA
COOLING	884.99 kVA	100.00%	884.99 kVA
VENTILATION	280.56 kVA	100.00%	280.56 kVA
MOTORS	61.40 kVA	100.00%	61.40 kVA
KITCHEN	24.27 kVA	65.00%	15.78 kVA
RECEPTACLES	286.24 kVA	51.75%	148.12 kVA
WATER HEATER	11.55 kVA	100.00%	11.55 kVA
MISC.	300.81 kVA	100.00%	300.81 kVA
ELEVATOR	0.00 kVA	0.00%	0.00 kVA
EV CHARGING	0.00 kVA	0.00%	0.00 kVA
Spare	0.00 kVA	0.00%	0.00 kVA

TOTAL KVA (CONNECTED):	1992.4 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	1869.0 kVA	2491.4 A	2468.9 A	2282.3 A
TOTAL AMP. (CONNECTED):	2396.5 A			
TOTAL AMP. (DEMAND):	2248.1 A			

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIRES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL SHALL BE COPPER.
4. ALL INCOMING PANEL AND BKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE AN ENERGY REDUCING MAINTENANCE SWITCH WITH LOCAL STATUS INDICATOR
6. PROVIDE METAL DIRECTORY FRAME.
7. THIS PANEL SHALL BE U.L. LISTED FOR USE AS S.E. EQUIPMENT.
8. SR - SEE RISER.
9. PROVIDE BKR WITH ADJUSTABLE LSI AND GFP TRIP FUNCTIONS.
10. SEE SPECIFICATIONS FOR METERING REQUIRED.
11. 100% RATED MAIN.

PANEL: DPA2

VOLTAGE: 480Y/277 3Ø | **FED FROM:** MSB
MOUNTING: SURFACE | **MAIN TYPE:** MCB | **MFR:**
ENCLOSURE: NEMA1 | **PHASE:** 3 | **TYPE:**
MAIN: 500 A | **WIRE:** 4 | **AIC:** 35 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
				1		5.85	43.47						2				
F	PANEL LPA2	SR	100 A	3	3			4.65	43.47			3	4	250 A	SR	PANEL MPA2	F
				5						3.24	43.47		6				
				7		40.68							8				
F	PANEL RPA2 (VIA TXRPA2)	SR	175 A	9	3			38.83					10				
				11						37.86			12				
				13			0.00						14				
				15					0.00			3	16	100 A	--	SPARE	--
				17							0.00		18				
--	SPACE ONLY	--	--	19	--	0.00	0.00					1	20	20 A	--	SPARE	--
--	SPACE ONLY	--	--	21	--			0.00	0.00			--	22	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	23	--					0.00	0.00	--	24	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	13.73 kVA	125.00%	17.16 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	6.89 kVA	100.00%	6.89 kVA
C	COOLING	10.82 kVA	100.00%	10.82 kVA
V	VENTILATION	113.07 kVA	100.00%	113.07 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	85.24 kVA	55.87%	47.62 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	17.98 kVA	100.00%	17.98 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

TOTAL KVA...	261.53 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	227.34 kVA	326.2 A	315.2 A	305.3 A
TOTAL AMP....	315 A			
TOTAL AMP. (DEMAND):	273 A			

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)

F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

SR - SEE RISER DIAGRAM

PANEL: DPB2

VOLTAGE: 480Y/277 3Ø | **FED FROM:** MSB
MOUNTING: SURFACE | **MAIN TYPE:** MCB | **MFR:**
ENCLOSURE: NEMA1 | **PHASE:** 3 | **TYPE:**
MAIN: 300 A | **WIRE:** 4 | **AIC:** 35 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
				1		8.20	5.37						2				
CO OLI NG	RTU-1	8	40 A	3	3			8.20	5.12			3	4	100 A	SR	PANEL LPB2	L
				5						8.20	0.65		6				
				7		21.82	0.00					--	8	--	--	SPACE ONLY	--
F	PANEL RPB2 (VIA TXRPB2)	SR	175 A	9	3			26.81	0.00			--	10	--	--	SPACE ONLY	--
				11						19.15	0.00	--	12	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	13	--	0.00	0.00					--	14	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	15	--			0.00	0.00			--	16	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	17	--					0.00	0.00	--	18	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	19	--	0.00	0.00					--	20	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	21	--			0.00	0.00			--	22	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	23	--					0.00	0.00	--	24	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	11.14 kVA	125.00%	13.93 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	24.60 kVA	100.00%	24.60 kVA
V	VENTILATION	6.45 kVA	100.00%	6.45 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	43.58 kVA	61.47%	26.79 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	14.51 kVA	100.00%	14.51 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

TOTAL KVA...	103.52 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	89.51 kVA	131.9 A	149.0 A	101.1 A
TOTAL AMP....	125 A			
TOTAL AMP. (DEMAND):	108 A			

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)

F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

SR - SEE POWER RISER DIAGRAM

PANEL: DPD1

VOLTAGE: 480Y/277 3Ø | **FED FROM:** MSB
MOUNTING: SURFACE | **MAIN TYPE:** MCB | **MFR:**
ENCLOSURE: NEMA1 | **PHASE:** 3 | **TYPE:**
MAIN: 300 A | **WIRE:** 4 | **AIC:** 35 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
H	EWH-1 MECH ROOM	12	15 A	1	1	2.00	9.28						2				
H	EWH-2 OUTDOORS ROOM	12	15 A	3	1			2.00	6.49			3	4	100 A	SR	PANEL LPD1	L
--	SPARE	--	20 A	5	1					0.00	2.71		6				
				7		0.80	26.97						8				
C	AHU-11	12	15 A	9	3			0.80	24.35			3	10	125 A	SR	PANEL RPD1 (VIA TXRPD1)	F
				11						0.80	25.72		12				
--	SPACE ONLY	--	--	13	--	0.00	0.00						14				
--	SPACE ONLY	--	--	15	--			0.00	0.00			3	16	60 A	--	SPARE	--
--	SPACE ONLY	--	--	17	--					0.00	0.00		18				
--	SPACE ONLY	--	--	19	--	0.00	0.00					--	20	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	21	--			0.00	0.00			--	22	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	23	--					0.00	0.00	--	24	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	13.22 kVA	125.00%	16.52 kVA
LE	LIGHTING - EXTERIOR	5.62 kVA	125.00%	7.03 kVA
H	HEATING	4.16 kVA	100.00%	4.16 kVA
C	COOLING	9.73 kVA	100.00%	9.73 kVA
V	VENTILATION	2.31 kVA	100.00%	2.31 kVA
M	MOTORS	4.20 kVA	100.00%	4.20 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	29.62 kVA	66.88%	19.81 kVA
WH	WATER HEATER	1.50 kVA	100.00%	1.50 kVA
MS	MISC.	31.00 kVA	100.00%	31.00 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

TOTAL KVA...	101.92 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	96.82 kVA	143.4 A	123.9 A	105.5 A
TOTAL AMP....	123 A			
TOTAL AMP. (DEMAND):	116 A			

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)

F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

SR - SEE RISER DIAGRAM

DPA1	DPB1	MSB	
DPA2	DPB2	DPD1	

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

PANEL SCHEDULES

E-901

Optima # 22-0082

01.12.2023 - BID SET

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PANEL: LPB1

VOLTAGE: 480Y/277 3Ø | FED FROM: DPB1
MOUNTING: SURFACE | MAIN TYPE: MLO | MFR:
ENCLOSURE: NEMA1 | PHASE: 3 | TYPE:
MAIN: 100 A | WIRE: 4 | AIC: 18 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
L	LIGHTS - CORRIDOR B	12	20 A	1	1	1.37	1.78					1	2	20 A	12	LIGHTS STORAGE D111	L
L	LIGHTS TEACHER WORKROOM 140	12	20 A	3	1			2.62	1.95			1	4	20 A	12	LIGHTS CLASSROOM B	L
L	LIGHTS CLASSROOM	12	20 A	5	1					2.60	0.17	1	6	20 A	12	LIGHTS - STORAGE A	L
LI...	SIGNAGE - LTS	12	20 A	7	1	0.15	0.86					1	8	20 A	12	LIGHTS - MECH/ELEC/IDF B	L
--	SPARE	--	20 A	9	1			0.00	0.26			1	10	20 A	12	LIGHTS - STORAGE B	L
--	SPARE	--	20 A	11	1					0.00	0.00	--	12	--	--	SPACE ONLY	--
--	SPARE	--	20 A	13	1	0.00	0.00					--	14	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	15	--			0.00	0.00			--	16	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	17	--					0.00	0.00	--	18	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	19	--	0.00	0.00					--	20	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	21	--			0.00	0.00			--	22	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	23	--					0.00	0.00	--	24	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	25	--	0.00	0.00					--	26	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	27	--			0.00	0.00			--	28	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	29	--					0.00	0.00	--	30	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	31	--	0.00	0.00					--	32	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	33	--			0.00	0.00			--	34	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	35	--					0.00	0.00	--	36	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	37	--	0.00	0.00					--	38	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	39	--			0.00	0.00			--	40	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	41	--					0.00	0.00	--	42	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	11.75 kVA	125.00%	14.68 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	0.00 kVA	0.00%	0.00 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	0.00 kVA	0.00%	0.00 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

		TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA...	11.75 kVA			
TOTAL KVA (DEMAND):	14.68 kVA	15.7 A	18.2 A	10.0 A
TOTAL AMP....	14 A			
TOTAL AMP. (DEMAND):	18 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: LPA1

VOLTAGE: 480Y/277 3Ø | FED FROM: DPA1
MOUNTING: SURFACE | MAIN TYPE: MLO | MFR:
ENCLOSURE: NEMA1 | PHASE: 3 | TYPE:
MAIN: 100 A | WIRE: 4 | AIC: 18 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
L	LIGHTS - CORRIDOR A1	12	20 A	1	1	2.09	0.63					1	2	20 A	12	LIGHTS - OUTSIDE A	L
L	LIGHTS - LIBRARY A	12	20 A	3	1			1.35	2.31			1	4	20 A	10	LIGHTS - OFFICE AREA A	L
L	LIGHTS - CLASSROOM A	8	20 A	5	1					2.54	2.27	1	6	20 A	8	LIGHTS - AREA A CLASSROOM WING	L
L	EXT LIGHTING - PARKING ADMIN	10	20 A	7	1	3.47							8				
L	EXT LIGHTING - BUS AND ROADWAY	12	20 A	9	1			2.32	0.00			--	10	--	--	SPACE ONLY	--
--	SPARE	--	20 A	11	1					0.00	0.00	--	12	--	--	SPACE ONLY	--
--	SPARE	--	20 A	13	1	0.00	0.00					--	14	--	--	SPACE ONLY	--
--	SPARE	--	20 A	15	1			0.00	0.00			--	16	--	--	SPACE ONLY	--
--	SPARE	--	20 A	17	1					0.00	0.00	--	18	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	19	--	0.00	0.00					--	20	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	21	--			0.00	0.00			--	22	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	23	--					0.00	0.00	--	24	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	25	--	0.00	0.00					--	26	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	27	--			0.00	0.00			--	28	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	29	--					0.00	0.00	--	30	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	31	--	0.00	0.00					--	32	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	33	--			0.00	0.00			--	34	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	35	--					0.00	0.00	--	36	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	37	--	0.00	0.00					--	38	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	39	--			0.00	0.00			--	40	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	41	--					0.00	0.00	--	42	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	11.19 kVA	125.00%	13.99 kVA
LE	LIGHTING - EXTERIOR	5.79 kVA	125.00%	7.24 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	0.00 kVA	0.00%	0.00 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	0.00 kVA	0.00%	0.00 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

		TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA...	16.98 kVA			
TOTAL KVA (DEMAND):	21.23 kVA	23.0 A	22.2 A	17.4 A
TOTAL AMP....	20 A			
TOTAL AMP. (DEMAND):	26 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: GENH

VOLTAGE: 480Y/277 3Ø | FED FROM: ATSG
MOUNTING: SURFACE | MAIN TYPE: MLO | MFR: COOPER BUSSMAN
ENCLOSURE: NEMA1 | PHASE: 3 | TYPE:
MAIN: 200 A | WIRE: 4 | AIC: 50 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
				1		23.52	0.00						2				
MS	PANEL GENL (VIA TXGENL)	SR	125 A	3	3			20.18	0.00			3	4	30 A	10	SPD	Oth er
				5						12.95	0.00		6				
				7		0.00	0.00					--	8	--	--	SPACE ONLY	--
--	SPARE	--	30 A	9	3			0.00	0.00			--	10	--	--	SPACE ONLY	--
				11						0.00	0.00	--	12	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	13	--	0.00	0.00					--	14	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	15	--			0.00	0.00			--	16	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	17	--					0.00	0.00	--	18	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	19	--	0.00	0.00					--	20	--	--	SPACE ONLY	--
				21									22				
				23									24				
				25									26				
				27									28				
				29									30				
				31									32				
				33									34				
				35									36				
				37									38				
				39									40				
				41									42				

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.00 kVA	0.00%	0.00 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	5.84 kVA	100.00%	5.84 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	1.00 kVA	100.00%	1.00 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	49.78 kVA	100.00%	49.78 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. BASED ON COOPER BUSSMANN FUSE PANEL WITH BRANCH FUSES FOR SELECTIVE COORDINATION
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

		TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA...	56.65 kVA			
TOTAL KVA (DEMAND):	56.65 kVA	88.9 A	76.9 A	46.8 A
TOTAL AMP....	68 A			
TOTAL AMP. (DEMAND):	68 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.
SR - SEE RISER DIAGRAM

PANEL: LPB2

VOLTAGE: 480Y/277 3Ø | FED FROM: DPB2
MOUNTING: SURFACE | MAIN TYPE: MLO | MFR:
ENCLOSURE: NEMA1 | PHASE: 3 | TYPE:
MAIN: 100 A | WIRE: 4 | AIC: 18 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
L	LIGHTS - CORRIDOR B	10	20 A	1	1	1.88	2.46					1	2	20 A	12	LIGHTS - CLASSROOM B2	L
L	LIGHTS - CLASSROOM B	12	20 A	3	1			2.66	2.46			1	4	20 A	12	LIGHTS - CLASSROOM B3	L
L	LIGHTS - CAFETERIA B	12	20 A	5	1					0.65	0.00	--	6	--	--	SPACE ONLY	--
LI...	LIGHTS CAFETERIA D100	12	20 A	7	1	1.03	0.00					--	8	--	--	SPACE ONLY	--
--	SPARE	--	20 A	9	1			0.00	0.00			--	10	--	--	SPACE ONLY	--
--	SPARE	--	20 A	11	1					0.00	0.00	--	12	--	--	SPACE ONLY	--
--	SPARE	--	20 A	13	1	0.00	0.00					--	14	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	15	--			0.00	0.00			--	16	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	17	--					0.00	0.00	--	18	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	19	--	0.00	0.00					--	20	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	21	--			0.00	0.00			--	22	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	23	--					0.00	0.00	--	24	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	25	--	0.00	0.00					--	26	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	27	--			0.00	0.00			--	28	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	29	--					0.00	0.00	--	30	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	31	--	0.00	0.00					--	32	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	33	--			0.00	0.00			--	34	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	35	--					0.00	0.00	--	36	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	37	--	0.00	0.00					--	38	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	39	--			0.00	0.00			--	40	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	41	--					0.00	0.00	--	42	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	11.14 kVA	125.00%	13.93 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	0.00 kVA	0.00%	0.00 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	0.00 kVA	0.00%	0.00 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

		TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA...	11.14 kVA			
TOTAL KVA (DEMAND):	13.93 kVA	21.9 A	21.0 A	2.3 A
TOTAL AMP....	13 A			
TOTAL AMP. (DEMAND):	17 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: LPA2

VOLTAGE: 480Y/277 3Ø | FED FROM: DPA2
MOUNTING: SURFACE | MAIN TYPE: MCB | MFR:
ENCLOSURE: NEMA1 | PHASE: 3 | TYPE:
MAIN: 100 A | WIRE: 4 | AIC: 18 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
L	LIGHTS - CLASSROOM A	12	20 A	1	1	2.51	2.52					1	2	20 A	10	LIGHTS - CORRIDOR A2	L
L	LIGHTS - LAB A	12	20 A	3	1			2.51	2.14			1	4	20 A	12	LIGHTS - CLASSROOM A4	L
L	LIGHTS - COUNCELING A	12	20 A	5	1					2.36	0.87	1	6	20 A	12	LIGHTS - MEDIA CENTER A	L
LI...	LIGHTS GENERAL/MECH/WORK	12	20 A	7	1	0.81	0.00					--	8	--	--	SPACE ONLY	--
--	SPARE	--	20 A	9	1			0.00	0.00			--	10	--	--	SPACE ONLY	--
--	SPARE	--	20 A	11	1					0.00	0.00	--	12	--	--	SPACE ONLY	--
--	SPARE	--	20 A	13	1	0.00	0.00					--	14	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	15	--			0.00	0.00			--	16	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	17	--					0.00	0.00	--	18	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	19	--	0.00	0.00					--	20	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	21	--			0.00	0.00			--	22	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	23	--					0.00	0.00	--	24	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	25	--	0.00	0.00					--	26	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	27	--			0.00	0.00			--	28	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	29	--					0.00	0.00	--	30	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	31	--	0.00	0.00					--	32	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	33	--			0.00	0.00			--	34	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	35	--					0.00	0.00	--	36	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	37	--	0.00	0.00					--	38	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	39	--			0.00	0.00			--	40	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	41	--					0.00	0.00	--	42	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	13.73 kVA	125.00%	17.16 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	0.00 kVA	0.00%	0.00 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	0.00 kVA	0.00%	0.00 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

		TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA...	13.73 kVA			
TOTAL KVA (DEMAND):	17.16 kVA	21.9 A	17.6 A	11.7 A
TOTAL AMP....	17 A			
TOTAL AMP. (DEMAND):	21 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: GENL

VOLTAGE: 208Y/120 3Ø | FED FROM: TXGENL
MOUNTING: SURFACE | MAIN TYPE: FUSE | MFR: COOPER BUSSMAN
ENCLOSURE: NEMA1 | PHASE: 3 | TYPE:
MAIN: 250 A | WIRE: 4 | AIC: 50 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
MS	REC - IDF 225A	12	20 A	1	1	0.50	0.50					1	2	20 A	12	REC - IDF 225A	MS
MS	REC - IDF 225A	12	20 A	3	1			0.50	0.50			1	4	20 A	12	REC - IDF 225A	MS
MS	REC - IDF 225A	12	20 A	5	1					0.50	1.50	1	6	30 A	10	IDF 225A RACK 1	MS
MS	IDF 225A RACK 2	10	30 A	7	1	1.50	1.50					1	8	30 A	10	IDF 225A RACK 3	MS
MS	REC - IDF 228	12	20 A	9	1			0.50	0.50			1	10	20 A	12	REC - IDF 228	MS
MS	REC - IDF 228	12	20 A	11	1					0.50	0.50	1	12	20 A	12	REC - IDF 228	MS
MS	REC - IDF 228	12	20 A	13	1	0.50	1.50					1	14	30 A	10	IDF 228 RACK 1	MS
MS	IDF 228 RACK 2	10	30 A	15	1			1.50	1.50			1	16	30 A	10	IDF 228 RACK 3	MS
MS	SECURITY - CORRIDOR 100	12	20 A	17	1					0.10	0.40	1	18	20 A	12	SECURITY - VESTIBULE G013	MS
MS	SECURITY - LOBBY G003	12	20 A	19	1	0.40	0.50					1	20	20 A	12	REC - IDF 138	MS
MS	IDF 138 RACK 1	10	30 A	21	1			1.50	1.50			1	22	30 A	10	IDF 138 RACK 2	MS
MS	IDF 138 RACK 3	10	30 A	23	1					1.50	0.50	1	24	20 A	12	REC - IDF 138	MS
MS	REC - IDF 138	12	20 A	25	1	0.50	1.50					1	26	30 A	10	IDF 138 RACK 4	MS
MS	REC - MDF 134	12	20 A	27	1			1.00	1.00			1	28	20 A	12	REC - MDF 134	MS
MS	REC - MDF 134	12	20 A	29	1					1.00	1.00	1	30	20 A	12	REC - MDF 134	MS
MS	MDF 134 RACK 1	10	30 A	31	1	1.50	1.50					1	32	30 A	10	MDF 134 RACK 2	MS
MS	MDF 134 RACK 3	10	30 A	33	1			1.50	1.50			1	34	30 A	10	MDF 134 RACK 4	MS
MS	REC - MDF 134	12	20 A	35	1					1.00	0.50	1	36	20 A	12	BATTERY CHARGER	MS
MS	DATA G110 RACK 1	10	30 A	37	1	1.50	1.50					1	38	30 A	10	DATA G110 RACK 2	MS
MS	DATA G110 RACK 3	10	30 A	39	1			1.50	0.36			1	40	20 A	12	REC - DATA G110	MS
MS	REC - DATA G110	12	20 A	41	1					0.36	0.36	1	42	20 A	12	REC - DATA G110	MS
MS	LIGHTING - FREEZER/HEAT (NOTE 7)	12	20 A	43	1	0.80	0.70					1	44	20 A	12	LIGHTING - COOLER 145	MS
MS	01E - FREEZER HEAT (NOTE 7)	12	20 A	45	1			1.00	0.19			2	46	15 A	12	01F - FREEZER EVAP.	MS
MS	01B - COOLER EVAP.	12	15 A	47	1					0.02	0.19		48				
H	BLOCK HEATER (NOTE 7)	12	20 A	49	1	1.50	0.30					1	50	20 A	12	SEC VESTIBULE B00	MI...
MI...	DOOR HARDWARE POWER	8	20 A	51	1			0.10	0.20			1	52	20 A	8	CAMERA INJECTOR	MI...
				53						1.35	0.48		54				
CO OLI NG	01G - FREEZER CONDENSER	10	30 A	55	3	1.35	0.48					3	56	15 A	12	01C - COOLER CONDENSER	CO OLI NG
				57				1.35	0.48				58				
MS	BAS	12	20 A	59	1					0.50	0.00	1	60	20 A	--	SPARE	--
--	SPARE	--	30 A	61	2	0.00	0.00						62				
				63				0.00	0.00			3	64	30 A	--	SPARE	--
--	SPARE	--	30 A	65	2					0.00	0.00		66				
				67		0.00	1.50					2	68	30 A	10	DATA RACK 014	MIS C.
--	SPARE	--	30 A	69	2			0.00	1.50				70				
				71						0.00	0.50	1	72	20 A	12	BASEMENT DEDICATED IT POWER	MS
--	SPARE	--	30 A	73	2	0.00	2.00					1	74	30 A	10	DATA RACK 014	MI...
				75				0.00	0.50			1	76	20 A	12	REC - DATA RACK 014	R...
MI...	GEN REC./LTG	12	20 A	77	1					0.20	0.00	1	78	20 A	--	SPARE	--
--	SPARE	--	20 A	79	1	0.00	0.00						80				
--	SPARE	--	20 A	81	1			0.00	0.00			3	82	30 A	10	SPD	Oth er
--	SPARE	--	20 A	83	1					0.00	0.00		84				

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.00 kVA	0.00%	0.00 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	5.84 kVA	100.00%	5.84 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	1.00 kVA	100.00%	1.00 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	49.78 kVA	100.00%	49.78 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. BASED ON COOPER BUSSMANN FUSE PANEL WITH BRANCH FUSES FOR SELECTIVE COORDINATION
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.
7. PROVIDE NEMA 1 ENCLOSED BREAKER WITH 30mA GFCI BREAKER IN SERIES ABOVE PANEL.

		TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA...	56.65 kVA			
TOTAL KVA (DEMAND):	56.65 kVA	205.3 A	177.4 A	107.9 A
TOTAL AMP....	157 A			
TOTAL AMP. (DEMAND):	157 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

LPB1	LPA1	GENH
LPB2	LPA2	GENL

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

PANEL SCHEDULES

E-902

Optima # 22-0082

01.12.2023 - BID SET

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PANEL: LS

VOLTAGE: 480Y/277 3Ø | **FED FROM:** ATSL
MOUNTING: SURFACE | **MAIN TYPE:** MLO | **MFR:**
ENCLOSURE: NEMA1 | **PHASE:** 3 | **TYPE:**
MAIN: 100 A | **WIRE:** 4 | **AIC:** 50 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
				1		0.00	0.52					1	2	20 A	12	EM - LTS BASEMENT STORAGE	Li...
F	PANEL LSL VIA XFMR TXLSL	SR	50 A	3	3			0.00	2.41			1	4	20 A	6	EM - LTS STAIR AND CORRIDOR 1A	Li...
				5						0.00	3.02	1	6	20 A	4	EM - EXTERIOR LIGHTING - C	L
Li...	EM - ELEV SHAFT/EQ ROOM	12	20 A	7	1	0.09	0.04					1	8	20 A	12	EM - ELEV LOBBY	Li...
Li...	EM - LTS AREA C GYM/MECH	12	20 A	9	1			1.38	2.88			1	10	20 A	12	EM- LTS STAIR AND CORRIDOR 1B	Li...
Li...	EM - LTS STAIR AND CORRIDOR 2A	8	20 A	11	1					3.07	2.75	1	12	20 A	10	EM - LTS STAIR AND CORRIDOR 2B	Li...
Li...	GYM EMERGENCY LTG	12	20 A	13	1	1.45	0.00						14				
--	SPARE	--	20 A	15	1			0.00	0.00			3	16	30 A	10	SPD	Other
--	SPARE	--	20 A	17	1					0.00	0.00		18				
--	SPARE	--	20 A	19	1	0.00	0.00					--	20	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	21	--			0.00	0.00			--	22	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	23	--					0.00	0.00	--	24	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	25	--	0.00	0.00					--	26	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	27	--			0.00	0.00			--	28	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	29	--					0.00	0.00	--	30	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	31	--	0.00	0.00					--	32	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	33	--			0.00	0.00			--	34	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	35	--					0.00	0.00	--	36	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	37	--	0.00	0.00					--	38	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	39	--			0.00	0.00			--	40	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	41	--					0.00	0.00	--	42	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	17.60 kVA	125.00%	22.01 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	0.00 kVA	0.00%	0.00 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	0.00 kVA	0.00%	0.00 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. BASED ON COOPER BUSSMANN FUSE PANEL WITH BRANCH FUSES FOR SELECTIVE COORDINATION
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.
7. GENERATOR IS BACKUP FOR ALL LIFE SAFETY (EM) CIRCUITS

TOTAL KVA...	17.60 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	22.01 kVA	7.6 A	26.6 A	34.4 A
TOTAL AMP....	21 A			
TOTAL AMP. (DEMAND):	26 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.
SR - SEE RISER DIAGRAM

PANEL: LSL

VOLTAGE: 208Y/120 3Ø | **FED FROM:**
MOUNTING: SURFACE | **MAIN TYPE:** FUSE | **MFR:** COOPER/BUSSMAN
ENCLOSURE: NEMA1 | **PHASE:** 3 | **TYPE:**
MAIN: 110 A | **WIRE:** 4 | **AIC:** 50 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
Li...	LIGHTS EXCEPTIONAL A102	12	20 A	1	1	0.32	0.50					1	2	20 A	12	FACP - WH 148 *	Mi...
				3				0.00	0.30			1	4	20 A	12	NAC - ELEC 112	Mi...
MS	SPD	10	30 A	5	3					0.00	0.30	1	6	20 A	12	NAC -. ELEC D103	Mi...
				7		0.00	0.30					1	8	20 A	12	NAC - ELEC G112	Mi...
Mi...	NAC - ELEC 238	12	20 A	9	1			0.30	0.30			1	10	20 A	12	NAC - ELEC 225	Mi...
Mi...	ERRS AMP	12	20 A	11	1					0.50	0.50	1	12	20 A	12	ERRS AMP	Mi...
Mi...	TWO WAY MASTER STATION	10	20 A	13	1	0.30	0.05					1	14	20 A	12	LIGHTS CONFERENCE ROOM 013	Li...
--	SPARE	--	20 A	15	1			0.00	0.02			1	16	20 A	12	ELEV. TWO WAY	Ot...
--	SPARE	--	20 A	17	1					0.00	0.00	--	18	--	--	SPACE ONLY	--
--	SPARE	--	20 A	19	1	0.00	0.00					--	20	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	21	--			0.00	0.00			--	22	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	23	--					0.00	0.00	--	24	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	25	--	0.00	0.00					--	26	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	27	--			0.00	0.00			--	28	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	29	--					0.00	0.00	--	30	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	31	--	0.00	0.00					--	32	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	33	--			0.00	0.00			--	34	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	35	--					0.00	0.00	--	36	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	37	--	0.00	0.00					--	38	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	39	--			0.00	0.00			--	40	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	41	--					0.00	0.00	--	42	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.37 kVA	125.00%	0.46 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	0.00 kVA	0.00%	0.00 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	3.30 kVA	100.00%	3.30 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. BASED ON COOPER BUSSMANN FUSE PANEL WITH BRANCH FUSES FOR SELECTIVE COORDINATION
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.
7. GENERATOR IS BACKUP FOR ALL LIFE SAFETY (EM) CIRCUITS

TOTAL KVA...	3.68 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	3.77 kVA	12.7 A	7.6 A	11.3 A
TOTAL AMP....	10 A			
TOTAL AMP. (DEMAND):	10 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.
* - FIRE ALARM CIRCUIT

PANEL: MPC1A

VOLTAGE: 480Y/277 3Ø | **FED FROM:** MSB
MOUNTING: SURFACE | **MAIN TYPE:** MLO | **MFR:**
ENCLOSURE: NEMA1 | **PHASE:** 3 | **TYPE:**
MAIN: 150 A | **WIRE:** 4 | **AIC:** 35 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
				1		5.57	3.70						2				
V	AHU-1 SUPPLY	8	40 A	3	3			5.57	3.70			3	4	30 A	10	AHU-1 RETURN	V
				5						5.57	3.70		6				
V	AHU-3 SUPPLY	6	50 A	9	3	7.33	7.33						8				
				11				7.33	7.33			3	10	50 A	6	AHU-3 RETURN	V
				13						7.33	7.33		12				
--	SPARE	--	20 A	15	3	0.00	0.00						14				
				17				0.00	0.00			3	16	30 A	--	SPARE	--
				19						0.00	0.00		18				
--	SPACE ONLY	--	--	21	--	0.00	0.00					--	20	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	23	--			0.00	0.00			--	22	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	25	--					0.00	0.00	--	24	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	27	--	0.00	0.00					--	26	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	29	--			0.00	0.00			--	28	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	31	--	0.00	0.00					--	30	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	33	--			0.00	0.00			--	32	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	35	--					0.00	0.00	--	34	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	37	--	0.00	0.00					--	36	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	39	--			0.00	0.00			--	38	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	41	--					0.00	0.00	--	40	--	--	SPACE ONLY	--
												--	42	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.00 kVA	0.00%	0.00 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	71.80 kVA	100.00%	71.80 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	0.00 kVA	0.00%	0.00 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	0.00 kVA	0.00%	0.00 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

TOTAL KVA...	71.80 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	71.80 kVA	86.4 A	86.4 A	86.4 A
TOTAL AMP....	86 A			
TOTAL AMP. (DEMAND):	86 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: MPA2

VOLTAGE: 480Y/277 3Ø | **FED FROM:** DPA2
MOUNTING: SURFACE | **MAIN TYPE:** MCB | **MFR:**
ENCLOSURE: NEMA1 | **PHASE:** 3 | **TYPE:**
MAIN: 250 A | **WIRE:** 4 | **AIC:** 35 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
				1		2.10	2.10						2				
VENTIL A...	AHU-5 SUPPLY	12	15 A	3	3			2.10	2.10			3	4	15 A	12	AHU-5 RETURN	Other; V...
				5						2.10	2.10		6				
VENTIL A...	AHU-6 SUPPLY	12	20 A	7	3	3.05	2.10						8				
				9				3.05	2.10			3	10	15 A	12	AHU-6 RETURN	VENTIL A...
				11						3.05	2.10		12				
VENTIL A...	AHU-7 SUPPLY	8	40 A	13	3	5.82	3.87						14				
				15				5.82	3.87			3	16	20 A	12	AHU-7 RETURN	Other; V...
				17						5.82	3.87		18				
VENTIL A...	AHU-8 SUPPLY	12	20 A	19	3	2.90	2.20						20				
				21				2.90	2.20			3	22	20 A	12	AHU-8 RETURN	Other; V...
				23						2.90	2.20		24				
VENTIL A...	AHU-9 SUPPLY	12	20 A	25	3	3.70	3.01						26				
				27				3.70	3.01			3	28	15 A	12	AHU-9 RETURN	Other; V...
				29						3.70	3.01		30				
VENTIL A...	AHU-10 SUPPLY	8	40 A	31	3	5.60	4.82						32				
				33				5.60	4.82			3	34	20 A	12	AHU-10 RETURN	Other; V...
				35						5.60	4.82		36				
				37		0.00	2.20						38				
--	SPARE	--	30 A	39	3			0.00	2.20			3	40	15 A	12	ERV-1	HEATING...
				41						0.00	2.20		42				

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.00 kVA	0.00%	0.00 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	6.60 kVA	100.00%	6.60 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	112.32 kVA	100.00%	112.32 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	0.00 kVA	0.00%	0.00 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	0.00 kVA	0.00%	0.00 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

TOTAL KVA...	130.42 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	130.42 kVA	156.9 A	156.9 A	156.9 A
TOTAL AMP....	157 A			
TOTAL AMP. (DEMAND):	157 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: MPC1B

VOLTAGE: 480Y/277 3Ø | **FED FROM:** MSB
MOUNTING: SURFACE | **MAIN TYPE:** MLO | **MFR:**
ENCLOSURE: NEMA1 | **PHASE:** 3 | **TYPE:**
MAIN: 200 A | **WIRE:** 4 | **AIC:** 35 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
				1		7.00	3.70						2				
V	AHU-2 SUPPLY	6	50 A	3	3			7.00	3.70			3	4	30 A	10	AHU-2 RETURN	V
				5						7.00	3.70		6				
V	AHU-4 SUPPLY	4	70 A	7	3	9.42	7.48						8				
				9				9.42	7.48			3	10	50 A	6	AHU-4 RETURN	V
				11						9.42	7.48		12				
				13		0.00	0.00						14				
--	SPARE	--	20 A	15	3			0.00	0.00			3	16	30 A	--	SPARE	--
				17						0.00	0.00		18				
				19		0.00	0.00						20				
--	SPARE	--	60 A	21	3			0.00	0.00			--	22	--	--	SPACE ONLY	--
				23						0.00	0.00	--	24	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	25	--	0.00	0.00					--	26	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	27	--			0.00	0.00			--	28	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	29	--					0.00	0.00	--	30	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	31	--	0.00	0.00					--	32	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	33	--			0.00	0.00			--	34	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	35	--					0.00	0.00	--	36	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	37	--	0.00	0.00					--	38	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	39	--			0.00	0.00			--	40	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	41	--					0.00	0.00	--	42	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.00 kVA	0.00%	0.00 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	82.78 kVA	100.00%	82.78 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	0.00 kVA	0.00%	0.00 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	0.00 kVA	0.00%	0.00 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

TOTAL KVA...	82.78 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	82.78 kVA	99.6 A	99.6 A	99.6 A
TOTAL AMP....	100 A			
TOTAL AMP. (DEMAND):	100 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

LS	LSL	MPC1A	
MPA2		MPC1B	

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

PANEL SCHEDULES

E-903

Optima # 22-0082

01.12.2023 - BID SET

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PANEL: RPA1

VOLTAGE: 208Y/120 3Ø | FED FROM: TXRPA1
MOUNTING: SURFACE | MAIN TYPE: MCB | MFR:
ENCLOSURE: NEMA1 | PHASE: 3 | TYPE:
MAIN: 400 A | WIRE: 4 | AIC: 10 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
R	REC - CORRIDOR A 116C	12	20 A	1	1	1.26	0.72					1	2	20 A	12	REC - CORRIDOR A2	R
R	REC - CORRIDOR A3	12	20 A	3	1			1.08	0.72			1	4	20 A	12	REC - EXCEPTIONAL A102	R...
R...	REC - ART A104	12	20 A	5	1					0.90	0.18	1	6	20 A	12	REC - EXCEPTIONAL A102	R...
R...	REC - ART A104	12	20 A	7	1	1.08	0.80					1	8	20 A	12	WASHER A101B (NOTE 8)	MI...
R...	REC - CONF A101A	12	20 A	9	1			0.90	0.30			1	10	20 A	12	EWC - BOYS 132 (NOTE 8)	R
R	REC - STORAGE CORR A	12	20 A	11	1					1.26	0.90	1	12	20 A	12	REC - CONFERENCE A122	R...
R	REC - RECEPTION A	12	20 A	13	1	1.08	0.54					1	14	20 A	12	REC - OFFICERS 104	R
R	REC - HEALTH RM A	12	20 A	15	1			0.90	1.44			1	16	20 A	12	REC - OFFICE 110, 108	R
R	REC - REGISTRAR 109	12	20 A	17	1					0.90	0.50	1	18	20 A	12	UC REF. - HEALTHRM 103 (NOTE 8)	MI...
R...	REC - METAL DETECTOR EAST	12	20 A	19	1	0.90	1.08					1	20	20 A	12	REC - SEC/SIMS A	R
H...	VAV BOXES	12	20 A	21	1			0.50	0.30			1	22	20 A	12	EWC LOUNGE (NOTE 8)	R
R	REC - TEACHER LOUNGE A	12	20 A	23	1					0.36	1.26	1	24	20 A	12	REC - MEDIA CENTER A	R
R	PRINTER - MAIL ROOM A	12	20 A	25	1	0.80	0.54					1	26	20 A	12	REC - MEDIA CENTER A M100	R
R	REC - MEDIA CENTER A	12	20 A	27	1			1.44	0.54			1	28	20 A	12	REC - WORKROOM A M102	R
R	REC - WORKROOM A	12	20 A	29	1					0.36	0.90	1	30	20 A	12	REC - CONFERENCE A M104	R
R	REC - OFFICE A4	12	20 A	31	1	1.44	0.72					1	32	20 A	12	REC - RESOURCE A 136	R
R	REC - ISS A	12	20 A	33	1			1.44	0.54			1	34	20 A	12	REC - LIBRARY A M105	R
R	REC - RESOURCE A136	12	20 A	35	1					0.72	0.30	1	36	20 A	12	REC - STEM / CPU LAB 137	MI...
R	REC - STEM / CPU LAB 137	12	20 A	37	1	0.72	0.72					1	38	20 A	12	REC - STEM / CPU LAB 137	R
R	REC - STEM / CPU LAB 137	12	20 A	39	1			0.54	0.72			1	40	20 A	12	REC - STEM / CPU LAB 137	R...
R...	REC - STEM / CPU LAB 137	12	20 A	41	1					0.36	0.36	1	42	20 A	12	REC - CUST 126 A	R
R...	REC - STEM / CPU LAB 137	12	20 A	43	1	0.72	0.72					1	44	20 A	12	REC - SCIENCE PREP A B104A	R...
MI...	EWC - BATHROOM (NOTE 8)	12	20 A	45	1			0.30	0.18			1	46	20 A	12	REC - ELEC A 112	R
R	REC - OUTSIDE A	8	20 A	47	1					0.90	0.72	1	48	20 A	12	REC - ART A 104	R...
R...	REC - WORKROOM A2	12	20 A	49	1	0.54	1.50					2	50	30 A	10	DRYER - LAUNDRY A2	MISC.
R...	REC - SCIENCE PREP A2	12	20 A	51	1			0.54	1.50				52				
MI...	REC - REFRIGERATOR (NOTE 8)	12	20 A	53	1					0.50	0.36	1	54	20 A	12	REC - LAUNDRY A 101C	R...
MI...	DISHWASHER (NOTE 8)	12	20 A	55	1	0.70	0.90					1	56	20 A	12	REC - OUTDOOR ART WALL	R...
R...	REC - NURSE OFFICE	12	20 A	57	1			0.72	0.50			1	58	20 A	12	REC - EXCEPTIONAL TLT	MI...
R...	REC - AP2	12	20 A	59	1					0.90	0.18	1	60	20 A	12	REC - EXCEPTIONAL A101	R...
MI...	EWC ADMIN (NOTE 8)	12	20 A	61	1	0.30	0.70					1	62	20 A	12	FRIDGE - EXCEPTIONAL A2 (NOTE 8)	MI...
R...	REC - SECURITY A 101	12	20 A	63	1			0.90	0.50			1	64	20 A	12	DISHWASHER - EXCEPTIONA (NOT...	MI...
R...	REC - OFFICERS 104	12	20 A	65	1					0.36	0.72	1	66	20 A	12	REC - EXCEPTIONAL A101	R...
R...	REC - OFFICE A 107	12	20 A	67	1	1.08	0.54					1	68	20 A	12	REC - EXCEPTIONAL A101	R...
R...	REC - CORRIDOR A4	12	20 A	69	1			0.72	0.72			1	70	20 A	12	REC - EXCEPTIONAL A101	R...
R...	REC - CORRIDOR A5	12	20 A	71	1					1.08	0.72	1	72	20 A	12	REC - METAL DETECTORS NORTH	R...
R...	REC - EXCEPTIONAL A102	12	20 A	73	1	0.90	0.90					1	74	20 A	12	REC - EXCEPTIONAL A102	R...
R...	REC - FOREIGN LANGUAGE A103	12	20 A	75	1			0.72	0.18			1	76	20 A	12	REC - FOREIGN LANGUAGE A103	R...
R...	REC - FOREIGN LANGUAGE A103	12	20 A	77	1					0.90	0.90	1	78	20 A	12	REC - FOREIGN LANGUAGE A103	R...
MI...	FANS F-9,10,11 - SCIENCE B104A	12	20 A	79	1	1.85	1.87					1	80	20 A	12	FAN F-14	MI...
MISC.	KILN	8	40 A	81	3			3.67	0.60			1	82	20 A	12	REC - NURSE ICE (NOTE 8)	MI...
				83						3.67	0.10	1	84	20 A	12	SMOKE DAMPER	MI...
				85		3.67	0.50					1	86	20 A	12	REC - STUDENT CHECK-IN	R...
R...	FLR BOX - CONFERENCE ROOM...	12	20 A	87	1			0.36	0.80			1	88	20 A	12	PRINTER - RECEPTION 120	R...
R...	REC - RECEPTION 120	12	20 A	89	1					0.72	0.18	1	90	20 A	12	REC - MAIL ROOM A 123	R...
R...	REC - MEDIA CENTER M100	12	20 A	91	1	0.72	0.72					1	92	20 A	12	REC - CORRIDOR A	R...
R...	REC - PRINCIPAL 121	12	20 A	93	1			1.44	0.72			1	94	20 A	12	REC - FIN. SEC. 124	R...
R...	RECEPTACLES MEDIA CENTER M100	12	20 A	95	1					0.72	0.36	1	96	20 A	12	REC - CUST 126 A	R...
R...	REC - CUST A 126	12	20 A	97	1	0.36	0.36					1	98	20 A	12	REC - TEACHER LOUNGE A 125	R...
MI...	FRIDGE M102 (NOTE 8)	12	20 A	99	1			0.60	0.83			1	100	15 A	12	FAN - F-15	V...
MI...	VENDING - TEACHERS LG (NOTE 8)	12	20 A	101	1					0.18	1.00	1	102	20 A	12	VENDING - TEACHERS LG (NOTE 8)	MI...
MI...	FRIDGE - TEACHERS LG (NOTE 8)	12	20 A	103	1	0.60	0.36					1	104	20 A	12	REC - TEACH LOUNGE 125	R...
MI...	HAND DRYER (NOTE 9)	12	20 A	105	1			1.00	1.00			1	106	20 A	12	HAND DRYER (NOTE 9)	MI...
MI...	HAND DRYER (NOTE 9)	12	20 A	107	1					1.00	1.00	1	108	20 A	12	HAND DRYER (NOTE 9)	MI...
MI...	HAND DRYER (NOTE 9)	12	20 A	109	1	1.00	1.00					1	110	20 A	12	HAND DRYER (NOTE 9)	MI...
MI...	HAND DRYER (NOTE 9)	12	20 A	111	1			1.00	1.00			1	112	20 A	12	HAND DRYER (NOTE 9)	MI...
R...	REC - CLASS 6-1 A	12	20 A	113	1					0.72	0.30	1	114	20 A	12	REC - CLASS 6-1 A2	MI...
R...	REC - CLASS 6-1 A3	12	20 A	115	1	0.90	0.90					1	116	20 A	12	REC - CLASS 6-1 A4	R...
MI...	REC - CLASS 6-2 A	12	20 A	117	1			0.30	0.72			1	118	20 A	12	REC - CLASS 6-2 A2	R...
R...	REC - CLASS 6-2 A3	12	20 A	119	1					0.90	0.90	1	120	20 A	12	REC - CLASS 6-2 A4	R...
R...	REC - CLASS 6-3 A	12	20 A	121	1	0.72	0.30					1	122	20 A	12	REC - CLASS 6-3 A2	MI...
R...	REC - CLASS 6-3 A3	12	20 A	123	1			0.90	0.90			1	124	20 A	12	REC - CLASS 6-3 A4	R...
R...	REC - CLASS 6-4 A	12	20 A	125	1					1.08	0.30	1	126	20 A	12	REC - CLASS 6-4 A2	MI...
R...	REC - CLASS 6-4 A3	12	20 A	127	1	0.54	0.36					1	128	20 A	12	REC - CLASS 6-4 A4	R...
R...	REC - CLASS 6-4 A5	12	20 A	129	1			0.36	0.36			1	130	20 A	12	REC - CLASS 6-4 A6	R...
R...	REC - CLASS 6-5 A	12	20 A	131	1					0.72	0.30	1	132	20 A	12	REC - CLASS 6-5 A2	MI...
R...	REC - CLASS 6-5 A3	12	20 A	133	1	0.90	0.90					1	134	20 A	12	REC - CLASS 6-5 A4	R...
R...	METAL DETECTORS - SOUTH	12	20 A	135	1			0.72	0.30			1	136	20 A	12	ALERT POWER - MEDIA M100	MI...
R...	REC - MEDIA CENTER M100	12	20 A	137	1					0.36	0.18	1	138	20 A	12	REC - AV PRODUCTION A M106	R...
R...	REC - AV PRODUCTION A5	12	20 A	139	1	0.72	0.72					1	140	20 A	12	REC - STEM / CPU LAB A6	R...
MI...	AUTO DOORS VESTIBULE 100	12	20 A	141	1			0.60	0.18			1	142	20 A	12	REC - RESOURCE A4	R...
R...	REC - RESOURCE A136	12	20 A	143	1					0.36	0.30	1	144	20 A	12	REC - KILN FAN - A104B	V...
R...	REC - RESOURCE A136	12	20 A	145	1	0.72	0.54					1	146	20 A	12	REC - AV PRODUCTION A M106	R...
R...	REC - AV PRODUCTION A2	12	20 A	147	1			0.18	0.72			1	148	20 A	12	REC - AV PRODUCTION A M106	R...
R	REC - EQUIPMENT STORAGE M101	12	20 A	149	1					0.18	0.35	2	150	20 A	12	RCP2	MOT...
LI...	**LIGHTS CONF 210**	12	20 A	151	1	0.11	0.35						152				
R...	REC - EQUIPMENT STORAGE M101	12	20 A	153	1			0.18	0.18			1	154	20 A	12	REC - EQUIP STORAGE M101	R...
R...	REC - EQUIPMENT STORAGE M101	12	20 A	155	1					0.18	0.18	1	156	20 A	12	REC - ELEVATOR 130	R...
Ot...	SUMP SP1	12	20 A	157	1	0.02	0.18					1	158	20 A	12	RECE - ELEV-1 130-1	R...
MI...	EWC - CORRIDOR 105C (NOTE 8)	12	20 A	159	1			0.30	0.00			1	160	20 A	--	SPARE	--
MI...	EWC - CORRIDOR 105C (NOTE 8)	12	20 A	161	1					0.30	0.00	1	162	20 A	--	SPARE	--
R...	REC - WORK ROOM 123	12	20 A	163	1	0.72	0.00					1	164	20 A	--	SPARE	--
MI...	SUMP ALARM	12	20 A	165	1			0.18	0.00			1	166	20 A	--	SPARE	--
LI...	**LIGHTS EXCEPTIONAL...**	8	20 A	167	1					1.26	0.00	1	168	20 A	--	SPARE	--
Ot...	ELEV CONTROLS	12	20 A	169	1	0.02	0.00					1	170	20 A	--	SPARE	--
Ot...	ELEV LIGHTS	12	20 A	171	1			0.02	0.00			1	172	20 A	--	SPARE	--
--	SPACE ONLY	--	--	173	--					0.00	0.00	1	174	20 A	--	SPARE	--
--	SPACE ONLY	--	--	175	--	0.00	0.00					1	176	20 A	--	SPARE	--
--	SPACE ONLY	--	--	177	--			0.00	0.00			1	178	20 A	--	SPARE	--
--	SPACE ONLY	--	--	179	--					0.00	0.00	1	180	20 A	--	SPARE	--
--	SPACE ONLY	--	--	181	--	0.00	0.00					1	182	20 A	--	SPARE	--
--	SPACE ONLY	--	--	183	--			0.00	0.00			1	184	20 A	--	SPARE	--
--	SPACE ONLY	--	--	185	--					0.00	0.00	1	186	20 A	--	SPARE	--
--	SPACE ONLY	--	--	187	--	0.00	0.00					1	188	20 A	--	SPARE	--
--	SPACE ONLY	--	--	189	--			0.00	0.00			1	190	20 A	--	SPARE	--
--	SPACE ONLY	--	--	191	--					0.00	0.00	--	192	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	193	--	0.00	0.00					--	194	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	195	--			0.00	0.00			--	196	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	197	--					0.00	0.00	--	198	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	199	--	0.00	0.00					--	200	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	201	--			0.00	0.00			--	202	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	203	--					0.00	0.00	--	204	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	205	--	0.00	0.00					3	206	30 A	10	SPD	Other
--	SPACE ONLY	--	--	207	--			0.00	0.00				208				
--	SPACE ONLY	--	--	209	--					0.00	0.00		210				

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	1.37 kVA	125.00%	1.71 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.50 kVA	100.00%	0.50 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	1.00 kVA	100.00%	1.00 kVA
M	MOTORS	0.70 kVA	100.00%	0.70 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	73.12 kVA	56.84%	41.56 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	39.81 kVA	100.00%	39.81 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.
7. PROVIDE FEED-THRU LUGS.
8. PROVIDE CLASS A GFI (6mA-PERSONNEL) BRKR (250' MAX).
9. PROVIDE HANDLE LOCK.

		TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA...	118.76 kVA			
TOTAL KVA (DEMAND):	87.54 kVA	375.6 A	329.3 A	294.1 A
TOTAL AMP....	330 A			
TOTAL AMP. (DEMAND):	243 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: RPA2

VOLTAGE: 208Y/120 3Ø | FED FROM: TXRPA2
MOUNTING: SURFACE | MAIN TYPE: MCB | MFR:
ENCLOSURE: NEMA1 | PHASE: 3 | TYPE:
MAIN: 400 A | WIRE: 4 | AIC: 10 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
R	REC - COLLAB 225F	12	20 A	1	1	0.72	1.26					1	2	20 A	12	REC - CORRIDOR 201C	R
R	REC - TEST COORD 1	12	20 A	3	1			0.72	0.72			1	4	20 A	12	REC - TEST COORD 2	R
H...	VAV'S	12	20 A	5	1					0.02	1.08	1	6	20 A	12	REC - TLT COUNSELING	R
R	REC - ELEV C1	12	20 A	7	1	0.18	0.72					1	8	20 A	12	REC - ROOFTOP	R
R	REC - STORAGE 206/207	12	20 A	9	1			1.26	1.44			1	10	20 A	12	REC - COUNSELOR 203/204	R
R	REC - ASST PRIN #1 205	12	20 A	11	1					0.72	0.50	1	12	20 A	12	AHU-6 CONTROLS	MI...
R	REC - PSYCH 213	12	20 A	13	1	1.44	0.30					1	14	20 A	12	EWC - GUIDENCE HALL (NOTE 8)	R
R	REC - COUNSELOR 211	12	20 A	15	1			0.72	0.72			1	16	20 A	12	REC - CONF 210	R
R	REC - COLLAB B201	12	20 A	17	1					0.72	0.54	1	18	20 A	12	REC - COLLAB B201	R
MS	HAND DRYER - (HL)	12	20 A	19	1	1.00	0.72					1	20	20 A	12	REC- EXPLORING TECH B203	R
R	REC- EXPLOR. TECH SYSTEMS B203	12	20 A	21	1			0.72	0.72			1	22	20 A	12	REC- EXPLORING TECH B203	R
R	REC- EXPLOR. TECH SYSTEMS B203	12	20 A	23	1					0.72	0.72	1	24	20 A	12	REC - COLLAB	R
R	REC - COLLAB	12	20 A	25	1	0.18	0.36					1	26	20 A	12	REC - CUST 220	R
R	REC- EXPLORING/ BUS/ MARK. B206	12	20 A	27	1			0.18	0.36			1	28	20 A	12	REC- EXPLORING/ BUS./ MARK. B206	R
R	REC - CPU LAB B208	12	20 A	29	1					0.72	0.21	1	30	20 A	12	FANS F-20, F-21 STORAGE A204B	H...
R	REC - CPU LAB B208	12	20 A	31	1	0.54	1.26					1	32	20 A	12	REC - RESOURCE 7 B210	R
R	REC - RESOURCE 7 B210 C2	12	20 A	33	1			0.72	0.90			1	34	20 A	12	REC - Room 241A, B208A	R
R	REC - STEM LAB 241	12	20 A	35	1					0.72	0.72	1	36	20 A	12	REC - STEM LAB 241	R
R	REC - STEM LAB 241	12	20 A	37	1	0.72	0.72					1	38	20 A	12	REC - STEM LAB 241	R
R	REC - RESOURCE 8 A206 C	12	20 A	39	1			0.18	1.08			1	40	20 A	12	REC - RESOURCE 8 A206 C2	R
R	REC - COLLAB 225G	12	20 A	41	1					0.72	0.30	1	42	20 A	12	EWC - GIRLS 218 (NOTE 8)	MS
MS	EWC - BOYS 217 (NOTE 8)	12	20 A	43	1	0.30	0.30					1	44	20 A	12	EWC - GIRLS 222 (NOTE 8)	MS
MS	EWC - BOYS 223 (NOTE 8)	12	20 A	45	1			0.30	0.45			1	46	20 A	12	ROOF FANS F34,35,36,37	V...
R	REC - TEACHER WORKROOM B	12	20 A	47	1					0.18	0.72	1	48	20 A	12	REC - CLASSROOM A207	R...
R	REC - CONF	12	20 A	49	1	0.36	0.72					1	50	20 A	12	REC - GUIDANCE	R
MI...	AHU-5 CONTROLS	12	20 A	51	1			0.50	0.72			1	52	20 A	12	REC - COLLAB B201	R
R	REC - COLLAB B201	12	20 A	53	1					0.54	0.18	1	54	20 A	12	REC - COLLAB B201	R
R	REC - TECH SYSTEMS B203	12	20 A	55	1	0.72	0.72					1	56	20 A	12	REC- EXPLORING TECH B203	R
R	REC - SYSTEMS B203	12	20 A	57	1			0.72	0.72			1	58	20 A	12	REC- EXPLORING TECH B203	R
R	REC - TECH SYSTEMS B203	12	20 A	59	1					0.36	1.00	1	60	20 A	12	HAND DRYER (HL)	MS
MS	HAND DRYER (HL)	12	20 A	61	1	1.00	1.00					1	62	20 A	12	HAND DRYER (HL)	MS
R	REC - SCIENCE PREP B207A	12	20 A	63	1			0.54	0.54			1	64	20 A	12	REC - SCIENCE PREP B207A	R
MS	FAN F-23,24,25 - STOR	12	20 A	65	1					2.35	0.50	1	66	20 A	12	AHU-7 CONTROLS	MI...
R	FRIDGE - PREP B207A (NOTE 8)	12	20 A	67	1	0.50	1.00					1	68	20 A	12	DISHWASHER - B207A (NOTE 8)	R
R	REC - BUSINESS/ MARKETING B206	12	20 A	69	1			0.72	0.54			1	70	20 A	12	REC - BUSINESS/ MARKETING B206	R
R	REC - SCIENCE CLASSROOM B207	12	20 A	71	1					0.36	0.54	1	72	20 A	12	REC - SCIENCE CLASS 7-4 B207	R
R	REC - SCIENCE CLASSROOM B207	12	20 A	73	1	0.36	1.08					1	74	20 A	12	REC - SCIENCE CLASS 7-4 B207	R
R	REC - SCIENCE CLASSROOM B207	12	20 A	75	1			0.36	0.18			1	76	20 A	12	REC - SCIENCE CLASS 7-4 B207	R
R	REC - CLASSROOM 7-5 B209	12	20 A	77	1					0.72	0.90	1	78	20 A	12	REC - CLASSROOM 7-5 B209	R
R	REC - CLASSROOM 7-5 B209	12	20 A	79	1	0.90	0.18					1	80	20 A	12	REC - CLASSROOM 7-5 B209	R
R	REC - CLASSROOM 7-3 B205	12	20 A	81	1			0.90	0.72			1	82	20 A	12	REC - CLASSROOM 7-3 B205	R
R	REC - CLASSROOM 7-3 B205	12	20 A	83	1					0.18	0.90	1	84	20 A	12	REC - CLASSROOM 7-3 B205	R
R	REC - STEM LAB 241	12	20 A	85	1	0.72	0.72					1	86	20 A	12	REC - STEM LAB 241	R
R	REC - STEM LAB 241	12	20 A	87	1			1.08	0.18			1	88	20 A	12	REC - MECH 221	R
R	REC - STEM LAB 241	12	20 A	89	1					0.54	0.90	1	90	20 A	12	REC - CLASSROOM A207	R...
R	REC - CPU LAB B208	12	20 A	91	1	0.54	1.00					1	92	20 A	12	REC - PRINTER	MS
R	REC - CPU LAB B208	12	20 A	93	1			0.72	0.72			1	94	20 A	12	REC - CPU LAB B208	R
R	REC - BUSINESS/ MARKETING B206	12	20 A	95	1					0.54	1.00	1	96	20 A	12	HAND DRYER (HL)	MS
MS	HAND DRYER (HL)	12	20 A	97	1	1.00	1.00					1	98	20 A	12	HAND DRYER (HL)	MS
MS	HAND DRYER (HL)	12	20 A	99	1			1.00	0.18			1	100	20 A	12	REC - TEACHER WORKROOM 224	R
R	REC - CLASSROOM 7-2 B204	12	20 A	101	1					0.72	0.18	1	102	20 A	12	REC - CLASSROOM 7-2 B204	R
R	REC - CLASSROOM 7-2 B204	12	20 A	103	1	0.90	0.90					1	104	20 A	12	REC - CLASSROOM 7-2 B204	R
R	REC - CLASSROOM 7-1 B202	12	20 A	105	1			0.72	0.90			1	106	20 A	12	REC - CLASSROOM 7-1 B202	R
R	REC - CLASSROOM 7-1 B202	12	20 A	107	1					1.08	0.18	1	108	20 A	12	REC - CLASSROOM 7-1 B202	R
R	REC - COLLAB	12	20 A	109	1	0.90	0.54					1	110	20 A	12	REC - COLLAB	R
R	REC - COLLAB	12	20 A	111	1			0.54	0.18			1	112	20 A	12	REC - CLASSROOM 8-4 A205	R
R	REC - CLASSROOM 8-4 A205	12	20 A	113	1					0.72	0.90	1	114	20 A	12	REC - CLASSROOM 8-4 A205	R
R	REC - CLASSROOM 8-4 A205	12	20 A	115	1	0.90	0.18					1	116	20 A	12	REC - SCIENCE 8-1 A204	R
R	REC - SCIENCE 8-1 A204	12	20 A	117	1			0.54	0.36			1	118	20 A	12	REC - SCIENCE 8-1 A204	R
R	REC - SCIENCE 8-1 A204	12	20 A	119	1					0.36	1.08	1	120	20 A	12	REC - SCIENCE 8-1 A204	R
R	REC - SCIENCE 8-1 A204	12	20 A	121	1	0.36	0.18					1	122	20 A	12	REC - CLASSROOM 8-3 A203	R
R	REC - CLASSROOM 8-3 A203	12	20 A	123	1			0.72	0.90			1	124	20 A	12	REC - CLASSROOM 8-3 A203	R
R	REC - CLASSROOM 8-3 A203	12	20 A	125	1					0.72	0.72	1	126	20 A	12	REC - CLASSROOM 8-1 A201	R
R	REC - CLASSROOM 8-1 A201	12	20 A	127	1	0.18	0.90					1	128	20 A	12	REC - CLASSROOM 8-1 A201	R
R	REC - CLASSROOM 8-1 A201	12	20 A	129	1			0.90	0.90			1	130	20 A	12	REC - CLASSROOM 8-2 A202	R
R	REC - CLASSROOM 8-2 A202	12	20 A	131	1					0.90	0.18	1	132	20 A	12	REC - CLASSROOM 8-2 A202	R
R	REC - CLASSROOM 8-2 A202	12	20 A	133	1	0.72	0.54					1	134	20 A	12	REC - RESOURCE 8 A206	R
R	REC - RESOURCE 8 A206	12	20 A	135	1			0.72	0.72			1	136	20 A	12	REC - RESOURCE 7 B210	R
R	REC - RESOURCE 7 B210	12	20 A	137	1					0.18	0.36	1	138	20 A	12	REC - CUST	R
R	REC - CUST	12	20 A	139	1	0.36	1.14					2	140	20 A	12	ODU-2	C
C	ODU-7	12	20 A	141	2			1.14	1.14				142				
				143						1.14	1.98	2	144	40 A	8	ODU-1	C
MI...	FRIDGE- SCIENCE A204A (NOTE 8)	12	20 A	145	1	0.50	1.98						146				
R...	DISHWASHER - SCI. A204A (NOTE 8)	12	20 A	147	1			0.18	0.54			1	148	20 A	12	REC - SCIENCE PREP A204A	R...
C	ODU-8	12	20 A	149	2					1.14	0.72	1	150	20 A	12	REC - SCIENCE PREP A204A	R...
				151		1.14	0.94					1	152	20 A	12	FAN F-22	H...
H...	VAV BOX POWER	12	20 A	153	1			0.27	0.36			1	154	20 A	12	REC - CUST 226	R...
--	SPARE	--	20 A	155	1					0.00	0.36	1	156	20 A	12	RECEPTACLES CUST 226	R...
R...	RECEPTACLES CPU LAB B208	12	20 A	157	1	0.36	0.90					1	158	20 A	12	REC - CORRIDOR	R...
R...	RECEPTACLES CPU LAB B208	12	20 A	159	1			0.36	1.26			1	160	20 A	12	RECEPTACLES CORRIDOR	R...
R...	RECEPTACLES CPU LAB B208	12	20 A	161	1					0.36	0.54	1	162	20 A	12	REC - COLLABORATIOn	R...
R...	RECEPTACLES CPU LAB B208	12	20 A	163	1	0.36	0.36					1	164	20 A	12	REC - CUST 226	R...
R...	RECEPTACLES CPU LAB B208	12	20 A	165	1			0.36	0.90			1	166	20 A	12	REC - CLASSROOM A207	R...
R...	RECEPTACLES CPU LAB B208	12	20 A	167	1					0.36	0.18	1	168	20 A	12	REC - CLASSROOM A207	R...
R...	REC - EXPLORING/ BUS./ MARK. B206	12	20 A	169	1	0.36	0.36					1	170	20 A	12	REC - EXPLORING/ BUS./ MARK. B206	R...
R...	REC - EXPLORING/ BUS./ MARK. B206	12	20 A	171	1			0.36	0.54			1	172	20 A	12	REC - EXPLORING/ BUS./ MARK. B206	R...
Other	SPD	10	30 A	173	3					0.00	0.00	1	174	20 A	--	SPARE	--
				175		0.00	0.00					1	176	20 A	--	SPARE	--
				177				0.00	0.00			1	178	20 A	--	SPARE	--
R...	REC - REFRIGERATOR (NOTE 8)	12	20 A	179	1					0.18	0.00	1	180	20 A	--	SPARE	--
MS	EWC - RM 224 (NOTE 8)	12	20 A	181	1	0.30	0.00					1	182	20 A	--	SPARE	--
R...	REC - TEACHER WORKROOM	12	20 A	183	1			0.36	0.00			1	184	20 A	--	SPARE	--
R...	REC - CLASSROOM A208	12	20 A	185	1					0.90	0.00	1	186	20 A	--	SPARE	--
R...	REC - CLASSROOM A208	12	20 A	187	1	0.18	0.00					1	188	20 A	--	SPARE	--
R...	REC - CLASSROOM A208	12	20 A	189	1			0.72	0.00			1	190	20 A	--	SPARE	--
R...	REC - CLASSROOM A208	12	20 A	191	1					0.90	0.00	1	192	20 A	--	SPARE	--
--	SPACE ONLY	--	--	193	--	0.00	0.00					1	194	20 A	--	SPARE	--
--	SPACE ONLY	--	--	195	--			0.00	0.00			1	196	20 A	--	SPARE	--
--	SPACE ONLY	--	--	197	--					0.00	0.00	1	198	20 A	--	SPARE	--
--	SPACE ONLY	--	--	199	--	0.00	0.00					1	200	20 A	--	SPARE	--
--	SPACE ONLY	--	--	201	--			0.00	0.00			1	202	20 A	--	SPARE	--
--	SPACE ONLY	--	--	203	--					0.00	0.00	1	204	20 A	--	SPARE	--
--	SPACE ONLY	--	--	205	--	0.00	0.00					1	206	20 A	--	SPARE	--
--	SPACE ONLY	--	--	207	--			0.00	0.00			1	208	20 A	--	SPARE	--
--	SPACE ONLY	--	--	209	--					0.00	0.00	1	210	20 A	--	SPARE	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.00 kVA	0.00%	0.00 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.29 kVA	100.00%	0.29 kVA
C	COOLING	10.82 kVA	100.00%	10.82 kVA
V	VENTILATION	0.75 kVA	100.00%	0.75 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	85.24 kVA	55.87%	47.62 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	17.98 kVA	100.00%	17.98 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.
7. PROVIDE FEED-THRU LUGS.
8. GFCI RATED BREAKER, 6mA.

		TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA...	117.38 kVA			
TOTAL KVA (DEMAND):	79.76 kVA	340.3 A	324.8 A	315.5 A
TOTAL AMP....	326 A			
TOTAL AMP. (DEMAND):	221 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.
HL - PROVIDE HANDLE LOCK

PANEL: RPB1

VOLTAGE: 208Y/120 3Ø | FED FROM: TXRPB1
MOUNTING: SURFACE | MAIN TYPE: MCB | MFR:
ENCLOSURE: NEMA1 | PHASE: 3 | TYPE:
MAIN: 250 A | WIRE: 4 | AIC: 22 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
R	REC - TEACHER'S LOUNGE B 140	12	20 A	1	1	0.90	0.90					1	2	20 A	12	REC - BATHROOM B	R
R	PRINTER - WORKRM 140 B	12	20 A	3	1			0.50	0.36			1	4	20 A	12	REC - TEACHER'S LOUNGE B	R
R	REFRIGE REC - WRKRM 140 (NOTE 8)	12	20 A	5	1					0.50	0.30	1	6	20 A	12	EWC - WORKROOM (NOTE 8)	R
V	FAN F-18	12	20 A	7	1	1.87	0.21					1	8	20 A	12	FANS F-16, 17 - STORAGE B108B	V
V	FAN F-19	12	20 A	9	1			1.87	0.72			1	10	20 A	12	REC - SCIENCE PREP B108A	R
R	REC - SCIENCE PREP B108A	12	20 A	11	1					0.54	0.50	1	12	20 A	12	FRIDGE - SCIENCE PREP (NOTE 8)	R
R	DISHWASHER - PREP (NOTE 8)	12	20 A	13	1	0.70	0.90					1	14	20 A	12	REC - CHORUS A105	R
R	REC - CHORUS A105	12	20 A	15	1			0.72	0.54			1	16	20 A	12	REC - CHORUS A105	R
--	SPARE	--	20 A	17	1					0.00	1.44	1	18	20 A	12	REC - HALL	R...
R	REC - PRACTICE A106B, 105B	12	20 A	19	1	1.26	1.44					1	20	20 A	12	REC - OFFICE B 106A, 105A	R
H...	VAV'S	12	20 A	21	1			0.29	0.72			1	22	20 A	12	REC - PRACTICE B	R
R	REC - BAND A106	12	20 A	23	1					0.36	0.54	1	24	20 A	12	REC - BAND A106	R
R	REC - BAND B 106	12	20 A	25	1	0.72	0.18					1	26	20 A	12	REC - STORAGE D102	R
R	REC - CORR, STOR D102	12	20 A	27	1			0.90	0.90			1	28	20 A	12	REC - PLATFORM-1 D101-1	R
R	REC - PLATFORM-1 D101-1	12	20 A	29	1					0.72	0.18	1	30	20 A	12	REC - PLATFORM-1 D101-1	R
--	SPARE	--	20 A	31	1	0.00	0.00					--	32	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	33	--			0.00	0.72			1	34	20 A	12	REC - CLASSROOM SS B106	R
R	REC - CLASSROOM SS B106	12	20 A	35	1					0.90	0.90	1	36	20 A	12	REC - CLASSROOM SS B106	R
R	REC - CLASSROOM SS B106	12	20 A	37	1	0.18	0.72					1	38	20 A	12	REC - CLASSROOM MATH B107	R
R	REC - CLASSROOM MATH B107	12	20 A	39	1			0.90	0.90			1	40	20 A	12	REC - CLASSROOM MATH B107	R
R	REC - CLASSROOM MATH B107	12	20 A	41	1					0.18	0.18	1	42	20 A	12	REC - CLASSROOM SCIENCE B108	R
R	REC - CLASSROOM SCIENCE B108	12	20 A	43	1	0.54	0.36					1	44	20 A	12	REC - CLASSROOM SCIENCE B108	R
R	REC - CLASSROOM SCIENCE B108	12	20 A	45	1			0.36	1.08			1	46	20 A	12	REC - CLASSROOM SCIENCE B108	R
R	REC - CLASSROOM SCIENCE B108	12	20 A	47	1					0.36	0.36	1	48	20 A	12	REC - CLASSROOM SCIENCE B109	R
R	REC - CLASSROOM SCIENCE B109	12	20 A	49	1	1.08	0.36					1	50	20 A	12	REC - CLASSROOM SCIENCE B109	R
R	REC - CLASSROOM SCIENCE B109	12	20 A	51	1			0.36	0.54			1	52	20 A	12	REC - CLASSROOM SCIENCE B109	R
R	REC - CLASSROOM SCIENCE B109	12	20 A	53	1					0.18	0.18	1	54	20 A	12	REC - CLASSROOM MATH B111	R
R	REC - CLASSROOM MATH B111	12	20 A	55	1	0.72	0.90					1	56	20 A	12	REC - CLASSROOM MATH B111	R
R	REC - CLASSROOM MATH B111	12	20 A	57	1			0.90	0.18			1	58	20 A	12	REC - CLASSROOM SS B112	R
R	REC - CLASSROOM SS B112	12	20 A	59	1					0.72	1.08	1	60	20 A	12	REC - CLASSROOM SS B112	R
R	REC - CLASSROOM SS B112	12	20 A	61	1	0.72	0.18					1	62	20 A	12	REC - CLASSROOM LA B110	R
R	REC - CLASSROOM LA B110	12	20 A	63	1			0.72	1.08			1	64	20 A	12	REC - CLASSROOM LA B110	R
R	REC - CLASSROOM LA B110	12	20 A	65	1					0.72	0.42	1	66	20 A	12	PLATFORM LIGHTING - TRACK	LI...
--	SPARE	--	20 A	67	1	0.00	0.18					1	68	20 A	12	REC - TEACHER WORKROOM 140	R...
R	REC - CAFETERIA D100	12	20 A	69	1			1.08	0.00			1	70	20 A	12	SCIENCE ROOM EPO SWITCHES	MS
MS	FIRE/SMOKE DAMPERS	12	20 A	71	1					0.05	1.50	1	72	20 A	12	STAGE SCREEN	MS
MS	STAGE CURTAIN	12	20 A	73	1	1.00	0.00					1	74	20 A	--	SPARE	--
MS	STAGE FLOOR BOX	12	20 A	75	1			0.18	0.00			1	76	20 A	--	SPARE	--
LI...	PLATFORM LIGHTING - TRACK	12	20 A	77	1					0.28	0.00	1	78	20 A	--	SPARE	--
R...	RECEPTACLES CORRIDOR-1 001C-1	12	20 A	79	1	0.90	0.00					1	80	20 A	--	SPARE	--
LI...	PLATFORM LIGHTING - TRACK	12	20 A	81	1			0.28	0.00			1	82	20 A	--	SPARE	--
LI...	PLATFORM LIGHTING - TRACK	12	20 A	83	1					0.42	0.00	1	84	20 A	--	SPARE	--
--	SPARE	--	20 A	85	1	0.00	0.00					3	86	30 A	10	SPD	MS
--	SPARE	--	20 A	87	1			0.00	0.00				88				
--	SPARE	--	20 A	89	1					0.00	0.00		90				
--	SPARE	--	20 A	91	1	0.00	0.00					--	92	--	--	SPACE ONLY	--
--	SPARE	--	20 A	93	1			0.00	0.00			--	94	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	95	--					0.00	0.00	--	96	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	1.41 kVA	125.00%	1.77 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.29 kVA	100.00%	0.29 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	1.86 kVA	100.00%	1.86 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	34.74 kVA	64.39%	22.37 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	6.85 kVA	100.00%	6.85 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.
7. PROVIDE FEED-THRU LUGS.
8. PROVIDE CLASS A GFI (6mA-PERSONNEL) BRKR (250' MAX).

		TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA...	47.24 kVA			
TOTAL KVA (DEMAND):	35.23 kVA	145.2 A	144.2 A	112.7 A
TOTAL AMP....	131 A			
TOTAL AMP. (DEMAND):	98 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

RPA1 RPA2 RPB1

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23174 BRIAN E. THOMPSON
01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

PANEL SCHEDULES

E-904

Optima # 22-0082

01.12.2023 - BID SET

PANEL: RPB2

VOLTAGE: 208Y/120 3Ø — FED FROM: TXRPB2

MOUNTING: SURFACE — MAIN TYPE: MCB — MFR:
ENCLOSURE: NEMA1 — PHASE: 3 — TYPE:
MAIN: 400 A — WIRE: 4 — AIC: 10 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A	A	B	B	C	C	Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
R	REC - SCIENCE PREP A209A	12	20 A	1	1	0.72	0.00					1	2	20 A	--	SPARE	--
--	SPARE	--	20 A	3	1			0.00	0.18			1	4	20 A	12	REC - IDF	R...
R	REC - ELEC 225	12	20 A	5	1					0.18	0.18	1	6	20 A	12	REC - IDF	R...
H...	VAV'S - CORRIDOR 220C	-	20 A	7	1	0.00	1.00					1	8	20 A	12	REC - REFRIGERATOR (NOTE 8)	R...
R	REC - TEACHER WORKROOM	12	20 A	9	1			0.36	1.00			1	10	20 A	12	REC - PRINTER	R...
R	REC - CUST 229	12	20 A	11	1					0.36	1.00	1	12	20 A	12	HAND DRYER (HL)	MI...
MS	EWC - BOYS 237 (NOTE 8)	12	20 A	13	1	0.30	0.30					1	14	20 A	12	EWC - GIRLS 236 (NOTE 8)	MI...
R	REC - STORAGE 232	12	20 A	15	1			1.26	0.30			1	16	20 A	12	EWC - GIRLS 231 (NOTE 8)	MI...
MS	EWC - BOYS 230 (NOTE 8)	12	20 A	17	1					0.30	0.00	--	18	--	--	SPACE ONLY	--
R	REC - CORRIDOR 230C-2	12	20 A	19	1	1.26	0.18					1	20	20 A	12	REC - ELEC 238	R...
--	SPARE	--	20 A	21	1			0.00	0.00			--	22	--	--	SPACE ONLY	--
--	SPARE	--	20 A	23	1					0.00	0.45	1	24	20 A	12	FANS F-38, 39, 40 & 41	V...
R	REC - TEACHER WORKROOM	12	20 A	25	1	0.36	0.90					1	26	20 A	12	REC - TLT	R...
R	REC - EWC (NOTE 8)	12	20 A	27	1			0.30	0.18			1	28	20 A	12	REC - WORK RM 227	R...
--	SPACE ONLY	--	--	29	--					0.00	0.36	1	30	20 A	12	RECEPTACLES CUST 229	R...
R	REC - CUST 229	12	20 A	31	1	0.36	0.04					1	32	15 A	12	FAN F-8	V...
R	REC - SCIENCE PREP A209A	12	20 A	33	1			0.36	0.18			1	34	20 A	12	SCIENCE PREP A209A	R...
R	FRIDGE - PREP A209A (NOTE 8)	12	20 A	35	1					0.50	1.61	1	36	20 A	12	FAN F-26 AND F-27	V...
H...	FAN-29 - SCIENCE A209A	-	20 A	37	1	0.00	1.00					1	38	20 A	12	HAND DRYER (HL)	MI...
MS	HAND DRYER (HL)	12	20 A	39	1			1.00	1.00			1	40	20 A	12	HAND DRYER (HL)	MI...
MS	HAND DRYER (HL)	12	20 A	41	1					1.00	0.74		42				
				43		0.49	0.74					3	44	15 A	12	FAN F-2	VEN TIL A...
VEN TIL A...	FAN F-1	12	15 A	45	3			0.49	0.74				46				
				47						0.49	0.18	1	48	15 A	12	FAN F-3	V...
R	REC - RTU - 1	12	20 A	49	1	0.36	1.00					1	50	20 A	12	HAND DRYER (HL)	MI...
MS	HAND DRYER (HL)	12	20 A	51	1			1.00	1.00			1	52	20 A	12	HAND DRYER (HL)	MI...
R	FRIDGE - PREP B213A (NOTE 8)	12	20 A	53	1					0.50	1.00	1	54	20 A	12	DISHWASHER PREP B213A (NOTE 8)	MI...
R	REC - SCIENCE PREP B213A	12	20 A	55	1	0.36	0.72					1	56	20 A	12	REC - SCIENCE PREP B213A	R...
V...	FAN F-31 AND F-30	12	20 A	57	1			1.61	0.54			1	58	20 A	12	REC - COLLAB 239	R...
--	SPACE ONLY	--	--	59	--					0.00	0.00	--	60	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	61	--	0.00	0.72					1	62	20 A	12	REC - COLLAB	R...
R...	REC - COLLAB	12	20 A	63	1			0.72	0.00			--	64	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	65	--					0.00	0.00	--	66	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	67	--	0.00	0.00					--	68	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	69	--			0.00	0.00			--	70	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	71	--					0.00	0.54	1	72	20 A	12	REC - SCIENCE CLASSROOM A209	R...
R...	REC - SCIENCE CLASSROOM A209	12	20 A	73	1	0.36	0.36					1	74	20 A	12	REC - SCIENCE CLASSROOM A209	R...
R...	REC - SCIENCE CLASSROOM A209	12	20 A	75	1			1.08	0.36			1	76	20 A	12	REC - SCIENCE CLASSROOM A209	R...
R...	REC - SCIENCE CLASSROOM A209	12	20 A	77	1					0.18	0.18	1	78	20 A	12	REC - SCIENCE CLASSROOM A210	R...
R...	REC - SCIENCE CLASSROOM A210	12	20 A	79	1	0.54	0.36					1	80	20 A	12	REC - SCIENCE CLASSROOM A210	R...
R...	REC - SCIENCE CLASSROOM A210	12	20 A	81	1			0.36	1.08			1	82	20 A	12	REC - SCIENCE CLASSROOM A210	R...
R...	REC - SCIENCE CLASSROOM A210	12	20 A	83	1					0.36	0.72	1	84	20 A	12	REC - CLASSROOM A212	R...
R...	REC - CLASSROOM A212	12	20 A	85	1	0.18	0.90					1	86	20 A	12	REC - CLASSROOM A212	R...
R...	REC - CLASSROOM A212	12	20 A	87	1			0.90	0.90			1	88	20 A	12	REC - CLASSROOM B211	R...
R...	REC - CLASSROOM B211	12	20 A	89	1					0.90	0.18	1	90	20 A	12	REC - CLASSROOM B211	R...
R...	REC - CLASSROOM B211	12	20 A	91	1	0.72	0.18					1	92	20 A	12	REC - CLASSROOM B212	R...
R...	REC - CLASSROOM B212	12	20 A	93	1			0.72	0.90			1	94	20 A	12	REC - CLASSROOM B212	R...
R...	REC - CLASSROOM B212	12	20 A	95	1					0.90	0.36	1	96	20 A	12	REC - SCIENCE CLASSROOM B213	R...
R...	REC - SCIENCE CLASSROOM B213	12	20 A	97	1	0.54	0.18					1	98	20 A	12	REC - SCIENCE CLASSROOM B213	R...
R...	REC - SCIENCE CLASSROOM B213	12	20 A	99	1			0.36	0.90			1	100	20 A	12	REC - SCIENCE CLASSROOM B213	R...
R...	REC - SCIENCE CLASSROOM B213	12	20 A	101	1					0.36	0.54	1	102	20 A	12	REC - SCIENCE CLASSROOM B214	R...
R...	REC - SCIENCE CLASSROOM B214	12	20 A	103	1	0.18	0.36					1	104	20 A	12	REC - SCIENCE CLASSROOM B214	R...
R...	REC - SCIENCE CLASSROOM B214	12	20 A	105	1			1.08	0.36			1	106	20 A	12	REC - SCIENCE CLASSROOM B214	R...
R...	REC - SCIENCE CLASSROOM B214	12	20 A	107	1					0.36	0.18	1	108	20 A	12	REC - CLASSROOM B216	R...
R...	REC - CLASSROOM B216	12	20 A	109	1	0.90	0.72					1	110	20 A	12	REC - CLASSROOM B216	R...
R...	REC - CLASSROOM B216	12	20 A	111	1			0.90	0.90			1	112	20 A	12	REC - CLASSROOM B217	R...
R...	REC - CLASSROOM B217	12	20 A	113	1					0.18	0.72	1	114	20 A	12	REC - CLASSROOM B217	R...
R...	REC - CLASSROOM B217	12	20 A	115	1	0.90	0.18					1	116	20 A	12	REC - CLASSROOM B215	R...
R...	REC - CLASSROOM B215	12	20 A	117	1			0.72	0.90			1	118	20 A	12	REC - CLASSROOM B215	R...
R...	REC - CLASSROOM B215	12	20 A	119	1					0.90	0.18	1	120	20 A	12	REC - CLASSROOM A213	R...
R...	REC - CLASSROOM A213	12	20 A	121	1	0.72	0.90					1	122	20 A	12	REC - CLASSROOM A213	R...
R...	REC - CLASSROOM A213	12	20 A	123	1			0.90	0.18			1	124	20 A	12	REC - CLASSROOM A211	R...
R...	REC - CLASSROOM A211	12	20 A	125	1					0.72	0.90	1	126	20 A	12	REC - CLASSROOM A211	R...
R...	REC - CLASSROOM A211	12	20 A	127	1	0.90	0.00						128				
MI...	VAV'S	12	20 A	129	1			0.15	0.00			3	130	30 A	10	SPD	Other
--	SPARE	--	20 A	131	1					0.00	0.00		132				
H...	FAN 28 - SCIENCE A209A	12	20 A	133	1	0.94	0.00					--	134	--	--	SPACE ONLY	--
H...	FAN-32 - SCIENCE PREP B213A	12	20 A	135	1			0.94	0.00			--	136	--	--	SPACE ONLY	--
H...	FAN-33 - SCIENCE PREP B213A	12	20 A	137	1					0.94	0.00	--	138	--	--	SPACE ONLY	--
--	SPARE	--	15 A	139	1	0.00	0.00					--	140	--	--	SPACE ONLY	--
--	SPARE	--	15 A	141	1			0.00	0.00			--	142	--	--	SPACE ONLY	--
--	SPARE	--	30 A	143	1					0.00	0.00	--	144	--	--	SPACE ONLY	--
--	SPARE	--	20 A	145	1	0.00	0.00					--	146	--	--	SPACE ONLY	--
--	SPARE	--	20 A	147	1			0.00	0.00			--	148	--	--	SPACE ONLY	--
--	SPARE	--	20 A	149	1					0.00	0.00	--	150	--	--	SPACE ONLY	--
--	SPARE	--	20 A	151	1	0.00	0.00					--	152	--	--	SPACE ONLY	--
--	SPARE	--	20 A	153	1			0.00	0.00			--	154	--	--	SPACE ONLY	--
--	SPARE	--	20 A	155	1					0.00	0.00	--	156	--	--	SPACE ONLY	--
--	SPARE	--	20 A	157	1	0.00	0.00					--	158	--	--	SPACE ONLY	--
--	SPARE	--	20 A	159	1			0.00	0.00			--	160	--	--	SPACE ONLY	--
--	SPARE	--	20 A	161	1					0.00	0.00	--	162	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	163	--	0.00	0.00					--	164	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	165	--			0.00	0.00			--	166	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	167	--					0.00	0.00	--	168	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.00 kVA	0.00%	0.00 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	6.45 kVA	100.00%	6.45 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	43.58 kVA	61.47%	26.79 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	14.51 kVA	100.00%	14.51 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.
7. PROVIDE FEED-THRU LUGS.
8. GFCI RATED BREAKER, 6mA.

		TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA...	67.78 kVA			
TOTAL KVA (DEMAND):	50.99 kVA	185.3 A	226.8 A	159.6 A
TOTAL AMP....	188 A			
TOTAL AMP. (DEMAND):	142 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.
HL - PROVIDE HANDLE LOCK.

PANEL: RPC1

VOLTAGE: 208Y/120 3Ø — FED FROM: TXRPC1

MOUNTING: SURFACE — MAIN TYPE: MCB — MFR:
ENCLOSURE: NEMA1 — PHASE: 3 — TYPE:
MAIN: 175 A — WIRE: 4 — AIC: 10 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A	A	B	B	C	C	Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
V	FAN F-45/DAMPERS	12	15 A	1	1	0.88	0.85					1	2	20 A	12	WH-1 UNIT 1	MS
MS	WH-1 UNIT 2	12	20 A	3	1			0.85	0.85			1	4	20 A	12	WH-1 UNIT 3	MS
MS	WH-1 UNIT 4	12	20 A	5	1					0.85	0.85	1	6	20 A	12	WH-1 UNIT 5	MS
MS	WH-1 UNIT 6	12	20 A	7	1	0.85	0.85					1	8	20 A	12	WH-1 UNIT 7	MS
MS	WH-2	12	20 A	9	1			0.85	1.40			1	10	20 A	12	CHILLER 1 HEAT TAPE (NOTE 8)	MI...
MS	WH-2	12	20 A	11	1					0.85	0.85	1	12	20 A	12	WH-2	MS
R	EWC - CAFETERIA (NOTE 7)	12	20 A	13	1	1.02	1.08					1	14	20 A	12	REC - CAFETERIA B2	R
MS	WH-2	12	20 A	15	1			0.85	2.00			1	16	30 A	10	PUMP P-6	MS
MS	PUMP P-5	10	30 A	17	1					2.00	0.72	1	18	20 A	12	BAS CONTROLLER	R...
R	REC & FAN 43 - ELEC 149	12	20 A	19	1	0.80	1.10					1	20	25 A	10	FAN F-6	V...
W...	MECH ROOM RCP TIMERS	12	20 A	21	1			0.70	1.26			1	22	20 A	12	REC - CORRIDOR B	R
MI...	CHILLER 1 CONTROLS	12	20 A	23	1					0.50	1.40	1	24	20 A	12	CHILLER 2 HEAT TAPE (NOTE 8)	MI...
MI...	CHILLER 2 CONTROLS	12	20 A	25	1	0.50	0.90					1	26	20 A	12	REC - STORAGE A106D	R
MS	BOILER 1 IGNITION	12	40 A	27	1			0.10	0.10			1	28	40 A	12	BOILER 2 IGNITION	MS
R	REC - CUST 2	12	20 A	29	1					0.36	0.36	1	30	20 A	12	REC - CUST 1	R
R	REC - CUST 3	12	20 A	31	1	0.36	0.30					1	32	20 A	12	RCP1	MS
R	REC - MECH	12	20 A	33	1			1.62	0.50			1	34	20 A	12	AHU-1 CONTROLS	MI...
R	REC - MECH B	12	20 A	35	1					0.90	0.50	1	36	20 A	12	AHU-4 CONTROLS	MI...
MI...	RECEIVING POWER DOOR	12	20 A	37	1	1.10	0.50					1	38	20 A	12	AHU-3 CONTROLS	MI...
H...	FAN F-7 - ELEC 149	10	25 A	39	1			1.25	0.50			1	40	20 A	12	AHU-2 CONTROLS	MI...
R...	REC - MECH 148	12	20 A	41	1					0.72	0.00	--	42	--	--	SPACE ONLY	--
MI...	EWC CAFETERIA (NOTE 7)	12	20 A	43	1	0.30	1.00					1	44	20 A	12	HAND DRYER (NOTE 10)	MS
MS	HAND DRYER (NOTE 10)	12	20 A	45	1			1.00	1.00			1	46	20 A	12	HAND DRYER (NOTE 10)	MS
MS	HAND DRYER (NOTE 10)	12	20 A	47	1					1.00	0.30	1	48	20 A	12	EWC CORRIDOR 144 (NOTE 7)	R
--	SPARE	--	20 A	49	1	0.00	0.30					1	50	20 A	12	EWC CORRIDOR 143 (NOTE 7)	R
--	SPARE	--	20 A	51	1			0.00	1.00			1	52	20 A	12	HAND DRYER (NOTE 10)	MS
--	SPARE	--	20 A	53	1					0.00	1.00	1	54	20 A	12	HAND DRYER (NOTE 10)	MS
--	SPARE	--	20 A	55	1	0.00	1.00					1	56	20 A	12	HAND DRYER (NOTE 10)	MS
--	SPACE ONLY	--	--	57	--			0.00	1.00			1	58	20 A	12	HAND DRYER (NOTE 10)	MS
--	SPACE ONLY	--	--	59	--					0.00	0.30	1	60	20 A	12	EWC CORRIDOR 141 (NOTE 7)	R
--	SPACE ONLY	--	--	61	--	0.00	0.30					1	62	20 A	12	EWC CORRIDOR 142 (NOTE 7)	R
--	SPACE ONLY	--	--	63	--			0.00	0.00			--	64	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	65	--					0.00	0.00	--	66	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	67	--	0.00	0.00					--	68	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	69	--			0.00	0.00			--	70	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	71	--					0.00	0.00	--	72	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	73	--	0.00	0.00					--	74	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	75	--			0.00	0.00			--	76	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	77	--					0.00	0.00	--	78	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	79	--	0.00	0.00						80				
--	SPACE ONLY	--	--	81	--			0.00	0.00			3	82	30 A	10	SPD	Other
--	SPACE ONLY	--	--	83	--					0.00	0.00		84				

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.00 kVA	0.00%	0.00 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	1.28 kVA	100.00%	1.28 kVA
M	MOTORS	0.30 kVA	100.00%	0.30 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	9.72 kVA	100.00%	9.72 kVA
WH	WATER HEATER	10.05 kVA	100.00%	10.05 kVA
MS	MISC.	21.60 kVA	100.00%	21.60 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.
7. PROVIDE CLASS B GFI (30mA EQUIPMENT BRKR.
8. PROVIDE CLASS A GFI (6mA-PERSONNEL) BRKR (250' MAX).
9. PROVIDE FEED THRU LUGS.
10. PROVIDE HANDLE LOCK.

		TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA...	44.29 kVA			
TOTAL KVA (DEMAND):	44.29 kVA	117.3 A	140.9 A	112.2 A
TOTAL AMP....	123 A			
TOTAL AMP. (DEMAND):	123 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: MPC1

VOLTAGE: 480Y/277 3Ø — FED FROM: MSB

MOUNTING: SURFACE — MAIN TYPE: MLO — MFR:
ENCLOSURE: NEMA1 — PHASE: 3 — TYPE:
MAIN: 125 A — WIRE: 4 — AIC: 65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A	A	B	B	C	C	Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
				1		2.00	2.00						2				
M	PUMP P-1 (5 HP)	12	15 A	3	3			2.00	2.00			3	4	15 A	12	PUMP P-2 (5 HP)	M
				5						2.00	2.00		6				
				7		3.70	3.70						8				
M	PUMP P-7 (7.5 HP)	10	25 A	9	3			3.70	3.70			3	10	25 A	10	PUMP P-8 (7.5 HP)	M
				11						3.70	3.70		12				
				13		3.67	3.67						14				
M	PUMP P-3 (10 HP)	10	30 A	15	3			3.67	3.67			3	16	30 A	10	PUMP P-4 (10 HP)	M
				17						3.67	3.67		18				
				19		2.00	0.00						20				
H	EDH-1	12	15 A	21	3			2.00	0.00			3	22	20 A	--	SPARE	--
				23						2.00	0.00		24				
H...	EUH-2 - ELEC G112	12	15 A	25	1	3.30	3.30					1	26	15 A	12	EUH-1 - MECH 148	H...
				27				0.00	0.00			--	28	--	--	SPACE ONLY	--
--	SPARE	--	30 A	29	3					0.00	0.00	--	30	--	--	SPACE ONLY	--
				31		0.00	0.00					--	32	--	--	SPACE ONLY	--
--	SPARE	--	30 A	33	1			0.00	0.00			--	34	--	--	SPACE ONLY	--
--	SPARE	--	20 A	35	1					0.00	0.00	--	36	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	37	--	0.00	0.00					--	38	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	39	--			0.00	0.00			--	40	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	41	--					0.00	0.00	--	42	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.00 kVA	0.00%	0.00 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	12.60 kVA	100.00%	12.60 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	56.20 kVA	100.00%	56.20 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	0.00 kVA	0.00%	0.00 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	0.00 kVA	0.00%	0.00 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

		TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA...	68.80 kVA			
TOTAL KVA (DEMAND):	68.80 kVA	98.7 A	74.8 A	74.8 A
TOTAL AMP....	83 A			
TOTAL AMP. (DEMAND):	83 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: RPD1

VOLTAGE: 208Y/120 3Ø — FED FROM: TXRPD1

MOUNTING: SURFACE — MAIN TYPE: MCB — MFR:
ENCLOSURE: NEMA1 — PHASE: 3 — TYPE:
MAIN: 250 A — WIRE: 4 — AIC: 10 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A	A	B	B	C	C	Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
R	REC - GYMNASIUM-1 G115-1	12	20 A	1	1	1.08	0.72					1	2	20 A	12	REC - CORRIDOR	R
R	REC - BOYS COACH G122	12	20 A	3	1			0.90	1.00			1	4	20 A	12	HAND DRYER (HL)	MS
R	REC - GIRLS COACH G118	12	20 A	5	1					0.90	0.30	1	6	20 A	12	EWC - CORRIDOR G004 (NOTE 7)	R
R	EWC - CORRIDOR G004 (NOTE 7)	12	20 A	7	1	0.30	1.26					1	8	20 A	12	REC - ACTIVITY G114	R
R	FAN F-44	12	20 A	9	1			0.37	0.54			1	10	20 A	12	REC - AD OFFICE	R
R...	REC - CORR	12	20 A	11	1					0.72	0.36	1	12	20 A	12	REC - CUST	R
R	REC - CUST	12	20 A	13	1	0.36	0.72					1	14	20 A	12	REC - COMMUNITY STORAGE G101	R
R	REC - CUST	12	20 A	15	1			0.36	0.72			1	16	20 A	12	REC - OUTSIDE	R...
MS	HAND DRYER (HL)	12	20 A	17	1					1.00	0.37	1	18	15 A	12	FAN F-13	V
R	REC - LAUNDRY	12	20 A	19	1	1.08	0.72					1	20	20 A	12	REC - PE CLASSROOM G106	R
MS	TIMER REC & RCP3 PUMP	12	20 A	21	1			0.68	0.90			1	22	20 A	12	REC - OUTSIDE	R
C	ODU - 5	12	20 A	23	2					1.14	1.14	2	24	20 A	12	ODU - 6	C
				25		1.14	1.14						26				
MS	ODU - 4	12	20 A	27	2			1.14	0.16			1	28	20 A	12	VAV'S	H...
				29						1.14	0.18	1	30	20 A	12	GAS DRYER (NOTE 7)	R
MS	WASHER	12	15 A	31	2	1.04	0.18					1	32	20 A	12	REC - PE CLASSROOM G106	R
				33				1.04	0.18			1	34	20 A	12	REC - PE CLASSROOM G106	R
R	REC - PE CLASSROOM G106	12	20 A	35	1					0.72	0.72	1	36	20 A	12	REC - PE CLASSROOM G106	R
R	REC - PE CLASSROOM G106	12	20 A	37	1	0.72	1.00					1	38	20 A	12	HAND DRYER (HL)	MS
MS	HAND DRYER (HL)	12	20 A	39	1			1.00	1.00			1	40	20 A	12	HAND DRYER (HL)	MS
MS	HAND DRYER (HL)	12	20 A	41	1					1.00	1.44	1	42	20 A	12	REC - LOBBY G003	R
R	METAL DETECTORS - GYM	12	20 A	43	1	0.72	0.30					1	44	20 A	12	EWC - GIRLS G103 (NOTE 7)	R
R	EWC - BOYS G104 (NOTE 7)	12	20 A	45	1			0.30	0.18			1	46	20 A	12	REC - CONCESSION	R
R	REC - CONCESSION	12	20 A	47	1					0.36	0.18	1	48	20 A	12	REC - CONCESSION	R
R	REC - CONCESSION	12	20 A	49	1	0.18	1.08					1	50	20 A	12	REC - CONCESSION G108	R
R	REC - CONCESSION	12	20 A	51	1			0.18	0.36			1	52	20 A	12	REC - FITNESS G107	R
V	FAN F-46	12	15 A	53	1					0.88	0.36	1	54	20 A	12	REC - FITNESS G107	R
R	REC - FITNESS G107	12	20 A	55	1	0.36	0.50					1	56	20 A	12	REC - FITNESS G107	R
R	REC - FITNESS G107	12	20 A	57	1			0.50	0.90			1	58	20 A	12	REC - FITNESS G107	R
R	REC - FITNESS G107	12	20 A	59	1					0.50	0.60	1	60	20 A	12	GOAL WINCH	M
M	GOAL WINCH	12	20 A	61	1	0.60	0.60					1	62	20 A	12	GOAL WINCH	M
M	GOAL WINCH	12	20 A	63	1			0.60	1.00				64				
M	GOAL WINCH	12	20 A	65	1					0.60	1.00	3	66	20 A	12	BLEACHER POWER	M
M	GOAL WINCH	12	20 A	67	1	0.60	1.00						68				
				69				1.00	1.00				70				
M	BLEACHER POWER	12	20 A	71	3					1.00	1.00	3	72	20 A	12	BLEACHER POWER	M
				73		1.00	1.00						74				
R...	SCORE BOARD - GYMNASIUM	12	20 A	75	1			0.50	0.68			1	76	20 A	12	WH3 - MECH G124	MS
R	REC - GYMNASIUM-1 G115-1	12	20 A	77	1					0.18	0.68	1	78	20 A	12	WH3 - MECH G124	MS
				79		2.00	0.68					1	80	20 A	12	WH3 - MECH G124	MS
M	GYM MAT MOVER	10	30 A	81	3			2.00	0.50			1	82	20 A	12	ADA DOOR ASSIST	MS
				83						2.00	0.00		84				
MI...	SOUND SYSTEM - ACTIVITY ROOM	12	20 A	85	1	1.00	0.00					3	86	30 A	10	SPD	MS
LI...	LIGHTS CONFERENCE ROOM 013	12	20 A	87	1			0.37	0.00				88				
V	FAN F-12	12	15 A	89	1					1.07	1.00	1	90	20 A	12	ICE MAKER (NOTE 7)	MI...
R	REC - MECH PENTHOUSE G007	12	20 A	91	1	0.90	0.50					1	92	20 A	12	REC BAS POWER MECH PENT	R...
MI...	AHU-10 CONTROLS	12	20 A	93	1			0.50	0.60			1	94	20 A	12	GYM DIVIDER	M...
MI...	AHU-9 CONTROLS	12	20 A	95	1					0.50	0.00	--	96	--	--	SPACE ONLY	--
MI...	AHU-8 CONTROLS	12	20 A	97	1	0.50	0.00					1	98	20 A	--	SPARE	--
--	SPACE ONLY	--	--	99	--			0.00	0.00			1	100	20 A	--	SPARE	--
--	SPACE ONLY	--	--	101	--					0.00	0.00	1	102	20 A	--	SPARE	--
--	SPACE ONLY	--	--	103	--	0.00	0.00					1	104	20 A	--	SPARE	--
--	SPACE ONLY	--	--	105	--			0.00	0.00			1	106	20 A	--	SPARE	--
--	SPACE ONLY	--	--	107	--					0.00	0.00	1	108	20 A	--	SPARE	--
--	SPACE ONLY	--	--	109	--	0.00	0.00					1	110	20 A	--	SPARE	--
--	SPACE ONLY	--	--	111	--			0.00	0.00			1	112	20 A	--	SPARE	--
--	SPACE ONLY	--	--	113	--					0.00	0.00	1	114	20 A	--	SPARE	--
--	SPACE ONLY	--	--	115	--	0.00	0.00					1	116	20 A	--	SPARE	--
--	SPACE ONLY	--	--	117	--			0.00	0.00			1	118	20 A	--	SPARE	--
--	SPACE ONLY	--	--	119	--					0.00	0.00	1	120	20 A	--	SPARE	--
				121		1.98	0.00					1	122	20 A	--	SPARE	--
F	PANEL RPDB	SR	80 A	123	3			3.19	0.00			1	124	20 A	--	SPARE	--
				125						2.68	0.00	1	126	20 A	--	SPARE	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.37 kVA	125.00%	0.46 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.16 kVA	100.00%	0.16 kVA
C	COOLING	7.33 kVA	100.00%	7.33 kVA
V	VENTILATION	2.31 kVA	100.00%	2.31 kVA
M	MOTORS	4.20 kVA	100.00%	4.20 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	29.62 kVA	66.88%	19.81 kVA
WH	WATER HEATER	1.50 kVA	100.00%	1.50 kVA
MS	MISC.	31.00 kVA	100.00%	31.00 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.
7. PROVIDE CLASS A GFI (6mA-PERSONNEL) BRKR (250' MAX).

		TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA...	77.04 kVA			
TOTAL KVA (DEMAND):	67.32 kVA	226.5 A	202.9 A	216.1 A
TOTAL AMP....	214 A			
TOTAL AMP. (DEMAND):	187 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.
SR - SEE RISER
HL - PROVIDE HANDLE LOCK

RPB2 RPC1 RPD1
MPC1

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — BRIAN E. THOMPSON
01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

PANEL SCHEDULES

E-905

Optima # 22-0082

01.12.2023 - BID SET

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PANEL: KPD1

VOLTAGE: 208Y/120 3Ø
FED FROM: TXK
MOUNTING: SURFACE
ENCLOSURE: NEMA1
MAIN: 700 A
MAIN TYPE: MCB
PHASE: 3
WIRE: 4
MFR:
TYPE:
AIC: 22 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
				1		5.34	12.50						2				
MS	PANEL KPL1	SR	200 A	3	3			6.34	16.77			3	4	200 A	SR	PANEL KPL2	MS
				5						2.48	13.34		6				
				7		13.07	9.60						8				
MS	HOOD UDS SUPPLY	2/0	175 A	9	3			13.07	9.60			3	10	100 A	2	#40 - DISHWASHER	MS
				11						13.07	9.60		12				
				13		10.00	0.00					--	14	--	--	SPACE ONLY	--
MS	#40 - DISHWASHER BOOSTER	2	100 A	15	3			10.00	0.00			--	16	--	--	SPACE ONLY	--
				17						10.00	0.00	--	18	--	--	SPACE ONLY	--
--	SPARE	--	20 A	19	1	0.00	0.00					--	20	--	--	SPACE ONLY	--
--	SPARE	--	20 A	21	1			0.00	0.00			--	22	--	--	SPACE ONLY	--
--	SPARE	--	20 A	23	1					0.00	0.00	--	24	--	--	SPACE ONLY	--
				25		0.00	0.00					--	26	--	--	SPACE ONLY	--
--	SPARE	--	60 A	27	3			0.00	0.00			--	28	--	--	SPACE ONLY	--
				29						0.00	0.00	--	30	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	31	--	0.00	0.00					--	32	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	33	--			0.00	0.00			--	34	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	35	--					0.00	0.00	--	36	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	37	--	0.00	0.00					--	38	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	39	--			0.00	0.00			--	40	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	41	--					0.00	0.00	--	42	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.00 kVA	0.00%	0.00 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	2.00 kVA	100.00%	2.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	24.27 kVA	65.00%	15.78 kVA
R	RECEPTACLES	9.22 kVA	100.00%	9.22 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	119.28 kVA	100.00%	119.28 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

TOTAL KVA...	154.77 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	146.27 kVA	423.5 A	467.4 A	404.1 A
TOTAL AMP....	430 A			
TOTAL AMP. (DEMAND):	406 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.
SR - SEE RISER

PANEL: LPD1

VOLTAGE: 480Y/277 3Ø
FED FROM: DPD1
MOUNTING: SURFACE
ENCLOSURE: NEMA1
MAIN: 100 A
MAIN TYPE: MLO
PHASE: 3
WIRE: 4
MFR:
TYPE:
AIC: 18 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
L	LIGHTS - BASEMENT	12	20 A	1	1	2.24	3.31					1	2	20 A	4	ROADWAY SITE LIGHTING	LE
LE	EXTERIOR LIGHTING - PARKING GYM	12	20 A	3	1			2.31	1.08			1	4	20 A	12	LIGHTS - CORRIDOR/LOBBY C	L
L	LIGHTS - ACTIVITY C	12	20 A	5	1					0.84	1.86	1	6	20 A	10	LIGHTS - GYMNASIUM C	L
L	LIGHTS - GYMNASIUM	10	20 A	7	1	2.01	1.72					1	8	20 A	12	LIGHTS - GYMNASIUM	L
L	LIGHTS - MECH PENTHOUSE	12	20 A	9	1			0.26	2.84			1	10	20 A	8	LIGHTS - CLASS/GENERAL C	L
				11						0.00	--	12	--	--	--	SPACE ONLY	--
--	SPARE	--	20 A	13	1	0.00	0.00					--	14	--	--	SPACE ONLY	--
--	SPARE	--	20 A	15	1			0.00	0.00			--	16	--	--	SPACE ONLY	--
--	SPARE	--	20 A	17	1					0.00	0.00	--	18	--	--	SPACE ONLY	--
--	SPARE	--	20 A	19	1	0.00	0.00					--	20	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	21	--			0.00	0.00			--	22	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	23	--					0.00	0.00	--	24	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	25	--	0.00	0.00					--	26	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	27	--			0.00	0.00			--	28	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	29	--					0.00	0.00	--	30	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	31	--	0.00	0.00					--	32	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	33	--			0.00	0.00			--	34	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	35	--					0.00	0.00	--	36	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	37	--	0.00	0.00					--	38	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	39	--			0.00	0.00			--	40	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	41	--					0.00	0.00	--	42	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	12.85 kVA	125.00%	16.06 kVA
LE	LIGHTING - EXTERIOR	5.62 kVA	125.00%	7.03 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	0.00 kVA	0.00%	0.00 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	0.00 kVA	0.00%	0.00 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

TOTAL KVA...	18.47 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	23.09 kVA	35.6 A	25.5 A	9.8 A
TOTAL AMP....	22 A			
TOTAL AMP. (DEMAND):	28 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: KPL1

VOLTAGE: 208Y/120 3Ø
FED FROM: KPD1
MOUNTING: RECESSED
ENCLOSURE: NEMA1
MAIN: 200 A
MAIN TYPE: MCB
PHASE: 3
WIRE: 4
MFR:
TYPE:
AIC: 10 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
R...	REC - KITCHEN D108	12	20 A	1	1	0.72	0.90					1	2	20 A	12	REC - KITCHEN B	R
R...	17 - MICROWAVE	12	20 A	3	1			1.92	1.20			1	4	20 A	12	HOOD SHUTDOWN	MI...
MI...	KITCHEN HOOD LTS	12	20 A	5	1					0.50	0.50	1	6	20 A	12	HOOD CONTROLS	MI...
R...	REC - OFFIEC D110	12	20 A	7	1	0.72	1.00					1	8	20 A	6	FIRE LINE BACKFLOW	H...
H...	DOMESTIC BACKFLOW	6	20 A	9	1			1.00	0.72			1	10	20 A	12	RECEPTACLES KITCHEN D108	R...
R...	RECEPTACLES STORAGE D111	12	20 A	11	1					0.38	1.10	1	12	20 A	12	8 - AIR CURTAIN	MI...
MISC.	DRYER	10	30 A	13	2	1.50	0.50					1	14	20 A	12	WASHER (NOTE 7)	MI...
				15				1.50	0.00			--	16	--	--	SPACE ONLY	--
--	SPARE (NOTE 7)	--	20 A	17	1					0.00	0.00	--	18	--	--	SPACE ONLY	--
--	SPARE (NOTE 7)	--	20 A	19	1	0.00	0.00					--	20	--	--	SPACE ONLY	--
--	SPARE (NOTE 7)	--	20 A	21	1			0.00	0.00			--	22	--	--	SPACE ONLY	--
--	SPARE	--	20 A	23	1					0.00	0.00	--	24	--	--	SPACE ONLY	--
--	SPARE	--	20 A	25	1	0.00	0.00					--	26	--	--	SPACE ONLY	--
--	SPARE	--	20 A	27	1			0.00	0.00			--	28	--	--	SPACE ONLY	--
--	SPARE	--	20 A	29	1					0.00	0.00	--	30	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	31	--	0.00	0.00					--	32	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	33	--			0.00	0.00			--	34	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	35	--					0.00	0.00	--	36	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	37	--	0.00	0.00					--	38	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	39	--			0.00	0.00			--	40	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	41	--					0.00	0.00	--	42	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.00 kVA	0.00%	0.00 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	2.00 kVA	100.00%	2.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	5.16 kVA	100.00%	5.16 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	7.00 kVA	100.00%	7.00 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.
7. PROVIDE CLASS A GFI (6mA-PERSONNEL) BRKR (250' MAX).

TOTAL KVA...	14.16 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	14.16 kVA	48.2 A	56.5 A	20.7 A
TOTAL AMP....	39 A			
TOTAL AMP. (DEMAND):	39 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: KPL2

VOLTAGE: 208Y/120 3Ø
FED FROM: KPD1
MOUNTING: RECESSED
ENCLOSURE: NEMA1
MAIN: 200 A
MAIN TYPE: MCB
PHASE: 3
WIRE: 4
MFR:
TYPE:
AIC: 10 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
				1		0.94	1.00					1	2	20 A	12	16 - COFFEE MACHINE / TEA MAKER	MS
K	20 - REACH IN CABINET (NOTE 7)	12	20 A	3	2			0.94	0.90			1	4	20 A	12	30 - PASS THROUGH HEATED CABINET (NOTE 7)	K
K	31 - PASS THROUGH (NOTE 7)	12	20 A	5	1					0.80	0.90		6				
				7		1.05	0.90					1	8	20 A	12	REC- RM D107, D108	R
MS	13 - ICE MAKER	12	20 A	9	2			1.05	0.90				10				
--	SPACE ONLY	--	--	11	--					0.00	0.90	2	12	20 A	12	20 - REACH IN CABINET (NOTE 7)	K
MS	52 - CASHIER'S COUNTER (NOTE 7)	12	20 A	13	1	0.18	0.18					1	14	20 A	12	RECEPTACLES SERVING D106	R...
MS	56 - P.O.S. (NOTE 7)	12	20 A	15	1			0.50	0.60			1	16	15 A	12	45 - MILK COOLER (NOTE 7)	MS
MS	56 - P.O.S.	12	20 A	17	1					0.50	0.84	1	18	15 A	12	46 - COLD FOOD COUNTER (NOTE 7)	MS
MS	46 - COLD FOOD COUNTER (NOTE 7)	12	15 A	19	1	0.84	0.84					1	20	15 A	12	46 - COLD FOOD COUNTER (NOTE 7)	MS
K	47 - HOT FOOD COUNTER (HL)	6	50 A	21	2			3.00	3.00			2	22	50 A	6	47 - HOT FOOD COUNTER (HL)	K
				23						3.00	3.00		24				
K	47 - HOT FOOD COUNTER (HL)	6	50 A	25	2	3.00	0.52					1	26	20 A	12	43 - REC - DISHWASH	MI...
				27				3.00	1.80			1	28	20 A	12	#50 - DROP IN FRI. (NOTE 7)	MI...
--	SPARE (NOTE 7)	--	20 A	29	1					0.00	1.80	1	30	20 A	12	#50 - DROP IN FRI. (NOTE 7)	MI...
--	SPARE (NOTE 7)	--	20 A	31	1	0.00	1.80					1	32	20 A	12	#50 - DROP IN FRI. (NOTE 7)	R...
--	SPARE	--	20 A	33	1			0.00	0.60			1	34	15 A	12	45 - MILK COOLER (NOTE 7)	MI...
--	SPARE	--	20 A	35	1					0.00	1.60	1	36	20 A	12	58 - COMMERCIAL MICROWAVE...	MI...
--	SPACE ONLY	--	--	37	--	0.00	1.26					1	38	20 A	12	57 - ICE DISPENSER (NOTE 7)	MI...
--	SPARE	--	20 A	39	2			0.00	0.48			1	40	20 A	12	57.1 - ICE MAKER (NOTE 7)	MI...
				41						0.00	0.00	--	42	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.00 kVA	0.00%	0.00 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	24.27 kVA	65.00%	15.78 kVA
R	RECEPTACLES	4.06 kVA	100.00%	4.06 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	14.28 kVA	100.00%	14.28 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.
7. PROVIDE CLASS A GFI (6mA-PERSONNEL) BRKR (250' MAX).

TOTAL KVA...	42.61 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	34.11 kVA	104.2 A	140.8 A	112.2 A
TOTAL AMP....	118 A			
TOTAL AMP. (DEMAND):	95 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.
HL - HANDLE LOCK

KPD1 | LPD1
KPL1 | KPL2

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

PANEL SCHEDULES

E-906

Optima # 22-0082

01.12.2023 - BID SET

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PANEL: DPF

VOLTAGE: 480Y/277 3Ø | FED FROM: UTILITY TRANSFORMER #2
MOUNTING: SURFACE | MAIN TYPE: MCB | MFR:
ENCLOSURE: NEMA3R | PHASE: 3 | TYPE:
MAIN: 400 A | WIRE: 4 | AIC: 35 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
H...	EWH-6	12	15 A	1	1	2.00	2.00					1	2	15 A	12	EWH-5	H...
H...	EWH-4	12	15 A	3	1			2.00	2.00			1	4	15 A	12	EWH-3	H...
--	SPARE	--	20 A	5	1					0.00	13.35		6				Oth er; R...
LI...	LIGHTS	12	20 A	7	1	0.67	13.58					3	8	125 A	SR	PANEL RPF VIA TXRPF	
Oth er; R...	PANEL DPB	SR	100 A	9	3			12.45	6.54				10				
				11						15.58	0.00	--	12	--	--	SPACE ONLY	--
				13		11.74	0.00					--	14	--	--	SPACE ONLY	--
--	SPARE	--	20 A	15	1			0.00	0.00			--	16	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	17	--					0.00	0.00	--	18	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	19	--	0.00	0.00					--	20	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	21	--			0.00	0.00			--	22	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	23	--					0.00	0.00	--	24	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	25	--	0.00	0.00					--	26	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	27	--			0.00	0.00			--	28	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	29	--					0.00	0.00	--	30	--	--	SPACE ONLY	--
				31									32				
				33									34				
				35									36				
				37									38				
				39									40				
				41									42				

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	1.60 kVA	125.00%	2.00 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	16.00 kVA	100.00%	16.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	17.40 kVA	100.00%	17.40 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	5.18 kVA	100.00%	5.18 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	41.69 kVA	100.00%	41.69 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.
7. THIS PANEL SHALL BE U.L. LISTED FOR USE AS S.E. EQUIP.

		TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA...	81.90 kVA			
TOTAL KVA (DEMAND):	82.30 kVA	111.6 A	83.0 A	107.7 A
TOTAL AMP....	99 A			
TOTAL AMP. (DEMAND):	99 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.
SR - SEE POWER RISER

PANEL: DPB

VOLTAGE: 480Y/277 3Ø | FED FROM: DPF
MOUNTING: SURFACE | MAIN TYPE: MCB | MFR:
ENCLOSURE: NEMA3R | PHASE: 3 | TYPE:
MAIN: 100 A | WIRE: 4 | AIC: 18 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
H...	EWH-4	12	15 A	1	1	2.00	0.68					1	2	20 A	12	BASEBALL LIGHTING *	LI...
H...	EWH-3	12	15 A	3	1			2.00	2.00			1	4	15 A	12	EWH-5	H...
H...	EWH-6	12	15 A	5	1					2.00	9.74		6				Oth er; R...
--	SPARE	--	20 A	7	1	0.00	9.77					3	8	70 A	SR	PANEL RPB VIA TXRPB	
--	SPARE	--	20 A	9	1			0.00	11.58				10				
--	SPACE ONLY	--	--	11	--					0.00	0.00	--	12	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	13	--	0.00	0.00					--	14	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	15	--			0.00	0.00			--	16	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	17	--					0.00	0.00	--	18	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	19	--	0.00	0.00					--	20	--	--	SPACE ONLY	--
				21									22				
				23									24				
				25									26				
				27									28				
				29									30				
				31									32				
				33									34				
				35									36				
				37									38				
				39									40				
				41									42				

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.93 kVA	125.00%	1.17 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	8.00 kVA	100.00%	8.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	8.70 kVA	100.00%	8.70 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	2.70 kVA	100.00%	2.70 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	19.42 kVA	100.00%	19.42 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.
7. THIS PANEL SHALL BE U.L. LISTED FOR USE AS S.E. EQUIP.
8. * - EMERGENCY UNIT FIXTURES SERVED OFF THIS CIRCUIT. PROVIDE HANDLE LOCK.

		TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA...	39.77 kVA			
TOTAL KVA (DEMAND):	40.00 kVA	45.3 A	56.6 A	42.4 A
TOTAL AMP....	48 A			
TOTAL AMP. (DEMAND):	48 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: RPS

VOLTAGE: 208Y/120 3Ø | FED FROM: RPB
MOUNTING: SURFACE | MAIN TYPE: MCB | MFR:
ENCLOSURE: NEMA1 | PHASE: 3 | TYPE:
MAIN: 100 A | WIRE: 4 | AIC: 10,000 AMPS SYMMETRICAL

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
MI...	SCOREBOARD	10	20 A	1	1	0.50	1.18					1	2	20 A	12	SCOREBOARD AND RECEPT	R...
MO TO RS	IRRIGATION ASSEMBLY	4	60 A	3	3			2.90	1.00			1	4	20 A	12	IRRIGATION CONTROL POWER	MI...
				5						2.90	0.26	1	6	20 A	12	LIGHTS - STORAGE	LI...
				7		2.90	0.90					1	8	20 A	12	REC - STORAGE	R...
MI...	FAN F-42	12	15 A	9	1			0.62	0.20			1	10	20 A	12	CAMERA INJECTOR	MI...
--	SPACE ONLY	--	--	11	--					0.00	0.00	1	12	20 A	--	SPARE	--
--	SPACE ONLY	--	--	13	--	0.00	0.00					1	14	20 A	--	SPARE	--
--	SPACE ONLY	--	--	15	--			0.00	0.00			1	16	20 A	--	SPARE	--
--	SPACE ONLY	--	--	17	--					0.00	0.00	1	18	20 A	--	SPARE	--
--	SPACE ONLY	--	--	19	--	0.00	0.00					1	20	20 A	--	SPARE	--
				21									22				
				23									24				
				25									26				
				27									28				
				29									30				
				31									32				
				33									34				
				35									36				
				37									38				
				39									40				
				41									42				

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.26 kVA	125.00%	0.32 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	8.70 kVA	100.00%	8.70 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	1.08 kVA	100.00%	1.08 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	3.32 kVA	100.00%	3.32 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

		TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA...	13.36 kVA			
TOTAL KVA (DEMAND):	13.43 kVA	47.7 A	41.4 A	26.3 A
TOTAL AMP....	37 A			
TOTAL AMP. (DEMAND):	37 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: RPF

VOLTAGE: 208Y/120 3Ø | FED FROM: TXRPF
MOUNTING: SURFACE | MAIN TYPE: MCB | MFR:
ENCLOSURE: NEMA3R | PHASE: 3 | TYPE:
MAIN: 250 A | WIRE: 4 | AIC: 10,000 AMPS SYMMETRICAL

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
MO TO RS	IRRIGATION ASSEMBLY	4	60 A	1	3	2.90	1.00					1	2	20 A	12	IRRIGATION CONTROL POWER	MI...
				3				2.90	0.50			1	4	20 A	12	FACP - FOOTBALL *	MI...
				5						2.90	0.50	1	6	20 A	12	SCOREBOARD	MI...
R...	SCOREBOARD AND RECEPT	12	20 A	7	1	1.18	0.50					1	8	20 A	10	FOOTBALL EXT RECEPT	MI...
MI...	SCOREBOARD	12	20 A	9	1			0.50	1.18			1	10	20 A	12	SCOREBOARD AND RECEPT	R...
MI...	FAN F-5	12	20 A	11	1					0.70	0.90	1	12	20 A	12	REC - FOOTBALL CONCESSION	R...
MIS C.	WH4 (FOOTBALL)	12	20 A	13	2	1.50	0.09					1	14	20 A	12	RECIRC PUMP (FOOTBALL)	Ot...
				15				1.50	0.50			1	16	20 A	12	REC - CONCESSION	MI...
MI...	REC - CONCESSION	12	20 A	17	1					0.50	0.50	1	18	20 A	12	REC - CONCESSION	MI...
R...	FAN CONCESSION	12	20 A	19	1	0.18	0.50					1	20	20 A	12	REC - REFRIGERATOR (NOTE 8)	MI...
MI...	HAND DRYER (NOTE 7)	12	20 A	21	1			1.00	0.50			1	22	20 A	12	REC - DATA G015	MI...
R...	REC - CONCESSION	12	20 A	23	1					0.18	0.36	1	24	20 A	12	REC - CONCESSION	R...
R...	REC - CONCESSION	12	20 A	25	1	0.50	5.00					2	26	100 A	SR	PANEL PB1	MIS C.
--	SPACE ONLY	--	--	27	--			0.00	5.00				28				
--	SPACE ONLY	--	--	29	--					0.00	0.00	1	30	20 A	--	SPARE (NOTE 8)	--
--	SPACE ONLY	--	--	31	--	0.00	0.00					1	32	20 A	--	SPARE	--
--	SPACE ONLY	--	--	33	--			0.00	0.00			1	34	20 A	--	SPARE	--
--	SPACE ONLY	--	--	35	--					0.00	0.00	1	36	20 A	--	SPARE	--
--	SPACE ONLY	--	--	37	--	0.00	0.00					1	38	20 A	--	SPARE	--
--	SPACE ONLY	--	--	39	--			0.00	0.00			1	40	20 A	--	SPARE	--
--	SPACE ONLY	--	--	41	--					0.00	0.00	1	42	20 A	--	SPARE	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.00 kVA	0.00%	0.00 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	8.70 kVA	100.00%	8.70 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	2.48 kVA	100.00%	2.48 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	22.27 kVA	100.00%	22.27 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.
7. PROVIDE HANDLE LOCK.
8. PROVIDE CLASS A GFI (6mA-PERSONNEL) BRKR (250' MAX).

		TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA...	33.47 kVA			
TOTAL KVA (DEMAND):	33.47 kVA	119.9 A	121.9 A	54.5 A
TOTAL AMP....	93 A			
TOTAL AMP. (DEMAND):	93 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.
SR - SEE POWER RISER.
* - FIRE ALARM CIRCUIT, RED HANDLE WITH HANDLE LOCK

PANEL: RPB

VOLTAGE: 208Y/120 3Ø | FED FROM: TXRPB
MOUNTING: SURFACE | MAIN TYPE: MCB | MFR:
ENCLOSURE: NEMA3R | PHASE: 3 | TYPE:
MAIN: 175 A | WIRE: 4 | AIC: 10,000 AMPS SYMMETRICAL

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
R...	REC - BASEBALL CONCESSION	12	20 A	1	1	0.90	0.70					1	2	20 A	12	FAN F-4	MI...
MIS C.	WH4 (BASEBALL)	12	20 A	3	2			1.50	0.02			1	4	20 A	12	RECIRC PUMP (BASEBALL)	Ot...
				5						1.50	0.60	1	6	20 A	10	DUGOUT - SOFTBALL	MI...
MI...	DUGOUT - SOFTBALL	10	20 A	7	1	0.60	0.60					1	8	20 A	12	DUGOUT - BASEBALL	MI...
MI...	DUGOUT - BASEBALL	8	20 A	9	1			0.60	1.00			1	10	20 A	12	BACKSTOP REC. PEDESTAL	MI...
MI...	BACKSTOP REC. PEDESTAL	8	20 A	11	1					1.00	5.48		12				RE CEP T...
MI...	DATA RACK G010	12	20 A	13	1	0.50	4.72					3	14	100 A	SR	PANEL RPS	
MI...	FACP - BASEBALL *	12	20 A	15	1			0.50	3.16				16				
MI...	HAND DRYER (NOTE 7)	12	20 A	17	1					1.00	1.00	1	18	20 A	12	HAND DRYER (NOTE 7)	MI...
R...	REC - CONCESSION	12	20 A	19	1	0.54	0.18					1	20	20 A	12	FAN CONCESSION	R...
MI...	REC - CONCESSION	12	20 A	21	1			0.50	0.50			1	22	20 A	12	REC - CONCESSION	MI...
MI...	REC - REFRIGERATOR (NOTE 8)	12	20 A	23	1					0.50	0.50	1	24	20 A	12	REC - CONCESSION	MI...
MI...	REC - CONCESSION	12	20 A	25	1	0.50	0.50					1	26	20 A	12	REC - CONCESSION	MI...
MI...	HAND DRYER (NOTE 7)	12	20 A	27	1			1.00	1.00			1	28	20 A	12	HAND DRYER (NOTE 7)	MI...
--	SPACE ONLY	--	--	29	--					0.00	0.00	1	30	20 A	--	SPARE (NOTE 8)	--
--	SPACE ONLY	--	--	31	--	0.00	0.00					1	32	20 A	--	SPARE	--
--	SPACE ONLY	--	--	33	--			0.00	0.00			1	34	20 A	--	SPARE	--
--	SPACE ONLY	--	--	35	--					0.00	0.00	1	36	20 A	--	SPARE	--
--	SPACE ONLY	--	--	37	--	0.00	0.00					1	38	20 A	--	SPARE	--
--	SPACE ONLY	--	--	39	--			0.00	0.00			1	40	20 A	--	SPARE	--
--	SPACE ONLY	--	--	41	--					0.00	0.00	1	42	20 A	--	SPARE	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.26 kVA	125.00%	0.32 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	8.70 kVA	100.00%	8.70 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	2.70 kVA	100.00%	2.70 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	19.42 kVA	100.00%	19.42 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.
7. PROVIDE HANDLE LOCK.
8. PROVIDE CLASS A GFI (6mA-PERSONNEL) BRKR (250' MAX).

		TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA...	31.10 kVA			
TOTAL KVA (DEMAND):	31.16 kVA	81.2 A	81.5 A	96.5 A
TOTAL AMP....	86 A			
TOTAL AMP. (DEMAND):	86 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.
SR - SEE POWER RISER
* - FIRE ALARM CIRCUIT, RED HANDLE WITH HANDLE LOCK

PANEL: RPDB

VOLTAGE: 208Y/120 3Ø | FED FROM: RPD1
MOUNTING: SURFACE | MAIN TYPE: MCB | MFR:
ENCLOSURE: NEMA1 | PHASE: 3 | TYPE:
MAIN: 80 A | WIRE: 4 | AIC: 10,000 AMPS SYMMETRICAL

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
MI...	EWC (NOTE 7)	12	20 A	1	1	0.36	0.00					--	2	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	3	--			0.00	0.18			1	4	20 A	12	RECEPTACLES GEN. STORAGE 010	R...
R	REC - BASEMENT WALL B	12	20 A	5	1					0.72	0.36	1	6	20 A	12	REC - BASEMENT KITCHEN	R
R	REC - BASEMENT FRIDGE (NOTE 7)	12	20 A	7	1	0.18	0.36					1	8	20 A	12	REC - BASEMENT TLT	R
R...	RECEPTACLES GEN. STORAGE 010	12	20 A	9	1			0.18	0.18			1	10	20 A	12	RECEPTACLES GEN. STORAGE 010	R...
R...	RECEPTACLES GEN. STORAGE 010	12	20 A	11	1					0.18	0.18	1	12	20 A	12	RECEPTACLES GEN. STORAGE 010	R...
R...	RECEPTACLES GEN. STORAGE 010	12	20 A	13	1	0.18	0.18					1	14	20 A	12	RECEPTACLES GEN. STORAGE 010	R...
R	REC - BASEMENT WALL A	12	20 A	15	1			1.26	1.08			1	16	20 A	12	REC - BASEMENT CONFERENCE	R
R	REC - BASEMENT CONF FLOOR BOX	12	20 A	17	1					0.54	0.54	1	18	20 A	12	REC - BASEMENT OFFICE 012	R
R	REC - BASEMENT OFFICE 011	12	20 A	19	1	0.54	0.18					1	20	15 A	12	FAN F-47/DAMPERS - STORAGE 010	MI...
C...	FCU-1 STORAGE 010	12	15 A	21	1			0.16	0.16			1	22	20 A	12	FCU-2 . STORAGE 010	C...
C...	FCU-3 GEN. STORAGE 010	12	20 A	23	1					0.16	0.00	--	24	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	25	--	0.00	0.00					--	26	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	27	--			0.00	0.00			--	28	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	29	--					0.00	0.00	--	30	--	--	SPACE ONLY	--
--	SPARE	--	20 A	31	1	0.00	0.00					--	32	--	--	SPACE ONLY	--
--	SPARE	--	20 A	33	1			0.00	0.00			--	34	--	--	SPACE ONLY	--
--	SPARE	--	20 A	35	1					0.00	0.00	--	36	--	--	SPACE ONLY	--
--	SPARE	--	20 A	37	1	0.00	0.00					--	38	--	--	SPACE ONLY	--
--	SPARE	--	20 A	39	1			0.00	0.00			--	40	--	--	SPACE ONLY	--
--	SPARE	--	20 A	41	1					0.00	0.00	--	42	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.00 kVA	0.00%	0.00 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.47 kVA	100.00%	0.47 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	6.66 kVA	100.00%	6.66 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	0.54 kVA	100.00%	0.54 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.
7. PROVIDE CLASS A GFI (6mA-PERSONNEL) BRKR (250' MAX).

		TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA...	7.85 kVA			
TOTAL KVA (DEMAND):	7.85 kVA	16.5 A	27.5 A	23.2 A
TOTAL AMP....	22 A			
TOTAL AMP. (DEMAND):	22 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

DPF DPB RPS
RPF RPB RPDB

GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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01-12-2023

MEMBERS OF THE AMERICAN INSTITUTE OF ARCHITECTS

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

PANEL SCHEDULES

E-907

Optima # 22-0082

01.12.2023 - BID SET

CONTRACTOR/INTEGRATOR RESPONSIBILITY MATRIX (a)

SYSTEM	EQUIPMENT FURNISHED	EQUIPMENT INSTALLED	RACEWAY FURNISHED & INSTALLED	POWER WIRING FURNISHED & INSTALLED	CONTROLS WIRING FURNISHED & INSTALLED	PROGRAMMING & INTEGRATION	DESIGNED BY
GROUNDING AND BONDING	ELECTRICAL	ELECTRICAL	ELECTRICAL	N/A	N/A	N/A	OPTIMA
CORRIDOR CABLE TRAYS	ELECTRICAL	ELECTRICAL	N/A	N/A	N/A	N/A	OPTIMA
TELECOM ROOM CABLE TRAYS	TELECOM	TELECOM	N/A	N/A	N/A	N/A	OPTIMA
STRUCTURED CABLING J-HOOKS	TELECOM	TELECOM	N/A	N/A	N/A	N/A	OPTIMA
SECURITY CABLING J-HOOKS	SECURITY	SECURITY	N/A	N/A	N/A	N/A	OPTIMA
PLYWOOD BACKBOARD	GENERAL	GENERAL	N/A	N/A	N/A	N/A	OPTIMA
EQUIPMENT RACKS & CABINETS	TELECOM	TELECOM	ELECTRICAL	ELECTRICAL	N/A	N/A	OPTIMA
TELECOMMUNICATIONS SERVICES - INTERNET SERVICE PROVIDER	UTILITY	UTILITY	ELECTRICAL	ELECTRICAL	N/A	N/A	UTILITY
TELECOMMUNICATIONS SERVICES - SITE/BETWEEN BUILDINGS (b)	TELECOM	TELECOM	ELECTRICAL	ELECTRICAL	N/A	N/A	OPTIMA
STRUCTURED CABLING	TELECOM	TELECOM	ELECTRICAL	ELECTRICAL	N/A	N/A	OPTIMA
STRUCTURED CABLING SURGE SUPPRESSION	TELECOM	TELECOM	N/A	N/A	N/A	N/A	OPTIMA
WIRELESS ACCESS POINTS	OWNER	TELECOM	ELECTRICAL	ELECTRICAL	N/A	OWNER	OWNER
WORKSTATIONS, PRINTERS & COPIERS	OWNER	OWNER	ELECTRICAL	ELECTRICAL	OWNER	OWNER	OWNER
VOIP TELEPHONE EQUIPMENT	OWNER	OWNER	ELECTRICAL	ELECTRICAL	OWNER	OWNER	OWNER
ACTIVE NETWORK ELECTRONICS	OWNER	OWNER	ELECTRICAL	ELECTRICAL	OWNER	OWNER	OWNER
INTRUSION DETECTION	SECURITY	SECURITY	ELECTRICAL	ELECTRICAL	SECURITY	SECURITY	OPTIMA
SECURITY/SURVEILLANCE	SECURITY	SECURITY	ELECTRICAL	ELECTRICAL	SECURITY	SECURITY	OPTIMA
HARDWIRED DOOR ACCESS CONTROL	SECURITY	SECURITY	ELECTRICAL	ELECTRICAL	SECURITY	SECURITY	OPTIMA
ELECTRIFIED DOOR HARDWARE (DOOR OPENERS AND HOLDS)	HARDWARE	HARDWARE	ELECTRICAL	ELECTRICAL	HARDWARE	HARDWARE	ARCHITECT
PUBLIC ADDRESS/INTERCOM	AUDIO/VISUAL	AUDIO/VISUAL	ELECTRICAL	ELECTRICAL	AUDIO/VISUAL	AUDIO/VISUAL	OPTIMA

NOTES:

(a) MATRIX NOT INCLUSIVE OF ALL SYSTEMS TO BE PROVIDED. REFER TO PROJECT MANUAL AND DRAWINGS FOR ADDITIONAL INFORMATION. IF A CONTRADICTION OF DIRECTION IS IDENTIFIED WITHIN THE RESPONSIBILITY MATRIX, DRAWINGS AND/OR SPECIFICATIONS, CONTRACTOR SHALL REQUEST CLARIFICATION PRIOR TO FINALIZING BID OR INCLUDE THE HIGHER COST OPTION IN THEIR BID. GENERAL CONTRACTOR IS ULTIMATELY RESPONSIBLE TO VERIFY ALL SCOPE IS COVERED.

(b) WHERE SERVICES ARE CALLED OUT WITH SPECIFIC INFORMATION (CABLE TYPE, COUNT, ETC), TELECOMMUNICATIONS CONTRACTOR SHALL INCLUDE CABLING WITHIN THEIR BID.

GENERAL NOTES:

A. COORDINATE WITH ARCHITECTURAL PLANS FOR EXACT NETWORK OUTLET LOCATIONS.

B. COORDINATE LOCATIONS OF CEILING MOUNTED DEVICES (WIRELESS ACCESS POINTS, SPEAKERS, CABLE TRAY, ETC) WITH ALL OTHER TRADES (ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, TECHNOLOGY, ETC).

C. ANY DIRECTION GIVEN IN THE FIELD THAT DEVIATES FROM THE CONSTRUCTION DOCUMENTS MUST BE DOCUMENTED AND VERIFIED WITH THE ENGINEER.

D. PROVIDE ALL REQUIRED HARDWARE FOR A COMPLETE INSTALLATION.

E. IF A CONTRADICTION OF DIRECTION IS IDENTIFIED WITHIN THE RESPONSIBILITY MATRIX, DRAWINGS AND/OR SPECIFICATIONS, CONTRACTOR SHALL REQUEST CLARIFICATION PRIOR TO FINALIZING BID OR INCLUDE THE HIGHER COST OPTION IN THEIR BID.

F. EACH 4" LOW VOLTAGE SITE CONDUIT SHALL BE PROVIDED WITH (3) 1.25" INNDERDUCTS.

G. ALL CONDUITS SHALL BE CONCEALED UNLESS OTHERWISE NOTED. WHERE CONDUITS ARE TO BE INSTALLED IN EXPOSED CEILINGS, CONDUITS SHALL BE INSTALLED TIGHT TO STRUCTURE AND PAINTED TO MATCH ADJACENT SURFACE.

H. NO SECTION OF LOW VOLTAGE CONDUIT SHALL CONTAIN MORE THAN (2) 90° BENDS, OR EQUIVALENT BETWEEN PULL POINTS. PROVIDE JUNCTION BOX SIZED PER NEC OR AS INDICATED.

I. NO SECTION OF LOW VOLTAGE CONDUIT SHALL BE LONGER THAN 100'-0" BETWEEN PULL POINTS. PROVIDE JUNCTION BOX SIZED PER NEC OR AS INDICATED.

J. ELECTRICAL CONTRACTOR SHALL COORDINATE EXACT CONDUIT ROUTING FOR TELECOMMUNICATIONS HORIZONTAL CABLING WITH STRUCTURED CABLING CONTRACTOR PRIOR TO INSTALLATION.

K. ALL 2" AND LARGER CONDUITS SHALL BE LABELED ON BOTH ENDS INDICATING DESTINATION LOCATION.

L. ALL JUNCTION BOXES MOUNTED IN EXTERIOR WALLS SHALL BE WEATHERPROOF AND GASKETED.

M. ELECTRICAL CONTRACTOR SHALL PROVIDE PULLSTRINGS (INTERIOR) OR MULE TAPE (EXTERIOR) FOR ALL CONDUITS (NEW AND EXISTING TO REMAIN) TO BE UTILIZED FOR LOW VOLTAGE SYSTEMS.

N. ELECTRICAL CONTRACTOR SHALL MAINTAIN FIRE RATINGS OF WALLS, PARTITIONS, FLOORS OR CEILINGS PER NEC & IBC WHEN INSTALLING RECESSED BOXES. BOXES IN RATED WALLS SHALL BE SEPARATED BY A HORIZONTAL DISTANCE NOT LESS THAN 24". THE HORIZONTAL DISTANCE MAY BE REDUCED, BUT SHALL NOT BE LESS THAN THE DEPTH OF THE WALL CAVITY, WHERE FILLED WITH CELLULOSE LOOSE FILL, ROCKWOOL OR SLAG MINERAL WOOL INSULATION OR WHERE PROTECTED BY LISTED PUTTY PADS OR OTHER LISTED MATERIALS/METHODS. ELECTRICAL CONTRACTOR SHALL PROVIDE LISTED PUTTY PADS AS REQUIRED. IN NO CASE SHALL THE AGGREGATE AREA OF OPENINGS EXCEED 100 SQUARE INCHES IN ANY 100 SQUARE FEET OF WALL SPACE. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH LOW VOLTAGE CONTRACTOR TO VERIFY FINAL INSTALLATION WILL SATISFY CODE REQUIREMENTS.

O. INSTALLATION OF AC VOLTAGE CABLING IN LOW VOLTAGE PATHWAYS IS NOT ACCEPTABLE.

P. CABLING SHALL PASS STRAIGHT THROUGH ANY PULL BOX. CHANGE OF DIRECTION IN A PULL BOX IS NOT ACCEPTABLE.

Q. CONDUITS SHALL HAVE A MAXIMUM 40% FILL RATIO.

R. FACEPLATES SHALL MATCH ADJACENT ELECTRICAL DEVICES. FINAL COLOR AND FINISH TO BE APPROVED BY ARCHITECT AND OWNER. PROVIDE STAINLESS STEEL FACEPLATES. CONTRACTOR SHALL PROVIDE ALTERNATE PRICING FOR PLASTIC FACEPLATES.

S. ALL FACEPLATES AND PATCH PANELS SHALL UTILIZE MODULAR JACKS.

T. COPPER JACK COLOR SHALL MATCH CABLE COLOR.

U. ALL CABLING SHALL BE PLENUM RATED UNLESS OTHERWISE NOTED.

V. ALL CABLING, TERMINATIONS AND HOUSINGS ARE TO BE RATED FOR THE ENVIRONMENTS IN WHICH THEY ARE INSTALLED.

W. CABLING SHALL NOT BE PAINTED. MANUFACTURERS WARRANTY MAY BE VOIDED.

X. DO NOT INSTALL BRUISED, KINKED, SCORED, DEFORMED, OR ABRADED CABLE. REMOVE AND DISCARD CABLE IF DAMAGED DURING INSTALLATION AND REPLACE IT WITH NEW CABLE.

Y. TERMINATE ALL CABLING ON DEDICATED SYSTEM PATCH PANEL. (WIRELESS, DATA, SECURITY, ETC.)

Z. PROVIDE OUTSIDE PLANT CATEGORY CABLING FOR IN/UNDERSLAB OR OUTDOOR APPLICATIONS. CONDUIT CONTAINING OUTSIDE PLANT CABLING SHALL BE EXTENDED TO LOCAL TELECOMMUNICATIONS ROOM. INDOOR/OUTDOOR CATEGORY CABLING IS AN ACCEPTABLE ALTERNATIVE. GENERAL CABLE: GENSPEED 10 UTP INDOOR/OUTDOOR 7141007 OR APPROVED EQUAL.

AA. ALL CABLING SHALL BE TERMINATED, TESTED AND LABELED PER SPECIFICATIONS. ALL LABELING SHALL BE MACHINE PRINTED. HAND WRITTEN LABELS ARE NOT ACCEPTABLE.

BB. PROVIDE PATCH CORD FOR EACH TERMINATED PORT IN TELECOMMUNICATIONS ROOM. COORDINATE EXACT LENGTH WITH OWNER.

CC. PROVIDE EQUIPMENT CORD FOR EACH WIRELESS ACCESS POINT AND NETWORK CAMERA. COORDINATE EXACT LENGTH WITH OWNER.

DD. PROVIDE SURGE SUPPRESSION MODULE AT DEVICES UTILIZING IN/UNDERSLAB CONDUIT AND EXTERIOR WIRELESS ACCESS POINT, CAMERA, AND NETWORK SPEAKER LOCATIONS. DITEK: DTK-MRJPOES OR APPROVED EQUAL. REFER TO EXTERIOR NETWORK DEVICE DETAIL. PROVIDE 24 CHANNEL, RACK MOUNTED SURGE SUPPRESSION AT RACK LOCATION FOR NETWORK PROTECTION. DITEK: DTK-RM24NETS OR APPROVED EQUAL. PROVIDE PATCH CORDS AS REQUIRED. INSTALL SURGE SUPPRESSION DEVICES WITHIN 24" OF BUILDING ENTRY OR EQUIPMENT ENCLOSURE.

EE. ALL PENETRATIONS THROUGH RATED WALLS MUST BE FIRESTOPPED. UTILIZE MECHANICAL FIRE RATED PATHWAYS. STI EZ-PATH OR APPROVED EQUAL.

FF. PROVIDE METALLIC J-HOOKS FOR CABLING IN ACCESSIBLE CEILING SPACES WITHOUT CABLE TRAY, BETWEEN CONDUITS, AND BETWEEN CONDUITS AND CABLE TRAY AT 3'-5' IRREGULAR INTERVALS. PANDUIT, COOPER B-LINE, NVENT CADDY, OR APPROVED EQUAL.

GG. THE USE OF J-HOOKS IN EXPOSED CEILING AREAS IS NOT ACCEPTABLE. PROVIDE CONDUIT OR SOLID BOTTOM CABLE TRAY. CONDUITS AND/OR SOLID BOTTOM CABLE TRAY SHALL BE PAINTED TO MATCH ADJACENT SURFACE.

HH. THE USE OF J-HOOKS ABOVE INACCESSIBLE CEILING AREAS IS NOT ACCEPTABLE. PROVIDE CONDUIT.

II. NYLON CABLE TIE WRAPS ARE NOT ACCEPTABLE FOR BINDING OR SECURING CABLE BUNDLES. UTILIZE HOOK AND LOOP STRAPS TO SECURE CABLING IN TELECOMMUNICATIONS ROOM. STRAPS SHALL BE EVENLY SPACED THROUGHOUT THE DRESSED LENGTH AND PLENUM RATED WHERE APPLICABLE.

JJ. PROVIDE (2) CATEGORY 6A CABLES TO EACH FIRE ALARM CONTROL PANEL FROM LOCAL TELECOMMUNICATIONS ROOM FOR NETWORK INTERFACE. EXTEND INCOMING ANALOG DEMARK TO LOCAL TELECOMMUNICATIONS ROOM AS REQUIRED. COORDINATE LOCATION AND REQUIREMENTS WITH FIRE ALARM CONTRACTOR.

KK. PROVIDE (1) CATEGORY 6A CABLE TO EACH EMERGENCY RESPONDER RADIO SYSTEM CONTROL PANEL FROM LOCAL TELECOMMUNICATIONS ROOM FOR NETWORK INTERFACE. COORDINATE LOCATION AND REQUIREMENTS WITH ELECTRICAL CONTRACTOR.

LL. PROVIDE (1) CATEGORY 6A CABLE TO EACH HVAC CONTROLLER (JACE) FROM LOCAL TELECOMMUNICATIONS ROOM FOR NETWORK INTERFACE. COORDINATE LOCATION AND REQUIREMENTS WITH HVAC CONTRACTOR

SECURITY GENERAL NOTES

1. ANYTIME A MONITORED DOOR(S) ARE OPENED THE AUDIBLE SHALL SOUND AT THE REMOTE LOCATIONS DESIRED INCLUDING THE SCHOOL OFFICES AND AND RESOURCE OFFICER'S LOCATIONS. EACH ALARM SHALL HAVE A UNIQUE LOCATION IDENTIFIER AND NAME DISPLAYED ON THE ACCESS CONTROL GRAPHICAL USER INTERFACE (GUI) MAPS MONITOR AS THE BREACHED DOOR FLASHES THE SCREEN IN RED.
2. THE SECURITY ADMINISTRATOR SHALL BE NOTIFIED IN ADVANCED FOR AUTHORIZATION WHEN MONITORED DOOR(S) ARE TO BE USED. THE ADMINISTRATOR SHALL SCHEDULE THE BY-PASS OF AUTHORIZED DOOR(S) VIA THE ACCESS CONTROL SYSTEMS, ALARMS ASSOCIATED SHALL NOT SOUND, BUT WILL BE LOGGED IN THE AUDIT TRAIL AND STATUS DISPLAYED ON THE MONITOR GUI. THE DOOR(S) SHALL BE RE-ARMED AT THE EXPIRATION OF THE SCHEDULE SET AND THE DOOR(S) ARE NO LONGER TO BE USED. THIS RE-ARMING SHALL BE AUTOMATIC AND NOT REQUIRE ADDITIONAL INPUT. STATUS OF ALL DOORS SHALL BE CONSTANTLY MONITORED.
3. SCHEDULES SHALL BE SET FOR DOORS ALLOWED TO BE USED DURING HOURS OF OPERATION (EXAMPLE -OFFICE DOORS ETC.) ONCE AN AUTHORIZED PERSON HAS PRESENTED THEIR CREDENTIALS AT THE DOOR.
4. ALL CAMERA FIELD VIEWS (FoV) SHALL BE FIELD VERIFIED PRIOR TO INSTALLATION. CONTRACTOR SHALL TEMPORARILY SUPPORT THE CAMERA AT THE LOCATION TO CONFIRM THE LOCATION WILL PROVIDE THE FoV DESIRED. RELOCATION OF CAMERAS NOT PROVIDING THE DESIRED FoV SHALL BE AT THE CONTRACTORS EXPENSE. VERIFY BEFORE INSTALLATION. SUBMIT THE FoV ELECTRONICALLY TO ENGINEER FOR ACCEPTANCE.
5. CAMERA LOCATIONS ARE NOT TO SCALE AND SHOW GENERAL PLACEMENT LOCATION.
6. MOST INTERIOR CAMERAS SHALL BE RECESSED CEILING MOUNTED WITH TRIM RINGS AND EXPOSED HOUSINGS COLOR MATCHED TO CEILING. PROVIDE ARCHITECT COLOR SAMPLES FOR VERIFICATION PRIOR TO ORDERING.
7. WALL MOUNTED CAMERAS LOCATIONS SHALL BE COORDINATED TO MAINTAIN THE DESIRED FIELD OF VIEW (FoV) WITH ALL EXPOSED HOUSINGS COMPONENTS COLOR MATCHED TO WALL. PROVIDE ARCHITECT COLOR SAMPLES FOR VERIFICATION PRIOR TO ORDERING.
8. ALL DOOR HARDWARE SHALL BE COORDINATED WITH THE ARCHITECTURAL DOOR HARDWARE CONSULTANT. HARDWARE SHOWN ON SECURITY DRAWINGS SHOW NEED AND DOES NOT SIGNIFY THE TYPE.
   - A. (EL)-ELECTRIC LOCK, TYPE -MAY BE (ELECTRIC MORTISE LOCK, STRIKE, MAGNETIC, ELECTRIC LATCH RETRACTION, CYLINDRICAL ETC.)
   - B. ELECTRIC MORTISE LOCK -SHALL HAVE BUILT-IN REQUEST TO EXIT (RX) SWITCH, HAVE ELECTRIFIED HINGE (EH) AND DOOR PREPPED AT FACTORY FOR PATHWAY FROM HINGE TO LOCK BODY AND RECESSED DOOR POSITION SENSOR (CONTACT)
   - C. ELECTRIC STRIKES REQUIRE REQUEST TO EXIT (RX) PASSIVE INFRARED SENSOR (PIR) ABOVE DOOR.
   - D. MAGNETIC LOCKS SHOULD BE ONLY USED AS LAST RESORT. THESE SPECIAL KNOWLEDGE DEVICES REQUIRE BOTH REQUEST TO EXIT (RX) PASSIVE INFRARED MOTION SENSOR (PIR) ABOVE DOOR AND A PUSH TO EXIT BUTTON (PB) WITHIN THE ADA AND BUILDING CODE REQUIREMENTS (NOT MORE THAN 5-FEET). THE PUSH BUTTON (PB) SHALL DIRECTLY BREAK THE POWER LEG TO THE LOCK AND NOT HAVE ANY INTERMEDIARY DEVICES.
   - E. ALL CONTROLLED OPENINGS IN PATH OR EGRESS MUST BE INTERCONNECTED TO THE FIRE ALARM SYSTEM AND FAIL-SAFE.
   - F. SECURITY CONTRACTOR SHALL PROVIDE, INSTALL, AND CABLE THE DOOR HARDWARE POWER SUPPLIES (PS). THESE POWER SUPPLIES (PS) SHALL SERVE UP TO 8-LOCKS. CONTRACTOR SHALL DETERMINE THE CURRENT DRAW OF EACH LOCK AND CONDUCTOR SIZE TO EACH LOCK. ALL POWER SUPPLIES SHALL BE LOCATED IN THE CLOSEST TECHNOLOGY/TELECOMMUNICATIONS ROOM. (EXCEPTION: ELECTRIC LATCH RETRACTION (ELR) LOCK POWER SUPPLY (PS) SHALL BE PROVIDED BY THE DOOR HARDWARE PROVIDER.
9. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
10. PATHWAYS SHALL BE CONCEALED. NO CONDUIT SHALL BE EXPOSED. WHEN FREE-AIR CABLING IS APPROVED, CONDUIT SHALL BE INSTALLED ABOVE HARD-CEILINGS OR INACCESSIBLE AREAS TO THE CLOSEST APPROVED TECHNOLOGY CABLE SUPPORT SYSTEM (CABLE TRAY, J-HOOKS NOT MORE THAN 5-FEET APART). BRIDLE RINGS SHALL NOT BE INSTALLED. SECURITY SYSTEMS CABLES SHALL HAVE A DEFINED AREA IN THE CABLE SUPPORT SYSTEM AND NOT COMMINGLING WITH OTHER SYSTEMS CABLES. AC VOLTAGE SHALL NOT BE INSTALLED IN THE TECHNOLOGY CABLE SUPPORT SYSTEM.
11. SECURITY AND TELECOMS CONDUITS SHALL NOT HAVE MORE THAN 180-DEGREE BENDS. A PULL-BOX IS REQUIRED AT 180-DEGREES.
12. CABLING SHALL PASS STRAIGHT THROUGH A PULL-BOX. CHANGE OF DIRECTION IN A PULL-BOX IS NOT PERMITTED.
13. CONDUITS (LB,LR,LL,TEES ETC.) OF ANY TYPE OR MANUFACTURER SHALL NOT BE INSTALLED FOR ANY SECURITY OR TECHNOLOGY CABLING.
14. ALL WALL MOUNTED SECURITY EQUIPMENT SHALL BE PLACED ON 4' X 8' X 3/4" AC FIRE RATED PLYWOOD WITHIN THE TELECOM EQUIPMENT ROOM.
15. SECURITY CONTRACTOR SHALL COORDINATE THE EXACT PLACEMENT OF ALL SECURITY EQUIPMENT WITH IT PRIOR TO MOUNTING ANY EQUIPMENT.

TELECOMMUNICATIONS STANDARDS:

INSTALLATION SHALL CONFORM TO THE FOLLOWING STANDARDS:

A. TIA-568.0-E (GENERIC TELECOMMUNICATIONS CABLING FOR CUSTOMER PREMISES)

B. TIA-568.1-D-1 (COMMERCIAL BUILDING TELECOMMUNICATIONS CABLING)

C. TIA-568.3-D (OPTICAL FIBER CABLING COMPONENTS)

D. TIA-568-C.2-1 (BALANCED TWISTED-PAIR TELECOMMUNICATIONS CABLING AND COMPONENTS)

E. TIA-569-D-1 (TELECOMMUNICATIONS PATHWAYS AND SPACES)

F. TIA-606-C (ADMINISTRATION STANDARD FOR TELECOMMUNCATIONS INFRASTRUCTURE)

G. TIA-607-D (TELECOMMUNICATIONS BONDING AND GROUNDING FOR CUSTOMER PREMISES)

CONDUIT CAPACITY SCHEDULE

CONDUIT		1.25"	1.50"	2.00"	2.50"	3.00"	4.00"
CABLES		7	10	18	25	40	70

NOTES:
A. UPSIZE CONDUIT TO NEXT SIZE SHOWN IN THIS SCHEDULE WHEN CABLE CAPACITY HAS BEEN EXCEEDED.
B. CONDUIT CAPACITY CALCULATED WITH 0.30" O.D. CATEGORY CABLE AT 40% FILL RATIO.

CONDUIT/SLEEVE SCHEDULE

CLASSROOMS	(2) 2" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.
COMPUTER LABS	(2) 4" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.
SMALL OFFICES	(2) 2" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.
LARGE OFFICES	(2) 2" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.
WORKSPACES	(2) 2" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.
CONFERENCE RMS.	(2) 2" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.
VESTIBULES	(1) 2" CONDUIT TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.

ADDITIONAL REQUIREMENTS:

A. PROVIDE A MINIMUM OF (2) 4" CONDUITS BETWEEN ALL ACCESSIBLE CEILING SPACES SEPARATED BY A HARD CEILING GREATER THAN 3'-0" UNLESS OTHERWISE NOTED. REFER TO TELECOMMUNICATIONS CONDUIT CAPACITY SCHEDULE.

B. PROVIDE A MINIMUM OF (1) 2" CONDUIT BETWEEN ALL ACCESSIBLE CEILING SPACES SEPARATED BY A WALL THAT IS CONSTRUCTED TO DECK UNLESS OTHERWISE NOTED. REFER TO TELECOMMUNICATIONS CONDUIT CAPACITY SCHEDULE.

CABLE SERVICE LOOP SCHEDULE

	SOURCE	DESTINATION	NOTES
HORIZONTAL - COPPER - DATA	10'-0"	1'-6"	
HORIZONTAL - COPPER - WAP	10'-0"	20'-0"	
HORIZONTAL - COPPER - INTERCOM	10'-0"	10'-0"	
HORIZONTAL - COPPER - CAMERA	10'-0"	20'-0"	
HORIZONTAL - FIBER	10'-0"	1'-6"	

NOTES:
A. UTILIZE FIGURE EIGHT CONFIGURATION FOR LARGE SERVICE LOOPS.
B. COIL CABLING FOR FIELD DEVICE LOCATIONS AT CABLE TRAY/J-HOOKS ABOVE ACCESSIBLE CEILING.
C. PROVIDE 20'-0" SERVICE LOOP WERE A ROOM IS UTILIZED AS A PULL POINT AND NO TERMINATIONS ARE MADE.

PULL BOX SIZING SCHEDULE

CONDUIT	PULL BOX WIDTH	PULL BOX LENGTH	PULL BOX DEPTH	PULL BOX WITH MULTIPLE CONDUITS (NOTE A)
1.00"	4.00"	16.00"	3.00"	2.00"
1.25"	6.00"	20.00"	3.00"	3.00"
1.50"	8.00"	27.00"	4.00"	4.00"
2.00"	8.00"	36.00"	4.00"	5.00"
2.50"	10.00"	42.00"	5.00"	6.00"
3.00"	12.00"	48.00"	5.00"	6.00"
4.00"	15.00"	60.00"	8.00"	8.00"

NOTES:
A. FOR EACH ADDITIONAL CONDUIT, ADD INDICATED DIMENSION TO PULL BOX WIDTH.
B. SIZING INDICATED IS FOR MINIMUM PULL BOX SIZE. INCREASE AS REQUIRED.

ABBREVIATIONS

ACT	ACOUSTICAL CEILING TILE	MH	MANHOLE
ADA	AMERICANS WITH DISABILITIES ACT	MIN	MINIMUM
AFF	ABOVE FINISHED FLOOR (ELEVATION TAKEN FROM FINISHED FLOOR)	NEC	NATIONAL ELECTRICAL CODE
		NVR	NETWORK VIDEO RECORDER
AFG	ABOVE FINISHED GRADE (ELEVATION TAKEN FROM FINISHED GRADE)	OSP	OUTSIDE PLANT
		PBB	PRIMARY BONDING BUSBAR
AV	AUDIO/VISUAL	PDU	POWER DISTRIBUTION UNIT
AVC	AUDIO/VISUAL CONTRACTOR	PoE	POWER OVER ETHERNET
AWG	AMERICAN WIRE GAUGE	PVC	POLYVINYL CHLORIDE
BOCT	BOTTOM OF CABLE TRAY	QTY	QUANTITY
C	CONDUIT	SBB	SECONDARY BONDING BUSBAR
CAM	CAMERA	SC	SECURITY CONTRACTOR
CATV	CABLE TELEVISION	SPECS	SPECIFICATIONS
CLG	CEILING	TC	TELECOMMUNICATIONS CONTRACTOR
CMU	CONCRETE MASONRY UNIT	TELECOM	TELECOMMUNICATIONS
EC	ELECTRICAL CONTRACTOR	TBB	TELECOMMUNICATIONS BONDING BACKBONE
ETR	EXISTING TO REMAIN		
EXT	EXTERIOR	TTB	TELEPHONE TERMINAL BACKBOARD
EV	ELECTRIC VEHICLE CHARGER	TYP	TYPICAL
FACP	FIRE ALARM CONTROL PANEL	UON	UNLESS OTHERWISE NOTED
GYP	GYPSUM BOARD	UPS	UNINTERRUPTIBLE POWER SUPPLY
HDMI	HIGH DEFINITION MULTIMEDIA INTERFACE	VoIP	VOICE OVER INTERNET PROTOCOL
HDTV	HIGH DEFINITION TELEVISION	WAP	WIRELESS ACCESS POINT
HH	HANDHOLE	WM	WIRE MANAGEMENT
IoT	INTERNET OF THINGS	WP	WEATHERPROOF
IP	INTERNET PROTOCOL	#D	QUANTITY OF DATA CONNECTIONS
J-BOX	JUNCTION BOX	#V	QUANTITY OF VOICE CONNECTIONS

CATEGORY CABLE COLORS

VOICE:	BLUE CABLE - BLUE JACK
DATA:	BLUE CABLE - BLUE JACK
WIRELESS ACCESS:	YELLOW CABLE - YELLOW JACK
CAMERAS:	GREEN CABLE - GREEN JACK
DOOR ACCESS:	ORANGE CABLE - ORANGE JACK
INTERCOM:	WHITE CABLE - WHITE JACK

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

TECHNOLOGY LEGEND AND NOTES

T-001

Optima # 22-0082

01.12.2023 - BID SET

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SYMBOLS:

SYMBOL	DESCRIPTION
#D/#V	NETWORK OUTLET. STANDARD HEIGHT (+18" AFF). ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT.
#D/#V	NETWORK OUTLET. ELEVATED HEIGHT (+42" AFF, UNLESS OTHERWISE NOTED). ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT.
#D	NETWORK OUTLET. CEILING MOUNTED. ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT.
W TV	NETWORK WALL PHONE OUTLET. ELEVATED HEIGHT (+42" AFF). ELECTRICAL CONTRACTOR SHALL PROVIDE 1-GANG JUNCTION BOX AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE AND PHONE WALL MOUNT FACEPLATE.
	NETWORK OUTLET - RACEWAY ONLY. STANDARD HEIGHT (+18" AFF). ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE.
	NETWORK OUTLET - RACEWAY ONLY. ELEVATED HEIGHT (+42" AFF, UNLESS OTHERWISE NOTED). ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE.
WAP	WIRELESS ACCESS POINT CONNECTION (CEILING). WHEN INSTALLED IN HARD/OPEN CEILING, ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. REFER TO WIRELESS ACCESS POINT DETAIL (HARD/OPEN CEILING). STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLES FOR EACH WIRELESS ACCESS POINT CONNECTION. WHEN INSTALLED IN ACCESSIBLE CEILING, STRUCTURED CABLING CONTRACTOR SHALL PROVIDE ABOVE CEILING BRACKET AND SURFACE BOX. REFER TO WIRELESS ACCESS POINT DETAIL (ACCESSIBLE CEILING). STRUCTURED CABLING CONTRACTOR SHALL PROVIDE 3'-0" EQUIPMENT CORD. WIRELESS ACCESS POINT EQUIPMENT SHALL BE OWNER FURNISHED, CONTRACTOR INSTALLED. COORDINATE WITH OWNER EXACT LOCATION AND MOUNTING METHOD OF WIRELESS ACCESS POINT EQUIPMENT.
WAP	WIRELESS ACCESS POINT CONNECTION (WALL). ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. REFER TO WIRELESS ACCESS POINT DETAIL (WALL). STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLES FOR EACH WIRELESS ACCESS POINT CONNECTION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE 3'-0" EQUIPMENT CORD. WIRELESS ACCESS POINT EQUIPMENT SHALL BE OWNER FURNISHED, CONTRACTOR INSTALLED. COORDINATE WITH OWNER EXACT LOCATION AND MOUNTING METHOD OF WIRELESS ACCESS POINT EQUIPMENT.
WAP EXT	WIRELESS ACCESS POINT CONNECTION (EXTERIOR). ELECTRICAL CONTRACTOR SHALL PROVIDE 12"x12"x6" DEEP JUNCTION BOX, 1" SLEEVE TO EXTERIOR AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLES FOR EACH WIRELESS ACCESS POINT CONNECTION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE SURGE PROTECTION AND 3'-0" EQUIPMENT CORD. WIRELESS ACCESS POINT EQUIPMENT SHALL BE OWNER FURNISHED, CONTRACTOR INSTALLED. REFER TO EXTERIOR NETWORK DEVICE DETAIL. COORDINATE WITH OWNER EXACT LOCATION AND MOUNTING METHOD OF WIRELESS ACCESS POINT EQUIPMENT.
TV XX-XX	DISPLAY CONNECTION WITH NETWORK AND DUPLEX POWER. ELECTRICAL CONTRACTOR SHALL PROVIDE 3-GANG JUNCTION BOX WITH OFFSET 1-GANG TRIM RING FOR LOW VOLTAGE SECTION, LOW VOLTAGE DIVIDER, 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE FOR NETWORK CABLING, 0.75" CONDUIT FOR POWER AND DUPLEX RECEPTACLE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE. REFER TO DISPLAY DETAIL. SUBSCRIPT : "AV-WP" - REFER TO AV DISPLAY WITH WALL PLATE DETAIL FOR REQUIREMENTS. "AV-FB" - REFER TO AV DISPLAY WITH FLOOR BOX DETAIL FOR REQUIREMENTS.
	CONDUIT/SLEEVE. 2" UNLESS OTHERWISE NOTED.
	RUNWAY LADDER CABLE TRAY IN TELECOMMUNICATIONS ROOMS.
	WIRE MESH CABLE TRAY ABOVE ACCESSIBLE CEILINGS; LENGTH AND WIDTH PER PLANS, 4" TALL.
	TWO-POST EQUIPMENT RACK WITH VERTICAL WIRE MANAGEMENT. PROVIDED BY TELECOMMUNICATIONS CONTRACTOR.
	FOUR-POST EQUIPMENT RACK WITH VERTICAL WIRE MANAGEMENT. PROVIDED BY TELECOMMUNICATIONS CONTRACTOR.
	3/4" FIRE-RATED AC PLYWOOD WITH TWO COATS OF FIRE RETARDANT LIGHT-COLORED PAINT ON ALL SIDES. STAMP SHALL BE VISIBLE. MOUNT 8" AFF WITH GRADE A SURFACE EXPOSED.
PBB	PRIMARY BONDING BUSBAR
SBB	SECONDARY BONDING BUSBAR
X	DRAWING NOTE

SYMBOLS:

SYMBOL	DESCRIPTION
# OF SENSORS	NETWORK CAMERA (CEILING). WHEN INSTALLED IN HARD/OPEN CEILING, ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. REFER TO CAMERA DETAIL (HARD/OPEN CEILING). STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE FOR EACH CAMERA CONNECTION. WHEN INSTALLED IN ACCESSIBLE CEILING, STRUCTURED CABLING CONTRACTOR SHALL PROVIDE ABOVE CEILING BRACKET AND SURFACE BOX. REFER TO CAMERA DETAIL (ACCESSIBLE CEILING). QUANTITY OF SENSORS REQUIRED INDICATED INSIDE CAMERA BY A NUMBER.
# OF SENSORS	NETWORK CAMERA (WALL). ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE FOR EACH CAMERA CONNECTION. REFER TO CAMERA DETAIL (WALL MOUNTED). QUANTITY OF SENSORS REQUIRED INDICATED INSIDE CAMERA BY A NUMBER.
EXT # OF SENSORS	NETWORK CAMERA (EXTERIOR CEILING). ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE FOR EACH CAMERA CONNECTION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE SURGE PROTECTION AND 1'-0" EQUIPMENT CORD. REFER TO EXTERIOR NETWORK DEVICE DETAIL. QUANTITY OF SENSORS REQUIRED INDICATED INSIDE CAMERA BY A NUMBER.
EXT # OF SENSORS	NETWORK CAMERA (EXTERIOR WALL). ELECTRICAL CONTRACTOR SHALL PROVIDE 12"x12"x6" DEEP JUNCTION BOX, 1" SLEEVE TO EXTERIOR AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE FOR EACH CAMERA CONNECTION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE SURGE PROTECTION AND 1'-0" EQUIPMENT CORD. REFER TO EXTERIOR NETWORK DEVICE DETAIL. QUANTITY OF SENSORS REQUIRED INDICATED INSIDE CAMERA BY A NUMBER.
CR	CARD READER. ELECTRICAL CONTRACTOR SHALL PROVIDE 1-GANG JUNCTION BOX AND 3/4" CONDUIT TO ACCESS CONTROL JUNCTION BOX ON SECURE SIDE OF DOOR. SECURITY CONTRACTOR SHALL PROVIDE DEVICE AND CABLING.
DC	DOOR CONTACT. ELECTRICAL CONTRACTOR SHALL PROVIDE 3/4" CONDUIT TO ACCESS CONTROL JUNCTION BOX ON SECURE SIDE OF DOOR. SECURITY CONTRACTOR SHALL PROVIDE DEVICE AND CABLING.
RTE	REQUEST TO EXIT DEVICE/CONNECTION. ELECTRICAL CONTRACTOR SHALL PROVIDE 1-GANG JUNCTION BOX AND 1" CONDUIT TO ACCESS CONTROL JUNCTION BOX ON SECURE SIDE OF DOOR. SECURITY CONTRACTOR SHALL PROVIDE DEVICE AND CABLING.
KP	KEYPAD. ELECTRICAL CONTRACTOR SHALL PROVIDE 1-GANG JUNCTION BOX AND 1" CONDUIT TO INTRUSION DETECTION CONTROL PANEL. SECURITY CONTRACTOR SHALL PROVIDE DEVICE AND CABLING.
ES	ELECTRIC STRIKE. ELECTRICAL CONTRACTOR SHALL PROVIDE 1" CONDUIT WITH PULL STRING IN DOOR FRAME TO ACCESS CONTROL JUNCTION BOX ON SECURE SIDE OF DOOR. HARDWARE CONTRACTOR SHALL PROVIDE DEVICE AND SECURITY CONTRACTOR SHALL PROVIDE CABLING.
EL	ELECTRIFIED LOCKSET. ELECTRICAL CONTRACTOR SHALL PROVIDE 1" CONDUIT WITH PULL STRING IN DOOR FRAME TO ACCESS CONTROL JUNCTION BOX ON SECURE SIDE OF DOOR. HARDWARE CONTRACTOR SHALL PROVIDE DEVICE AND SECURITY CONTRACTOR SHALL PROVIDE CABLINING.
PB	PUSH BUTTON DOOR RELEASE. ELECTRICAL CONTRACTOR SHALL PROVIDE 1-GANG JUNCTION BOX AND 3/4" CONDUIT TO ACCESS CONTROL JUNCTION BOX ON SECURE SIDE OF DOOR. SECURITY CONTRACTOR SHALL PROVIDE DEVICE AND CABLING.
IC	NETWORK INTERCOM 2-WAY SPEAKER (CEILING). WHEN INSTALLED IN HARD/OPEN CEILING, ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUITTO NEAREST ACCESSIBLE CEILING SPACE. WHEN INSTALLED IN ACCESSIBLE CEILING, STRUCTURED CABLING CONTRACTOR SHALL PROVIDE ABOVE CEILING BRACKET AND SURFACE BOX. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6 CABLE FOR EACH ROOM WITH A NETWORK SPEAKER CONNECTION; PROVIDE 10'-0" CABLE SLACK AND COIL AT CABLE TRAY/J-HOOKS ABOVE ACCESSIBLE CEILING. IP CLASSROOM MODULE SHALL BE LOCATED ABOVE CEILING. INTERCOM VENDOR/CONTRACTOR SHALL PROVIDEDAND INSTALL EQUIPMENT CORD/S AND ALL NECESSARY ACCESSORIES FOR A COMPLETE AND OPERABLE SYSTEM
IS	70-VOLT INTERCOM SPEAKER (CEILING). WHEN INSTALLED IN HARD/OPEN CEILING, ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUITTO NEAREST ACCESSIBLE CEILING SPACE. WHEN INSTALLED IN ACCESSIBLE CEILING, STRUCTURED CABLING CONTRACTOR SHALL PROVIDE ABOVE CEILING BRACKET AND SURFACE BOX. INTERCOM VENDOR/CONTRACTOR SHALL PROVIDE MINIMUM 18/2 WIRE TO AND BETWEEN SPEAKERS. PROVIDE 10' CABLE SLACK AND COIL AT CABLE TRAY/J-HOOKS ABOVE ACCESSIBLE CEILING. INTERCOM VENDOR/CONTRACTOR SHALL PROVIDEDAND INSTALL EQUIPMENT CORD/S AND ALL NECESSARY ACCESSORIES FOR A COMPLETE AND OPERABLE SYSTEM.
IS	70-VOLT INTERCOM SPEAKER (WALL). ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING. INTERCOM CONTRACTOR SHALL PROVIDE MINIMUM 18/2 WIRE TO AND BETWEEN SPEAKERS PROVIDE 1'-6" CABLE SLACK AND COIL AT CABLE TRAY/J-HOOKS ABOVE ACCESSIBLE CEILING. *SPEAKERS NOTED AS HIGH OUTPUT SHALL BE RAULAN ACC1412 OR APPROVED EQUAL
IS WP	HIGH OUTPUT 70-VOLT EXTERIOR INTERCOM SPEAKER (RAULAN ACC1412 OR APPROVED EQUAL). ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL RAULAND RECESSED, WEATHERPROOF BACKBOX, 1" SLEEVE TO EXTERIOR AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. INTERCOM VENDOR/CONTRACTOR SHALL PROVIDE MINIMUM 18/2 WIRE TO AND BETWEEN SPEAKERS. PROVIDE 10' CABLE SLACK AND COIL AT CABLE TRAY/J-HOOKS ABOVE ACCESSIBLE CEILING
CB	CALL STATION. 2-BUTTON IP CALL BUTTON, CALL & EMERGENCY. ELECTRICAL CONTRACTOR SHALL PROVIDE SINGLE GANG JUNCTION BOX AND 1" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDED TERMINATED CATEGORY CABLE IN JUNCTION BOX AND 10'FT SLACK ABOVE CEILING AT IP CLASSROOM MODULE LOCATION. INTERCOM VENDOR/CONTRACTOR SHALL PROVIDED ALL NECESSARY ACCESSORIES FOR A COMPLETE AND OPERABLE SYSTEM.
VC	70-VOLT INTERCOM SPEAK VOLUME CONTROL. ELECTRICAL CONTRACTOR SHALL PROVIDE SINGLE GANG JUNCTION BOX AND 1" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDED 18/2 WIRE AS REQUIRED.
IC	NETWORK VIDEO INTERCOM CALL STATION. ELEVATED HEIGHT (+42" AFF). ELECTRICAL CONTRACTOR SHALL PROVIDE 1-GANG JUNCTION BOX AND 1" CONDUIT TO LOCAL ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE FROM NETWORK INTERCOM TO LOCAL NETWORK SPEAKER.
AV1	DISPLAY CONNECTION WITH NETWORK, QUAD POWER AND AV. ELECTRICAL CONTRACTOR SHALL PROVIDE RECESSED AV WALL BOX, 2" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE FOR NETWORK AND AV CABLING, 2" CONDUIT TO ASSOCIATED FLOOR BOX AV CABLING (WHEN FLOOR BOX IS IN SAME ROOM), 0.75" CONDUIT FOR POWER AND DUPLEX RECEPTACLE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE, (1) HDMI TO WALL BOX "AV3, USB-C 3.2 OR HIGHER TO WALL BOC "AV3".
AV2	DATA FOR TEACHING DESK; NETWORK, QUAD POWER AND AV ROUGH-IN. ELECTRICAL CONTRACTOR SHALL PROVIDE RECESSED AV WALL BOX, 2" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE FOR NETWORK AND AV CABLING, 0.75" CONDUIT FOR POWER AND QUAD RECEPTACLE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (2) CATEGORY 6A CABLE .
M	MICROPHONE INPUT. SEE GYM SOUD SYSTEM DETAIL FOR ADDITIONAL INFORMATION.
M	SPEAKER. SEE GYM SOUD SYSTEM DETAIL FOR ADDITIONAL INFORMATION.

FLOOR BOXES:

SYMBOL	DESCRIPTION
FB4 #D/#V	4-GANG MULTI-SERVICE FLOOR BOX. ELECTRICAL CONTRACTOR SHALL PROVIDE FLOOR BOX, COVER, CONDUITS, ELECTRICAL DEVICES AND ASSOCIATED MOUNTING PLATES FOR A COMPLETE INSTALLATION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT. LEGRAND: EVOLUTION EFB4SS-OG OR APPROVED EQUAL.
FB6 #D/#V	6-GANG MULTI-SERVICE FLOOR BOX. ELECTRICAL CONTRACTOR SHALL PROVIDE FLOOR BOX, COVER, CONDUITS, ELECTRICAL DEVICES AND ASSOCIATED MOUNTING PLATES FOR A COMPLETE INSTALLATION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT. LEGRAND: EVOLUTION EFB6S-OG OR APPROVED EQUAL.
PT6 #D/#V	6" MULTI-SERVICE POKE-THRU FLOOR BOX. ELECTRICAL CONTRACTOR SHALL PROVIDE FLOOR BOX, COVER, CONDUITS, ELECTRICAL DEVICES AND ASSOCIATED MOUNTING PLATES FOR A COMPLETE INSTALLATION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT. LEGRAND: EVOLUTION 6AT OR APPROVED EQUAL.
PT8A #D/#V	8" MULTI-SERVICE POKE-THRU FLOOR BOX. ELECTRICAL CONTRACTOR SHALL PROVIDE FLOOR BOX, COVER, CONDUITS, ELECTRICAL DEVICES AND ASSOCIATED MOUNTING PLATES FOR A COMPLETE INSTALLATION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT. LEGRAND: EVOLUTION 8AT OR APPROVED EQUAL.
PT8B #D/#V	8" MULTI-SERVICE POKE-THRU FLOOR BOX. ELECTRICAL CONTRACTOR SHALL PROVIDE FLOOR BOX, COVER, CONDUITS, ELECTRICAL DEVICES AND ASSOCIATED MOUNTING PLATES FOR A COMPLETE INSTALLATION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT. LEGRAND: EVOLUTION 8AT OR APPROVED EQUAL.

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

TECHNOLOGY SYMBOLS

T-002

Optima # 22-0082

[redacted]

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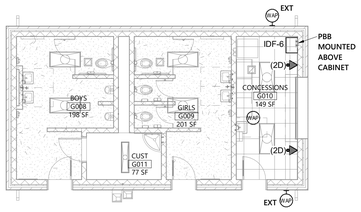
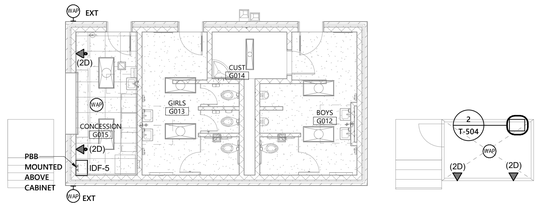
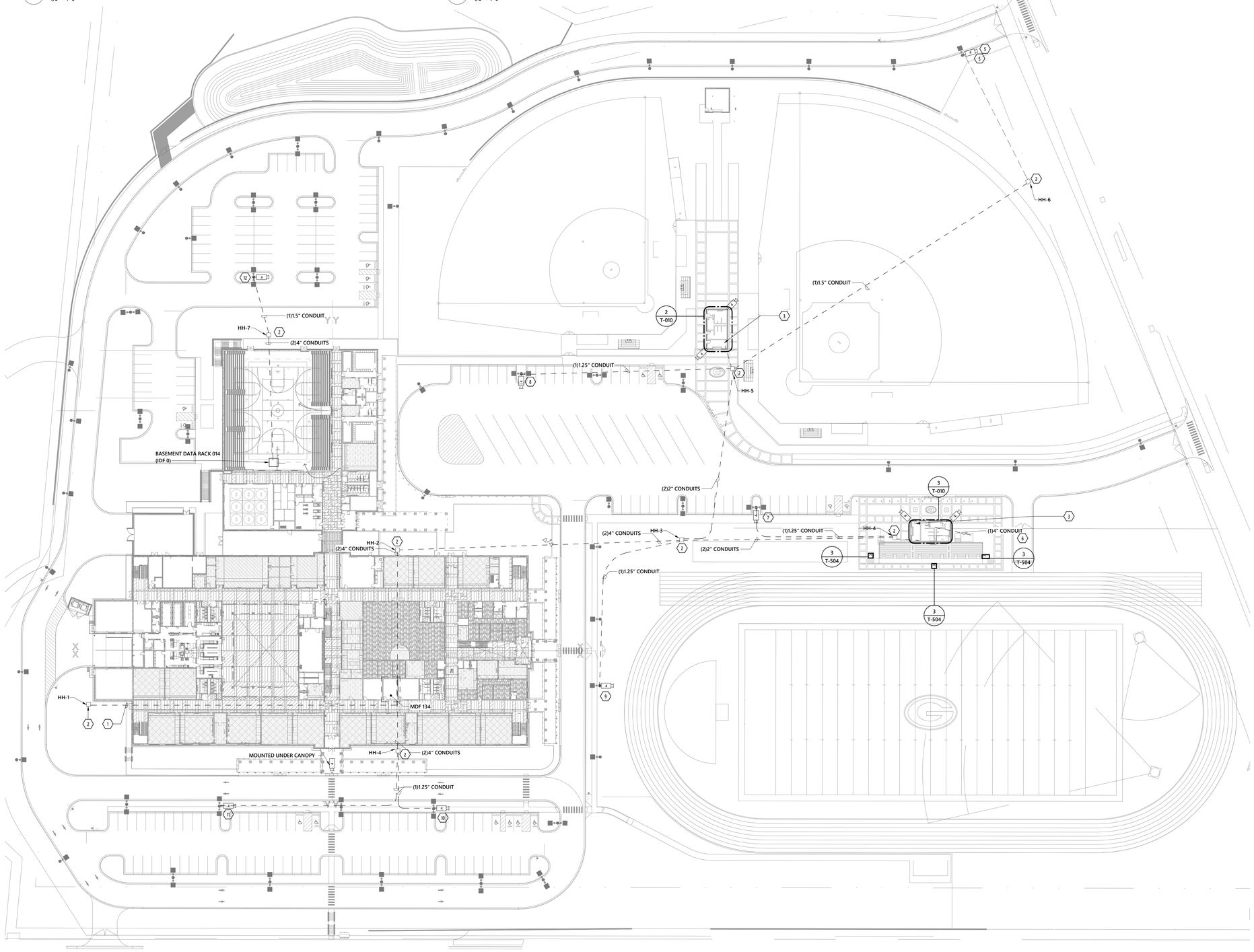


2 BASEBALL CONCESSION TECHNOLOGY PLAN
1/8" = 1'-0"



3 FOOTBALL CONCESSION TECHNOLOGY PLAN
1/8" = 1'-0"



1 TECHNOLOGY SITE PLAN
1" = 40'-0"

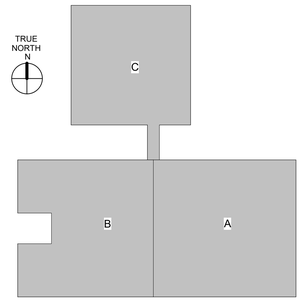
GENERAL NOTES:

A. LIGHT POLES SHOWN FOR REFERENCE ONLY, REFER TO THE ELECTRICAL DRAWINGS FOR ADDTIONAL INFORMATION.

KEYED NOTES:

1. PROVIDE AND INSTALL (3) 4" CONDUITS WITH (1) 3" 3-CELL PACK FABRIC MESH INNERDUCT IN EACH CONDUIT FROM MDF 134 TO HAND HOLE HH-1. CONTRACTOR SHALL PROVIDE ALLOWANCE FOR AN ADDITIONAL 90-LINEAR FEET OF CONDUIT AND FABRIC MECH INNERDUCT.
2. APPROXIMATE LOCATION OF HANDHOLE, FINAL LOCATION SHALL BE DETERMINED BY CIVIL. PROVIDE AND INSTALL PRECAST TELECOM HAND-HOLE WITH BOLT TO SECURE COVER. MINIMUM INTERIOR DIMENSIONS SHALL BE 3'-0"x3'-0"X3'-0"; REQUIRED HAND-HOLE COLLARS SHALL BE DETERMINED BY CIVIL, PROVIDED AND INSTALLED BY EC.
3. APPROXIMATE LOCATION OF PRESSBOX/FOOTBALL CONCESSIONS. CONTRACTOR SHALL PROVIDE AND INSTALL 12-STRAND ARMORED OM4 (OUTSIDE PLANT) FIBER FROM MDF TO PRESSBOX/FOOTBALL CONCESSIONS.
4. APPROXIMATE LOCATION OF BASEBALL CONCESSIONS. CONTRACTOR SHALL PROVIDE AND INSTALL 12-STRAND OM4 (OUTSIDE PLANT) FIBER FROM MDF TO BASEBALL CONCESSIONS
5. PROVIDE 2-STRAND ARMORED OM4 OUTSIDE PLANT, WITH A MEDIA CONVERTER AT BOTH ENDS FOR CAMERA. FIBER SHALL HOME RUN TO IDF 6 IN BASEBALL CONCESSIONS BUILDING.
6. (1)4" CONDUIT STUBBED UP FOR CONNECTION TO PREFABRICATED PRESS BOX.
7. (1) CAT 6A OSP BACK TO DATA RACK IN FOOTBALL CONCESSIONS.
8. (1) CAT 6A OSP BACK TO DATA RACK IN BASEBALL CONCESSIONS.
9. (1) 2-STRAND ARMORED OM4 OSP FIBER WITH MEDIA CONVERTERS AT BOTH ENDS BACK TO DATA RACK IN FOOTBALL CONCESSIONS.
10. (1) CAT 6A OSP BACK TO DATA RACK IN MDF.
11. (1) 2-STRAND OM4 OSP FIBER WITH MEDIA CONVERTERS AT BOTH ENDS BACK TO DATA RACK IN MDF.
12. (1) CAT 6A OSP BACK TO DATA RACK 014 (IDF 0)

KEY PLAN



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NORTH CAROLINA REGISTERED ARCHITECT SEAL
01-12-2023

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No.	Description	Date
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PROJECT: 9201-218240
DATE: 01-12-2023

TECHNOLOGY SITE PLAN

T-010

Optima # 22-0082

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CONDUIT/SLEEVE SCHEDULE

CLASSROOMS	(2) 2" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.
COMPUTER LABS	(2) 4" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.
SMALL OFFICES	(2) 2" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.
LARGE OFFICES	(2) 2" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.
WORKSPACES	(2) 2" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.
CONFERENCE RMS.	(2) 2" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.
VESTIBULES	(1) 2" CONDUIT TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.

ADDITIONAL REQUIREMENTS:

A. PROVIDE A MINIMUM OF (2) 4" CONDUITS BETWEEN ALL ACCESSIBLE CEILING SPACES SEPARATED BY A HARD CEILING GREATER THAN 3'-0" UNLESS OTHERWISE NOTED. REFER TO TELECOMMUNICATIONS CONDUIT CAPACITY SCHEDULE.

B. PROVIDE A MINIMUM OF (1) 2" CONDUIT BETWEEN ALL ACCESSIBLE CEILING SPACES SEPARATED BY A WALL THAT IS CONSTRUCTED TO DECK UNLESS OTHERWISE NOTED. REFER TO TELECOMMUNICATIONS CONDUIT CAPACITY SCHEDULE.

GENERAL NOTES:

A. REFER TO CONDUIT SCHEDULE ON SHEET T001 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

B. CONTRACTOR SHALL MOUNT CABLE TRAY A MINIMUM 6" ABOVE ACCESSIBLE CEILING. VERIFY FINAL CEILING HEIGHT WITH ARCHITECT PRIOR TO INSTALLATION. COORDINATE WITH ALL OTHER TRADES PRIOR TO INSTALL

C. ALL CONDUITS SHOWN ARE 4" CONDUITS; UNLESS OTHERWISE NOTED..

KEYED NOTES:

1. CABLE TRAY SHALL BE 6" WIDE BY 4" DEEP, LENGTHS PER PLAN.
2. CABLE TRAY SHALL BE 12" WIDE BY 4" DEEP, LENGTHS PER PLAN.
3. CABLE TRAY SHALL BE 18" WIDE BY 4" DEEP, LENGTHS PER PLAN.
4. (6) 4" CONDUITS
5. (3) 4" CONDUITS
6. (3) 4" CONDUITS; 2 WITH 1 STACKED ABOVE
7. (4) 4" CONDUITS; STACKED 2X2
8. (2) 4" CONDUITS TO IT CLOSET ON LEVEL ABOVE.
9. ALL NETWORK DEVICES SHALL HOME RUN BACK TO IDF/MDF AS NOTED.

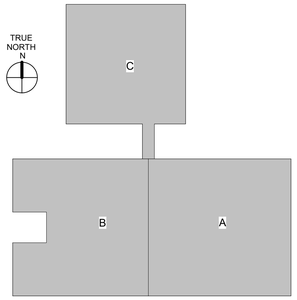
1 OVERALL FIRST FLOOR PATHWAY PLAN
3/64" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

OVERALL FIRST FLOOR PATHWAY PLAN

T-011

Optima # 22-0082

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CONDUIT/SLEEVE SCHEDULE

CLASSROOMS	(2) 2" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.
COMPUTER LABS	(2) 4" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.
SMALL OFFICES	(2) 2" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.
LARGE OFFICES	(2) 2" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.
WORKSPACES	(2) 2" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.
CONFERENCE RMS.	(2) 2" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.
VESTIBULES	(1) 2" CONDUIT TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.

ADDITIONAL REQUIREMENTS:

A. PROVIDE A MINIMUM OF (2) 4" CONDUITS BETWEEN ALL ACCESSIBLE CEILING SPACES SEPARATED BY A HARD CEILING GREATER THAN 3'-0" UNLESS OTHERWISE NOTED. REFER TO TELECOMMUNICATIONS CONDUIT CAPACITY SCHEDULE.

B. PROVIDE A MINIMUM OF (1) 2" CONDUIT BETWEEN ALL ACCESSIBLE CEILING SPACES SEPARATED BY A WALL THAT IS CONSTRUCTED TO DECK UNLESS OTHERWISE NOTED. REFER TO TELECOMMUNICATIONS CONDUIT CAPACITY SCHEDULE.

GENERAL NOTES:

A. REFER TO CONDUIT SCHEDULE ON SHEET T001 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

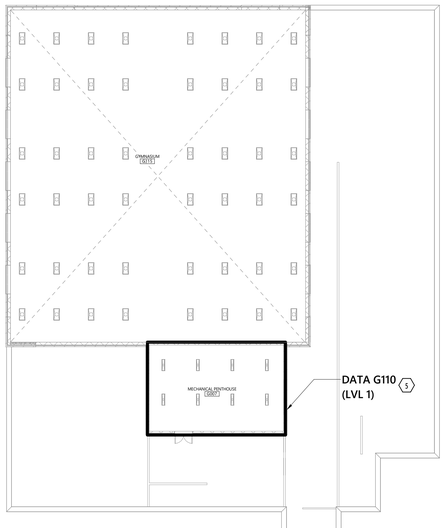
B. CONTRACTOR SHALL MOUNT CABLE TRAY 6" ABOVE ACCESSIBLE CEILING. VERIFY FINAL CEILING HEIGHT WITH ARCHITECT PRIOR TO INSTALLATION. COORDINATE WITH ALL OTHER TRADES.

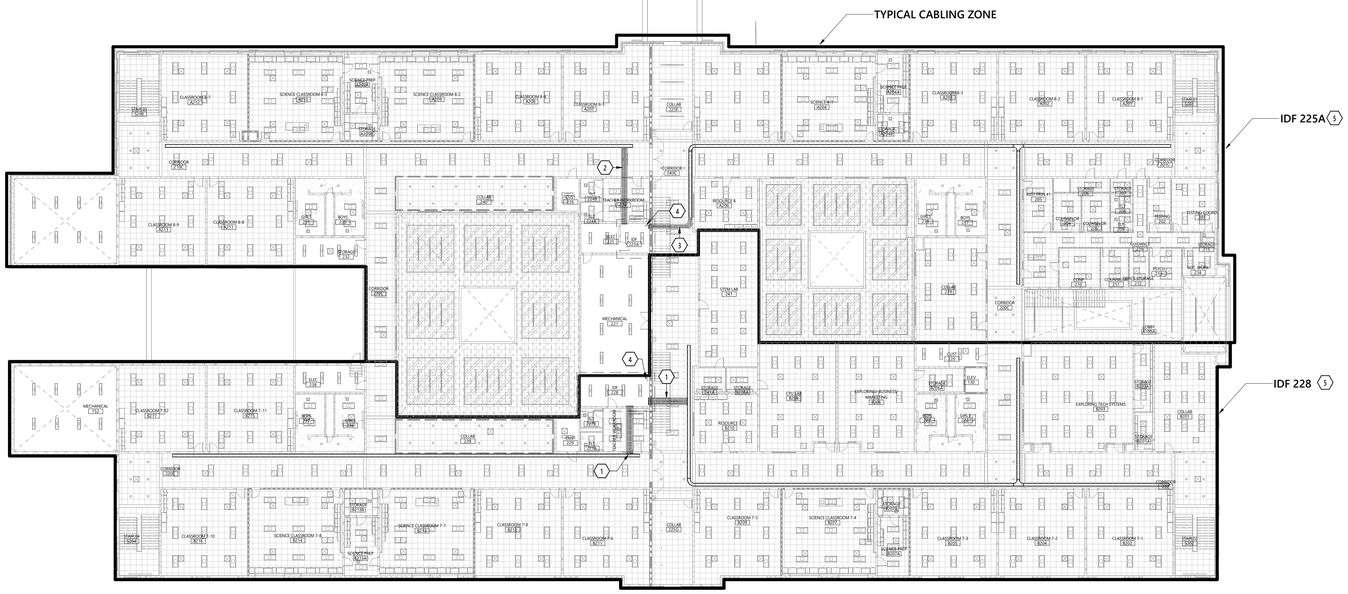
C. ALL CONDUITS SHOWN ARE 4" CONDUITS.

D. ALL CABLE TRAY SHOWN ON THIS SHEET SHALL BE 12" WIDE BY 4" DEEP, LENGTHS PER PLAN.

KEYED NOTES: (#)

1. (5) 4" CONDUITS
2. (4) 4" CONDUITS
3. (3) 4" CONDUITS
4. (2) 4" CONDUITS TO IT CLOSET ON LEVEL BELOW.
5. ALL NETWORK DEVICES SHALL HOME RUN BACK TO IDF/MDF AS NOTED.





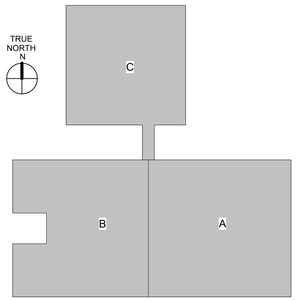
1 OVERALL SECOND FLOOR PATHWAY PLAN
3/64" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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PROJECT: 9201-218240
DATE: 01-12-2023

OVERALL SECOND FLOOR PATHWAY PLAN

T-012

Optima # 22-0082
[redacted]

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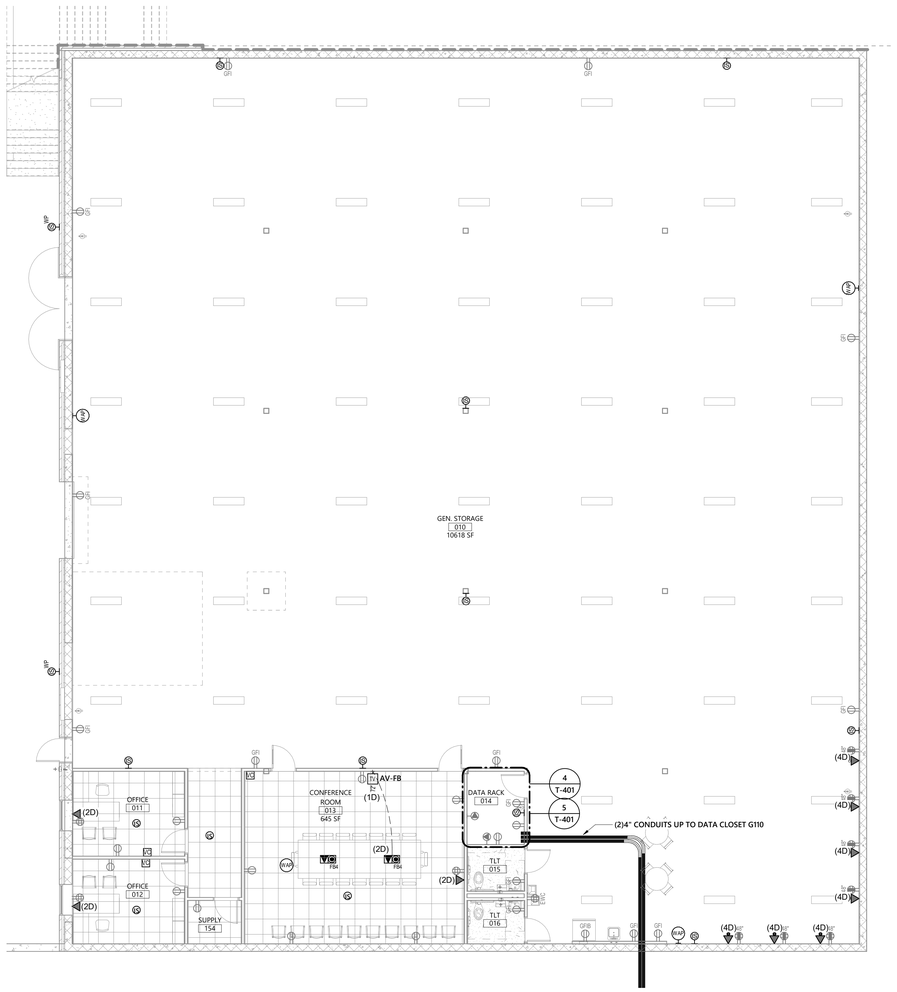


1 BASEMENT TECHNOLOGY PLAN

1/8" = 1'-0"

GENERAL NOTES:

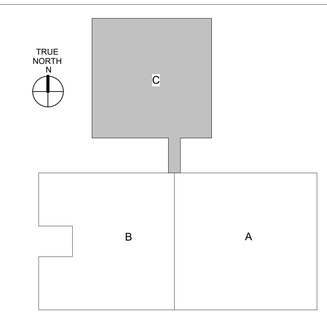
A. NETWORK DEVICES SHALL TERMINATE IN DATA CLOSET '014' ON THIS FLOOR.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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BASEMENT FLOOR TECHNOLOGY NETWORK PLAN

TN-100

Optima # 22-0082

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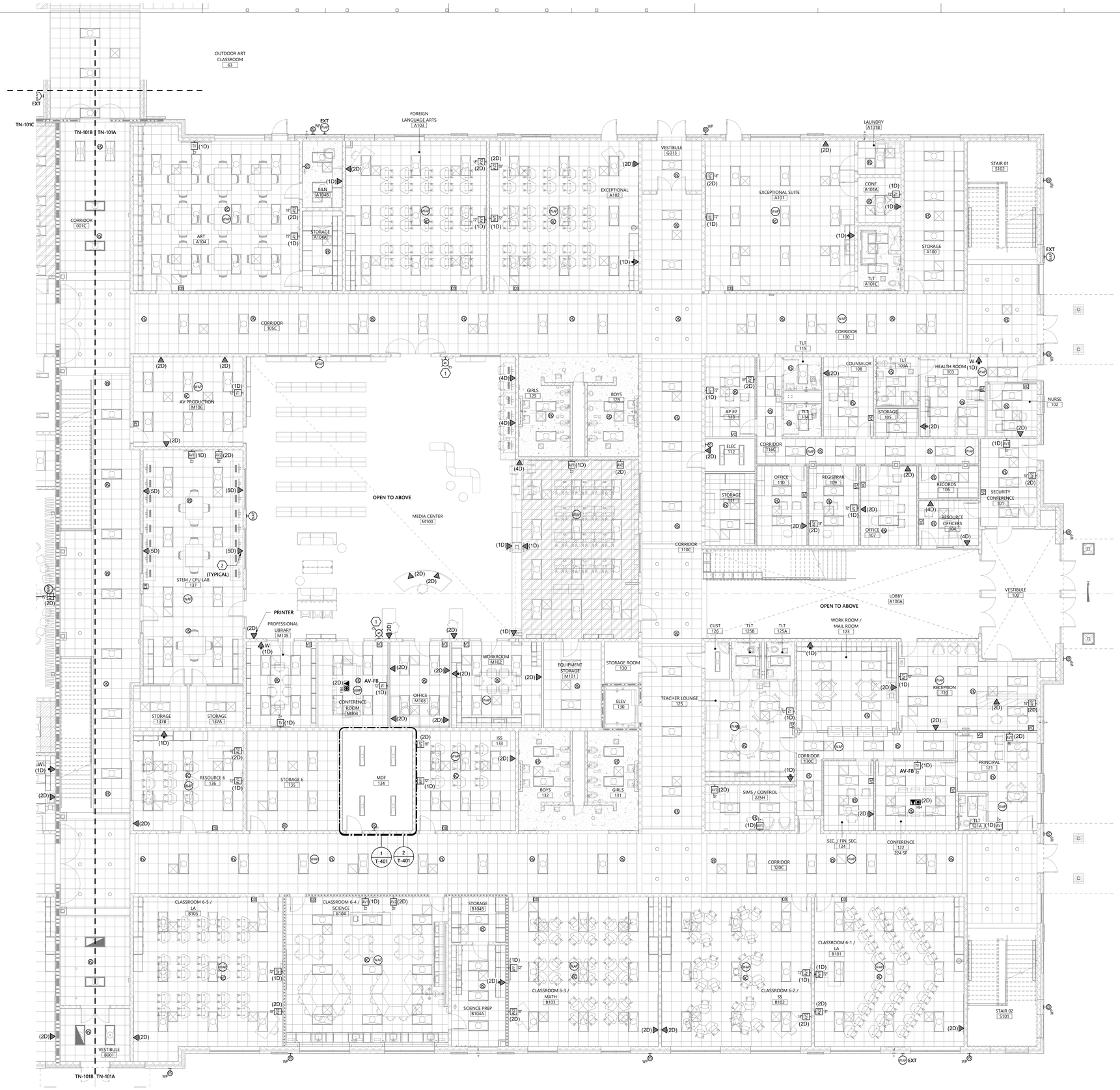


1 FIRST FLOOR DATA NETWORK PLAN - AREA A

1/8" = 1'-0"

GENERAL NOTES:

A. REFER TO OVERALL PATHWAY PLANS FOR CABLING ZONE INFORMATION.

KEYED NOTES:

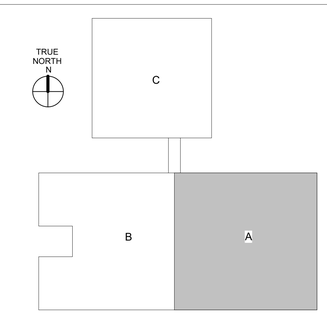
1. ALERT LIGHT. WALL MOUNT 9' AFF. BASED ON CORNELL L-101A OR EQUAL WITH 24V POWER SUPPLY. PROVIDE 2 CONDUCTOR PLENUM RATED CABLE WEST PENN 25224 OR EQUAL. SINGLE GANG BOX WITH STAINLESS STEEL FACEPLATE. RED LED MODULE WITH ACRYLIC WEDGE SHAPED DOME. LIGHT SHALL CLOSE (ILLUMINATE) ON CONTACT FROM PA/INTERCOM SYSTEM. CONNECT TO OUTPUT BOARD OF PA/INTERCOM SYSTEM.
2. FOR DEVICE OUTLETS UNDER WINDOWS, REFER TO DETAIL 8 ON SHEET T-501 FOR ADDITIONAL INFORMATION.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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FIRST FLOOR DATA NETWORK PLAN AREA A

TN-101A

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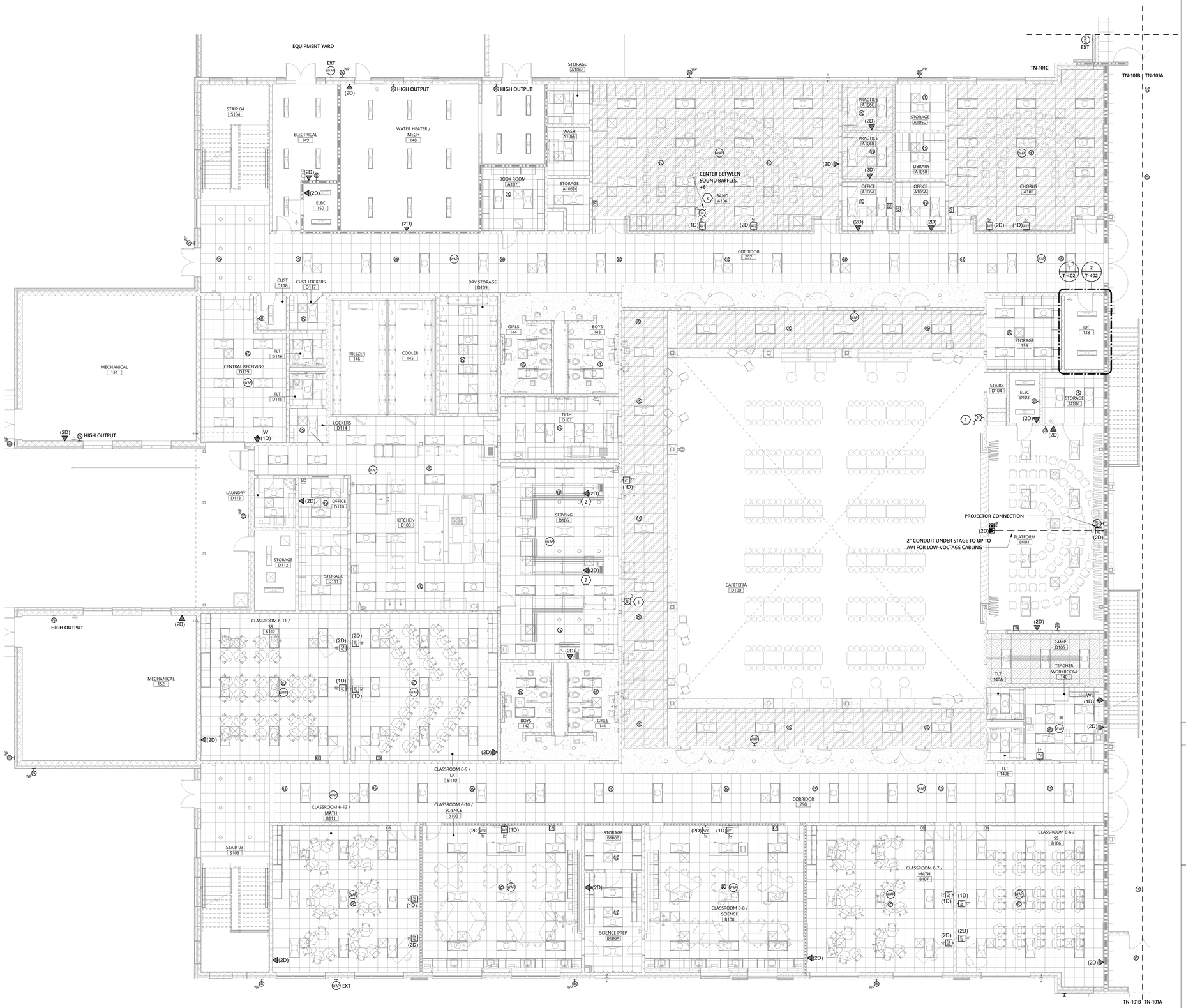


1 FIRST FLOOR DATA NETWORK PLAN - AREA B
1/8" = 1'-0"

GENERAL NOTES:

A. REFER TO OVERALL PATHWAY PLANS FOR CABLING ZONE INFORMATION.

KEYED NOTES:

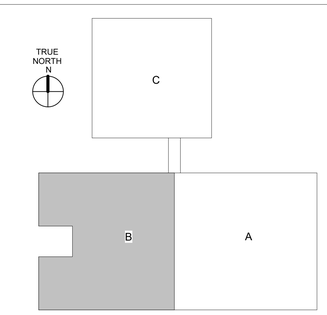
1. ALERT LIGHT. WALL MOUNT 9' AFF. BASED ON CORNELL L-101A OR EQUAL WITH 24V POWER SUPPLY. PROVIDE 2 CONDUCTOR PLENUM RATED CABLE WEST PENN 25224 OR EQUAL. SINGLE GANG BOX WITH STAINLESS STEEL FACEPLATE. RED LED MODULE WITH ACRYLIC WEDGE SHAPED DOME. LIGHT SHALL CLOSE (ILLUMINATE) ON CONTACT FROM PA/INTERCOM SYSTEM. CONNECT TO OUTPUT BOARD OF PA/INTERCOM SYSTEM.
2. TOMBSTONE STYLE FLOOR BOX. SEE SHEET E-006 DETAIL #13 FOR ADDITIONAL INFORMATION.
3. INTERCOM ALERT LIGHT. WALL MOUNT 9' AFF. SINGLE GANG BOX WITH STAINLESS STEEL FACEPLATE AND 1" CONDUIT TO ACCESSIBLE CEILING IN CLASSROOM. RED LED MODULE WITH ACRYLIC WEDGE SHAPED DOME. LIGHT SHALL CLOSE (ILLUMINATE) ON CONTACT FROM PA/INTERCOM SYSTEM. CONNECT TO OUTPUT IP CLASSROOM MODULE OF PA/INTERCOM SYSTEM.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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FIRST FLOOR DATA NETWORK PLAN AREA B

TN-101B

Optima # 22-0082

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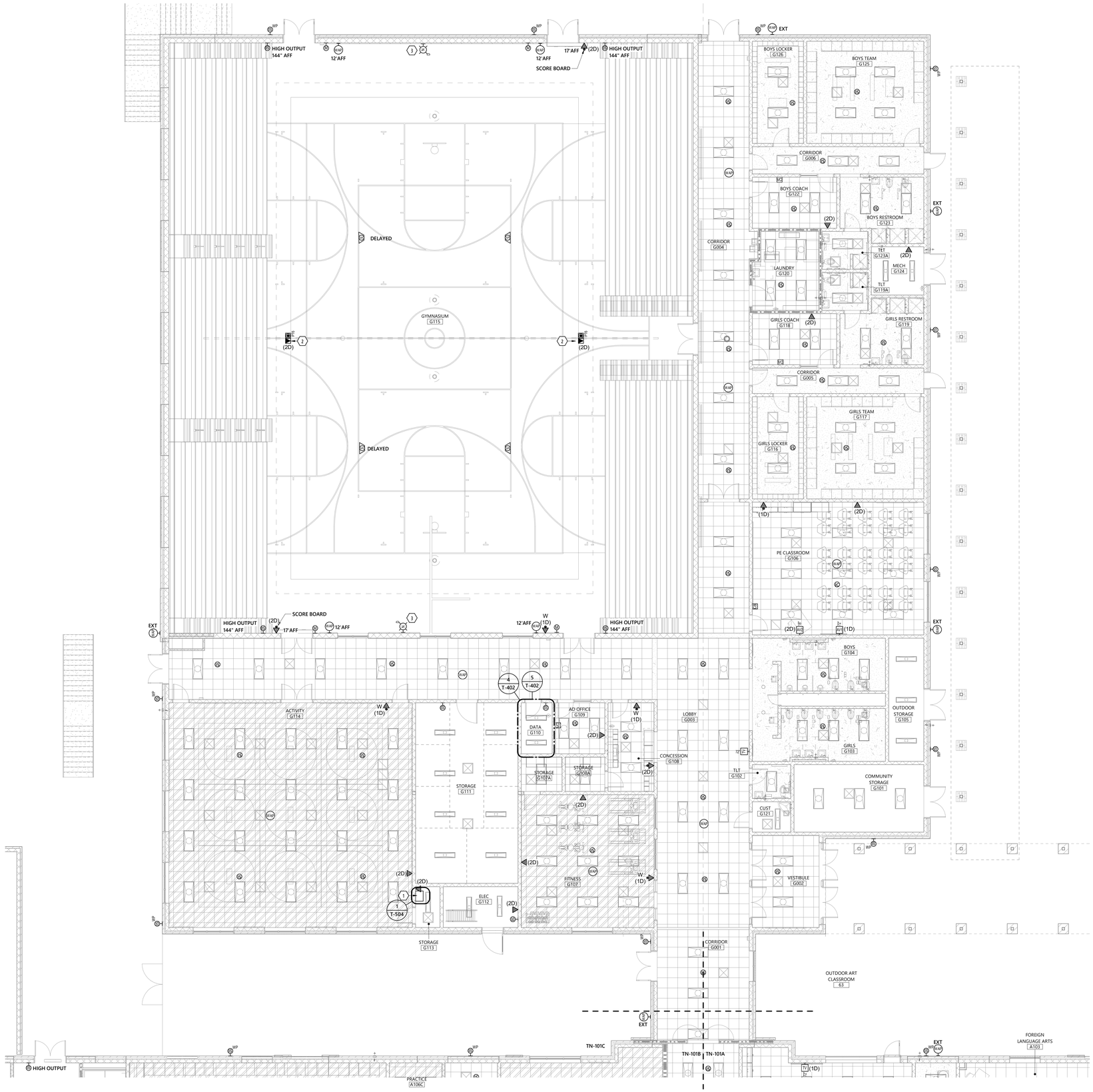


1 FIRST FLOOR DATA NETWORK PLAN - AREA C
1/8" = 1'-0"

GENERAL NOTES:

A. REFER TO OVERALL PATHWAY PLANS FOR CABLING ZONE INFORMATION.

KEYED NOTES:

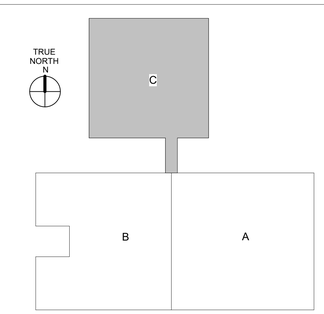
1. COORDINATE EXACT LOCATION OF GYM AUDIO RACK WITH OWNER PRIOR TO INSTALL.
2. PT6 SHALL HAVE PROVISIONS FOR GYM AUDIO MICROPHONE INPUT BACK TO AUDIO RACK.
3. ALERT LIGHT. WALL MOUNT 9' AFF. BASED ON CORNELL L-101A OR EQUAL WITH 24V POWER SUPPLY. PROVIDE 2 CONDUCTOR PLENUM RATED CABLE WEST PENN 25224 OR EQUAL. SINGLE GANG BOX WITH STAINLESS STEEL FACEPLATE. RED LED MODULE WITH ACRYLIC WEDGE SHAPED DOME. LIGHT SHALL CLOSE (ILLUMINATE) ON CONTACT FROM PA/INTERCOM SYSTEM. CONNECT TO OUTPUT BOARD OF PA/INTERCOM SYSTEM.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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FIRST FLOOR DATA NETWORK PLAN AREA C

TN-101C

Optima # 22-0082

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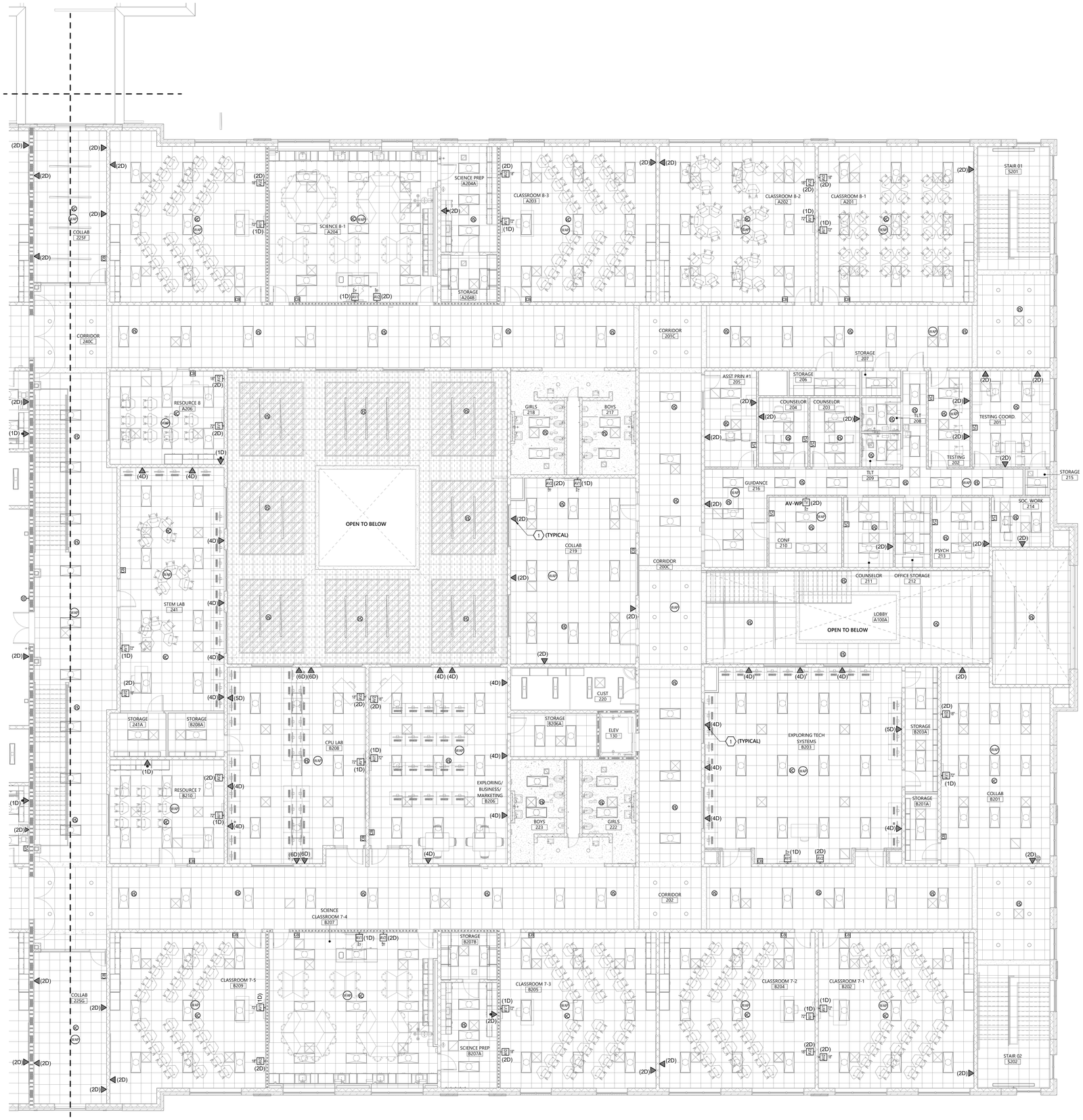


1 SECOND FLOOR DATA NETWORK PLAN - AREA A
1/8" = 1'-0"

GENERAL NOTES:

A. REFER TO OVERALL PATHWAY PLANS FOR CABLING ZONE INFORMATION.

KEYED NOTES:

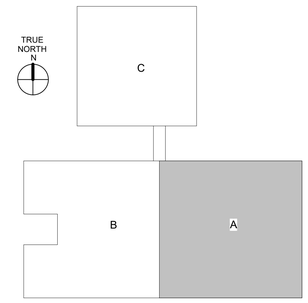
1. FOR DEVICE OUTLETS UNDER WINDOWS, REFER TO DETAIL 8 ON SHEET T-501 FOR ADDITIONAL INFORMATION.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

SECOND FLOOR DATA NETWORK PLAN AREA A

TN-102A

Optima # 22-0082

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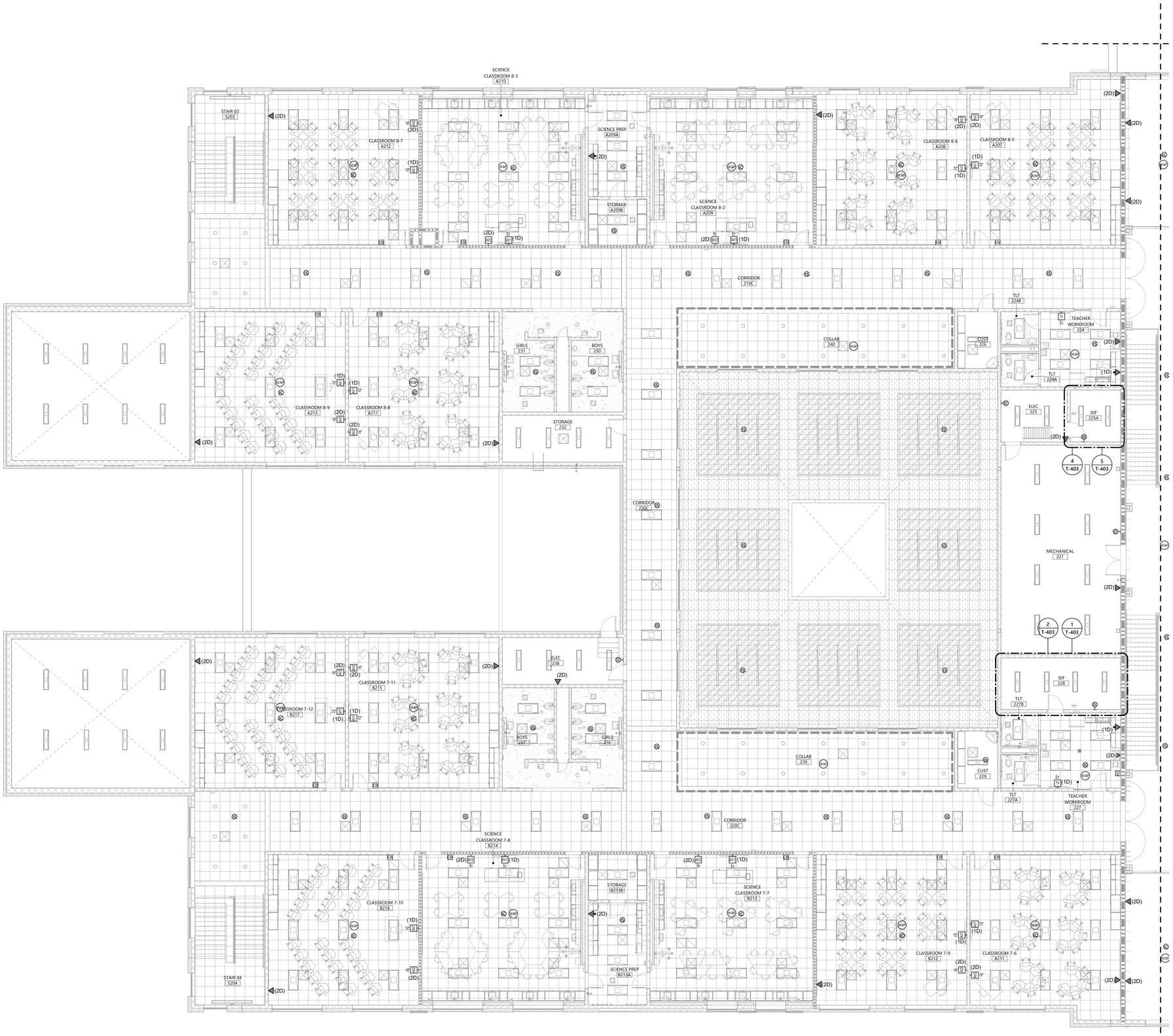

1 SECOND FLOOR DATA NETWORK PLAN - AREA B
1/8" = 1'-0"

GENERAL NOTES:

A. REFER TO OVERALL PATHWAY PLANS FOR CABLING ZONE INFORMATION.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
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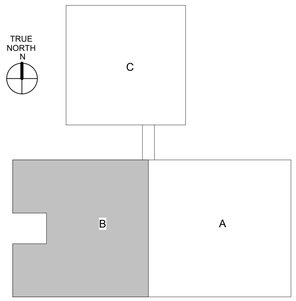
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

SECOND FLOOR DATA NETWORK PLAN AREA B

TN-102B

Optima # 22-0082

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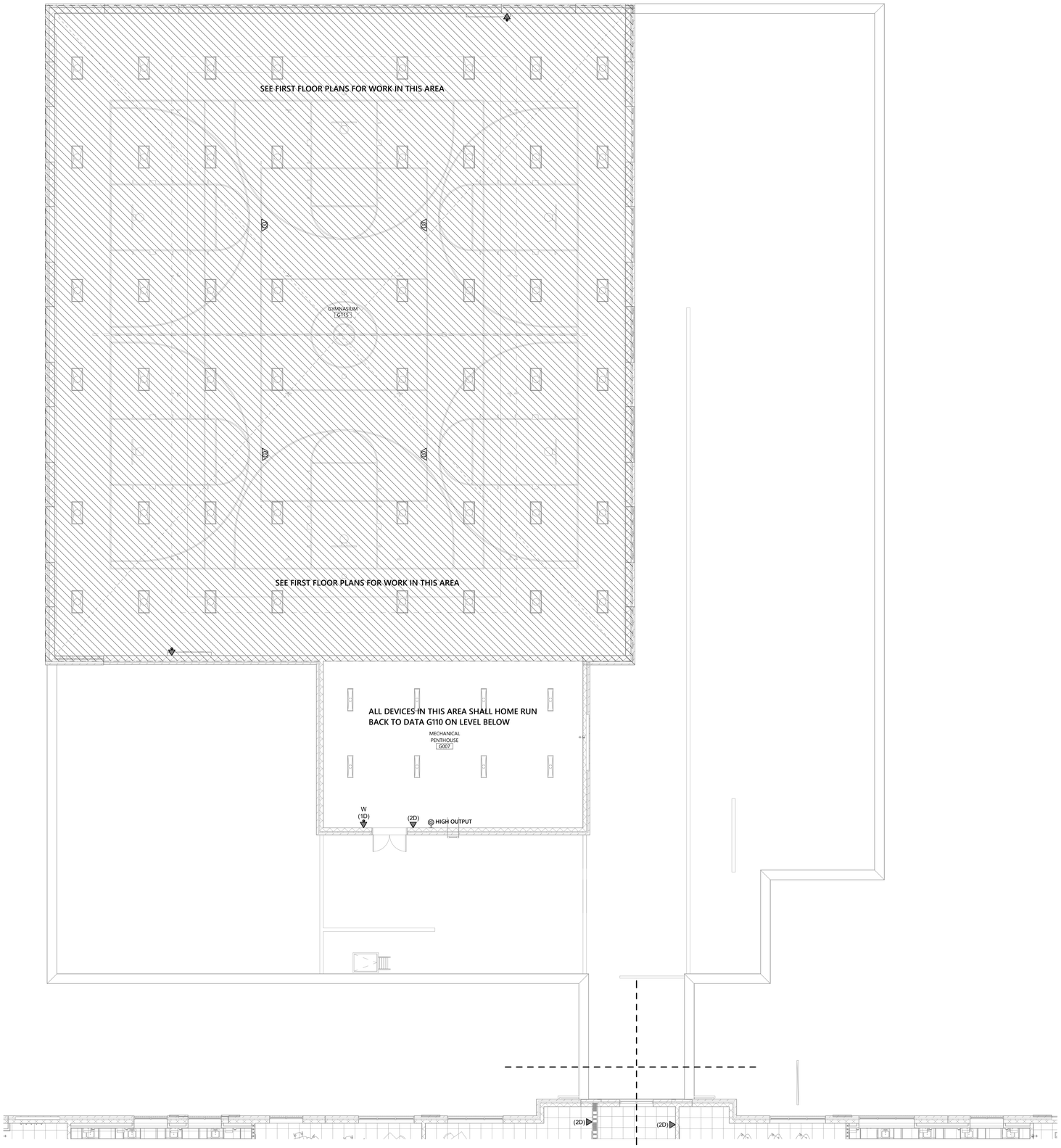

1 SECOND FLOOR DATA NETWORK PLAN - AREA C
1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
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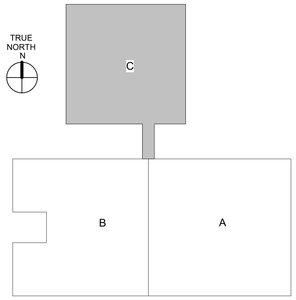

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
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SECOND FLOOR DATA NETWORK PLAN AREA C

TN-102C

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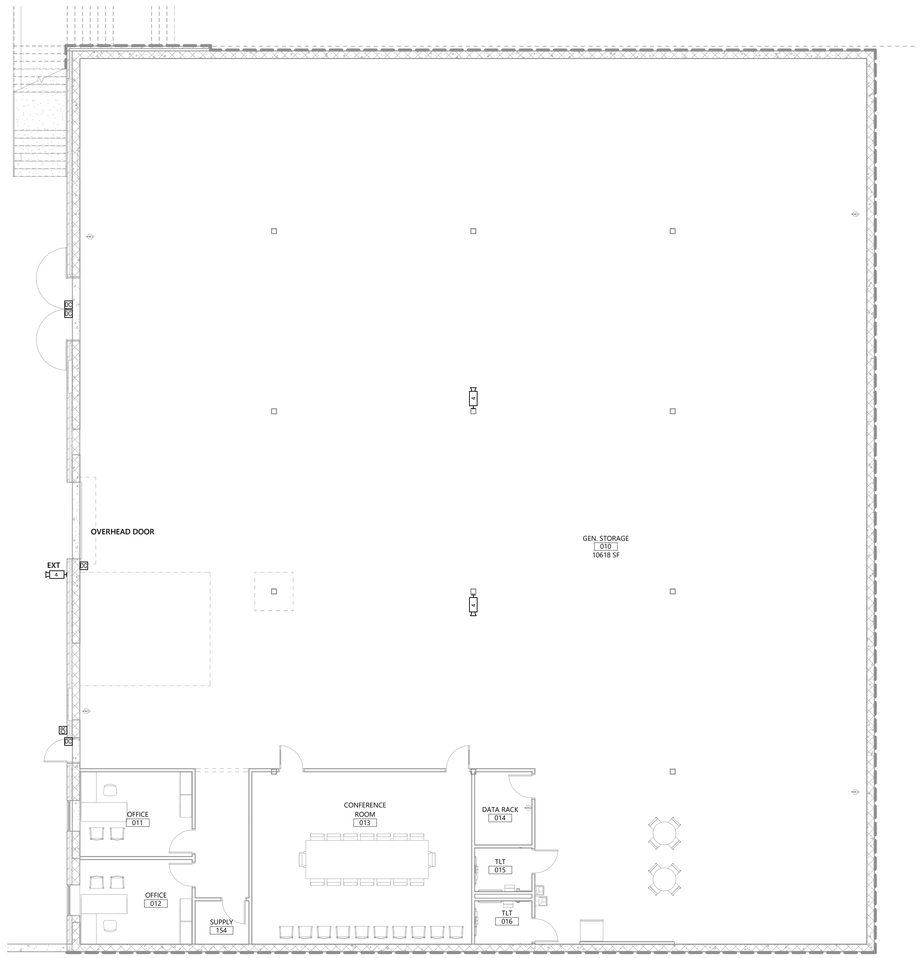

1 BASEMENT TECHNOLOGY SECURITY
1/8" = 1'-0"

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

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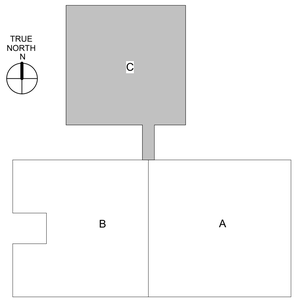
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
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BASEMENT FLOOR SECURITY PLAN

TY-100

Optima # 22-0082

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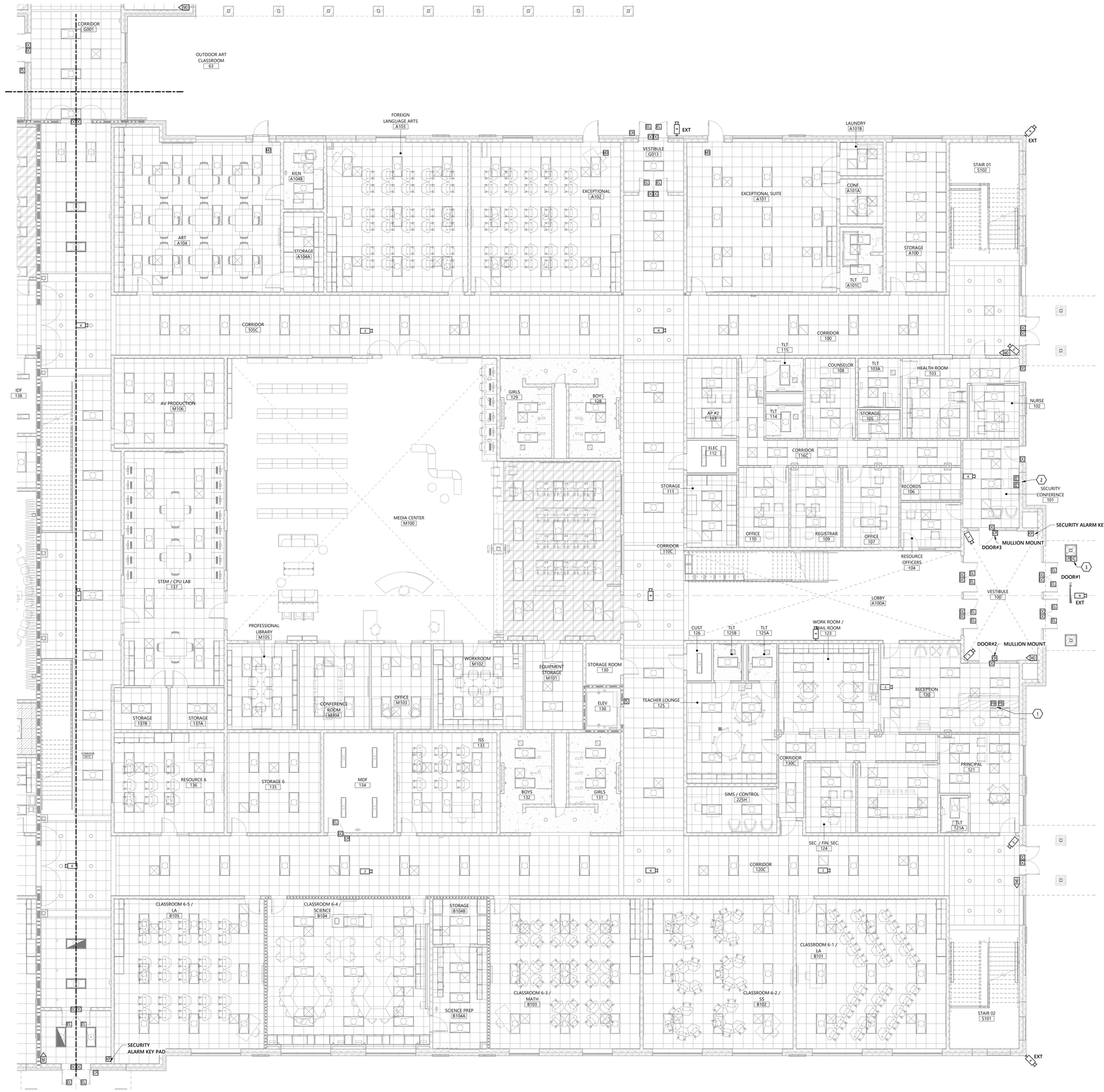

1 FIRST FLOOR TECHNOLOGY SECURITY - AREA A
1/8" = 1'-0"

KEYED NOTES:

1. DOOR RELEASE PUSH BUTTONS SHALL RELEASE DOOR#1 & DOOR#2.
2. DOOR RELEASE PUSH BUTTONS SHALL RELEASE DOOR#1 & DOOR#3.
3. NETWORK VIDEO INTERCOM; AIPONE MODEL 'IX-DVF-4A' OR OWNER APPROVED EQUAL PRIOR TO BID.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
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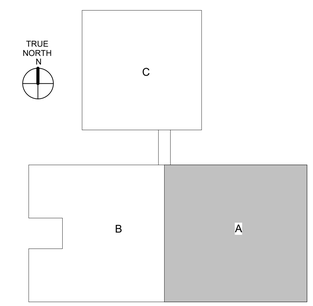
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

FIRST FLOOR SECURITY PLAN AREA A

TY-101A

Optima # 22-0082

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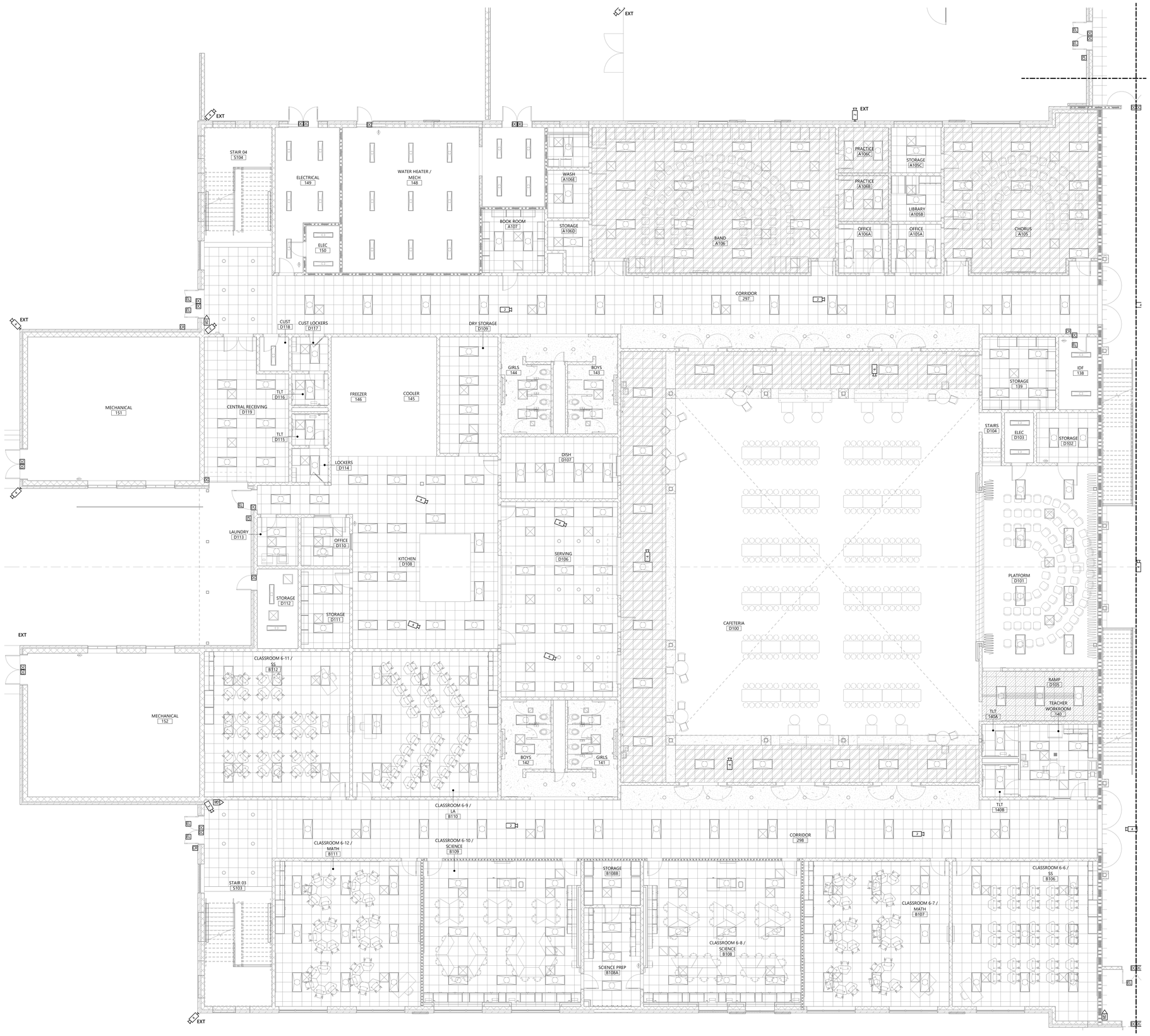

1 FIRST FLOOR TECHNOLOGY SECURITY - AREA B
1/8" = 1'-0"

GENERAL NOTES:

A. CONTRACTOR SHALL COORDINATE CAMERA FIELD OF VIEW AND ADJUST CAMERA LOCATION AS REQUIRED TO AVOID CEILING OBSTRUCTION SUCH AS EXIT SIGNS.

B. REFER TO OVERALL PATHWAY PLANS FOR CABLING ZONE INFORMATION.

PARTITION LEGEND

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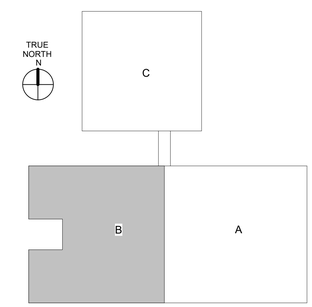
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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FIRST FLOOR SECURITY PLAN AREA B

TY-101B

Optima # 22-0082

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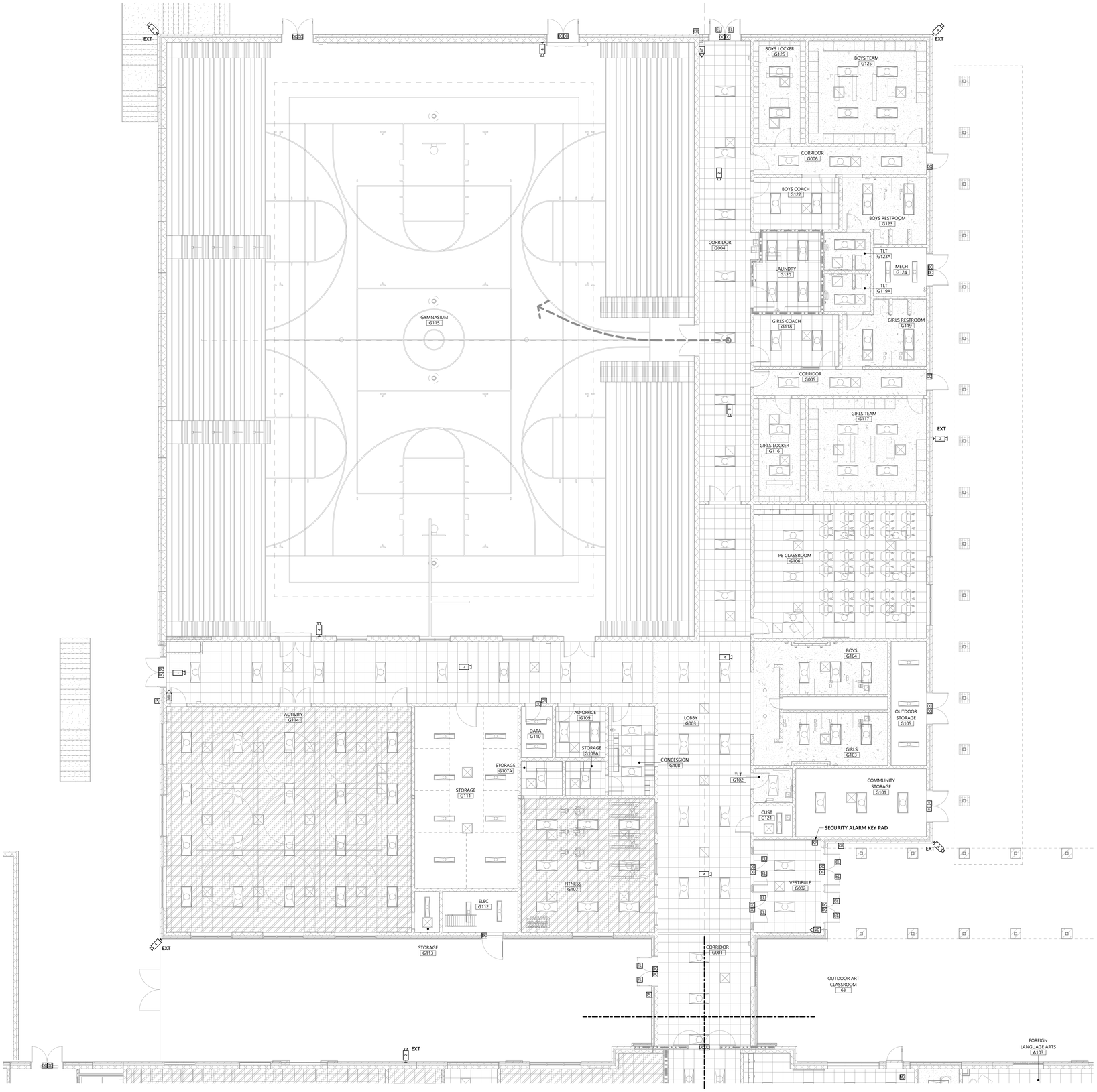

1 FIRST FLOOR TECHNOLOGY SECURITY - AREA C

1/8" = 1'-0"

GENERAL NOTES:

A. CONTRACTOR SHALL COORDINATE CAMERA FIELD OF VIEW AND ADJUST CAMERA LOCATION AS REQUIRED TO AVOID CEILING OBSTRUCTION SUCH AS EXIT SIGNS.

B. REFER TO OVERALL PATHWAY PLANS FOR CABLING ZONE INFORMATION.

PARTITION LEGEND

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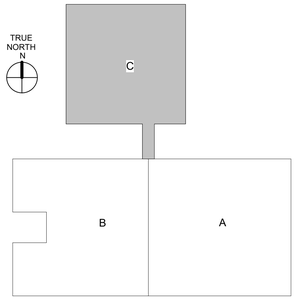
KEY PLAN



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PROJECT: 9201-218240

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FIRST FLOOR SECURITY PLAN AREA C

TY-101C

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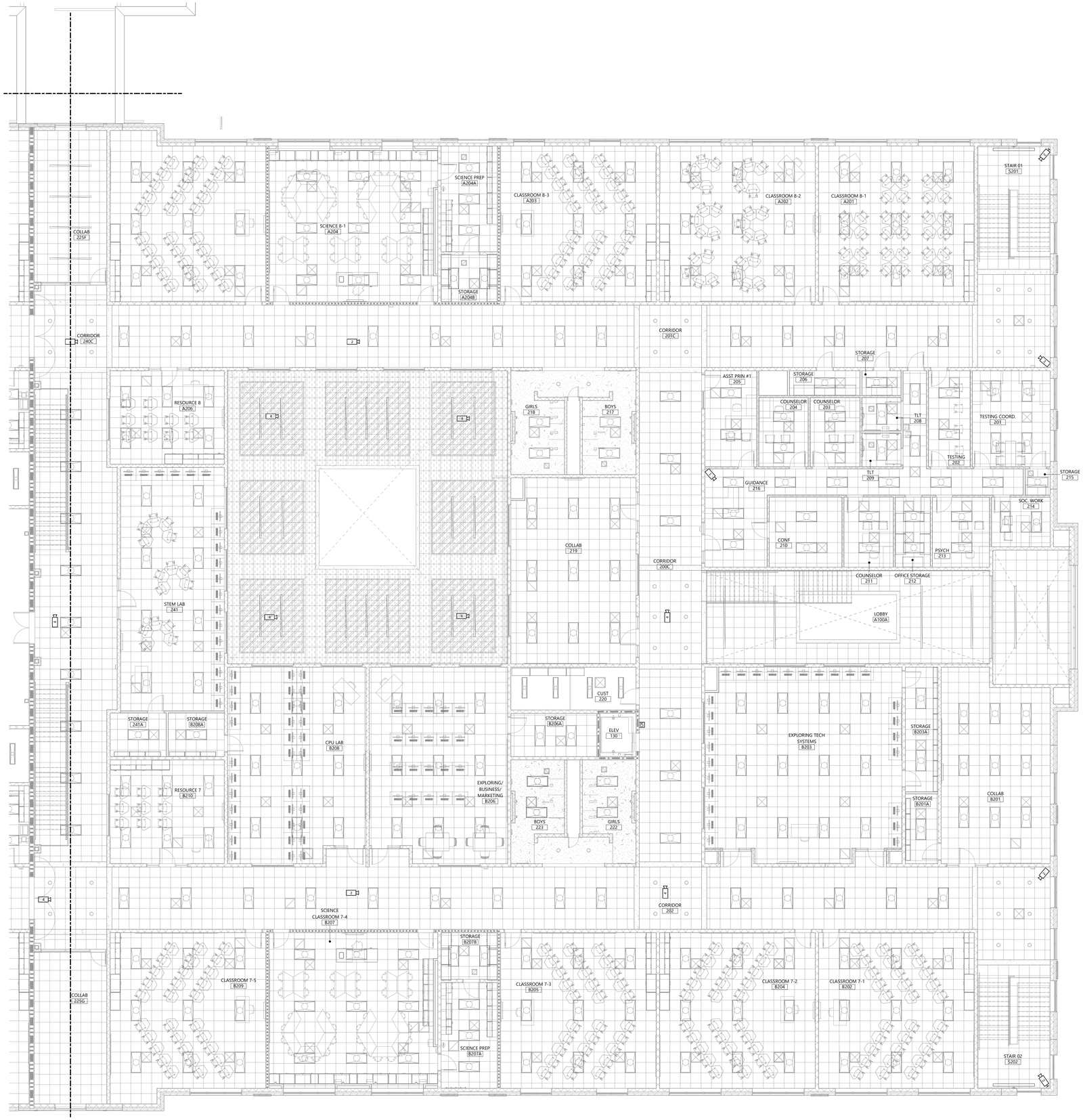

1 SECOND FLOOR TECHNOLOGY SECURITY - AREA A
1/8" = 1'-0"

GENERAL NOTES:

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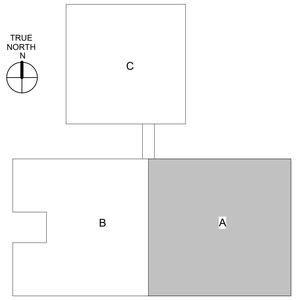

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No.	Description	Date
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DATE: 01-12-2023

SECOND FLOOR SECURITY PLAN AREA A

TY-102A

Optima # 22-0082

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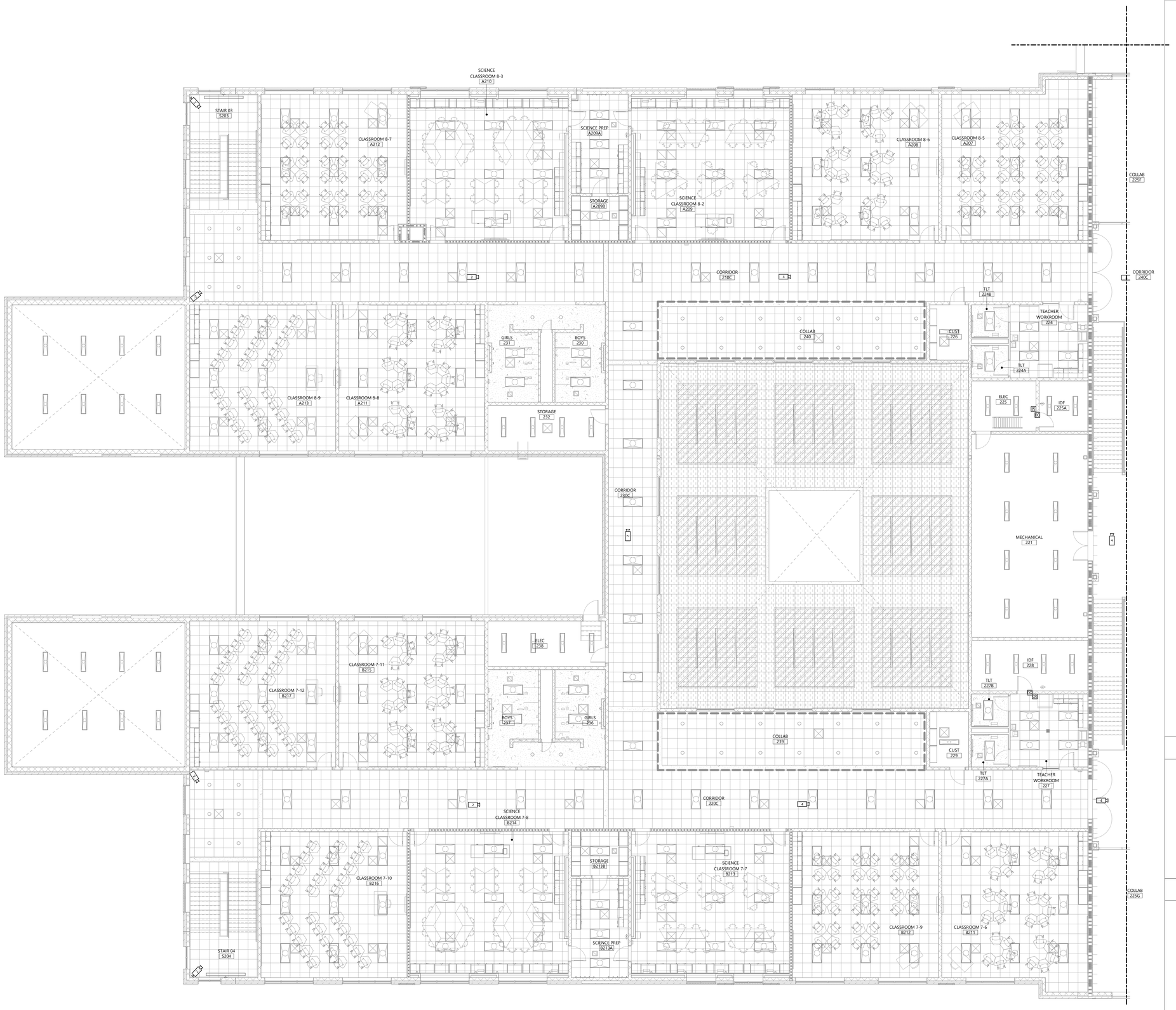

1 SECOND FLOOR TECHNOLOGY SECURITY - AREA B
1/8" = 1'-0"

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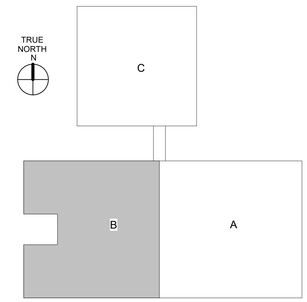
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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01-12-2023

NORTH CAROLINA REGISTERED ARCHITECT SEAL ENGINEER
01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

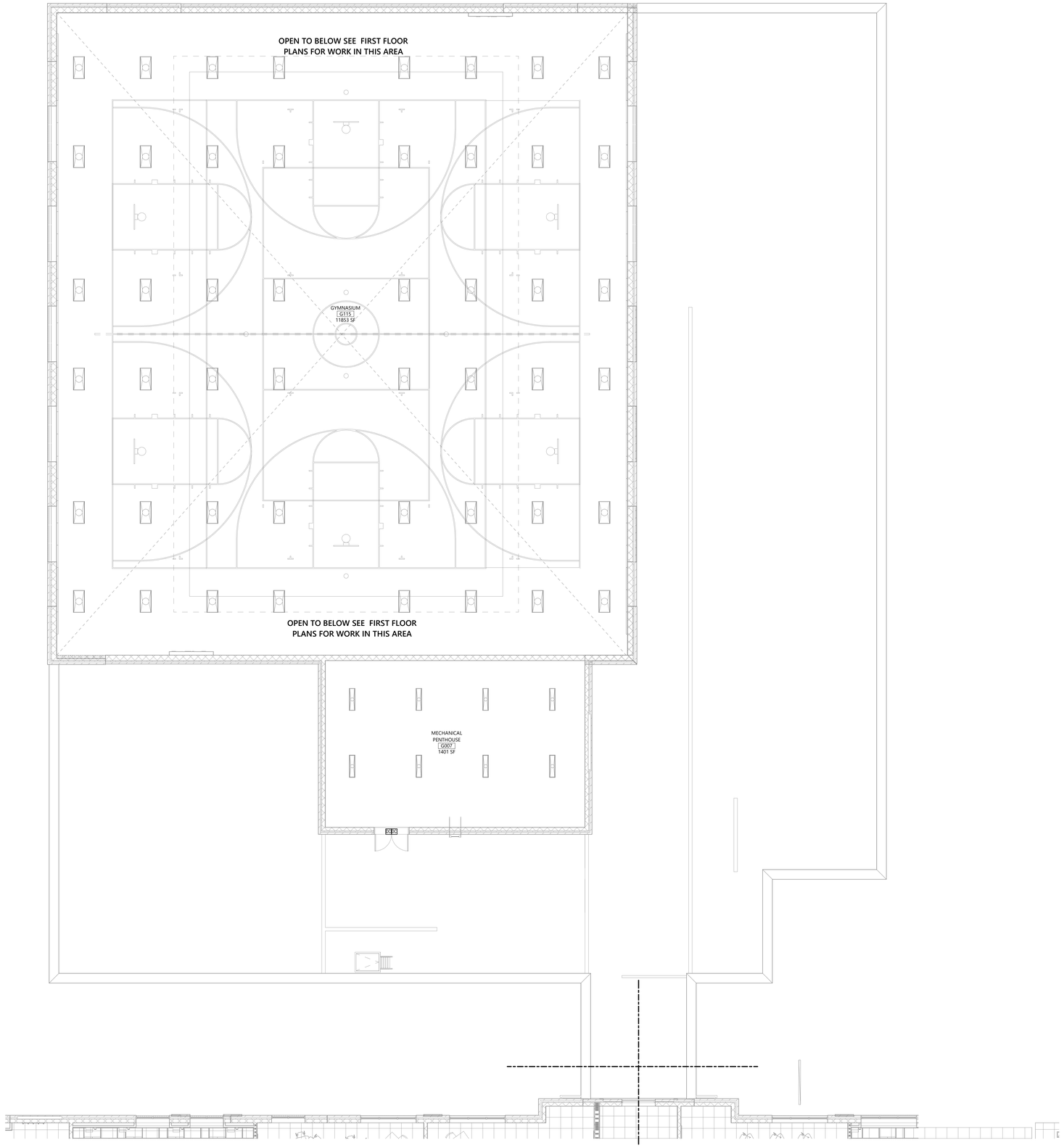
PROJECT: 9201-218240
DATE: 01-12-2023

SECOND FLOOR SECURITY PLAN AREA B

TY-102B

Optima # 22-0082

01.12.2023 - BID SET



1 SECOND FLOOR TECHNOLOGY SECURITY - AREA C
1/8" = 1'-0"

GENERAL NOTES:

A. CONTRACTOR SHALL COORDINATE CAMERA FIELD OF VIEW AND ADJUST CAMERA LOCATION AS REQUIRED TO AVOID CEILING OBSTRUCTION SUCH AS EXIT SIGNS.

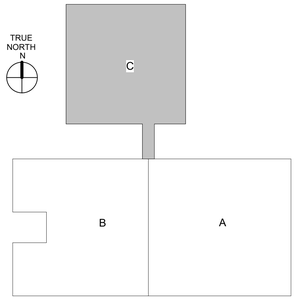
B. REFER TO OVERALL PATHWAY PLANS FOR CABLING ZONE INFORMATION.

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

SECOND FLOOR SECURITY PLAN AREA C

TY-102C

Optima # 22-0082

01.12.2023 - BID SET

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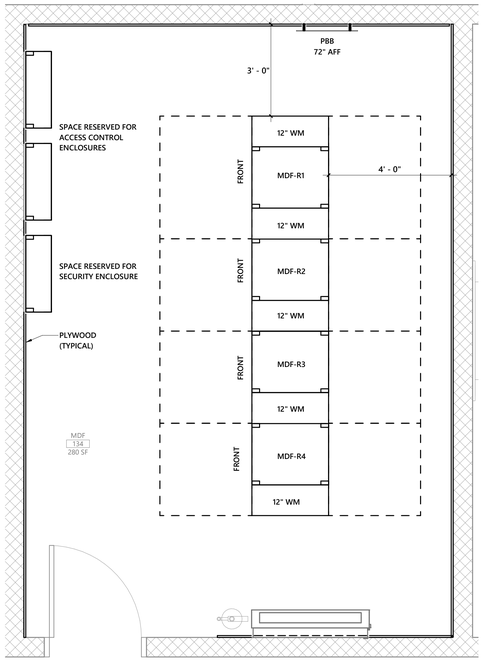
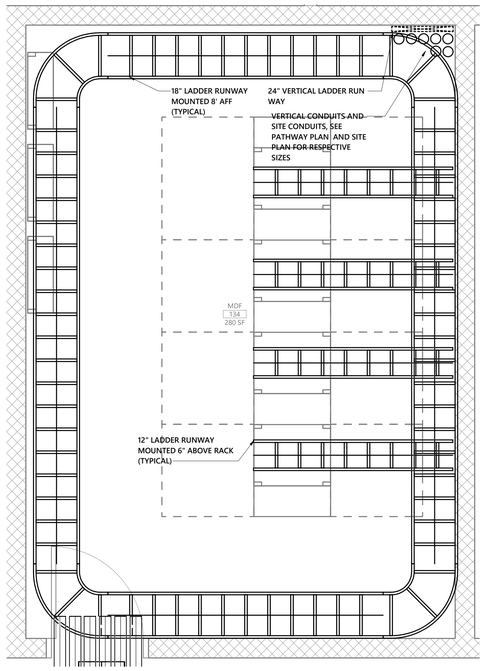


1 FIRST FLOOR ENLARGED MDF 134 (MDF) - AREA A - EQUIPMENT PLAN
1/2" = 1'-0"

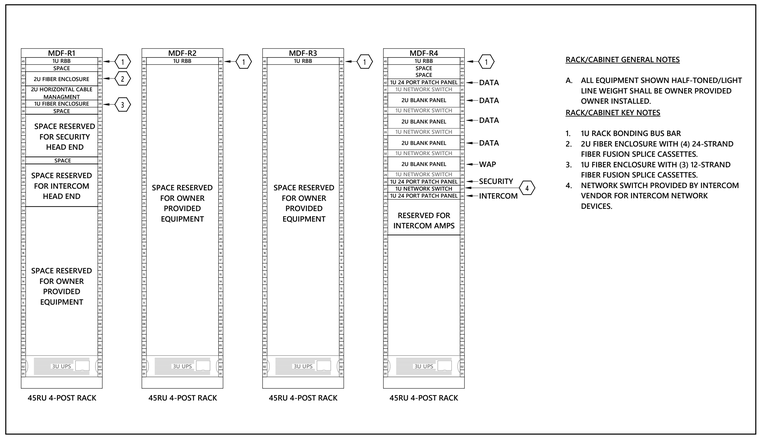


2 FIRST FLOOR ENLARGED MDF 134 (MDF) - AREA A - PATHWAY PLAN
1/2" = 1'-0"

GENERAL NOTES:

A. REFER TO OVERALL PATHWAY PLANS (T-011 & T-012) FOR ADDITIONAL CONDUIT/SLEEVE INFORMATION.

B. PROVIDE WATERFALL DEVICES AS REQUIRED TO SUPPORT CABLING.



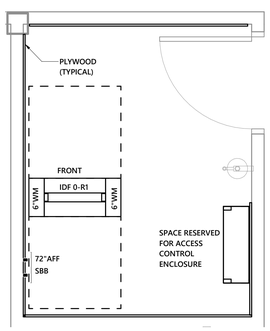
RACK/CABINET GENERAL NOTES

A. ALL EQUIPMENT SHOWN HALF-TONED/LIGHT LINE WEIGHT SHALL BE OWNER PROVIDED OWNER INSTALLED.

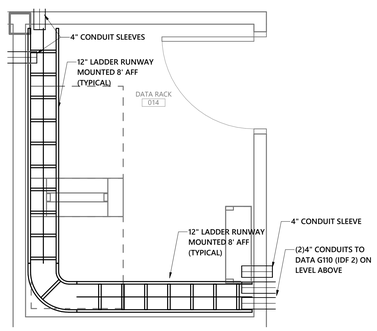
RACK/CABINET KEY NOTES

1. 1U RACK BONDING BUS BAR
2. 2U FIBER ENCLOSURE WITH (4) 24-STRAND FIBER FUSION SPLICE CASSETTES.
3. 1U FIBER ENCLOSURE WITH (3) 12-STRAND FIBER FUSION SPLICE CASSETTES.
4. NETWORK SWITCH PROVIDED BY INTERCOM VENDOR FOR INTERCOM NETWORK DEVICES.

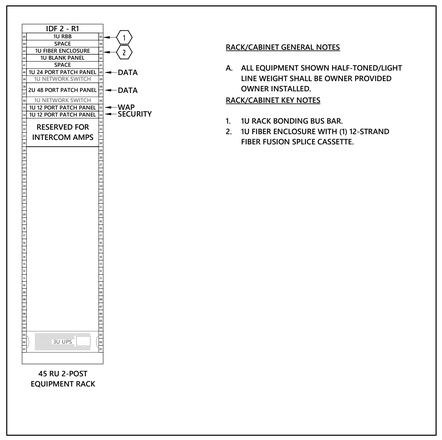
3 MDF - EQUIPMENT RACK ELEVATIONS
NO SCALE



4 BASEMENT ENLARGED DATA 014 (IDF 0) - EQUIPMENT PLAN
1/2" = 1'-0"



5 BASEMENT ENLARGED DATA 014 (IDF 0) - PATHWAY PLAN
1/2" = 1'-0"



RACK/CABINET GENERAL NOTES

A. ALL EQUIPMENT SHOWN HALF-TONED/LIGHT LINE WEIGHT SHALL BE OWNER PROVIDED OWNER INSTALLED.

RACK/CABINET KEY NOTES

1. 1U RACK BONDING BUS BAR.
2. 1U FIBER ENCLOSURE WITH (1) 12-STRAND FIBER FUSION SPLICE CASSETTE.

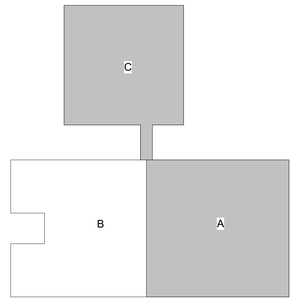
6 IDF 0 - EQUIPMENT RACK ELEVATION
NO SCALE

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

ENLARGED TECHNOLOGY PLANS

T-401

Optima # 22-0082

01.12.2023 - BID SET

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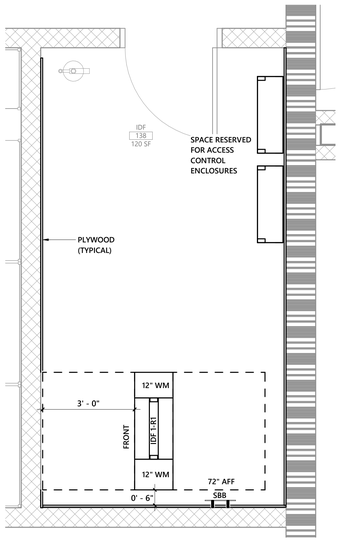
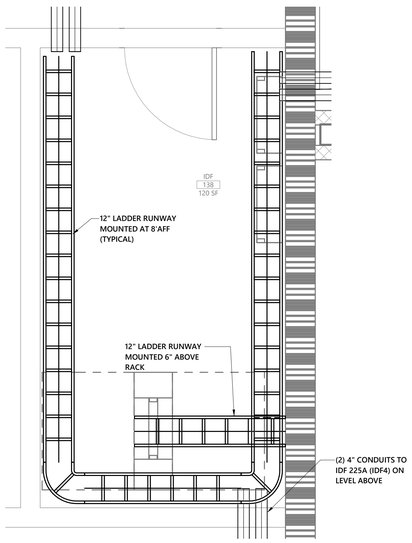
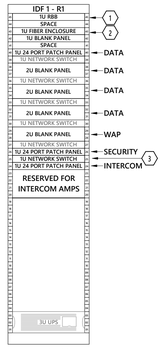


1 FIRST FLOOR ENLARGED IDF 138 (IDF 1) - AREA B - EQUIPMENT PLAN
1/2" = 1'-0"



2 FIRST FLOOR ENLARGED IDF 138 (IDF 1) - AREA B - PATHWAY PLAN
1/2" = 1'-0"



45 RU 2-POST
EQUIPMENT RACK

RACK/CABINET GENERAL NOTES

A. ALL EQUIPMENT SHOWN HALF-TONED/LIGHT LINE WEIGHT SHALL BE OWNER PROVIDED OWNER INSTALLED.

RACK/CABINET KEY NOTES

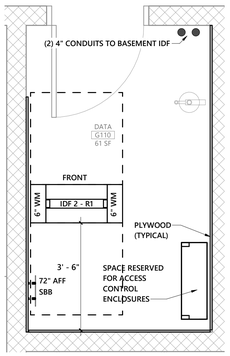
1. 1U RACK BONDING BUS BAR.
2. 1U FIBER ENCLOSURE WITH (1) 24-STRAND FIBER FUSION SPLICE CASSETTES.
3. NETWORK SWITCH PROVIDED BY INTERCOM VENDOR FOR INTERCOM NETWORK DEVICES.

3 EQUIPMENT RACK ELEVATION
NO SCALE

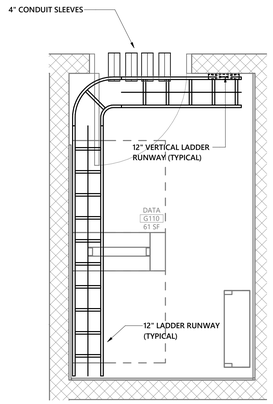
GENERAL NOTES:

A. REFER TO OVERALL PATHWAY PLANS (T-011 & T-012) FOR ADDITIONAL CONDUIT/SLEEVE INFORMATION.

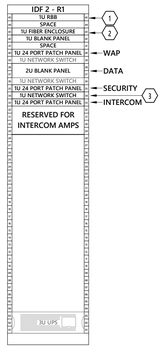
B. PROVIDE WATERFALL DEVICES AS REQUIRED TO SUPPORT CABLING.



4 FIRST FLOOR ENLARGED DATA G110 (IDF 2) - AREA C - EQUIPMENT PLAN
1/2" = 1'-0"



5 FIRST FLOOR ENLARGED DATA G110 (IDF 2) - AREA C - PATHWAY PLAN
1/2" = 1'-0"



45 RU 2-POST
EQUIPMENT RACK

RACK/CABINET GENERAL NOTES

A. ALL EQUIPMENT SHOWN HALF-TONED/LIGHT LINE WEIGHT SHALL BE OWNER PROVIDED OWNER INSTALLED.

RACK/CABINET KEY NOTES

1. 1U RACK BONDING BUS BAR.
2. 1U FIBER ENCLOSURE WITH (1) 24-STRAND FIBER FUSION SPLICE CASSETTES.
3. NETWORK SWITCH PROVIDED BY INTERCOM VENDOR FOR INTERCOM NETWORK DEVICES.

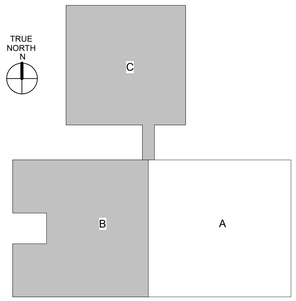
6 EQUIPMENT RACK ELEVATION
NO SCALE

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

- NON-RATED PARTITION TO 4" ABOVE CEILING
- NON-RATED METAL STUD PARTITION TO DECK
- NON-RATED CMU PARTITION
- SMOKE PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

KEY PLAN



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REVISIONS:

No.	Description	Date

PROJECT: 9201-218240
DATE: 01-12-2023

ENLARGED TECHNOLOGY PLANS

T-402

Optima # 22-0082

01.12.2023 - BID SET

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GENERAL NOTES:

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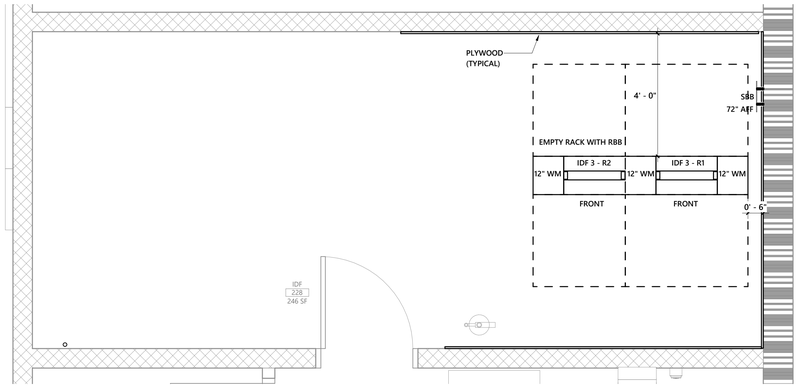
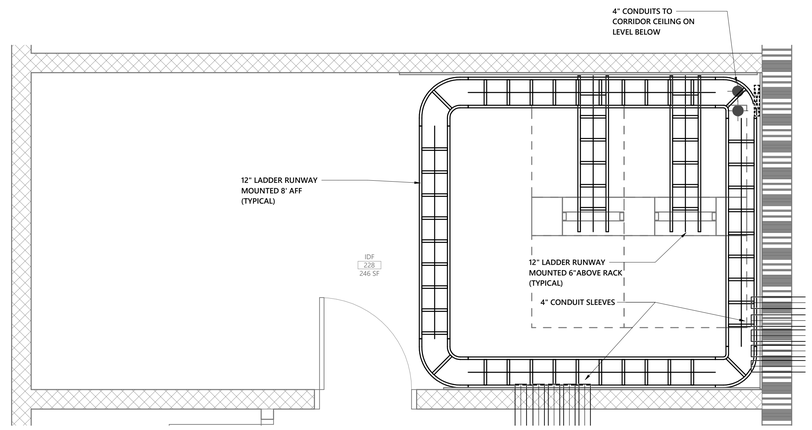
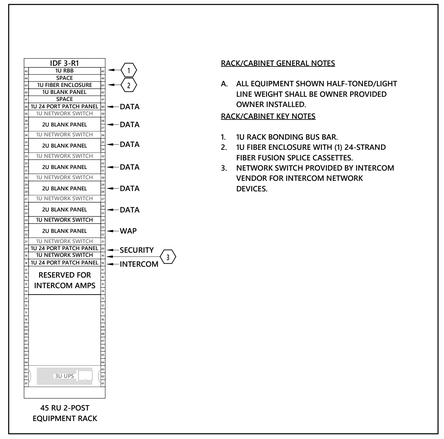
B. PROVIDE WATERFALL DEVICES AS REQUIRED TO SUPPORT CABLING.



1 SECOND FLOOR ENLARGED TECHNOLOGY PLAN - IDF 228 (IDF 3) - AREA B - EQUIPMENT PLAN
1/2" = 1'-0"



2 SECOND FLOOR ENLARGED TECHNOLOGY PLAN - IDF 228 (IDF 3) - AREA B - PATHWAY PLAN
1/2" = 1'-0"



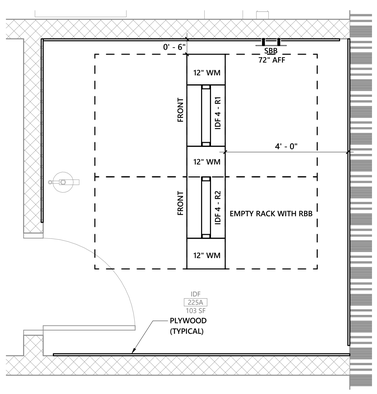
RACK/CABINET GENERAL NOTES

A. ALL EQUIPMENT SHOWN HALF-TONED/LIGHT LINE WEIGHT SHALL BE OWNER PROVIDED OWNER INSTALLED.

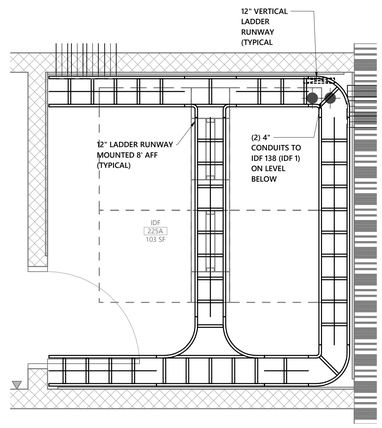
RACK/CABINET KEY NOTES

1. 1U RACK BONDING BUS BAR.
2. 1U FIBER ENCLOSURE WITH (1) 24-STRAND FIBER FUSION SPLICE CASSETTES.
3. NETWORK SWITCH PROVIDED BY INTERCOM VENDOR FOR INTERCOM NETWORK DEVICES.

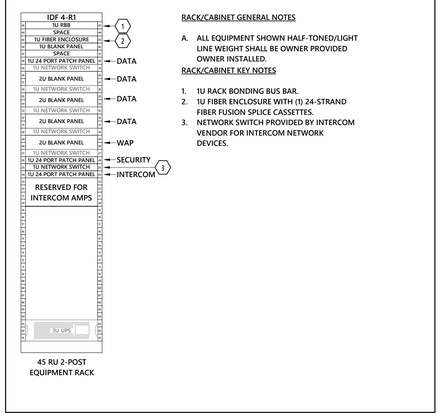
3 IDF 3 - EQUIPMENT RACK ELEVATION
NO SCALE



4 SECOND FLOOR ENLARGED TECHNOLOGY PLAN - IDF 225A (IDF 4) - AREA B - EQUIPMENT PLAN
1/2" = 1'-0"



5 SECOND FLOOR ENLARGED TECHNOLOGY PLAN - IDF 225A (IDF 4) - AREA B - PATHWAY PLAN
1/2" = 1'-0"



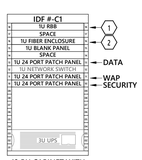
RACK/CABINET GENERAL NOTES

A. ALL EQUIPMENT SHOWN HALF-TONED/LIGHT LINE WEIGHT SHALL BE OWNER PROVIDED OWNER INSTALLED.

RACK/CABINET KEY NOTES

1. 1U RACK BONDING BUS BAR.
2. 1U FIBER ENCLOSURE WITH (1) 24-STRAND FIBER FUSION SPLICE CASSETTES.
3. NETWORK SWITCH PROVIDED BY INTERCOM VENDOR FOR INTERCOM NETWORK DEVICES.

6 IDF 4 - EQUIPMENT RACK ELEVATION
NO SCALE



CABINET GENERAL NOTES

A. ALL EQUIPMENT SHOWN HALF-TONED/LIGHT LINE WEIGHT SHALL BE OWNER PROVIDED OWNER INSTALLED.
B. TYPICAL CABINET LAYOUT FOR CONCESSION BUILDINGS.

RACK/CABINET KEY NOTES

1. 1U RACK BONDING BUS BAR.
2. 1U FIBER ENCLOSURE WITH (1) 12-STRAND FIBER FUSION SPLICE CASSETTES.

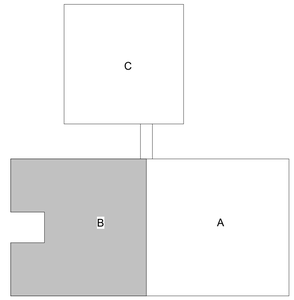
7 IDF 5/6 (CONCESSIONS) - EQUIPMENT CABINET ELEVATION
NO SCALE

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.

NON-RATED PARTITION TO 4" ABOVE CEILING
NON-RATED METAL STUD PARTITION TO DECK
NON-RATED CMU PARTITION
SMOKE PARTITION TO DECK
1 HR. RATED PARTITION TO DECK
2 HR. RATED PARTITION TO DECK

KEY PLAN



GASTON COUNTY SCHOOLS

GRIER MIDDLE SCHOOL REPLACEMENT

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01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

ENLARGED TECHNOLOGY PLANS

T-403

Optima # 22-0082

01.12.2023 - BID SET

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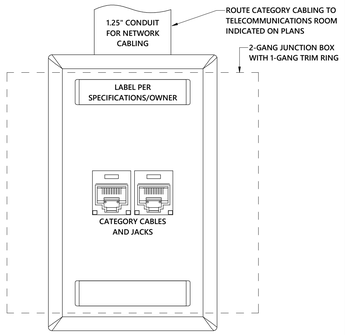
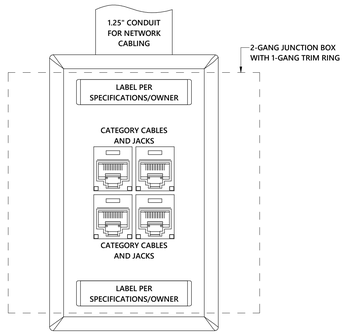
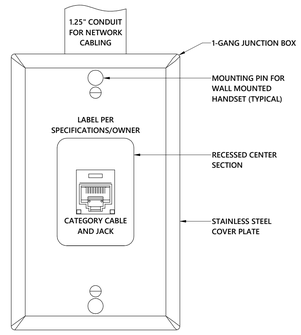


1 NETWORK OUTLET DETAIL - 2 PORT
NOT TO SCALE

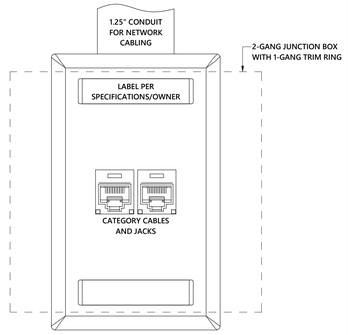


2 NETWORK OUTLET DETAIL - 4 PORT
NOT TO SCALE

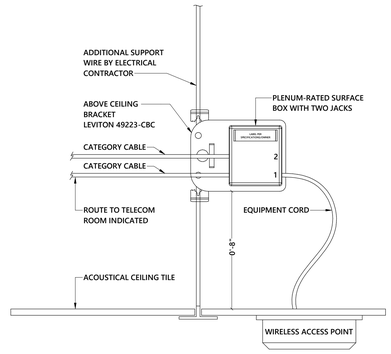


PANDUIT: KWPY OR APPROVED EQUAL

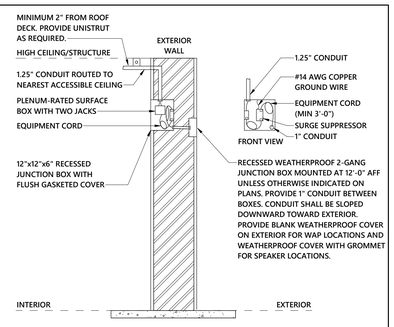
3 NETWORK WALL PHONE OUTLET DETAIL
NOT TO SCALE



4 WIRELESS ACCESS POINT DETAIL (WALL MOUNTED, HARD AND OPEN CEILING)
NOT TO SCALE



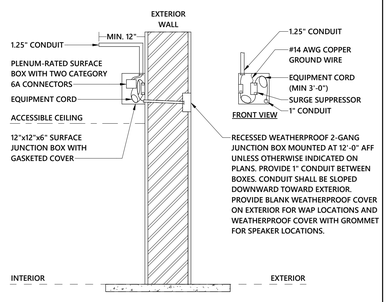
5 WIRELESS ACCESS POINT DETAIL (ACCESSIBLE CEILING)
NOT TO SCALE



GENERAL NOTES:

A. COORDINATE RECESSED JUNCTION BOX DEPTH WITH WALL CONSTRUCTION.
B. EXPOSED CONDUIT AND JUNCTION BOX COVER FINISH SHALL MATCH ADJACENT SURFACE.
C. ALL DEVICES SHALL BE SECURED INSIDE JUNCTION BOX.

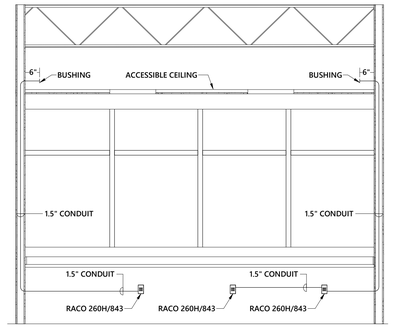
6 EXTERIOR NETWORK DEVICE DETAIL
NOT TO SCALE
HIGH CEILING/OPEN STRUCTURE
NEW EXTERIOR WALL



GENERAL NOTES:

A. SURFACE JUNCTION BOX SHALL BE LOCATED ABOVE ACCESSIBLE CEILING SPACE.
B. ALL DEVICES SHALL BE SECURED INSIDE JUNCTION BOX.

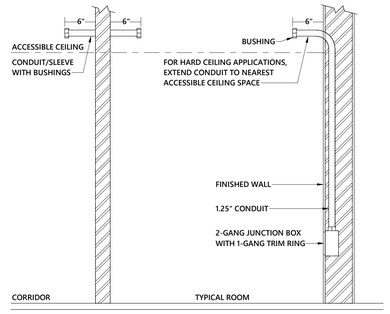
7 EXTERIOR NETWORK DEVICE DETAIL (ACCESSIBLE CEILING)
NOT TO SCALE



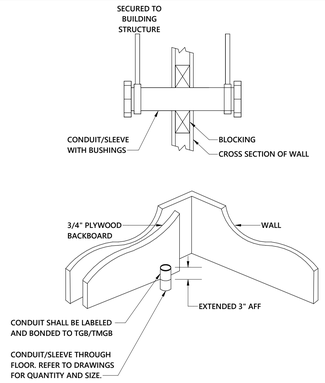
GENERAL NOTES:

A. FOR HARD CEILING APPLICATIONS, EXTEND CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE.
B. NO MORE THAN (2) CONSECUTIVE JUNCTION BOXES MAY BE SERVED HORIZONTALLY.

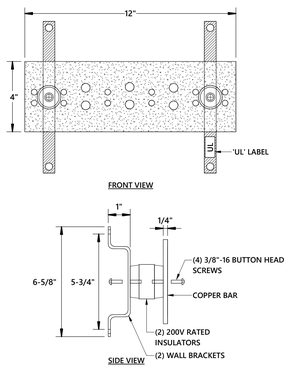
8 NETWORK OUTLETS UNDER WINDOW REQUIREMENTS
NOT TO SCALE



9 NETWORK OUTLET STUB UP DETAIL
NOT TO SCALE

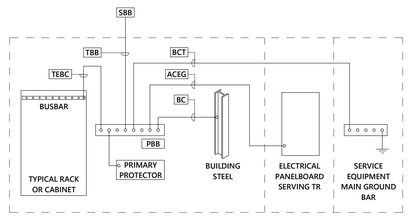


10 TELECOMMUNICATIONS CONDUIT/SLEEVE DETAIL
NOT TO SCALE



CPI: 40153-012 OR APPROVED EQUAL

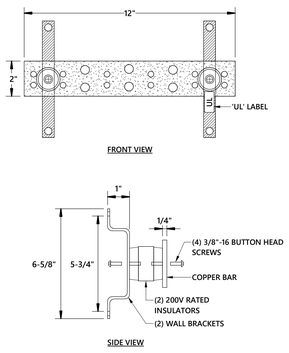
11 PRIMARY BONDING BUSBAR 'PBB'
NOT TO SCALE



TELECOMMUNICATIONS GROUNDING LEGEND

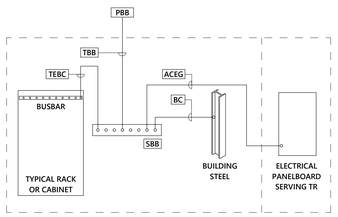
PBB	PRIMARY BONDING BUSBAR
SBB	SECONDARY BONDING BUSBAR
TBB	TELECOMMUNICATIONS BONDING BACKBONE. PROVIDE A MINIMUM #3/0 AWG GROUND IN 3/4" C.
TEBC	TELECOMMUNICATIONS EQUIPMENT BONDING CONDUCTOR. PROVIDE A MINIMUM #6 AWG GROUND.
BC	BONDING CONDUCTOR. PROVIDE A MINIMUM #6 AWG GROUND.
ACEG	ALTERNATING CURRENT EQUIPMENT GROUND. PROVIDE A MINIMUM #6 AWG GROUND.
BCT	BONDING CONDUCTOR FOR TELECOMMUNICATIONS. PROVIDE A MINIMUM #3/0 AWG GROUND IN 3/4" C.

12 TYPICAL PBB CONNECTIONS
NOT TO SCALE



CPI: 13622-012 OR APPROVED EQUAL

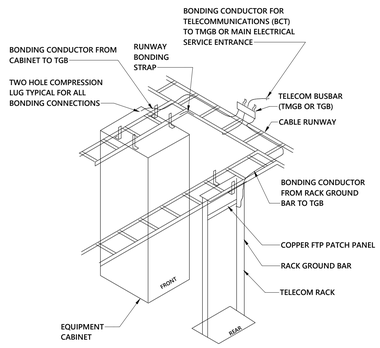
13 SECONDARY BONDING BUSBAR 'SBB'
NOT TO SCALE



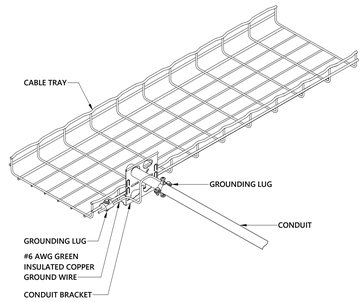
TELECOMMUNICATIONS GROUNDING LEGEND

PBB	TELECOMMUNICATIONS MAIN GROUND BAR
SBB	TELECOMMUNICATIONS GROUND BAR
TBB	TELECOMMUNICATIONS BONDING BACKBONE. PROVIDE A MINIMUM #3/0 AWG GROUND IN 3/4" CONDUIT.
TEBC	TELECOMMUNICATIONS EQUIPMENT BONDING CONDUCTOR. PROVIDE A MINIMUM #6 AWG GROUND.
BC	BONDING CONDUCTOR. PROVIDE A MINIMUM #6 AWG GROUND.
ACEG	ALTERNATING CURRENT EQUIPMENT GROUND. PROVIDE A MINIMUM #6 AWG GROUND.

14 TYPICAL SBB CONNECTIONS
NOT TO SCALE



15 CABLE TRAY BONDING AND GROUNDING
NOT TO SCALE



GENERAL NOTES:

A. DETAIL SHALL APPLY TO ALL CABLE TRAY/CONDUIT TRANSISTIONS.
B. BONDING CLAMP SHALL BE APPROVED FOR DISSIMILAR METAL CONNECTIONS.
C. GROUNDING LUGS SHALL BE TIN-PLATED COPPER WITH STAINLESS STEEL HARDWARE

16 CONDUIT AND CABLE TRAY CONNECTION DETAIL
NOT TO SCALE

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Expires 12-31-25
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01-12-2023

Thomas M Gandasa
Registered Architect
Commonwealth of Virginia
01-12-2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

TECHNOLOGY DETAILS

T-501

Optima # 22-0082

01.12.2023 - BID SET

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GENERAL NOTES:

A. BASIS OF DESIGN: LEGRAND EVOLUTION FLOOR BOX EFB45S-OG OR APPROVED EQUAL. PROVIDE HARDWARE AS REQUIRED TO CONNECT DEVICES AND CONDUITS AS INDICATED.

B. PROVIDE (2) 5-20R RECEPTACLES.

C. PROVIDE ALL INSTALLATION HARDWARE AS REQUIRED.

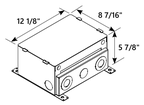
D. ROUTE STRUCTURED CABLING TO TELECOMMUNICATIONS ROOM INDICATED.

E. FLOOR BOX & COVER, CONDUIT, RECEPTACLES AND POWER WIRING SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR.

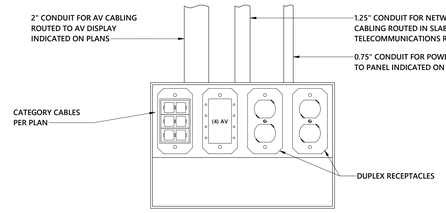
F. STRUCTURED CABLING AND ASSOCIATED HARDWARE SHALL BE PROVIDED BY STRUTURED CABLING CONTRACTOR.

G. A/V CABLING AND ASSOCIATED HARDWARE SHALL BE PROVIDED BY AV CONTRACTOR.

H. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO INSTALLATION.



DIMENSIONAL VIEW



FB4

1 4-GANG MULTI-SERVICE FLOOR BOX

NOT TO SCALE

GENERAL NOTES:

A. BASIS OF DESIGN: LEGRAND EVOLUTION POKE-THRU BAT OR APPROVED EQUAL. PROVIDE HARDWARE AS REQUIRED TO CONNECT DEVICES AND CONDUITS AS INDICATED.

B. PROVIDE (2) 5-20R RECEPTACLES. (PRE-WIRED)

C. PROVIDE ALL INSTALLATION HARDWARE AS REQUIRED.

D. ROUTE STRUCTURED CABLING TO TELECOMMUNICATIONS ROOM INDICATED.

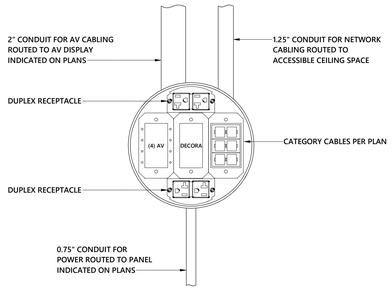
E. POKE-THRU & COVER, CONDUIT, RECEPTACLES AND POWER WIRING SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR.

F. STRUCTURED CABLING AND ASSOCIATED HARDWARE SHALL BE PROVIDED BY STRUTURED CABLING CONTRACTOR.

G. A/V CABLING AND ASSOCIATED HARDWARE SHALL BE PROVIDED BY AV CONTRACTOR.

H. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO INSTALLATION.

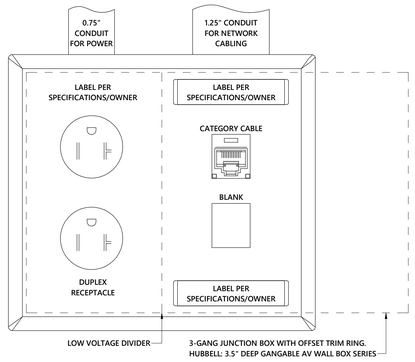
I. ALL CORE DRILLS AND CONDUIT PENETRATIONS SHALL BE COORDINATED, EVALUATED AND APPROVED BY THE STRUCTURAL ENGINEER PRIOR TO INSTALLATION.



PTBA

2 8" MULTI-SERVICE FIRE RATED POKE-THRU FLOOR BOX - TYPE A

NOT TO SCALE



TV

3 DISPLAY DETAIL WITH NETWORK AND DUPLEX POWER

NOT TO SCALE

GENERAL NOTES:

A. BASIS OF DESIGN: LEGRAND EVOLUTION WALL BOX EFSB4 OR APPROVED EQUAL. PROVIDE HARDWARE AS REQUIRED TO CONNECT DEVICES AND CONDUITS AS INDICATED.

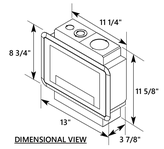
B. PROVIDE (2) 5-20R RECEPTACLES.

C. PROVIDE INSTALLATION HARDWARE AS REQUIRED. COORDINATE WITH ARCHITECTURAL DRAWINGS.

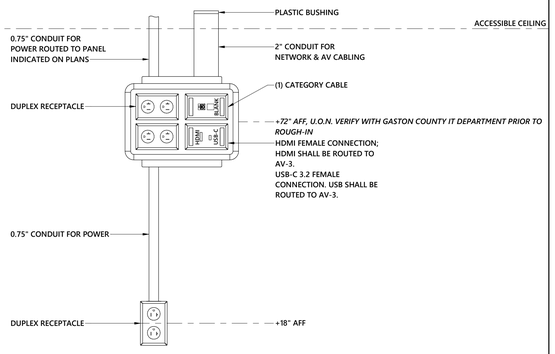
D. ROUTE STRUCTURED CABLING TO TELECOMMUNICATIONS ROOM INDICATED.

E. WALL BOX, CONDUIT, RECEPTACLES AND POWER WIRING SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR.

F. STRUCTURED CABLING AND ASSOCIATED HARDWARE SHALL BE PROVIDED BY STRUTURED CABLING CONTRACTOR.



DIMENSIONAL VIEW



AV1

4 AV-1 DISPLAY DETAIL

NOT TO SCALE

GENERAL NOTES:

A. BASIS OF DESIGN: LEGRAND EVOLUTION WALL BOX EFSB4 OR APPROVED EQUAL. PROVIDE HARDWARE AS REQUIRED TO CONNECT DEVICES AND CONDUITS AS INDICATED.

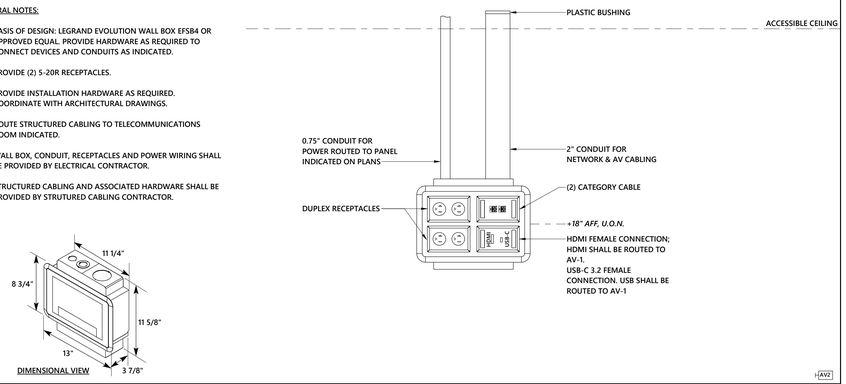
B. PROVIDE (2) 5-20R RECEPTACLES.

C. PROVIDE INSTALLATION HARDWARE AS REQUIRED. COORDINATE WITH ARCHITECTURAL DRAWINGS.

D. ROUTE STRUCTURED CABLING TO TELECOMMUNICATIONS ROOM INDICATED.

E. WALL BOX, CONDUIT, RECEPTACLES AND POWER WIRING SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR.

F. STRUCTURED CABLING AND ASSOCIATED HARDWARE SHALL BE PROVIDED BY STRUTURED CABLING CONTRACTOR.



DIMENSIONAL VIEW

AV2

5 AV-2 DISPLAY DETAIL

NOT TO SCALE

GENERAL NOTES:

A. BASIS OF DESIGN: LEGRAND EVOLUTION WALL BOX EFSB4 OR APPROVED EQUAL. PROVIDE HARDWARE AS REQUIRED TO CONNECT DEVICES AND CONDUITS AS INDICATED.

B. PROVIDE (2) 5-20R RECEPTACLES.

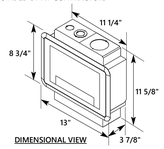
C. PROVIDE INSTALLATION HARDWARE AS REQUIRED. COORDINATE WITH ARCHITECTURAL DRAWINGS.

D. ROUTE STRUCTURED CABLING TO TELECOMMUNICATIONS ROOM INDICATED.

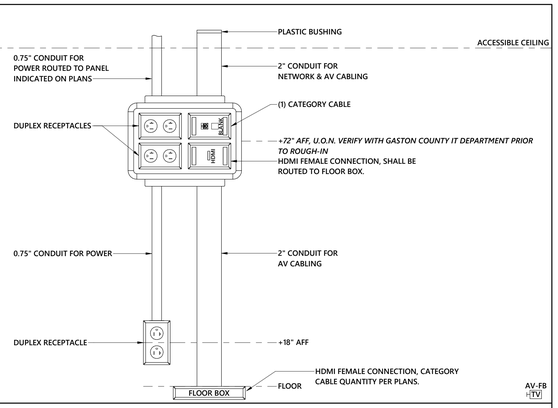
E. WALL BOX, CONDUIT, RECEPTACLES AND POWER WIRING SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR.

F. STRUCTURED CABLING AND ASSOCIATED HARDWARE SHALL BE PROVIDED BY STRUTURED CABLING CONTRACTOR.

G. A/V CABLING AND ASSOCIATED HARDWARE SHALL BE PROVIDED BY AV CONTRACTOR.



DIMENSIONAL VIEW



AV-FB
TV

6 AV DISPLAY DETAIL WITH FLOOR BOX

NOT TO SCALE

GENERAL NOTES:

A. BASIS OF DESIGN: LEGRAND EVOLUTION WALL BOX EFSB4 OR APPROVED EQUAL. PROVIDE HARDWARE AS REQUIRED TO CONNECT DEVICES AND CONDUITS AS INDICATED.

B. PROVIDE (2) 5-20R RECEPTACLES.

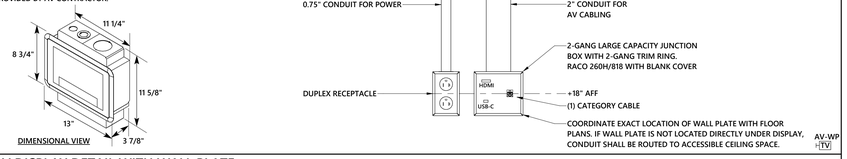
C. PROVIDE INSTALLATION HARDWARE AS REQUIRED. COORDINATE WITH ARCHITECTURAL DRAWINGS.

D. ROUTE STRUCTURED CABLING TO TELECOMMUNICATIONS ROOM INDICATED.

E. WALL BOX, CONDUIT, RECEPTACLES AND POWER WIRING SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR.

F. STRUCTURED CABLING AND ASSOCIATED HARDWARE SHALL BE PROVIDED BY STRUTURED CABLING CONTRACTOR.

G. A/V CABLING AND ASSOCIATED HARDWARE SHALL BE PROVIDED BY AV CONTRACTOR.



AV-WP
TV

7 AV DISPLAY DETAIL WITH WALL PLATE

NOT TO SCALE

GASTON COUNTY SCHOOLS

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

TECHNOLOGY DETAILS

T-502

Optima # 22-0082

01.12.2023 - BID SET

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GENERAL NOTES:

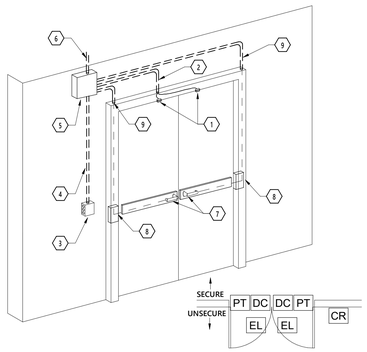
A. DOOR DETAIL INDICATES DOOR HANDLE OR CRASHBAR ON SECURED SIDE OF DOOR FOR REFERENCE ONLY. LOCK POWER WILL VARY DEPENDING ON LOCK TYPE AND DOOR HARDWARE. CONTRACTOR SHALL CROSS REFERENCE WITH DOOR HARDWARE SCHEDULE/SPECIFICATIONS TO CONFIRM FINAL REQUIREMENTS.

B. ALL CONDUITS SHALL BE CONCEALED; UNLESS OTHERWISE NOTED

C. PROVIDE AND INSTALL PULL STRINGS IN ALL CONDUITS.

KEYNOTES:

1. DOOR CONTACT: PROVIDE FLUSH MOUNTED DOOR STATUS MONITOR.
2. DOOR CONTACT CONDUIT: PROVIDE 1/2"C. FROM DOOR FRAME TO SECURITY ENCLOSURE ABOVE DOOR.
3. READER/KEYPAD: PROVIDE 4"X4"X2-1/8" FLUSH BACK-BOX AND SINGLE GANG MUD RING MOUNTED ON NON-SECURED SIDE OF DOOR AT 42" AFF.
4. READER/KEYPAD CONDUIT: PROVIDE 1/2"C. FROM JUNCTION BOX TO SECURITY ENCLOSURE ABOVE DOOR.
5. SECURITY ENCLOSURE ABOVE DOOR ON SECURE SIDE: PROVIDE 12"X12"X4" PAINTABLE ENCLOSURE MOUNTED ABOVE FINISHED ACCESSIBLE CEILING OR 10' AFF IN AREAS WITHOUT A CEILING ON SECURED SIDE OF DOOR. LOCAL POE DOOR CONTROLER SHALL BE INSTALLED INSIDE ENCLOSURE.
6. SECURITY ENCLOSURE CONDUIT: PROVIDE 1"C. TO NEAREST ACCESSIBLE CEILING, CABLE TRAY OR TELECOM ROOM.
7. ELECTRIFIED LOCKSET: INTERNAL ELECTRIFIED LOCKSET WITH INTEGRATED REX SWITCH, SHOWN FOR REFERENCE ONLY.
8. POWER TRANSFER HINGE: HINGE WITH ISOLATED ELECTRICAL CONNECTIVITY, SHOWN FOR REFERENCE ONLY.
9. POWER TRANSFER HINGE CONDUIT/ELECTRIFIED LOCKSET CONDUIT: PROVIDE 1/2"C. FROM DOOR FRAME TO SECURITY ENCLOSURE.



1 ACS DOUBLE DOOR - ELECTRIFIED HARWARE W/INTEGRATED REX
NOT TO SCALE

GENERAL NOTES:

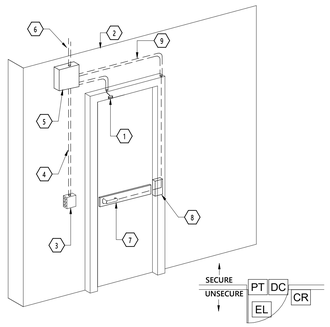
A. DOOR DETAIL INDICATES DOOR HANDLE OR CRASHBAR ON SECURED SIDE OF DOOR FOR REFERENCE ONLY. LOCK POWER WILL VARY DEPENDING ON LOCK TYPE AND DOOR HARDWARE. CONTRACTOR SHALL CROSS REFERENCE WITH DOOR HARDWARE SCHEDULE/SPECIFICATIONS TO CONFIRM FINAL REQUIREMENTS.

B. ALL CONDUITS SHALL BE CONCEALED; UNLESS OTHERWISE NOTED

C. PROVIDE AND INSTALL PULL STRINGS IN ALL CONDUITS.

KEYNOTES:

1. DOOR CONTACT: PROVIDE FLUSH MOUNTED DOOR STATUS MONITOR.
2. DOOR CONTACT CONDUIT: PROVIDE 1/2"C. FROM DOOR FRAME TO SECURITY ENCLOSURE ABOVE DOOR.
3. READER/KEYPAD: PROVIDE 4"X4"X2-1/8" FLUSH BACK-BOX AND SINGLE GANG MUD RING MOUNTED ON NON-SECURED SIDE OF DOOR AT 42" AFF.
4. READER/KEYPAD CONDUIT: PROVIDE 1/2"C. FROM JUNCTION BOX TO SECURITY ENCLOSURE ABOVE DOOR.
5. SECURITY ENCLOSURE ABOVE DOOR ON SECURE SIDE: PROVIDE 12"X12"X4" PAINTABLE ENCLOSURE MOUNTED ABOVE FINISHED ACCESSIBLE CEILING OR 10' AFF IN AREAS WITHOUT A CEILING ON SECURED SIDE OF DOOR. LOCAL DOOR CONTROLER SHALL BE INSTALLED INSIDE ENCLOSURE.
6. SECURITY ENCLOSURE CONDUIT: PROVIDE 1"C. TO NEAREST ACCESSIBLE CEILING, CABLE TRAY OR TELECOM ROOM.
7. ELECTRIFIED LOCKSET: INTERNAL ELECTRIFIED LOCKSET WITH INTEGRATED REX SWITCH, SHOWN FOR REFERENCE ONLY.
8. POWER TRANSFER HINGE: HINGE WITH ISOLATED ELECTRICAL CONNECTIVITY, SHOWN FOR REFERENCE ONLY.
9. POWER TRANSFER HINGE CONDUIT/ELECTRIFIED LOCKSET CONDUIT: PROVIDE 1/2"C. FROM DOOR FRAME TO SECURITY ENCLOSURE.



2 ACS SINGLE DOOR - ELECTRIFIED HARWARE W/INTEGRATED REX
NOT TO SCALE

GENERAL NOTES:

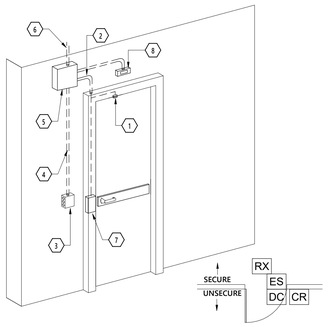
A. DOOR DETAIL INDICATES DOOR HANDLE OR CRASHBAR ON SECURED SIDE OF DOOR FOR REFERENCE ONLY. LOCK POWER WILL VARY DEPENDING ON LOCK TYPE AND DOOR HARDWARE. CONTRACTOR SHALL CROSS REFERENCE WITH DOOR HARDWARE SCHEDULE/SPECIFICATIONS TO CONFIRM FINAL REQUIREMENTS.

B. ALL CONDUITS SHALL BE CONCEALED; UNLESS OTHERWISE NOTED

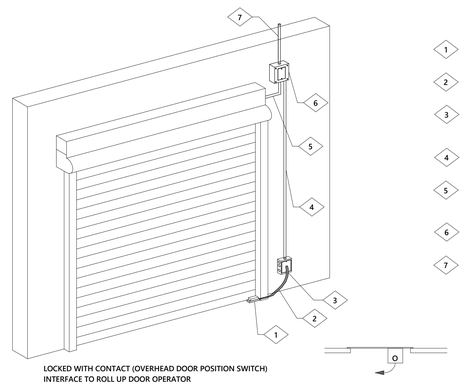
C. PROVIDE AND INSTALL PULL STRINGS IN ALL CONDUITS.

KEYNOTES:

1. DOOR CONTACT: PROVIDE FLUSH MOUNTED DOOR STATUS MONITOR.
2. DOOR CONTACT/LOCKING HARDWARE CONDUIT: PROVIDE 1/2"C. FROM DOOR FRAME TO SECURITY ENCLOSURE ABOVE DOOR.
3. READER/KEYPAD: PROVIDE 4"X4"X2-1/8" FLUSH BACK-BOX AND SINGLE GANG MUD RING MOUNTED ON NON-SECURED SIDE OF DOOR AT 42" AFF.
4. READER/KEYPAD CONDUIT: PROVIDE 1/2"C. FROM JUNCTION BOX TO SECURITY ENCLOSURE ABOVE DOOR.
5. SECURITY ENCLOSURE ABOVE DOOR ON SECURE SIDE: PROVIDE 12"X12"X4" PAINTABLE ENCLOSURE MOUNTED ABOVE FINISHED ACCESSIBLE CEILING OR 10' AFF IN AREAS WITHOUT A CEILING ON SECURED SIDE OF DOOR. LOCAL DOOR CONTROLER SHALL BE INSTALLED INSIDE ENCLOSURE.
6. SECURITY ENCLOSURE CONDUIT: PROVIDE 1"C. TO NEAREST ACCESSIBLE CEILING, CABLE TRAY OR TELECOM ROOM.
7. ELECTRIFIED STRIKE: INTERNAL ELECTRIFIED STRIKE, SHOWN FOR REFERENCE ONLY.
8. REQUEST TO EXIT (RX): PROVIDE MOTION RX DEVICE CENTERED AND MOUNTED TO TOP OF DOOR FRAME. PROVIDE SINGLE GANG J-BOX MOUNTED HORIZONTALLED, ROUTE CABLING INTO DOOR FRAME AND UP TO SECURITY ENCLOSURE ON SECURE SIDE.



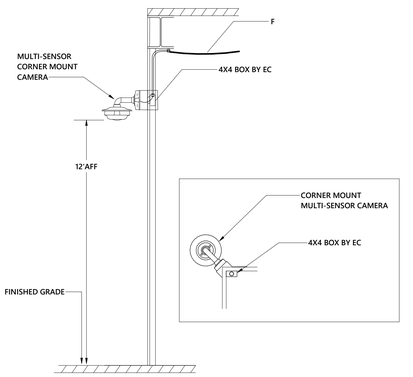
3 ACS SINGLE DOOR - ELECTRIC STRIKE W/REQUEST TO EXIT
NOT TO SCALE



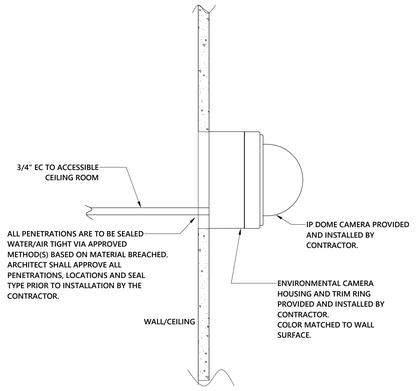
KEYNOTES:

1. DOOR POSITION SWITCH: PROVIDE SURFACE MOUNTED OVERHEAD DOOR STATUS MONITOR.
2. FLEXIBLE CONDUIT WHIP: PROVIDE 3/4" FLEXIBLE WHIP FROM DOOR POSITION SWITCH TO J-BOX ON WALL NEAR BASE OF DOOR.
3. DOOR POSITION SWITCH J-BOX: PROVIDE 4"X4"X2-1/8" (100mmX100mmX 54mm) BACK-BOX AND SINGLE GANG FACE PLATE MOUNTED ON NEAR BASE OF SECURED SIDE OF DOOR AT 12" AFF.
4. DOOR POSITION SWITCH CONDUIT: PROVIDE 3/4"C. (19mm) FROM MONITOR J-BOX TO SECURITY J-BOX.
5. DOOR OPERATOR CONDUIT: PROVIDE 3/4"C. (19mm) FROM OPERATOR INTERFACE POINT TO SECURITY J-BOX FOR CONTROL WIRING BACK TO SECURITY CONTROL PANEL.
6. SECURITY J-BOX: PROVIDE 8"X8"X4" (200mmX200mmX100mm) J-BOX MOUNTED ABOVE DOOR ON WALL ON SECURED SIDE OF DOOR.
7. SECURITY J-BOX CONDUIT: PROVIDE 1"C. (25mm) TO NEAREST ACCESSIBLE CEILING, CABLE TRAY, OR COMM ROOM.

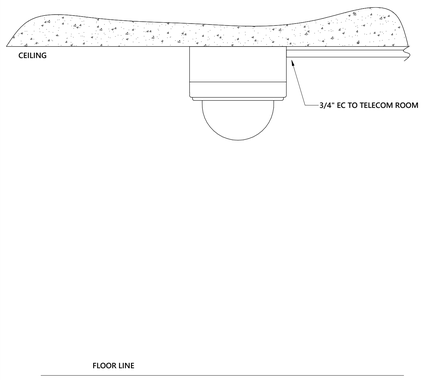
4 DOOR POSITION SWITCH - OVERHEAD DOOR TYPE 2
NO SCALE



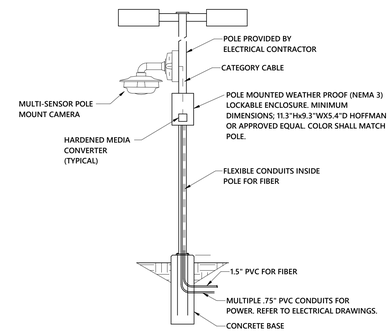
5 CORNER MOUNT MULTI-SENSOR CAMERA
NOT TO SCALE



6 SURFACE MOUNT EXTERIOR IP CAMERA INSTALLATION
NO SCALE



7 INTERIOR IP CAMERA - SURFACE MOUNT
NO SCALE



8 LIGHT POLE AND BASE DETAIL WITH TECHNOLOGY
NO SCALE

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

TECHNOLOGY DETAILS

T-503

Optima # 22-0082

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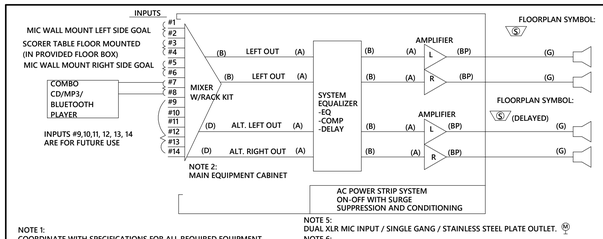


MAIN SPEAKER
-2 EACH
INSTALLED HOME SIDE. TYPICAL, WHETHER THE SPEAKERS ARE WALL MOUNTED OR FLOWN. ONLY THE MANUFACTURER'S HARDWARE THAT IS DESIGNED FOR THIS PURPOSE SHALL BE UTILIZED. SEE PLANS FOR LOCATIONS.

DELAYED SPEAKER
-2 EACH INSTALLED VISITOR SIDE (SEE PLANS FOR LOCATIONS). WHETHER THE SPEAKERS ARE WALL MOUNTED OR FLOWN. ONLY THE MANUFACTURER'S HARDWARE THAT IS DESIGNED FOR THIS PURPOSE SHALL BE UTILIZED.

NOTE 1:
COORDINATE WITH SPECIFICATIONS FOR ALL REQUIRED EQUIPMENT, CABLING, PLATES, ETC. SPEAKER MOUNT HEIGHTS AND LOCATIONS MAY VARY BASED ON THE PHYSICAL CONDITIONS OF THE ROOM. VERIFY WITH THE PROJECT ENGINEER ON PLACEMENT BEFORE INSTALLING SPEAKERS.

NOTE 2:
PROVIDE WALL MOUNT LOCKING CABINET. FILL IN ALL UNUSED SPACES WITH BLANK PANELS, MAKE USE OF VENT PANELS AS REQUIRED. SEE SPECIFICATIONS.

NOTE 3:
SEE SPECIFICATIONS FOR ASSISTED LISTENING SYSTEM. SEE PLANS FOR EQUIPMENT AND ANTENNA LOCATION.

NOTE 4:
SYSTEM REQUIRES (1) 20AMP 120VAC DEDICATED CIRCUIT INSTALLED IN THE BACK PAN OF THE WALL MOUNT CABINET.

NOTE 5:
DUAL XLR MIC INPUT / SINGLE GANG / STAINLESS STEEL PLATE OUTLET. (M)

NOTE 6:
MINIMUM SIZE CONDUIT IS 1" UNLESS OTHERWISE NOTED.

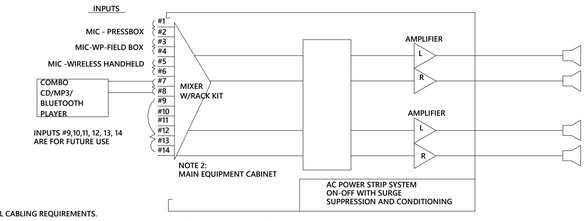
NOTE 7:
THIS SYSTEM SHALL BE TUNED AND BALANCED BY UTILIZING A FULL AUDIO SPECTRUM PINK NOISE GENERATOR FED THROUGH THE 1402 MACKIE MIXER AT UNITY GAIN. ADJUSTED TO AN OUTPUT REFERENCE OF 90 DECIBEL SOUND PRESSURE LEVEL THROUGHOUT THE LISTENING AREA.
UTILIZING A COMPUTER BASED AUDIO ANALYZER (6) SIX RANDOM SOUND PRESSURE LEVEL READINGS ARE TO BE OBTAINED IN LISTENING AREA AT DIFFERENT LOCATIONS, RECORDED AND PRINTED OUT, THEN TURNED OVER TO AN AUTHORIZED REPRESENTATIVE FROM THE CMS-ELECTRONICS DEPARTMENT. THIS SYSTEM IS TO BE ADJUSTED SO THAT SOUND SYSTEM'S PROGRAM LEVEL, WHEN MEASURED AS LISTED PREVIOUSLY, WILL REMAIN SMOOTH AND EVEN THROUGHOUT THE LISTENING AREA WITH SOUND PRESSURE OF NOT LESS THAN (+) OR (-) 2 DECIBEL AT ANY LISTENER'S SEAT.

NOTE 8:
GOOD SYSTEM PERFORMANCE IS BASED UPON SPEAKER CABLES AND MICROPHONE CABLES BEING RUN IN TOTALLY SEPARATE RACEWAYS. UNDER NO CIRCUMSTANCES SHOULD THE TWO BE RUN IN THE SAME CONDUIT.

CONNECTOR SCHEDULE
ALL PARTS #'S ARE SWITCHCRAFT

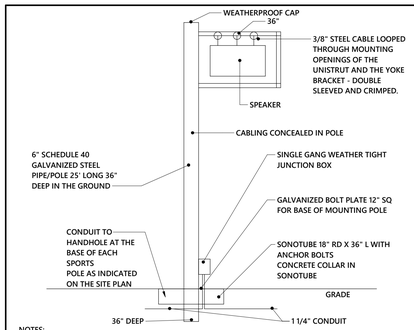
TYPE A=A3M	TYPE H=D3F
TYPE B=A3F	TYPE I=D3M
TYPE C=280	TYPE K=C3M
TYPE D=297	TYPE L=3502L
TYPE E=L12B	TYPE M=3051FP
TYPE F=N-111	SC= SCREW TERMINALS
TYPE G=184L	BP= BINDING POST

1 GYM SOUND SYSTEM
NO SCALE



NOTES:
1. SEE SPECIFICATIONS FOR ALL CABLING REQUIREMENTS.
2. MOUNT EXTERIOR ANTENNAS ON TOP EDGE OF PRESSBOX, NEAR THE EDGE (SOFFIT IF AVAILABLE.) DIRECTED TOWARD STADIUM.
3. PROVIDE FUSING ON EACH SIDE OF ALL SPEAKER LINES, 5A, 300V.
4. MIC OUTLET SHALL BE INSTALLED IN SINGLE GANG DEEP WIRE MOLD SURFACE BOX. CABLING SHALL BE INSTALLED IN A WIREMOLD RACEWAY 500 SERIES OR EQUAL, SURFACE MOUNTED, INSTALLED COMPLETE TO THE SOUND CABINET.
5. PROVIDE (1) HOFFMAN W.P. BOX 12"X12"X4". BASIS OF DESIGN IS ON THE CENTER POLE AT THE 50 YARD LINE. COORDINATE EXACT LOCATION WITH THE OWNER PRIOR TO ROUGH-IN. BOX SHALL CONTAIN (1) MICROPHONE JACK AND ONE SPEAKER JACK FOR THE MONITOR SPEAKER.
6. PROVIDE RIGHT ANGLE CONNECTORS FOR THE MIXER.
7. (2)-20A DEDICATED CIRCUITS REQUIRED.
8. PROVIDE A 25'-6" SCHEDULE 40 STEEL GALVANIZED POLE FOR EACH POLE SHOWN. POLE SHALL BE SET IN 3' DEEP 2' WIDE 3000PSI CONCRETE.
9. CONDUIT SHALL BE A MINIMUM OF 1 1/4" FOR ALL SITE CONDUIT. MICROPHONE AND SPEAKER CONDUIT SHALL ALWAYS BE SEPARATE.

2 STADIUM SOUND SYSTEM
NO SCALE



NOTES:
1. SEE SPECIFICATIONS FOR ALL POLE REQUIREMENTS. POLE STRUCTURAL SYSTEM, ANCHORING, BASE, STRUCTURAL ARMS, MOUNTING, AND INSTALLATION ARE PART OF THE EQUIPMENT.
2. UNISTRUT - 1 5/8" ALL JOINTS WELDED AND GALVANIZED. P-SERIES 12 GAUGE STEEL. BRACKET FOR SPEAKER SHALL HAVE A VERTICAL SUPPORT WELDED FROM TOP OF THE BRACKET TO THE BOTTOM OF THE BRACKET ON THE BOTTOM SIDE OF THE POLE.

3 STADIUM POLE SPEAKER - SOUND - SINGLE
NO SCALE

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REVISIONS:

No.	Description	Date

PROJECT: 9201-218240
DATE: 01-12-2023

TECHNOLOGY DETAILS

T-504

Optima # 22-0082
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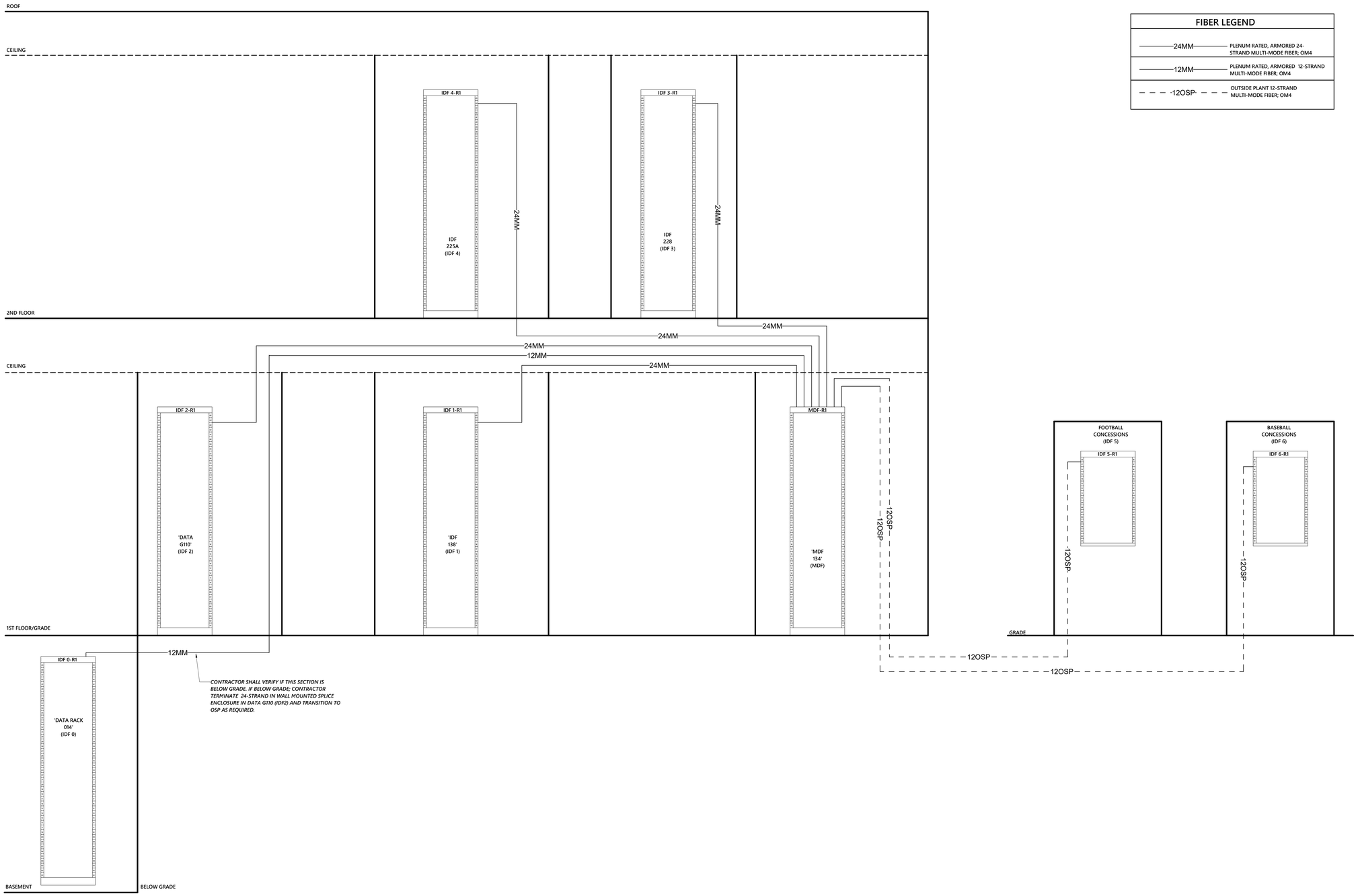

1 FIBER RISER DIAGRAM
NO SCALE

FIBER LEGEND	
24MM	PLENUM RATED, ARMORED 24-STRAND MULTI-MODE FIBER; OM4
12MM	PLENUM RATED, ARMORED 12-STRAND MULTI-MODE FIBER; OM4
12OSP	OUTSIDE PLANT 12-STRAND MULTI-MODE FIBER; OM4

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022

PROJECT: 9201-218240
DATE: 01-12-2023

TECHNOLOGY RISER DIAGRAMS

T-701

Optima # 22-0082

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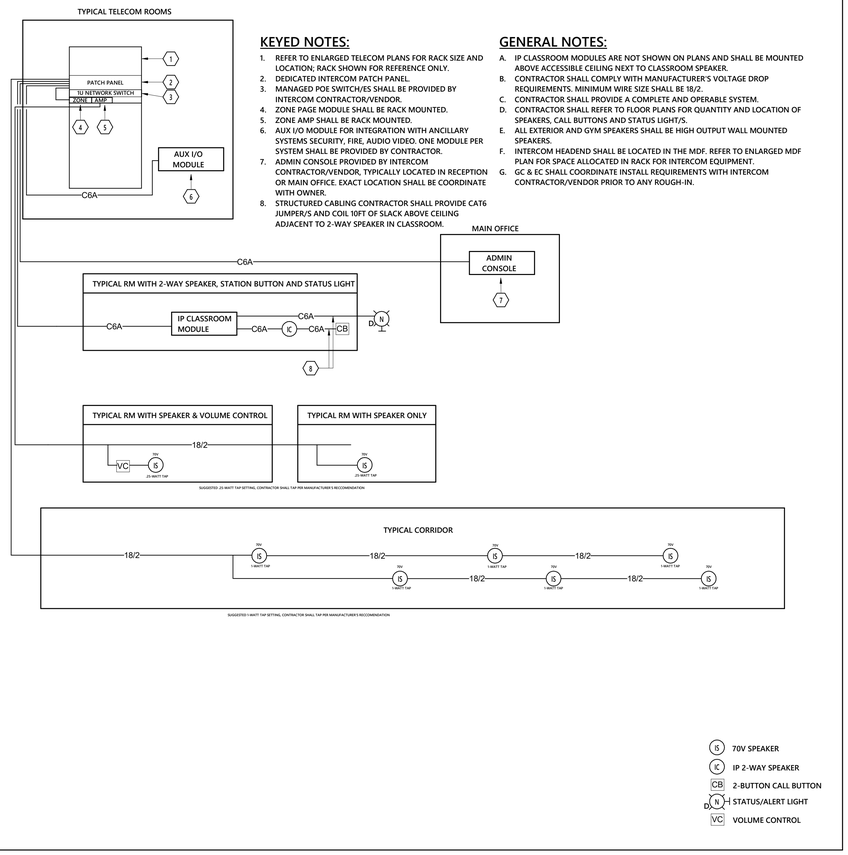

KEYED NOTES:

1. REFER TO ENLARGED TELECOM PLANS FOR RACK SIZE AND LOCATION; RACK SHOWN FOR REFERENCE ONLY.
2. DEDICATED INTERCOM PATCH PANEL.
3. MANAGED POE SWITCH/ES SHALL BE PROVIDED BY INTERCOM CONTRACTOR/VENDOR.
4. ZONE PAGE MODULE SHALL BE RACK MOUNTED.
5. ZONE AMP SHALL BE RACK MOUNTED.
6. AUX I/O MODULE FOR INTEGRATION WITH ANCILLARY SYSTEMS SECURITY, FIRE, AUDIO VIDEO. ONE MODULE PER SYSTEM SHALL BE PROVIDED BY CONTRACTOR.
7. ADMIN CONSOLE PROVIDED BY INTERCOM CONTRACTOR/VENDOR, TYPICALLY LOCATED IN RECEPTION OR MAIN OFFICE. EXACT LOCATION SHALL BE COORDINATE WITH OWNER.
8. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE CAT6 JUMPER/S AND COIL 10FT OF SLACK ABOVE CEILING ADJACENT TO 2-WAY SPEAKER IN CLASSROOM.

GENERAL NOTES:

A. IP CLASSROOM MODULES ARE NOT SHOWN ON PLANS AND SHALL BE MOUNTED ABOVE ACCESSIBLE CEILING NEXT TO CLASSROOM SPEAKER.
B. CONTRACTOR SHALL COMPLY WITH MANUFACTURER'S VOLTAGE DROP REQUIREMENTS. MINIMUM WIRE SIZE SHALL BE 18/2.
C. CONTRACTOR SHALL PROVIDE A COMPLETE AND OPERABLE SYSTEM.
D. CONTRACTOR SHALL REFER TO FLOOR PLANS FOR QUANTITY AND LOCATION OF SPEAKERS, CALL BUTTONS AND STATUS LIGHT/S.
E. ALL EXTERIOR AND GYM SPEAKERS SHALL BE HIGH OUTPUT WALL MOUNTED SPEAKERS.
F. INTERCOM HEADEND SHALL BE LOCATED IN THE MDF. REFER TO ENLARGED MDF PLAN FOR SPACE ALLOCATED IN RACK FOR INTERCOM EQUIPMENT.
G. GC & EC SHALL COORDINATE INSTALL REQUIREMENTS WITH INTERCOM CONTRACTOR/VENDOR PRIOR TO ANY ROUGH-IN.

1 INTERCOM & PA SYSTEM RISER
NOT TO SCALE

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REVISIONS:

No.	Description	Date

PROJECT: 9201-218240
DATE: 01-12-2023

TECHNOLOGY RISER DIAGRAMS

T-702

Optima # 22-0082

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