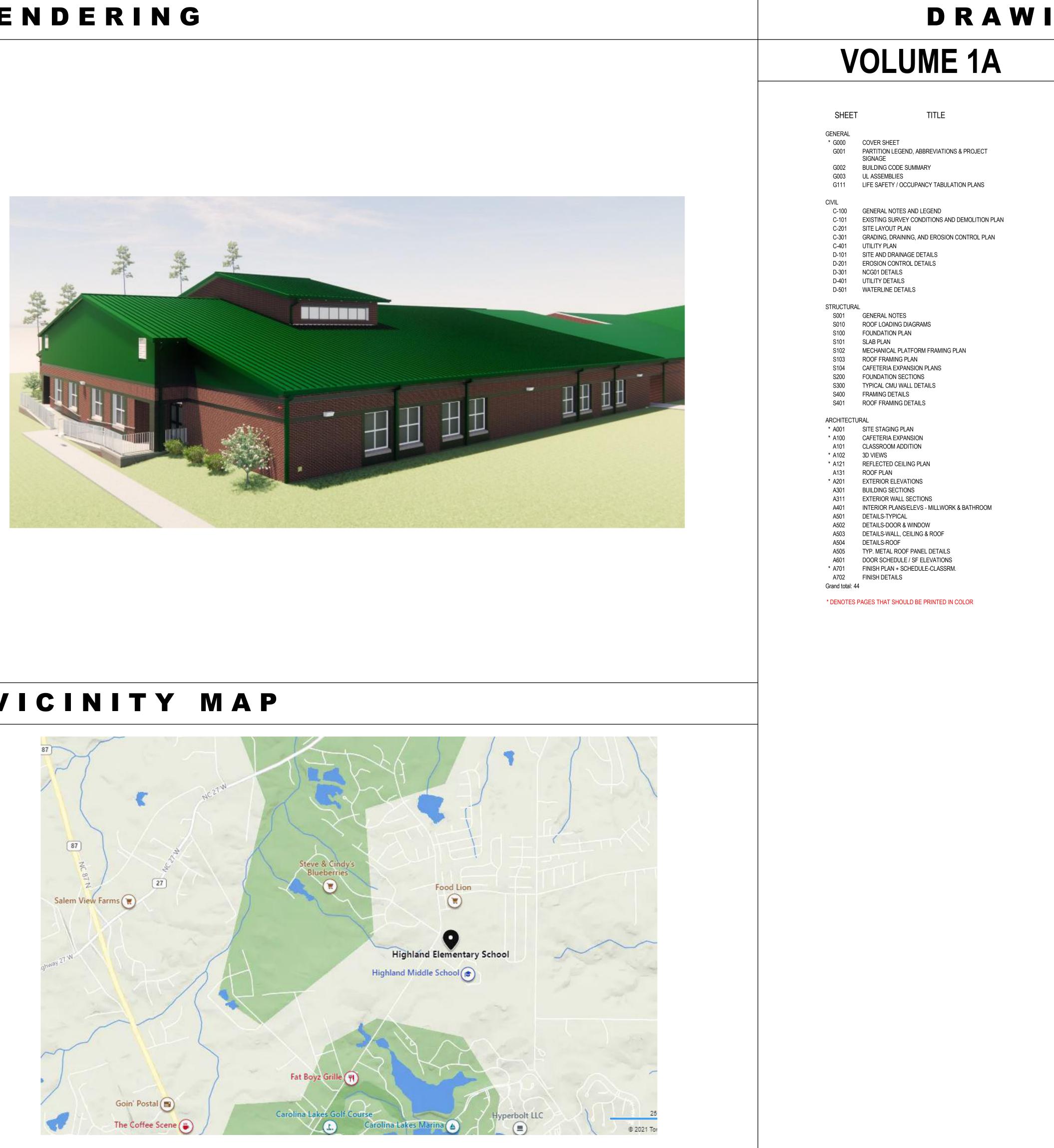
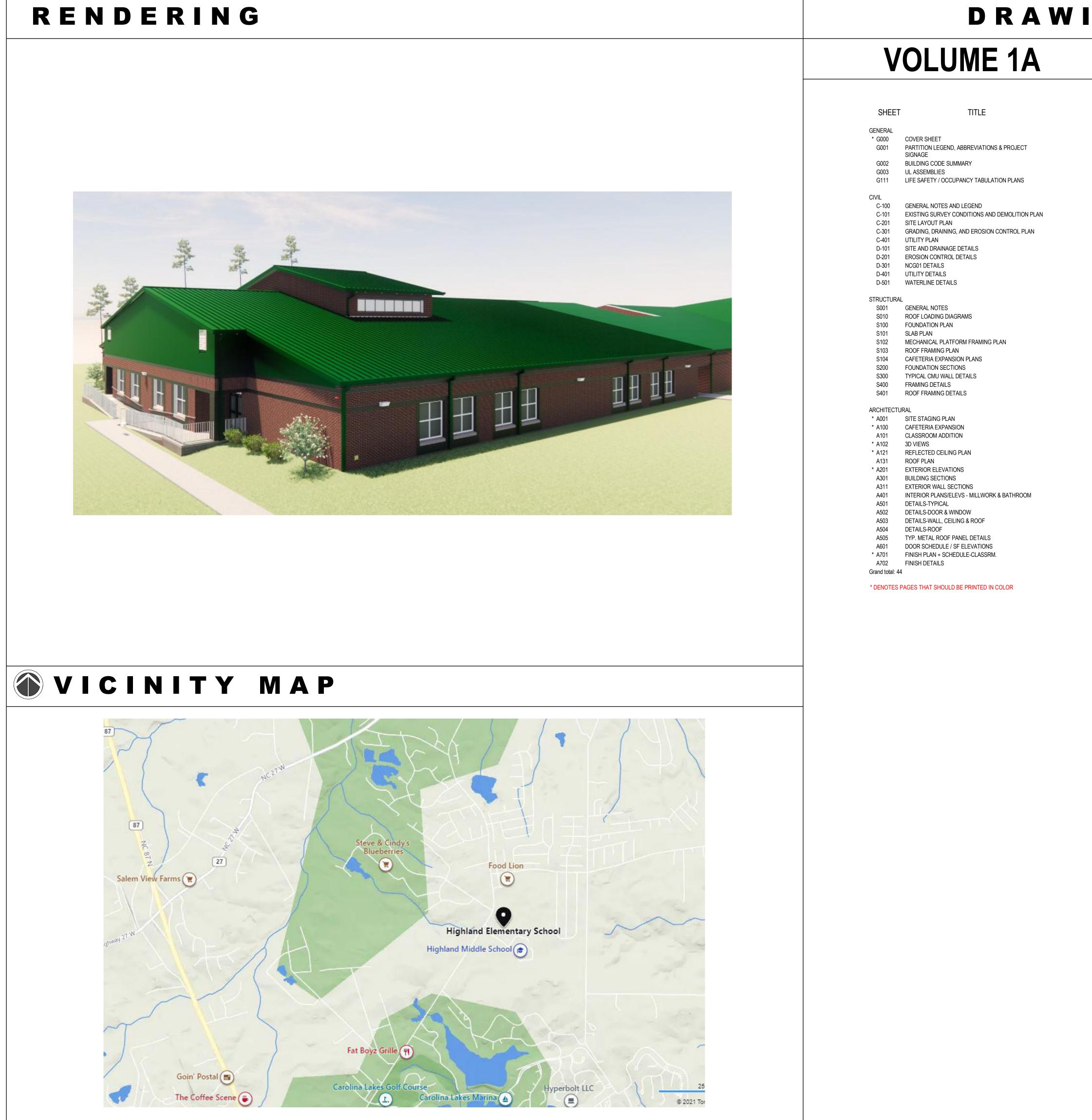


# **HIGHLAND ELEMENTARY ADDITION & RENOVATION VOLUME 1 1915 Buffalo Lake Road - Sanford NC 27332**

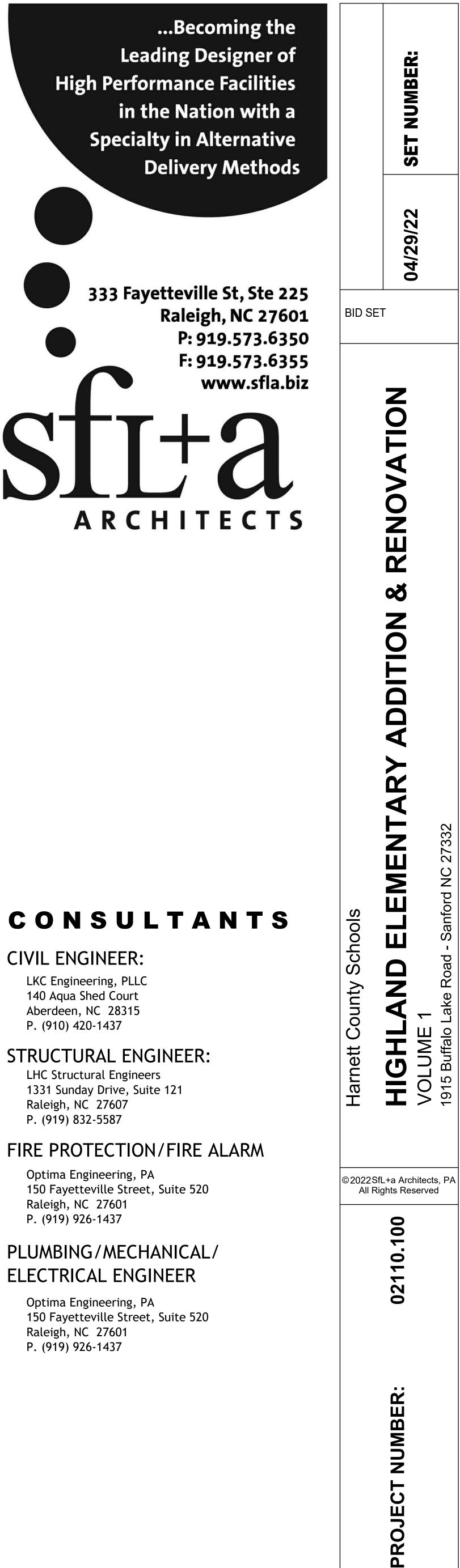
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# **CIVIL ENGINEER:**

# PLUMBING/MECHANICAL/ ELECTRICAL ENGINEER

- MECHANICAL ROOM DRAIN PIPING, PVC IS NOT ACCEPTABLE IN THESE AREAS.
- INSTALL PVC PIPING IN RETURN AIR PLENUMS.
- PIPING AT 1/4" PER FOOT MINIMUM.
- THE BUILDING OR FINISHED MATERIALS.

	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 2-1/2" AND SMALLER. PROVIDE DUCTILE IRON PIPE AND FITTINGS (AWWA C151, AWWA C110) WITH RUBBER GASKET JOINTS AND RODS (AWWA C111) FOR PIPING 3" 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). ALTERNATELY PROVIDE COPPER PIPE AND FITTINGS AS SPECIFIED ABOV EXCEPT WITH GROOVED ENDS (ASTM B 88, ASME B16.18) AND JOINTS UTILIZING GROOVED MECHANICAL COUPLINGS MEETING (ASTM F1476).
3.	INSULATE PIPING ABOVE GRADE (EXCEPT EXPOSED CONNECTIONS TO PLUMBING FIXTURES) WITH GLASS FIBER INSULATION HAVING A VAPOR BARRIER AND JACKET. PIPE INSULATION SHALL HAVE A CONDUCTIVIT NOT EXCEEDING 0.27 BTUH x SQ. FT., SEE LIST BELOW FOR INSULATION THICKNESS:
	<ul> <li>PROVIDE 1" THICK INSULATION FOR HOT WATER &amp; CIRCULATION PIPING SIZES 1/2" THRU 1-1/4".</li> <li>PROVIDE 1-1/2" THICK INSULATION FOR HOT WATER &amp; CIRCULATON PIPING SIZES 1-1/2" THRU 4".</li> <li>PROVIDE 1/2" THICK INSULATION FOR COLD WATER PIPING SIZES 1/2" THRU 1-1/4".</li> <li>PROVIDE 1" THICK INSULATION FOR COLD WATER PIPING SIZES 1-1/2" THRU 4".</li> </ul>
4.	PIPING INSULATION, JACKETS, COVERINGS, SEALERS, MASTICS AND ADHESIVES SHALL MEET A FLAME-SPREAU 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.
5.	PROTECT COPPER PIPING AGAINST CONTACT WITH DISSIMILAR METALS. ALL HANGERS, SUPPORTS, ANCHOR 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 INSTRUCTIONSSPECIFICATIONS AND LOCAL HEALTH DEPARTMENT REGULATIONS.
10.	BALANCE THE DOMESTIC HOT WATER CIRCULATION SYSTEM TO THE PERFORMANCE SPECIFICATIONS INDICATED ON THE 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. TEST AND BALANCE

REPORT TO BE COMPLETED BY AN INDEPENDENT, CERTIFIED TEST AND BALANCE CONTRACTOR.

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# SANITARY WASTE AND VENT PIPING

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) OR PROVIDE SCHEDULE 40 PVC PIPE AND SOCKET FITTINGS (ASTM D 2665) WITH SOLVENT WELD JOINTS (ASTM D2855). INSTALL PLASTIC PIPE BELOW GRADE PER ASTM D2321. FOAM CORE PVC PIPING IS NOT APPROVED. NOTE: PROVIDE CAST IRON PIPING SPECIFIED ABOVE FOR ALL KITCHEN GREASE WASTE PIPING UPSTREAM OF THE GREASE INTERCEPTOR AND FOR

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) OR PROVIDE SCHEDULE 40 PVC PIPE AND SOCKET FITTINGS (ASTM D 2665) WITH SOLVENT WELD JOINTS (ASTM D2855). FOAM CORE PIPE IS NOT APPROVED. DO NOT

SLOPE WASTE PIPING AT 1/4" PER FOOT MINIMUM FOR PIPING 2-1/2" AND SMALLER AND 1/8" PER FOOT MINIMUM FOR PIPING 3" AND LARGER UNLESS NOTED OTHERWISE. SLOPE ALL KITCHEN GREASE WASTE

PROVIDE CLEAN-OUTS AT THE BASE OF WASTE STACKS 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

PROVIDE FLOOR CLEANOUTS WITH TOPS DESIGNED TO MATCH SPECIFIC FLOOR FINISHES SUCH AS CARPET, TILE, ETC. YARD CLEANOUTS SHALL BE PROVIDED IN AN 18"x18"x6" CONCRETE PAD.

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

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.

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

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.

# SEISMIC NOTES

- 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.
- PROVIDE CALCULATIONS AND PREPARE SHOP DRAWINGS FOR THE SPECIFIC METHODS OF SEISMIC RESTRAINT TO BE USED IN ACCORDANCE WITH ASCE 7-10. REQUIRED RESTRAINT DEVICES, MATERIALS, AND SUPPLEMENTARY FRAMING SHALL BE AN INTEGRAL PART OF THE DESIGN AND INCLUDED IN THE SHOP DRAWINGS. PROVIDE ISOLATORS, SEISMIC MOUNTS, RESTRAINTS, ETC. AS NECESSARY TO COMPLY WITH ALL APPLICABLE REQUIREMENTS.
- CALCULATIONS SHALL BE PREPARED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NORTH CAROLINA WITH A MINIMUM 5 YEARS OF EXPERIENCE IN THE DESIGN AND SPECIFICATION OF SEISMIC RESTRAINT SYSTEMS.
- SUBMIT CALCULATIONS AND SHOP DRAWINGS TO THE ARCHITECT, ENGINEER, AND LOCAL AUTHORITY HAVING JURISDICTION FOR REVIEW AND APPROVAL.
- COPIES OF THE APPROVED RESTRAINT SYSTEM(S) INSTALLATION MANUAL SHALL BE ON THE JOBSITE PRIOR TO INSTALLATION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REQUIRED SPECIAL INSPECTIONS AND ASSOCIATED DOCUMENTATION. THE CONTRACTOR SHALL PROVIDE VERIFICATION IN WRITING OF COMPLIANCE WITH THE APPROVED SHOP DRAWINGS.
- REVIEW AND APPROVAL OF THE SHOP DRAWINGS AND CALCULATIONS BY THE ARCHITECT/ENGINEER/ SHALL NOT RELIEVE THE CONTRACTOR OF THEIR RESPONSIBILITY TO COMPLY WITH SEISMIC OR OTHER REQUIREMENTS OF THE 2018 NORTH CAROLINA BUILDING CODE AND ASCE 7-10.

# **COORDINATION DRAWINGS**

PER DIVISION 01 SPECIFICATIONS, THE MECHANICAL CONTRACTOR SHALL ORGANIZE COORDINATION MEETINGS TO DEVELOP A SET OF COORDINATION DRAWINGS WITH ALL CONTRACTORS (ELECTRICAL, MECHANICAL, PLUMBING, FIRE PROTECTION, IT/DATA, AND GENERAL CONTRACTOR). 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, 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 FABRICATION AND INSTALLATION OF DUCTWORK AND PIPING SYSTEMS, OR PURCHASE OF EQUIPMENT. THE FOLLOWING ITEMS REPRESENT THE MINIMUM **REQUIREMENTS AND COORDINATION DRAWINGS:** 

- 1. ALL COORDINATION DRAWINGS WILL BE PRODUCED AT 1/4" = 1'-0 SCALE. 2. COORDINATION DRAWINGS WILL BE DISTRIBUTED ON REPRODUCIBLE MATERIAL 48"X36".
- 3. COORDINATION DRAWINGS ARE NOT SHOP DRAWINGS AND ARE REQUIRED IN ADDITION TO SHOP DRAWINGS.
- 4. 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, AND GENERAL. ADDITIONAL SETS WILL BE SENT TO THE OWNER, ARCHITECT, AND ENGINEER.

# CABLE TRAY COORDINATION

A MINIMUM OF 12" CLEARANCE ABOVE THE CABLE TRAY AND 36" CLEARANCE TO ACCESS THE TRAY IS REQUIRED AT ALL LOCATIONS. PLUMBING PIPING SHALL NOT BE INSTALLED IN THE CABLE TRAY, NOR BE SUPPORTED BY THE CABLE TRAY OR THE CABLE TRAY SUPPORTS. PLUMBING PIPING SHALL NOT OBSTRUCT THE TRAY AND MUST LEAVE THE TRAY ACCESSIBLE THROUGHOUT ITS ROUTING.

## PLUMBING GENERAL NOTES

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.

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.

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

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.

WARRANT THE SYSTEM LABOR, MATERIALS 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

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.

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

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

WORKMANSHIP, EQUIPMENT AND MATERIALS AT NO ADDITIONAL COST TO THE OWNER.

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

10. 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.

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

12. 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.

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.

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

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

16. 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.

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

19. 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. 20. PROVIDE MANUFACTURERS RECOMMENDED CLEARANCES AROUND ALL EQUIPMENT FOR MAINTENANCE.

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

FIRE STOPPING:

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.

PIPE IDENTIFICATION:

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.

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:

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.

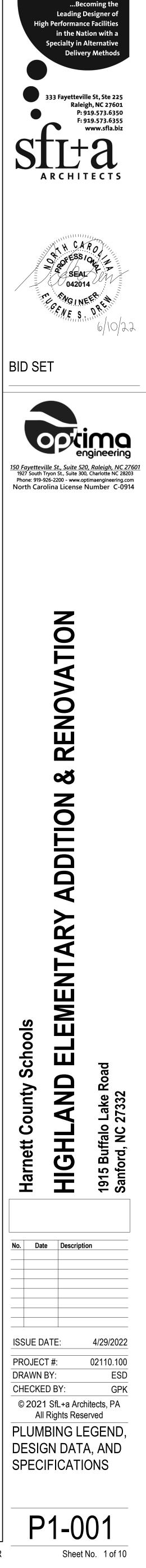
3. THE PLUMBING CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH SUBSTITUTIONS TO SPECIFIED PLUMBING FIXTURES AND EQUIPMENT INCLUDING BUT NOT LIMITED TO; PROVIDING MAINTENANCE ACCESS CLEARANCE, PIPING, ELECTRICAL, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC. AND ANY MODIFICATIONS 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.

		PLUME	ING LEGEN	ND
	<u>SYMBOL</u>	ABBREVIATION	DESCRIPTION	
		CW	COLD WATER PIPING	
		HW	HOT WATER PIPING	
		HWR	HOT WATER RETURN	PIPING
		тw	TEMPERED HOT WAT	ER PIPING
		КНЖ	140°F KITCHEN HOT	WATER PIPING
		KHR	140°F KITCHEN HOT	WATER RETURN PIPING
		w	SANITARY WASTE PI	PING
		v	SANITARY VENT PIPI	NG
	GW	GW	GREASE WASTE PIPIN	IG
	GV	GV	GREASE VENT PIPING	i
	CD	CD	CONDENSATE DRAIN	I PIPING
	——— ESD ———	ESD	EMERGENCY STORM	DRAIN PIPING
	PD	PD	PUMP DISCHARGE (S	UMP PUMP)
	G	G	NATURAL GAS PIPIN	G
	D	D	DRAIN PIPING (INDIF	RECT)
		-	PIPING ELBOW DOW	Ν
	O	-	PIPING ELBOW UP	
		-	PIPING CONTINUES	
		-	SHUT-OFF VALVE	
		-	CHECK VALVE	
		-	BALANCING VALVE	
		PRV	PRESSURE REDUCING	5 VALVE
	¥	-	SOLENOID VALVE	
		RPZ	REDUCED PRESSURE	BACKFLOW PREVENTER
		-	IN-LINE PUMP	
	─────────	-	PIPING REDUCER	
	@	FCO	FLOOR CLEANOUT	
	@	YCO	YARD CLEANOUT	
	———-СІ	WCO	WALL CLEANOUT	
		CO	PLUG CLEANOUT	
		FD	FLOOR DRAIN	
	<b>_</b>	FS	FLOOR SINK	
	@	RD	ROOF DRAIN	
		HB	HOSE BIBB / WALL H	
	—- <b>-0</b>	SA-#		SUFFIX INDICATES PDI S
	(#)	-	KITCHEN EQUIPMEN	ITAG
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		ADDITIC	NAL ABBREVIATIONS	
FF FG VTR AS FF	ABOVE FINISHED FI ABOVE FINISHED G ACID VENT THRU R BUILDING AUTOMA BELOW FINISHED FI	RADE OOF ATION SYSTEM		MANUFACTURER POUNDS PER SQUARE I TEMPERATURE AND PR TEMPERED WATER TYPICAL

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G	ABOVE FINISHED GRADE	PSI	POUNDS PER SQUARE
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F	BELOW FINISHED FLOOR	TYP	TYPICAL
Η	CUBIC FEET PER HOUR	UG	UNDERGROUND
G	CEILING	VTR	VENT THRU ROOF
ОNT	CONTINUATION	WSV	WASTE STACK VENT
N	DOWN	WC	WATER COLUMN
PF	GALLONS PER FLUSH		
PM	GALLONS PER MINUTE	EC	ELECTRICAL CONTRACT
Р	HORSE POWER	FSC	FOOD SERVICE CONTRA
IV	INVERT ELEVATION	GC	GENERAL CONTRACTO
N	KILOWATT	MC	MECHANICAL CONTRA
BH	1,000 BRITISH THERMAL UNIT / HOUR	PC	PLUMBING CONTRACT

	PLUMBING SHEET INDEX
SHEET NUMBER	SHEET NAME
P1-001	PLUMBING LEGEND, DESIGN DATA, AND SPECIFICATIONS
P1-002	PLUMBING SCHEDULES
P1-101	CLASSROOM ADDITION PLUMBING UNDERSLAB WASTE PLAN
P1-102	CLASSROOM ADDITION PLUMBING ABOVE GROUND WASTE & VENT I
P1-103	CLASSROOM ADDITION PLUMBING LOFT WASTE AND VENT PLAN
P1-201	CLASSROOM ADDITION PLUMBING WATER SUPPLY PLAN
P1-202	CLASSROOM ADDITION PLUMBING LOFT SUPPLY PLAN
P1-301	PLUMBING RISER DIAGRAMS
P1-302	PLUMBING RISER DIAGRAMS
P1-501	PLUMBING DETAILS

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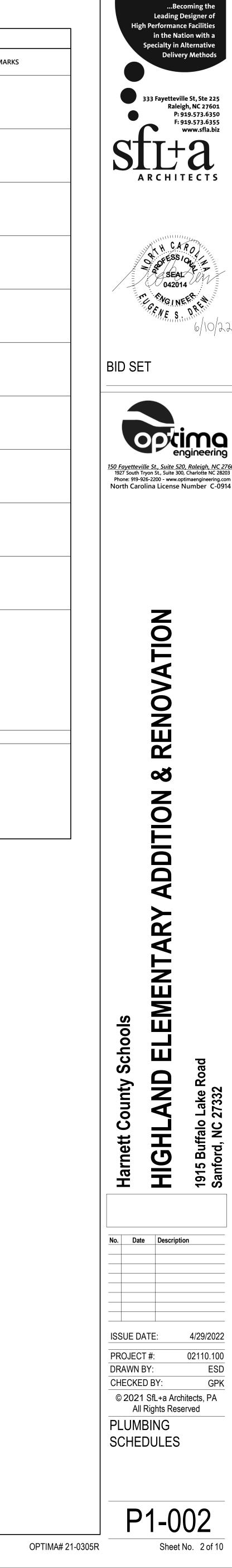


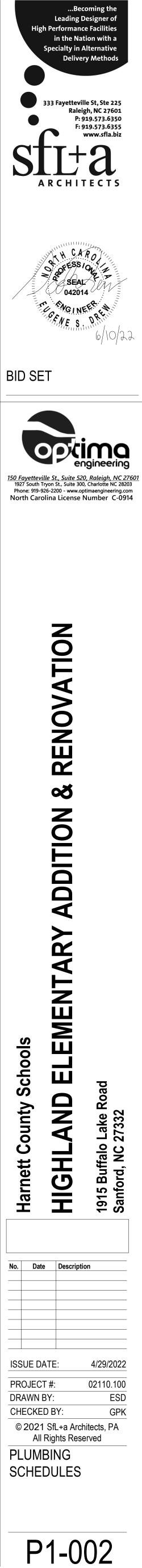
		PLUMBING SP	PECIALTIES SCHEDULE				PLUMB	ING FIXTURE SCHEDULE	
	CS-xBALANCING VALVE, THERMOSTATIC, AUTOMATIC, SUFFIX INDICATES PIPE SIZE, SEE FLOOR PLANSSA-xSHOCK ARRESTOR, SUFFIX INDICATES PDI SIZE	CONNECTION SIZE           W         V         CW         HW           -         -         -         **           -         -         X         -           -         -         3/4"         -	SPECIFICATION	REMARKS         PROVIDE 105°F MODEL         SEE SHOCK ARRESTOR TABLE THIS SHEET         MOUNT 18" AFF	FL FL	DESCRIPTION XTURE: TOILET: ELONGATED, WHITE VITREOUS CHINA, LOOR MOUNTED, TOP SPUD, 1.6 GPF. LUSH VALVE: CHROME PLATED, MANUAL, FLUSH VALVE, 1.6 PF.	CONNECTION SIZ W V CW 4" 2" 1"	E SPECIFICATION HW FIXTURE: KOHLER "WELLCOMME" K-96053 FLUSH VALVE: SLOAN "ROYAL" 111-1.6 SEAT: CHURCH 9400SSC	REMARKS
Ľ	HB2       HOSE BIBB, EXTENION, EXPOSED,         STAINLESS STEEL FACE PLATE, FREEZELESS, ANTI-SIPHON         CO       PLUG CLEANOUT, CAST IRON BODY         WCO       WALL CLEANOUT, CAST IRON BODY, STAINLESS STEEL WALL PLATE         FCO       FLOOR CLEANOUT, CAST IRON BODY, NICKEL BRONZE TOP, ADJUSTABLE         YCO       YARD CLEANOUT, CAST IRON BODY, NICKEL BRONZE TOP,	**     -     -       **     -     -       **     -     -       **     -     -       **     -     -       **     -     -	EQUIPMENT: ZURN Z1310-34EL, PROVIDE VACUUM BREAKER AND METAL LOOSE KEY FOR EACH HOSE BIBB CLEANOUT: ZURN Z-1440-BP, BRONZE PLUG CLEANOUT: ZURN Z-1446-BP, BRONZE PLUG CLEANOUT: ZURN ZN-1400-BP, BRONZE PLUG CLEANOUT: ZURN ZN-1400-BP, BRONZE PLUG	MOUNT 18" AFF GAS / WATER TIGHT GAS / WATER TIGHT GAS / WATER TIGHT, INSTALL TOP FLUSH WITH FINISHED FLOOR GAS / WATER TIGHT, INSTALL TOP FLUSH	P2 FI FL FL FL FL FL	IXTURE: TOILET: ELONGATED, WHITE VITREOUS CHINA, LOOR MOUNTED, TOP SPUD, 1.6 GPF. LUSH VALVE: CHROME PLATED, MANUAL, FLUSH VALVE, 1.6 PF. IXTURE: URINAL. WHITE VITREOUS CHINA, CARRIER IOUNTED, 0.5 GPF LUSH VALVE: CHROME-PLATED, MANUAL, TOP-SPUD, FLUSH	4" 2" 1" 2" 2" 3/4"	<ul> <li>FIXTURE: KOHLER "HIGHCLIFF" K-96057</li> <li>FLUSH VALVE: SLOAN "ROYAL" 111-1.6</li> <li>SEAT: CHURCH 9400SSC</li> <li>FIXTURE: KOHLER "DEXTER" K-5016</li> <li>FLUSH VALVE: SLOAN "ROYAL" 186-0.5-SG</li> </ul>	NOTE 1
	SQUARE NICKEL BRONZE GRATE, ADJUSTABLE, TRAP PRIMER	3" 2"	INSTALL IN 18"x 18"x 6" DEEP CONCRETE PAD DRAIN: ZURN ZN415-SZ1-DP-P-Y DRAIN: ZURN ZN415-P-Y	WITH FINISHED GRADE         INSTALL TOP FLUSH WITH FINISHED         FLOOR.         INSTALL TOP OF DRAIN LIP FLUSH WITH         FLOOR.	P3A FI M FA	ALVE, 0.5 GPF. XTURE: LAVATORY, ADA. 20"x18", VITREOUS CHINA, CARRIER IOUNTED, 4" CENTERS. AUCET: CHROME PLATED, 4" CENTERS, VANDAL-RESISTANT ANDLES AND SPOUT, METERING FAUCET, 0.50 GPM.		1/2" FIXTURE: KOHLER "HUDSON" K-2867 FAUCET: ZURN Z86500-XL-IN-3M	NOTES 2, 4
_	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 SIO HOSE BIBBS ZUF DRAINS ZUF	CCEPTED MANUFACTURERS: OUX CHIEF, PPP INC., ZURN, WATTS JRN, WOODFORD, ZURN, J.R. SMITH JRN, J.R. SMITH, WADE		P4A FI FI	XTURE: LAVATORY, ADA. 20"x18", VITREOUS CHINA, CARRIER IOUNTED, 4" CENTERS. AUCET: CHROME-PLATED, 4" CENTERS, VANDAL-RESISTANT, EVER HANDLES, 0.50 GPM. XTURE: WATER COOLER & BOTTLE FILLER, ADA. STAINLESS STEEL INISH, SINGLE BOWL, VANDAL RESISTANT, CARRIER MOUNTED, ITEGRAL WATER FILTER, SENSOR OPERATED BOTTLE FILLER WITH		1/2"       FIXTURE: KOHLER "HUDSON" K-2867         FAUCET: ZURN Z81101-XL-3M         -       FIXTURE: ELKAY LZS8WSLK	NOTES 2, 4 NOTE 3
	SYMBOL DESCRIPTION	<b>WA</b> STORAGE	ATER HEATER SCHEDULE	CIFICATION NOTES	P4B FI	UTO SHUT-OFF. XTURE: WATER COOLER. STAINLESS STEEL FINISH, SINGLE BOWL, ANDAL RESISTANT, CARRIER MOUNTED, INTEGRAL WATER ILTER.	2" 1-1/2" 1/2"	- FIXTURE: ELKAY LZS8L	NOTE 3
~	WH1       VERTICAL STORAGE, ELECTRIC         NOTES:       1.         1.       APPROVED MANUFACTURERS: BRADFORD WHITE, RHI         2.       WATER HEATER SHALL MEET OR EXCEED THE REQUIRE         3.       SET WATER HEATER OUTLET TEMPERATURE TO 120 °F.	EMENTS OF THE NORTH CAROLINA	A6         6         480         3         A.O. SMITH DSE-30-6	1 - 5	ST CI FA VA	XTURE: CASEWORK SINK, 22"x20", SINGLE BOWL, 18 GAUGE TAINLESS STEEL, COUNTER MOUNTED, SELF RIMMING, 4" ENTERS, RIGHT-HAND BUBBLER. AUCET: 8" GOOSENECK FAUCET, WRIST BLADE HANDLES, ANDAL RESISTANT AERATOR, 1.5 GPM.		1/2"       FIXTURE: JUST MFG. CRB-2022-A-GR         FAUCET: ZURN Z871B4-XL-17F         BUBBLER: ZURN Z83600-XL         1/2"       FIXTURE: EKLAY LRAD221955	NOTES 4
	4. SEE PLUMBING DETAIL SHEETS FOR INSTALLATION. 5. PROVIDE UNIT WITH FIVE (5) YEAR MANUFACTURER'S	S WARRANTY.	L EXPANSION TANK SCHEDULE		P6 FI	TAINLESS STEEL, COUNTER MOUNTED, SELF RIMMING, 4" ENTERS. AUCET: 8" GOOSENECK FAUCET, WRIST BLADE HANDLES, ANDAL RESISTANT AERATOR, 1.5 GPM. XTURE: MOP SINK, 24"x 24"x 12", CORNER, TERRAZZO BASIN, 6" ROP FRONT WITH STAINLESS STEEL THRESHOLD CAP, 36" HIGH TAINLESS STEEL WALL GUARDS, HOSE, MOP HANGER BRACKET.		FAUCET: ZURN Z871B4-XL-17F         1/2"         FIXTURE: FIAT TSBC6011-830AA-832AA-MSG2424         FAUCET: ZURN Z843M1-FC	
_	SYMBOL       DESCRIPTION         ET1       EXPANSION TANK SERVING WH1 DIAPHRAGM, THERMAL EXPANSION         NOTES:       1.         1.       APPROVED MANUFACTURERS: AMTROL, BELL & GOSSI         2.       PROVIDE WITH PRESSURE GAUGE, AIR-CHARGE FITTIN	(GAL) 5.0 SETT, WATTS, WESSELS.	VOLUME (GAL)     (LB)     SPEC       3.3     28.0     WESSELS TTA-12	CIFICATION NOTES	NOTES: 1. SEE ARC	AUCET: POLISHED CHROME, 8" CENTERS, VACUUM BREAKER. CHITECTURAL PLANS FOR MOUNTING HEIGHT. PROVIDE A FLOOR M A BLOCK WALL, PROVIDE EXTENDED STUD LENGTHS TO COMPENS/			
	3. MOUNT SECURELY AND INDEPENDENTLY FROM STRU SYMBOL DESCRIPTION		PUMP SCHEDULE		CARRIEI 3. SEE ARC CARRIEI	CHITECTURAL PLANS FOR MOUNTING HEIGHT. PROVIDE A FLOOR M R IS LOCATED BEHIND BLOCK WALL, PROVIDE EXTENDED CONCEALE CHITECTURAL PLANS FOR MOUNTING HEIGHT. PROVIDE A FLOOR M R IS LOCATED BEHIND BLOCK WALL, PROVIDE EXTENDED CONCEALE DE PRE-MANUFACTURED ADA COMPLIANT INSULATION KIT FOR EXP	D ARM SLEEVES TO COM DUNTED, ADJUSTABLE C D ARM SLEEVES TO COM	IPENSATE FOR THE BLOCK WALL THICKNESS. ONCEALED ARM CARRIER EQUAL TO ZURN Z1225 SERIES. WHEN IPENSATE FOR THE BLOCK WALL THICKNESS.	
~	CP1       CIRCULATION PUMP SERVING WH1         INLINE       INLINE         NOTES:       1.       APPROVED MANUFACTURERS: BELL & GOSSETT, GRUN         2.       PUMP SHALL BE BRONZE OR STAINLESS STEEL CONST         3.       MOUNT SECURELY FROM STRUCTURE SUCH THAT THE	TRUCTION. IE PIPING BEARS NO WEIGHT OF TH	FT-HD         HP         V         PH         HZ           8.0         1/6         120         1         60         BELL & GOSSETT NBF-33	1 - 4	WHICH MOS	ACTOR IS RESPONSIBLE FOR PROVIDING THE MODEL ST CLOSELY MATCHES THE SPECIFIED PRODUCT. CODUCTS MADE BY THE MANUFACTURER'S LISTED.	PRODUCT TYPE: VITREOUS CHINA FLUSH VALVES ENAMELED CAST IRON CARRIERS STAINLESS STEEL SINKS FAUCETS WATER COOLERS SUPPLIES, STOPS	AMERICAN STANDARD, ZURN, CHICAGO ELKAY, HALSEY TAYLOR, HAWS ZURN, MCGUIRE, BRASSCRAFT	
_			SA-B     12 - 32     B     3/4"     PLU       SA-C     33 - 60     C     1"     GU       SA-D     61 - 113     D     1-1/4"     SIC       SA-E     114 - 154     E     1-1/2"     PLU	TABLE         REMARKS         STALL SHOCK ARRESTORS PER THE         JMBING DRAINAGE INSTITUTE (P.D.I.)         IDELINES.         CEPTED MANUFACTURERS:         DUX CHIEF, WATTS, PPP INC., ZURN         ARY ARRESTOR CENTERED ON BRANCH         JPPLY EXCEEDS 20'-0" IN OVERALL LENGTH.         Image: Content of the state of the st			HOSE BIBBS UTILITY SINKS	ZURN, J.R. SMITH, WOODFORD FIAT, FLORESTONE, STERN WILLIAMS	
			CW SUPPLY MAIN	↓ ↓ → SHUT-OFF VALVE					
Ind Elementary Addition_MEPFP_K22.rvt									
Autodesk Docs://Highland ES Addition/21-0305R_Highla									
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SHOCK ARRESTOR TABLE					
DRAWING SYMBOL	FIXTURE UNITS	P.D.I. WH201 DESIGNATION	ARRESTOR SIZE	REMARKS	
SA-A	1 - 11	А	1/2"	INSTALL SHOCK ARRESTORS PER THE	
SA-B	12 - 32	В	3/4"	PLUMBING DRAINAGE INSTITUTE (P.D.I.)	
SA-C	33 - 60	с	1"		
SA-D	61 - 113	D	1-1/4"	ACCEPTED MANUFACTURERS: SIOUX CHIEF, WATTS, PPP INC., ZURN	
SA-E	114 - 154	E	1-1/2"		
CW SUPPLY M			CONDARY ARRESTOR CENTERED ON BRANCH ICH SUPPLY EXCEEDS 20'-0" IN OVERALL LENGTH.		
				FIXTURE SUPPLY (TYPICAL)	

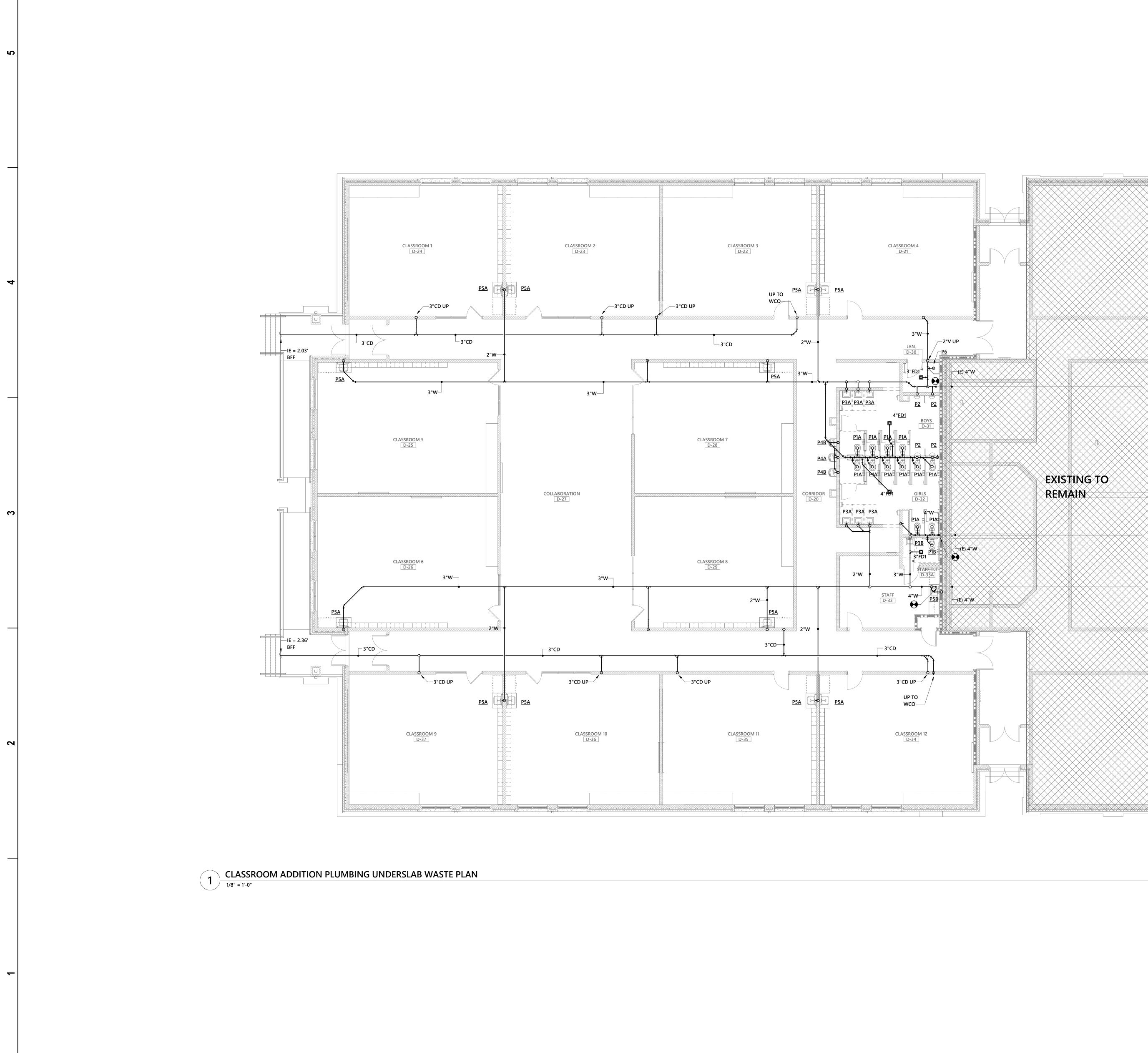
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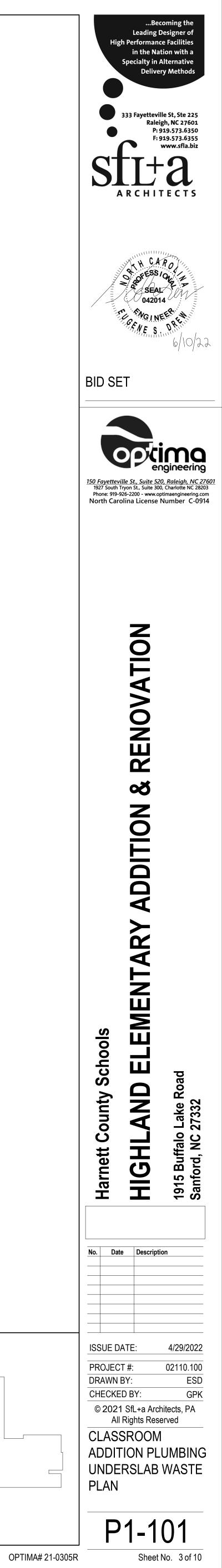


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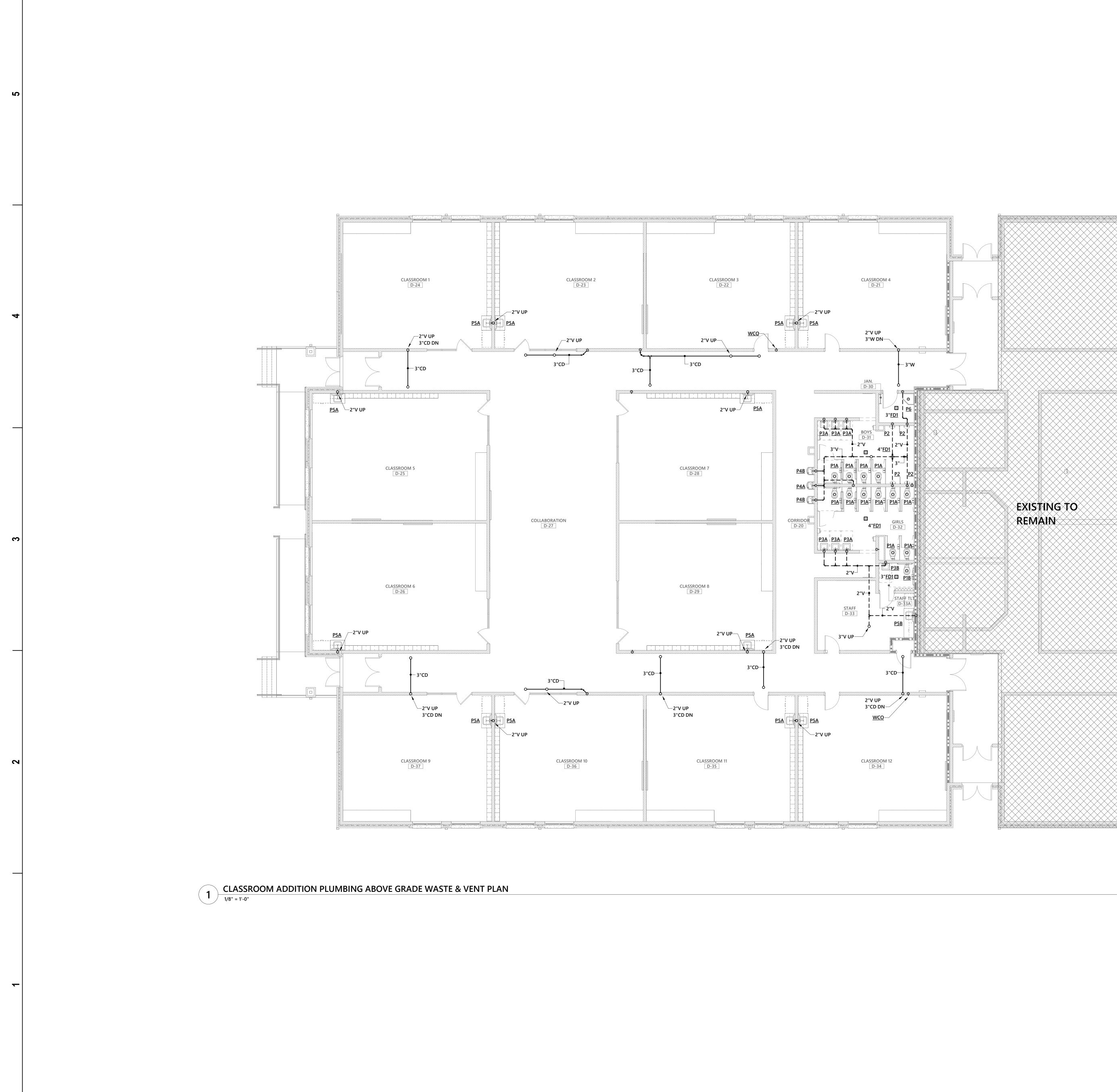
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<u>KEYPLAN</u>



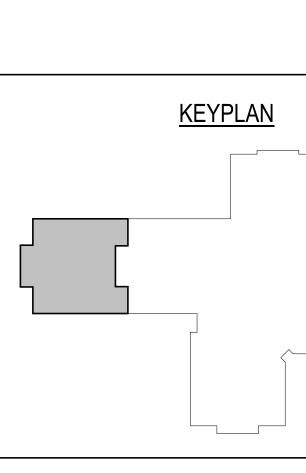
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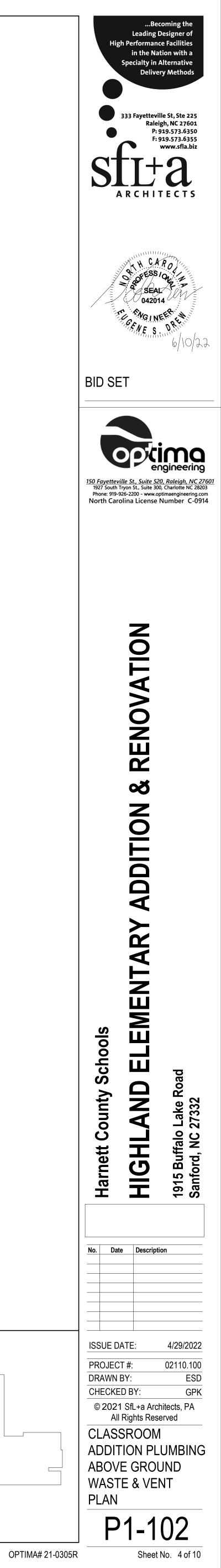
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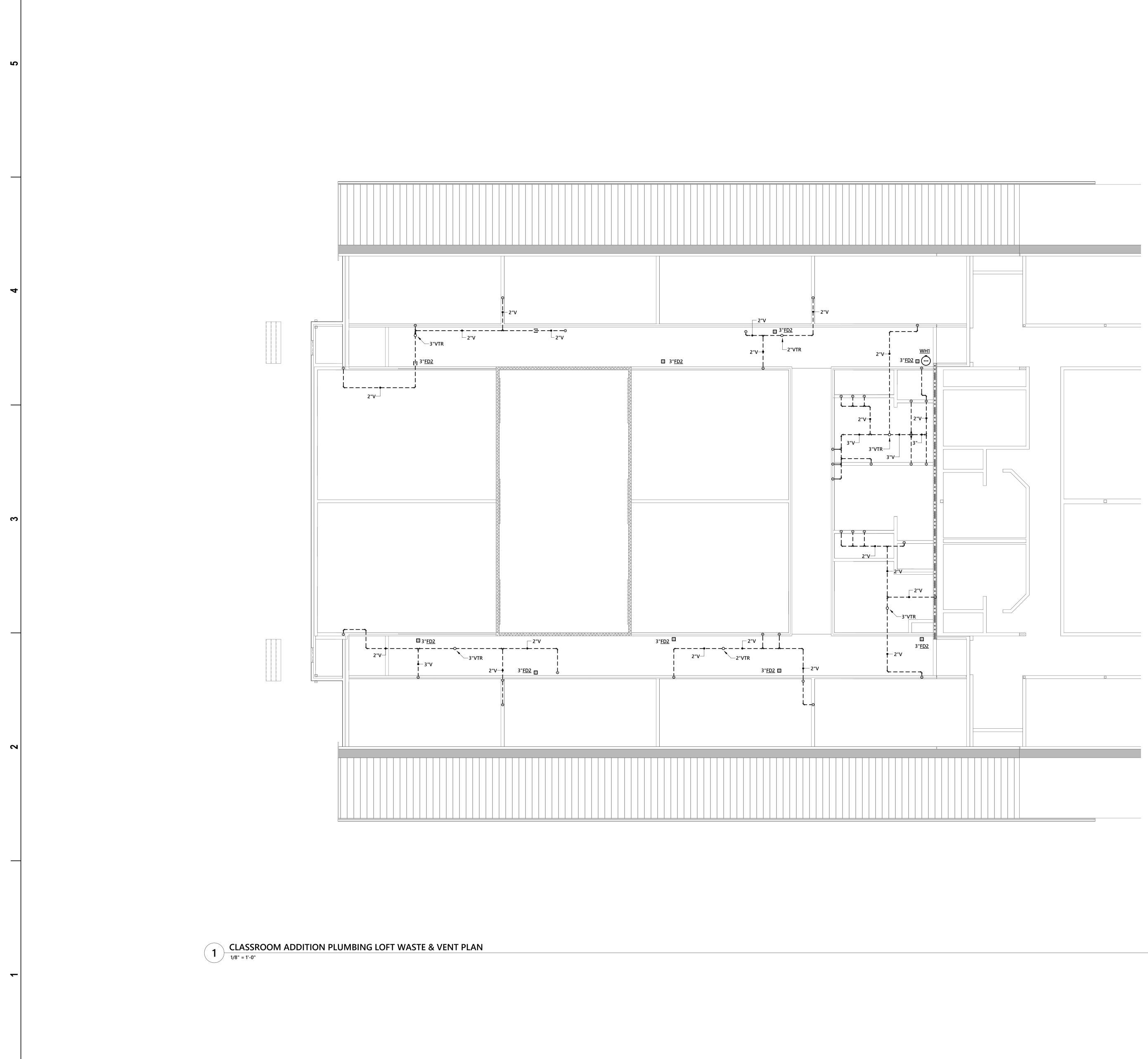
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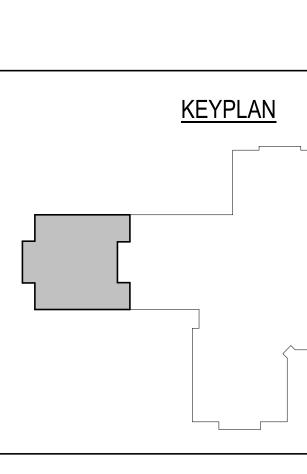
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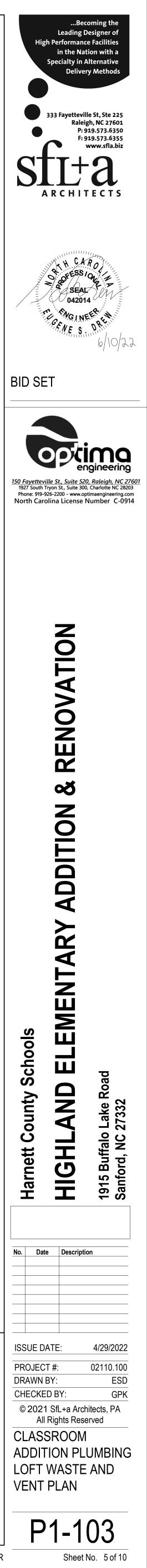




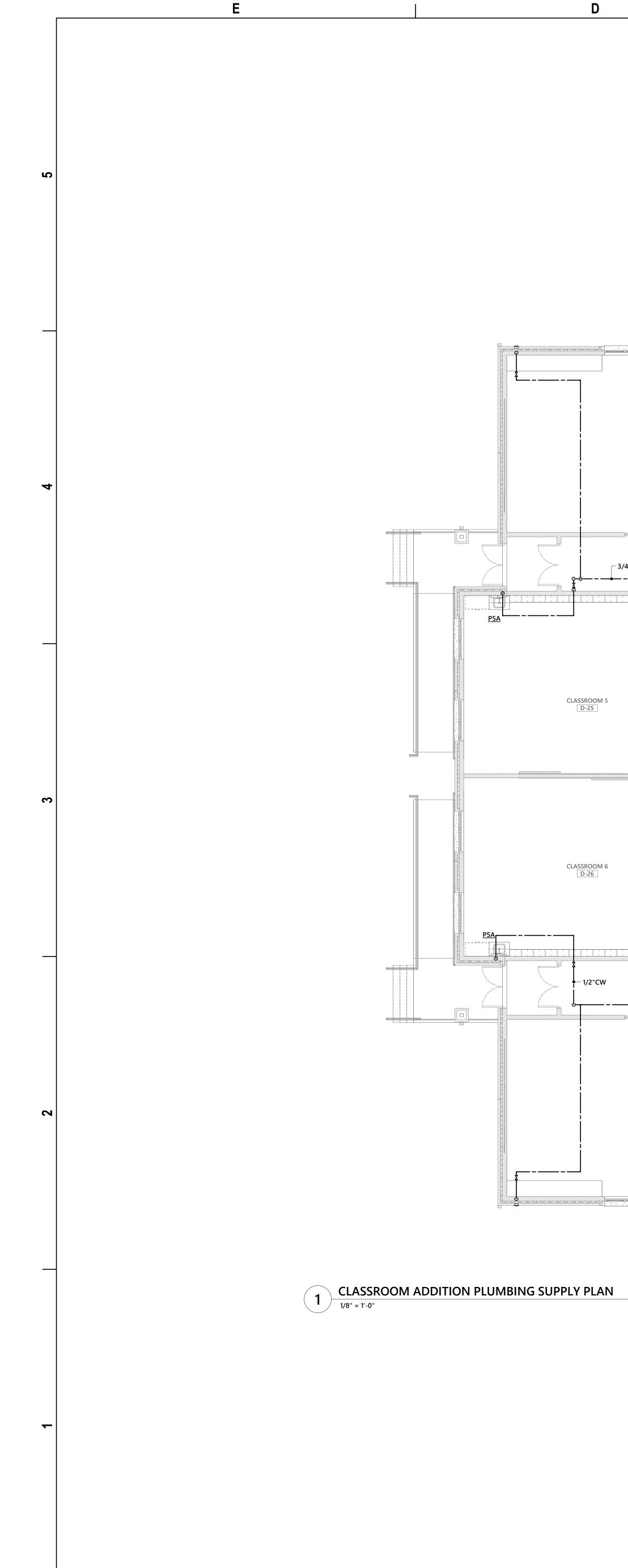
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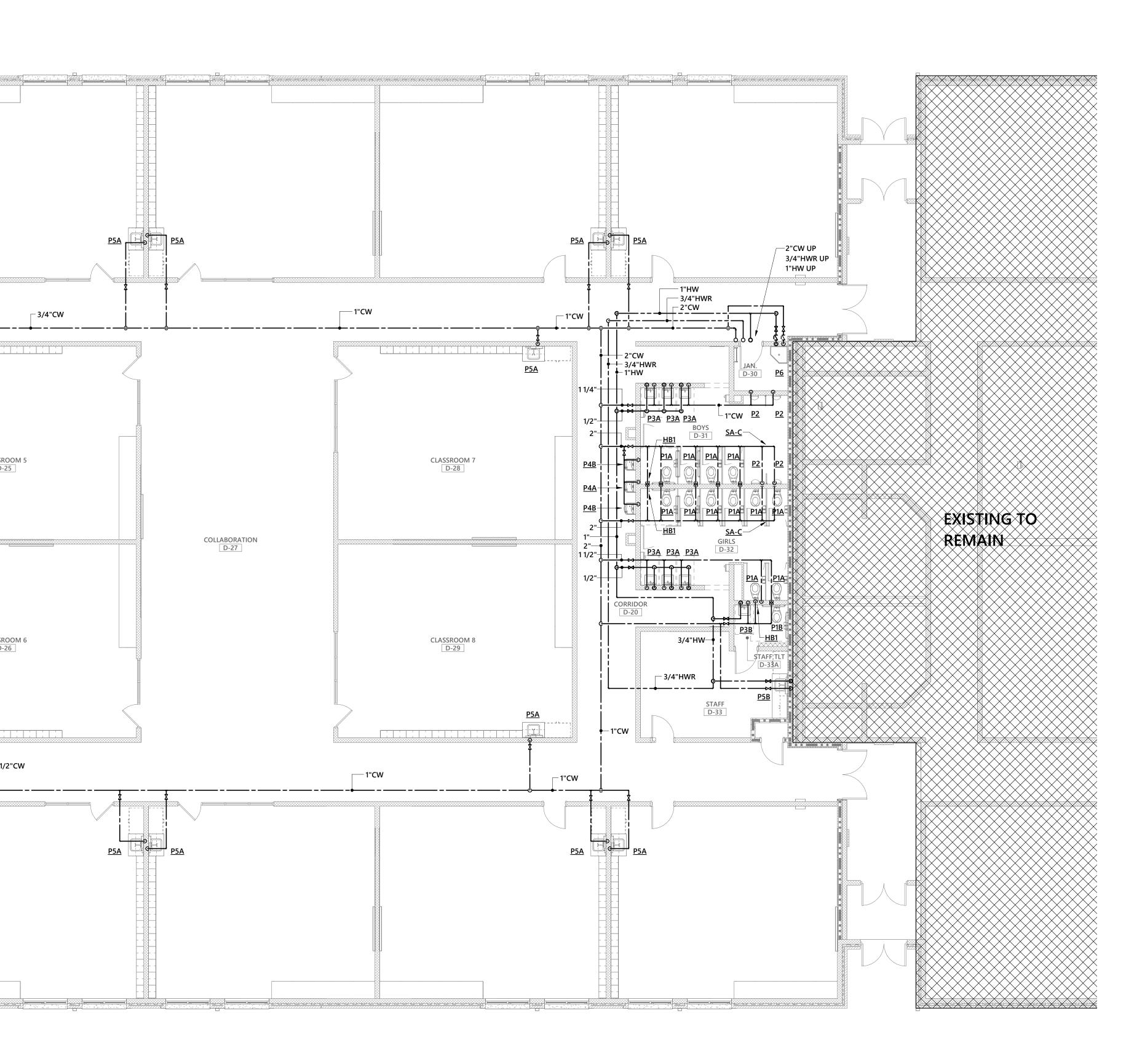


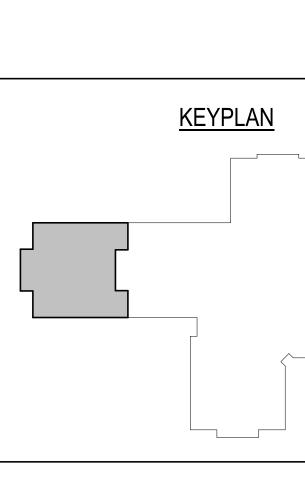


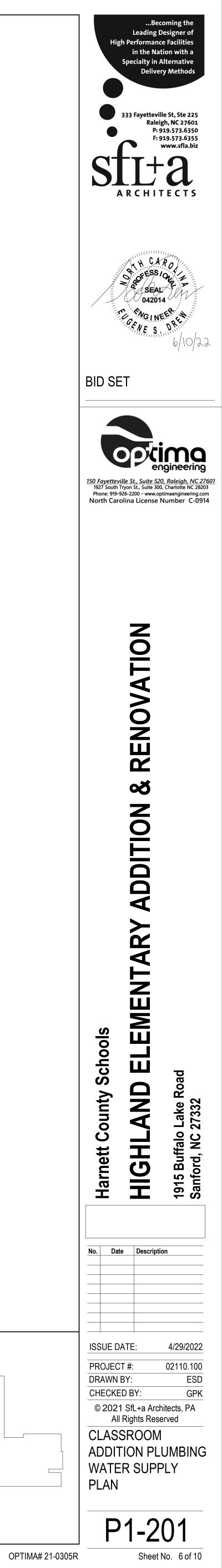


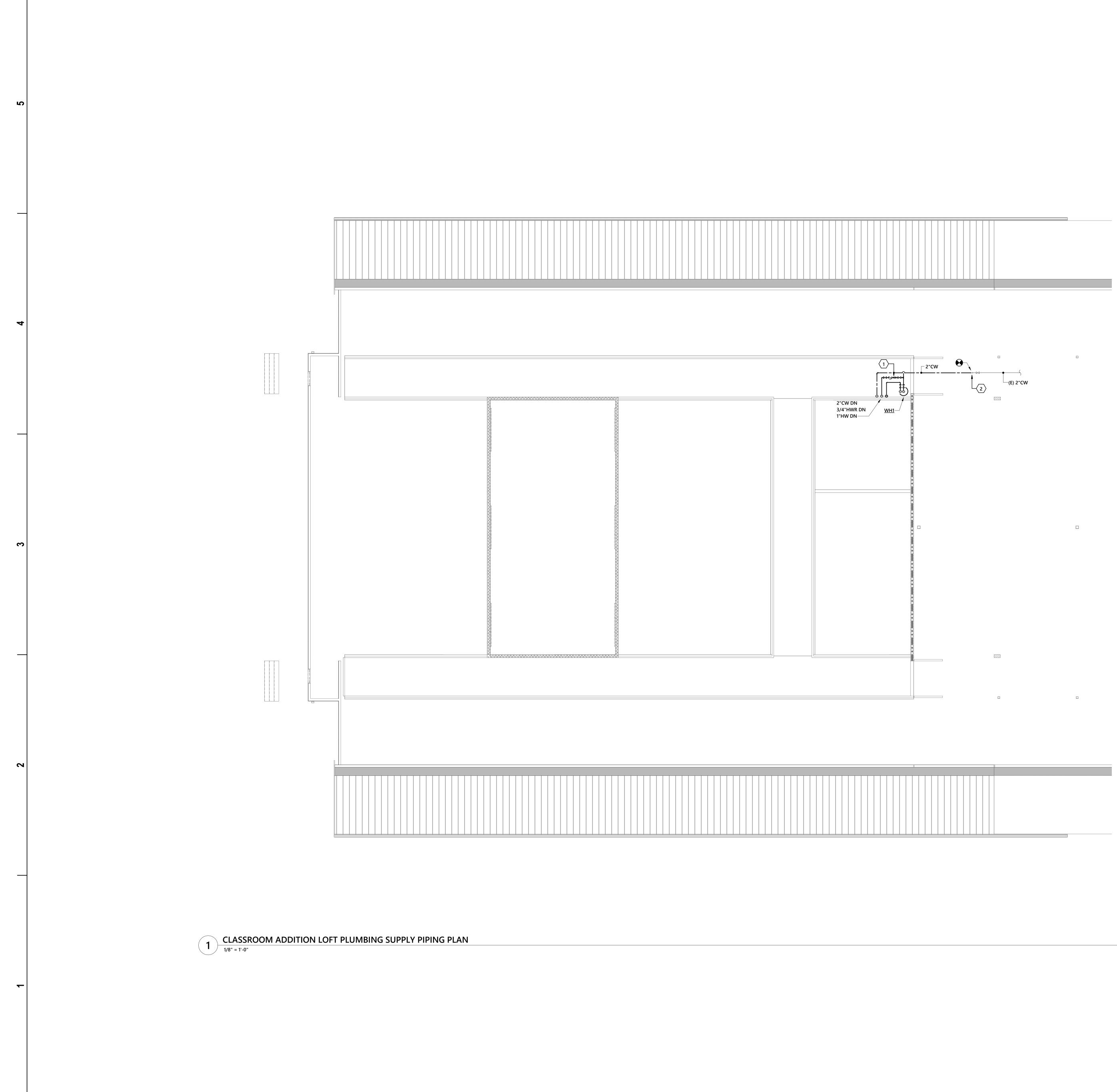


1/2"CW









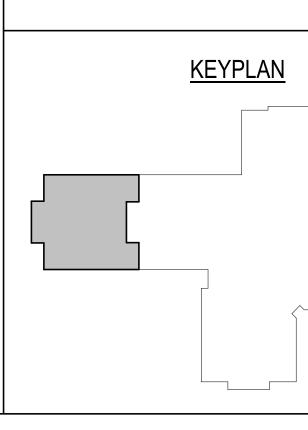
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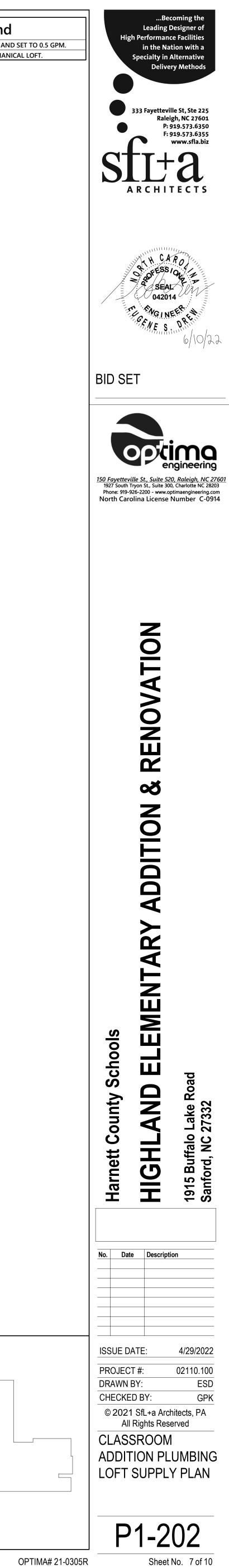
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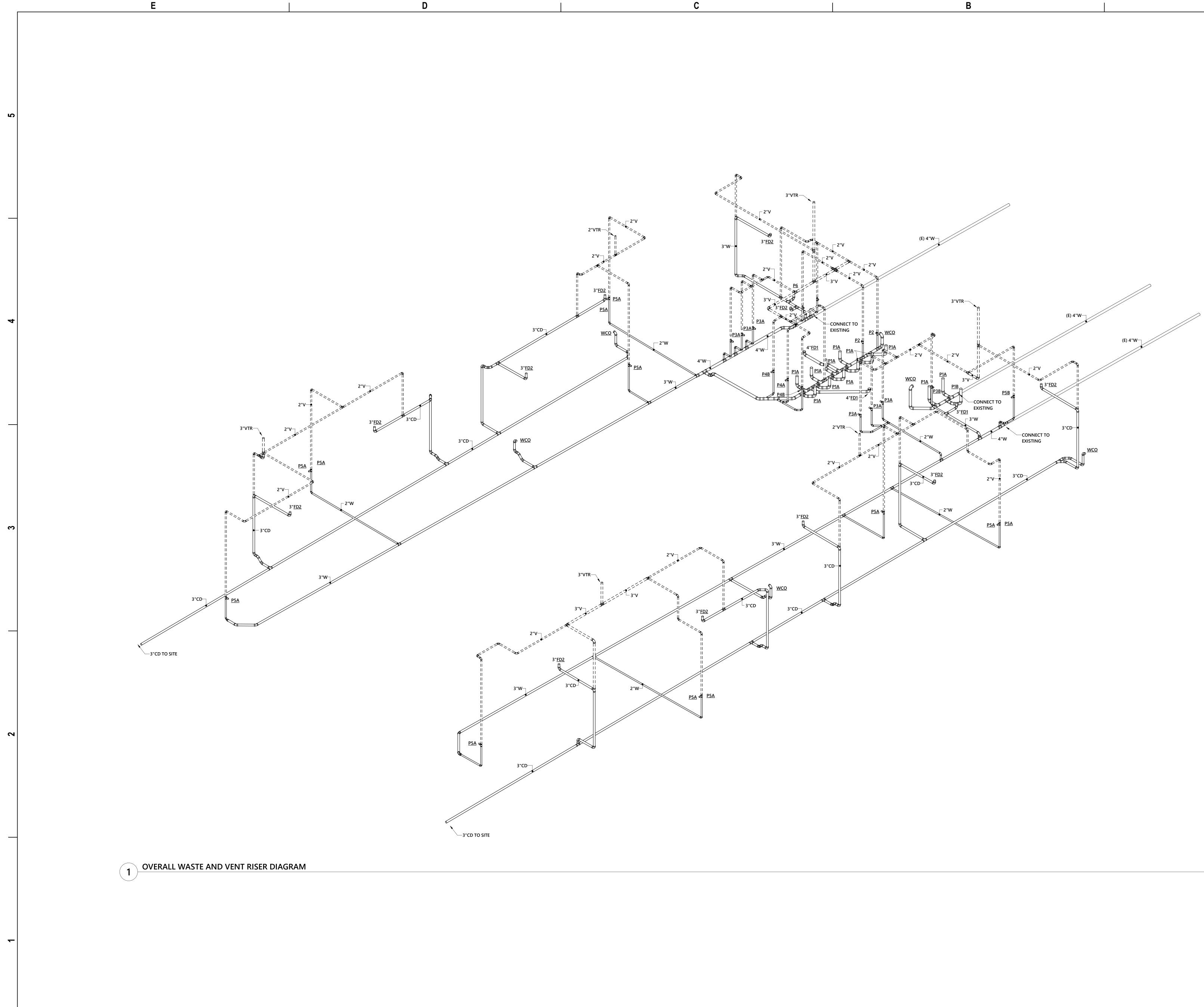
# Keynote Legend

PROVIDE HOT WATER RECIRCULATION ASSEMBLY AND SET TO 0.5 GPM. 2 CONNECT NEW 2"CW TO EXISTING 2"CW IN MECHANICAL LOFT.





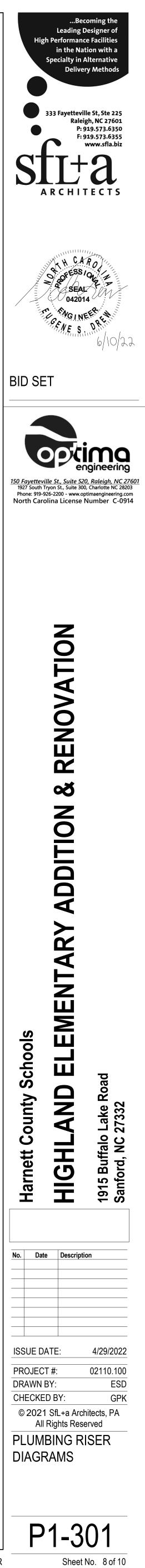
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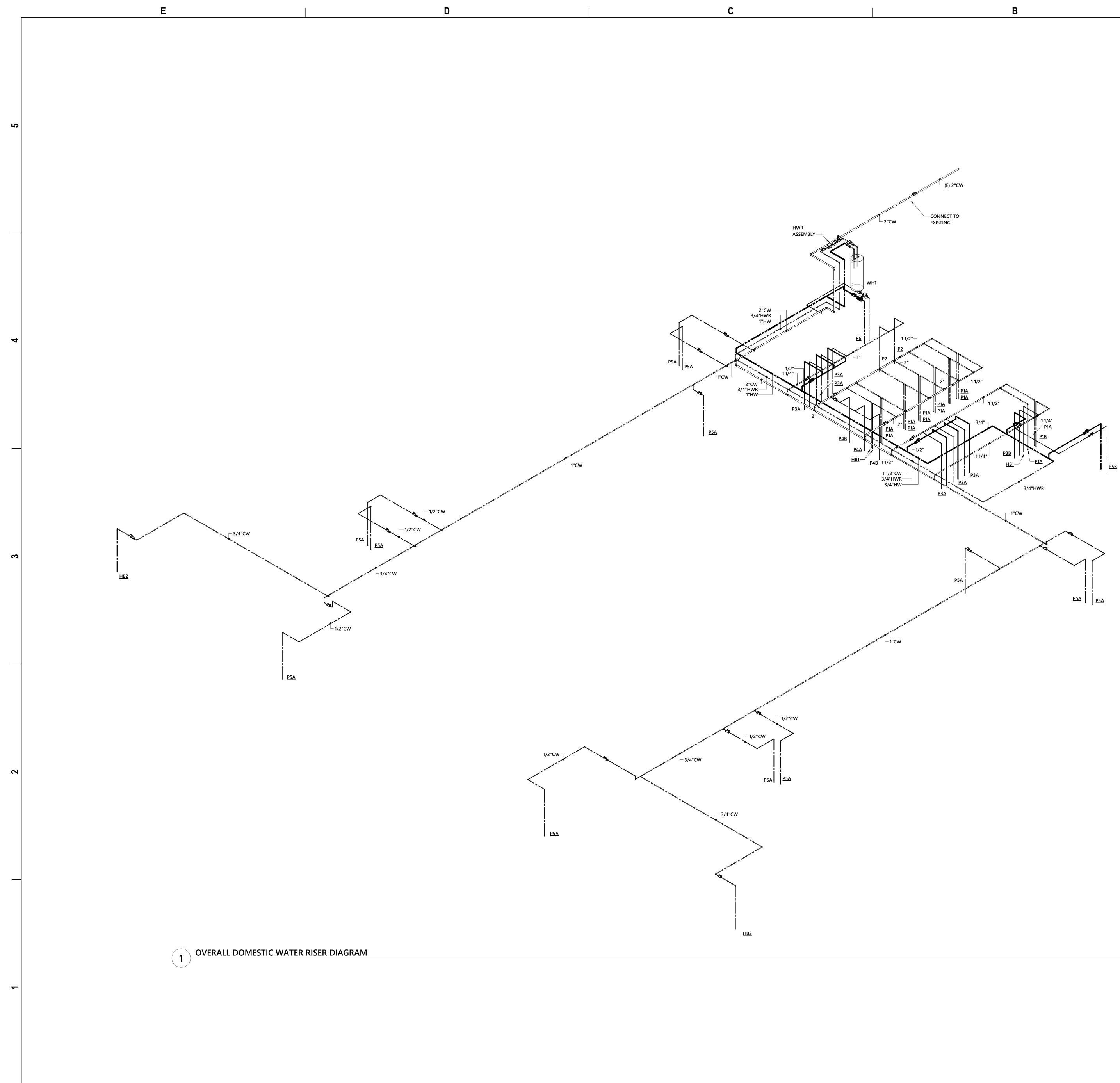


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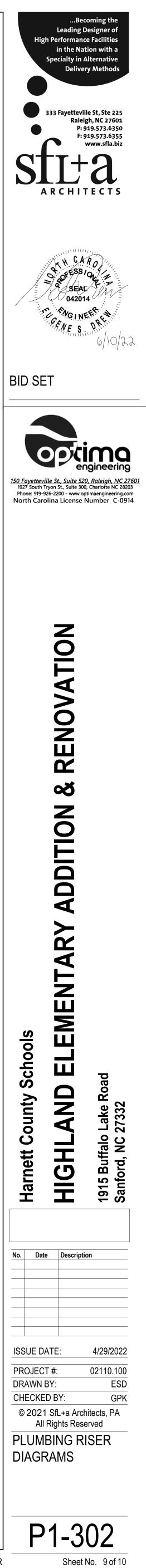
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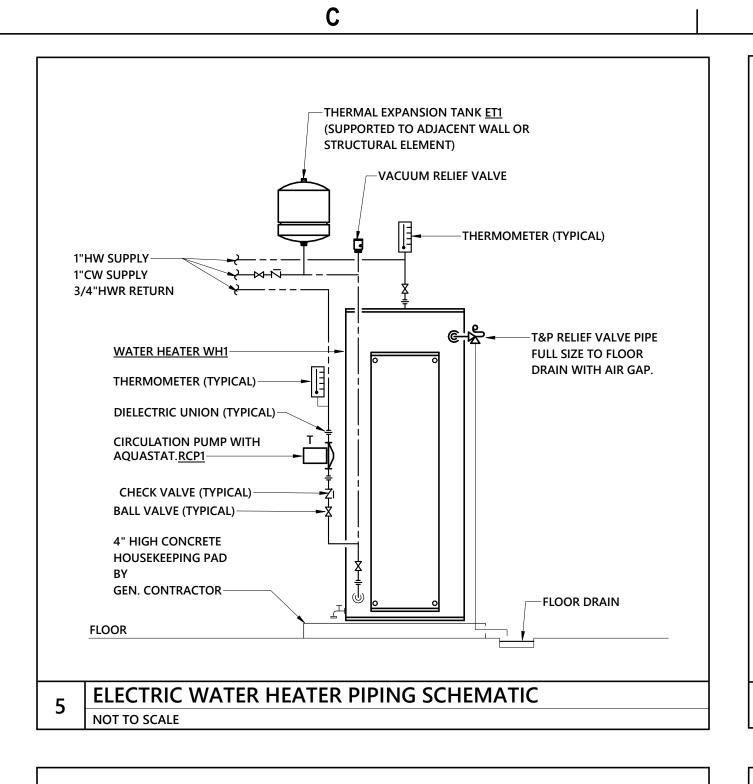


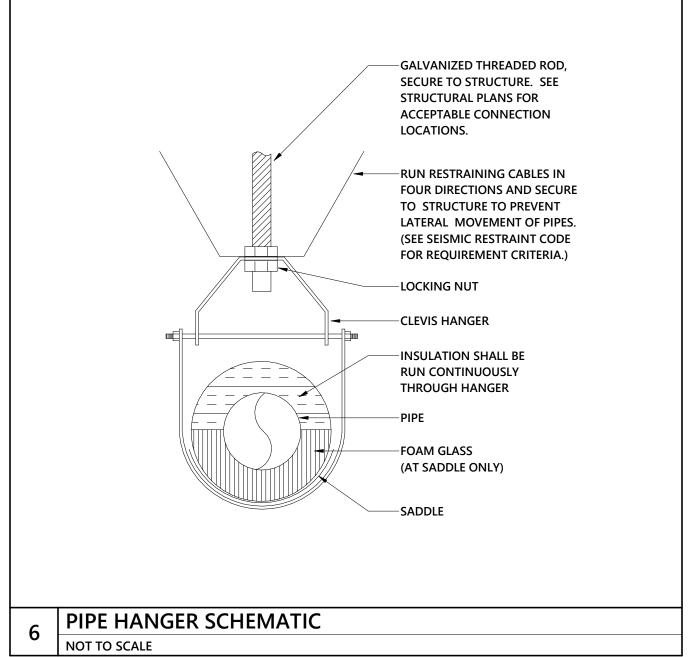


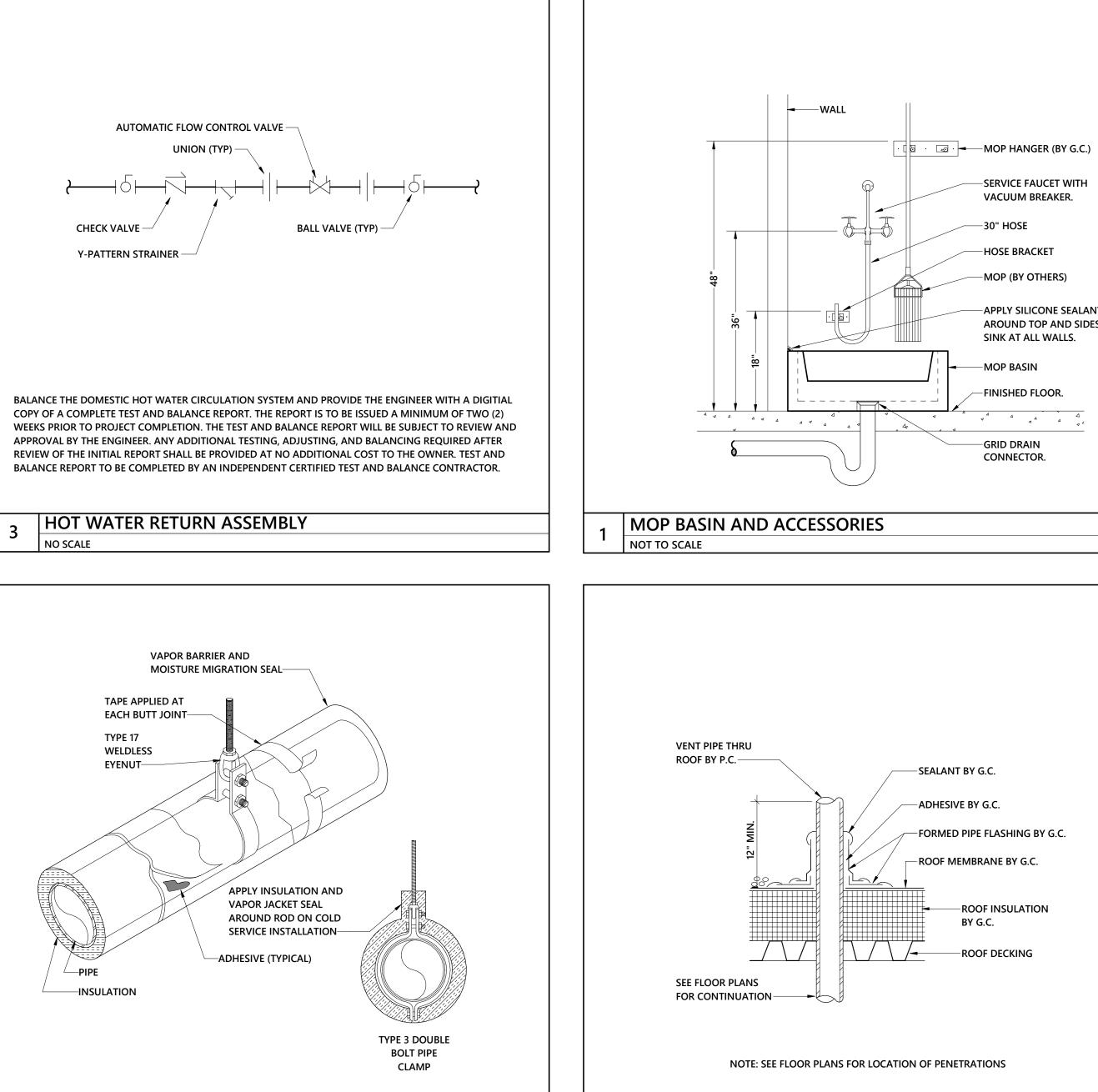
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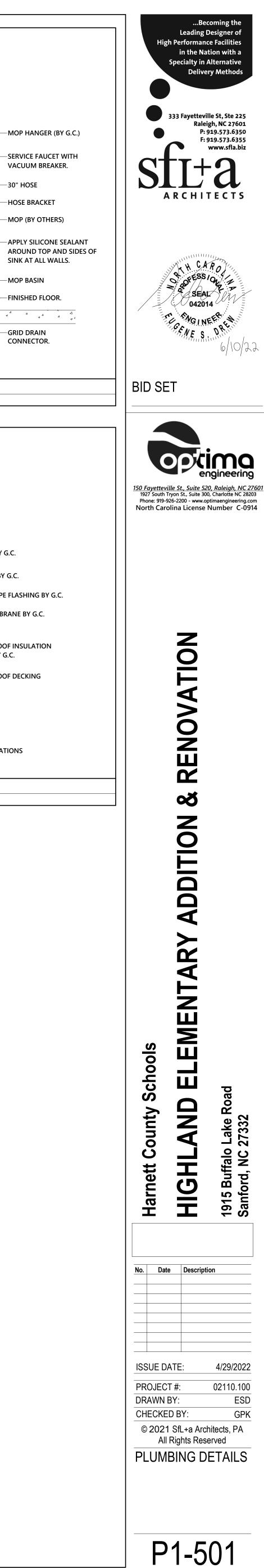
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4 SUPPORT PIPE HANGER, INSULATION AND VAPOR JACKET

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Sheet No. 10 of 10

MECHANICAL G	SENERAL NOTES
SEE SPECIFICATIONS FOR ADDITIONAL PROJECT REQUIREMENTS. THESE GENERAL NOTES ARE INTENDED TO SUPPLEME CONTRADICTS THE REQUIREMENTS LISTED HERE, THE QUESTION SHALL BE ASKED PRIOR TO BIDDING OR THE MORE ST	
1. DO NOT SCALE DRAWINGS. SEE ARCHITECTURAL DRAWINGS AND REFLECTED CEILING PLANS FOR EXACT LOCATION OF DOORS, WINDOWS, CEILING DIFFUSERS, ETC.	14. CONTRACTOR SHALL LOCATE EXHAUST FANS, OUTLETS, AND GAS FLUES A MINIMUM OF 10'-0" F OUTSIDE AIR INTAKE.
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	15. ALL CHILLED WATER, HOT WATER, AND CONDENSER WATER PIPING 2" AND LESS SHALL BE SCHE BLACK STEEL OR HARD-DRAWN TYPE-L COPPER PIPE AND FITTINGS. ALL CHILLED WATER, HOT PIPING GREATER THAN 2" SHALL BE (WELDED) SCHEDULE 40 BLACK STEEL. PROVIDE BRONZE VAI FITTINGS WITH COPPER PIPING AND CAST IRON VALVES AND FITTINGS WITH SCHEDULE 40 BLACK
MODIFICATIONS TO ANY ASSOCIATED MECHANICAL, PLUMBING, OR ELECTRICAL SYSTEMS REQUIRED BY THIS SPECIFIC MANUFACTURER'S INSTALLATION INSTRUCTIONS.	16. CHILLED WATER PIPING SHALL BE INSULATED WITH 1½" THICK PHENOLIC CLOSED CELL, ASTM C1 FOAM, 2.2 LBS. NOMINAL DENSITY, CFC FREE; ASTM C518, K-VALUE OF 0.13 AT 75° F. HOT WATEF AND SMALLER) SHALL BE INSULATED WITH 1½" THICK FIBERGLASS INSULATION. HOT WATER PIL
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.	LARGER) SHALL BE INSULATED WITH 2" THICK FIBERGLASS INSULATION. FIBERGLASS INSULATI HAVE A K-VALUE OF 0.27 (OR LESS) AT 75°F. INSULATION SHALL HAVE A FACTORY APPLIED PRES VAPOR BARRIER JACKET WITH PRESSURE SENSITIVE ADHESIVE SELF SEALING LAP. ALL FITTINGS PVC FITTING COVERS. ALL PIPING OUTSIDE SHALL HAVE A BITUMINOUS COATING ALUMINUM JA PVC FITTING COVERS.
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,	17. ALL CHILLED WATER AND HOT WATER PIPING SHALL PITCH DOWN IN DIRECTION OF FLOW WITH VENTS AT ALL HIGH POINTS AND ½" RAIN VALVES AT ALL LOW POINTS.
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	18. PROVIDE UNIONS, FLANGES OR COUPLINGS AT CONNECTION TO ALL VALVES AND EQUIPMENT. DIRECT WELDED OR THREADED CONNECTIONS TO VALVES, EQUIPMENT OR OTHER APPARATUS
<ol> <li>CLASS 4.</li> <li>ALL PIPING, DUCTS, VENTS, ETC., EXTENDING THROUGH WALLS AND ROOF SHALL BE FLASHED AND</li> </ol>	19. PROVIDE NON-CONDUCTING DIELECTRIC UNIONS WHENEVER CONNECTING DISSIMILAR METAL
<ul><li>COUNTERFLASHED IN A WATERPROOF MANNER.</li><li>6. ALL PIPING AND DUCTWORK LOCATIONS SHALL BE COORDINATED WITH THE WORK UNDER OTHER DIVISIONS</li></ul>	20. ALL ISOLATION VALVES, TERMINAL UNITS, CONTROLS, ETC. REQUIRING ACCESS AND SERVICE SH INSTALLED WITHIN 18" OF THE CEILING FOR SERVICE ACCESSIBILITY. LOCATIONS SHALL BE INDIC CEILING GRID PER THE SPECIFICATIONS.
<ul> <li>OF THE SPECIFICATIONS, TO AVOID INTERFERENCE.</li> <li>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</li> </ul>	<ol> <li>ALL EQUIPMENT CONCRETE PAD SIZES FOR MECHANICAL EQUIPMENT SHALL BE CONFIRMED WI SHOP DRAWING SUBMITTALS AND ASSOCIATED UNIT MANUFACTURER ANCHOR LOCATIONS PE FABRICATION/INSTALLATION. THE MECHANICAL AND PLUMBING CONTRACTORS SHALL COORD EXACT LOCATION OF MECHANICAL EQUIPMENT HOUSEKEEPING PADS WITH THE FLOOR DRAIN I PRIOR TO INSTALLATION OF DRAINS AT EQUIPMENT/PAD LOCATIONS.</li> <li>DUCTWORK AND PIPING PASSING THROUGH/ABOVE ELECTRICAL ROOMS SHALL BE CLOSELY CO WITH THE ELECTRICAL CONTRACTOR. DUCTWORK OR PIPING SHALL NOT BE LOCATED ABOVE ELE PANELS.</li> </ol>
<ul> <li>REPORT TO BE COMPLETED BY AN INDEPENDENT, CERTIFIED TEST AND BALANCE CONTRACTOR.</li> <li>UPON PROJECT COMPLETION, THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE OWNER INSTALLATION INFORMATION INCLUDING RECORD SUBMITTALS (WITH ANY SUBMITTAL REVIEW COMMENTS ADDRESSED) AND 0&amp;M MANUALS FOR EACH PIECE OF EQUIPMENT INCLUDING ALL SELECTED OPTIONS, THE NAME AND ADDRESS OF AT LEAST ONE SERVICE AGENCY, FULL CONTROL SYSTEM 0&amp;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 2018 NCECC APPENDIX C1).</li> </ul>	<ol> <li>EQUIPMENT OPERATED DURING CONSTRUCTION SHALL USE FILTERED MEDIA TO PREVENT CONST DEBRIS FROM ENTERING COILS, DUCTWORK SYSTEMS, AIR TERMINALS ETC. AT COMPLETION OF CONSTRUCTION, MECHANICAL CONTRACTOR SHALL CLEAN ALL SYSTEMS WITH ALL CONTROL D OPEN AND REMOVE ANY REMAINING DEBRIS PRIOR TO TEST AND BALANCING. MECHANICAL CO SHALL REPLACE ALL FILTRATION WITH NEW FILTERS AT COMPLETION OF CONSTRUCTION. ANY I AIR TERMINALS, AND/OR OTHER EQUIPMENT UPSTREAM OF FILTRATION SHALL BE CLEANED THO OF CONSTRUCTION DEBRIS BEFORE HANDING OVER TO OWNER.</li> <li>PROVIDE COMBINATION FIRE/SMOKE DAMPERS WITH AN IONIZATION TYPE DUCT MOUNTED SM</li> </ol>
9. PROVIDE A ONE YEAR WARRANTY FOR ALL WORK PERFORMED BEGINNING ON THE DAY THE SYSTEM IS COMPLETELY OPERATIONAL AND ACCEPTABLE BY THE OWNER.	DETECTOR IN DUCTED APPLICATIONS, OR SPOT DETECTORS IN OPENING APPLICATIONS (WITHIN DAMPER WITH NO AIR OUTLETS OR INLETS BETWEEN DETECTOR AND DAMPER), INSTALLED IN T WIRED, TO CLOSE THE DAMPER UPON ACTIVATION. DUCT MOUNTED SMOKE DETECTORS AND S DETECTORS SHALL BE SUPPLIED, WIRED FOR INTERFACE WITH FIRE ALARM SYSTEM AND UNIT SH
10. PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND ALL EQUIPMENT FOR MAINTENANCE AND FILTER REMOVAL.	THE ELECTRICAL CONTRACTOR. DETECTORS SHALL BE INSTALLED IN THE DUCT BY THE MECHAN CONTRACTOR.
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 <sup>3</sup> / <sub>4</sub> ". TERMINATE ROOFTOP UNIT DRAINS ON A CONCRETE SPLASHBLOCK.	25. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING RESTRAINTS TO RESIST EARTHQUAKE EFFECTS ON THE MECHANICAL SYSTEMS. THE REQUIREMENTS FOR THOSE RESTR FOUND IN THE LOCAL BUILDING CODE AND ASCE 7. THE ANCHORAGE OF THE MECHANICAL SYSTEM COMPLY WITH THE REQUIREMENTS OF THE LOCAL BUILDING CODE AND ASCE 7.
<ol> <li>ANY DEVICE REQUIRING A THERMOSTAT FOR CONTROL SHALL BE FURNISHED WITH A THERMOSTAT WHETHER INDICATED ON THE DRAWINGS OR NOT.</li> <li>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.</li> </ol>	26. MECHANICAL CONTRACTOR SHALL PROVIDE PRE-PRINTED COLOR-CODED PIPE LABELS WITH 1- LETTERING INDICATING SERVICE AND FLOW DIRECTION. PLASTIC PIPE LABELS UTILIZED IN A RE PLENUM SHALL BE LISTED/APPROVED FOR USE IN A RETURN AIR PLENUM. ALL PIPING TO MATE FACILITIES STANDARD (IF APPLICABLE). OTHERWISE, PIPE LABELS SHALL MATCH THE FOLLOWIN CHILLED WATER: GREEN BACKGROUND, WHITE LETTERING HOT WATER PIPING: YELLOW BACKGROUND, BLACK LETTERING REFRIGERANT PIPING: YELLOW BACKGROUND, BLACK LETTERING
	<ol> <li>27. ALL MECHANICAL EQUIPMENT SHALL BE U.L. LISTED AND LABELED AS A COMPLETE PACKAGE, NO</li> <li>27. ALL MECHANICAL EQUIPMENT SHALL BE U.L. LISTED AND LABELED AS A COMPLETE PACKAGE, NO</li> </ol>

2

# AL NOTES

## ICATIONS. IN THE EVENT THAT THE VERBIAGE IS IN CONFLICT OR LL APPLY AT THE ENGINEER'S DISCRETION.

ACTOR SHALL LOCATE EXHAUST FANS, OUTLETS, AND GAS FLUES A MINIMUM OF 10'-0" FROM ANY E AIR INTAKE.

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

D WATER PIPING SHALL BE INSULATED WITH 11/2" THICK PHENOLIC CLOSED CELL, ASTM C1126 RIGID 2.2 LBS. NOMINAL DENSITY, CFC FREE; ASTM C518, K-VALUE OF 0.13 AT 75° F. HOT WATER PIPING (11⁄2" ALLER) SHALL BE INSULATED WITH 11/2" THICK FIBERGLASS INSULATION. HOT WATER PIPING (2" AND SHALL BE INSULATED WITH 2" THICK FIBERGLASS INSULATION. FIBERGLASS INSULATION SHALL K-VALUE OF 0.27 (OR LESS) AT 75°F. INSULATION SHALL HAVE A FACTORY APPLIED PRESSURIZED BARRIER JACKET WITH PRESSURE SENSITIVE ADHESIVE SELF SEALING LAP. ALL FITTINGS SHALL HAVE TING COVERS. ALL PIPING OUTSIDE SHALL HAVE A BITUMINOUS COATING ALUMINUM JACKET AND TING COVERS.

ILLED WATER AND HOT WATER PIPING SHALL PITCH DOWN IN DIRECTION OF FLOW WITH MANUAL AIR AT ALL HIGH POINTS AND 1/2" RAIN VALVES AT ALL LOW POINTS.

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

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

JIPMENT CONCRETE PAD SIZES FOR MECHANICAL EQUIPMENT SHALL BE CONFIRMED WITH APPROVED PRAWING SUBMITTALS AND ASSOCIATED UNIT MANUFACTURER ANCHOR LOCATIONS PRIOR TO ATION/INSTALLATION. THE MECHANICAL AND PLUMBING CONTRACTORS SHALL COORDINATE THE LOCATION OF MECHANICAL EQUIPMENT HOUSEKEEPING PADS WITH THE FLOOR DRAIN LOCATIONS TO INSTALLATION OF DRAINS AT EQUIPMENT/PAD LOCATIONS.

ORK AND PIPING PASSING THROUGH/ABOVE ELECTRICAL ROOMS SHALL BE CLOSELY COORDINATED HE ELECTRICAL CONTRACTOR. DUCTWORK OR PIPING SHALL NOT BE LOCATED ABOVE ELECTRICAL

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

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

CHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING RESTRAINTS TO RESIST THE QUAKE EFFECTS ON THE MECHANICAL SYSTEMS. THE REQUIREMENTS FOR THOSE RESTRAINTS ARE IN THE LOCAL BUILDING CODE AND ASCE 7. THE ANCHORAGE OF THE MECHANICAL SYSTEMS SHALL Y WITH THE REQUIREMENTS OF THE LOCAL BUILDING CODE AND ASCE 7.

NICAL CONTRACTOR SHALL PROVIDE PRE-PRINTED COLOR-CODED PIPE LABELS WITH 1-1/2" HIGH NG INDICATING SERVICE AND FLOW DIRECTION. PLASTIC PIPE LABELS UTILIZED IN A RETURN AIR A SHALL BE LISTED/APPROVED FOR USE IN A RETURN AIR PLENUM. ALL PIPING TO MATCH EXISTING IES STANDARD (IF APPLICABLE). OTHERWISE, PIPE LABELS SHALL MATCH THE FOLLOWING: D WATER: GREEN BACKGROUND, WHITE LETTERING ATER PIPING: YELLOW BACKGROUND, BLACK LETTERING ERANT PIPING: YELLOW BACKGROUND, BLACK LETTERING

CHANICAL 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.** 

THE MECHANICAL CONTRACTOR SHALL ORGANIZE COORDINATION MEETINGS TO DEVELOP A SET OF DRAWINGS WITH ALL CONTRACTORS (ELECTRICAL, MECHANICAL, PLUMBING, FIRE PROTECTION, IT/DATA, AND GENERAL CONTRACTOR). 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) 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 FABRICATION AND INSTALLATION OF DUCTWORK AND PIPING SYSTEMS, OR PURCHASE OF EQUIPMENT. THE FOLLOWING ITEMS REPRESENT THE MINIMUM REQUIREMENTS FOR SHOP DRAWINGS AND COORDINATION DRAWINGS:

- ALL SHOP AND COORDINAGION DRAWINGS WILL BE 1/4" = 1'-0" SCALE 2. DRAWINGS WILL BE ORIGINAL DRAWINGS AND NOT OVERLAYS OF THE CONTRACT/DESIGN
- 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.
- 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, AND GENERAL. ADDITIONAL SETS WILL BE SENT TO THE OWNER, ARCHITECT, AND ENGINEER.

	MECHANICAL DUCT SYMBOLS
SYMBOL	DESCRIPTION
16x8	SQUARE DUCT SIZE TAG (WIDTH x HEIGHT)
16/8	OVAL DUCT SIZE TAG (WIDTH / HEIGHT)
16"Ø	ROUND DUCT SIZE TAG (DIAMETER)
(E)	EXISTING DUCT TAG
	DUCT BEING DEMOLISHED
S/A	SUPPLY AIR
O/A	OUTDOOR AIR
R/A	RETURN AIR
E/A	EXHAUST AIR
L/A	RELIEF AIR
$\square$	SUPPLY AIR DIFFUSER (4-WAY)
	RETURN AIR GRILLE
	RETURN AIR GRILLE WITH SOUND BOOT
	EXHAUST AIR GRILLE
$\mathbf{\Theta}$	POINT OF EXISTING TO NEW CONNECTION
	POINT OF DISCONNECT TO EXISTING CONNECTION
M.C.	MECHANICAL CONTRACTOR
E.C.	ELECTRICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
N.I.C.	NOT IN CONTRACT
(EX)	EXISTING
AFF	ABOVE FINISHED FLOOR
DN	DOWN
UP	UP
x	SECTION CUT REFERRING DETAIL NUMBER REFERRING SHEET NUMBER

## MECHANICAL ACCESSORIES SYMBOL LEGEND RECTANGULAR DUCT MOUNTED MOTOR OPERATED DAMPER, INTERLOCK WITH FAN AS M INDICATED. (DAMPER BY M.C.)

# MECHANICAL DIDINIC CVMDOLC

MBOL	DESCRIPTION
-**	BUTTERFLY VALVE
<b>—</b> ⋈——	3-PIECE BALL VALVE
_ī	CHECK VALVE
-1	STRAINER WITH BLOWDOWN VALVE WITH HOSE CONN.
	BALANCING VALVE
	B&G CIRCUIT SETTER
	UNION
Q	THERMOMETER
(P) I	PRESSURE GAGE & COCK
<del>•</del> I	GAGE COCK
	FLOW SWITCH
¥	ECCENTRIC REDUCER
<b>&gt;</b>	CONCENTRIC REDUCER
	STEAM TRAP, F&T
	STEAM TRAP, TB
	CONTROL VALVE
X	GAS COCK
_&	PRESSURE REDUCING/REGULATING VALVE
S	SOLENOID VALVE

	MECHANICAL PIPING SYSTEMS LEGEND
—CHR—	CHILLED WATER RETURN
—снs—	CHILLED WATER SUPPLY
—HWR—	HOT WATER RETURN
—HWS—	HOT WATER SUPPLY

# 

	ABBREVI	AIION	5
Ø	ROUND	LVR	LOUVER
ABV	ABOVE	LWT	LEAVING WATER TEMPERATURE
AC	AIR CONDITIONING	M/A	MIXED AIR
AD	AREA DRAIN	MAX	MAXIMUM
ADD	ADDENDUM	MBH	ONE THOUSAND BTU PER HOUR
AFF	ABOVE FINISHED FLOOR	MCF	ONE THOUSAND CUBIC FEET
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY	MD	MOTORIZED DAMPER
ALT	ALTERNATE	MECH	MECHANICAL
AP	ACCESS PANEL	MFR	MANUFACTURER
ARCH	ARCHITECT/ARCHITECTURAL	MIN	MINIMUM
BFF	BELOW FINISHED FLOOR	MISC	MISCELLANEOUS
BLW	BELOW	MTR	MOTOR
BTU	BRITISH THERMAL UNITS	MU/A	MAKE-UP/AIR
BTUH	BRITISH THERMAL UNITS PER HOUR	NC	NOISE CRITERIA
-		-	
CAP	CAPACITY	NC	NORMALLY CLOSED
CB	CATCH BASIN	NIC	NOT IN CONTRACT
CFM	CUBIC FEET PER MINUTE	NO	NUMBER
CLG	CEILING	NO	NORMALLY OPEN
со	CLEAN OUT	NTS	NOT TO SCALE
CW	COLD WATER	0	OXYGEN
D	DEGREE	0/A	OUTSIDE AIR
		•	
DB	DRY BULB	ORD	OVERFLOW ROOF DRAIN
DIA	DIAMETER	PD	PRESSURE DROP
DN	DOWN	PIV	POST INDICATOR VALVE
EA	EACH	PLBG	PLUMBING
EAT	ENTERING AIR TEMPERATURE	PRESS	PRESSURE
ELEC	ELECTRICAL	PRV	PRESSURE REDUCING VALVE
-		PSI	
EQUIP	-	-	POUNDS PER SQUARE INCH
EWC	ELECTRIC WATER COOLER	PSIG	POUNDS PER SQUARE INCH GAU
EWT	ENTERING WATER TEMPERATURE	PWR	POWER
E/A	EXHAUST AIR	R	DUCT RISER
EX	EXISTING	R/A	RETURN AIR
EXIST	EXISTING	RCP	RADIANT CEILING PANEL
F	DEGREES FAHRENHEIT	RD	ROOF DRAIN
FCO	FLOOR CLEAN OUT	REC	RECESSED
FD	FLOOR DRAIN	RED	REDUCER
FD	FIRE DAMPER	RH	RELATIVE HUMIDITY
FDV	FIRE DEPARTMENT VALVE	RL/A	RELIEF AIR
FL	FLOOR	RM	ROOM
FO	FUEL OIL	RPM	<b>REVOLUTIONS PER MINUTE</b>
FOV	FUEL OIL VENT	RW	RAIN WATER
-			
FOR	FUEL OIL RETURN	SF	SQUARE FOOT
FOS	FUEL OIL SUPPLY	S/A	SUPPLY AIR
FPM	FEET PER MINUTE	SAN	SANITARY
FS	FLOOR SINK	SF	SQUARE FOOT
FT	FOOT/FEET	SD	SMOKE DAMPER
FTR	FIN TUBE RADIATION	SM	SURFACE MOUNT
GAL	GALLON	SP	STANDPIPE
GC	GENERAL CONTRACTOR	SP	STATIC PRESSURE
GPM	GALLONS PER MINUTE	STM	STEAM
GW	GREASE WASTE	Т	THERMOSTAT
НВ	HOSE BIB	TD	TEMPERATURE DROP
НР	HORSE POWER	TDR	TRENCH DRAIN
HTG	HEATING	TEMP	TEMPERATURE
-	_		
HTR	HEATER	ТҮР	TYPICAL
HW	HOT WATER	UG	UNDERGROUND
HYD	HYDRANT	VAC	VACUUM
ID	INDIRECT	V	VENT
IN	INCH	VAV	VARIABLE AIR VOLUME
INV	INVERT	VENT	VENTILATION
LB	POUND	VENT	VENT THROUGH ROOF
	POUNDS PER HOUR	W	WASTE
LAT	LEAVING AIR TEMPERATURE	WB	WET BULB
LP	LOW PRESSURE	WCO	WALL CLEAN OUT
	LIQUEFIED PETROLEUM GAS	WH	WALL HYDRANT

# TESTING, ADJUSTING, AND BALANCING

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. TEST AND BALANCE REPORT TO BE COMPLETED BY AN INDEPENDENT, CERTIFIED TEST AND BALANCE CONTRACTOR.

- CONDUCT TESTING AND BALANCING IN ACCORDANCE WITH TECHNICAL PORTIONS OF THE AABC "NATIONAL STANDARDS FOR TESTING AND BALANCING HVAC SYSTEMS", LATEST EDITION.
- INSTRUMENTS USED FOR BALANCING MUST HAVE BEEN CALIBRATED WITHIN A PERIOD OF SIX (6) MONTHS PRIOR TO BALANCING. SUBMIT SERIAL NUMBERS, AND DATES OF CALIBRATION OF ALL INSTRUMENTS TO BE USED PRIOR TO THE START OF WORK.
- I. SET HVAC SYSTEM AIRFLOW AND WATER FLOW RATES WITHIN THE FOLLOWING TOLERANCES: A. SUPPLY, RETURN, AND EXHAUST FANS AND EQUIPMENT WITH FANS: MINUS 5 TO PLUS 10
- PERCENT
- B. AIR OUTLETS AND INLETS: PLUS/MINUS 10 PERCENT.
- C. HEATING-WATER FLOW RATE: 0 TO MINUS 10 PERCENT.
- D. COOLING-WATER FLOW RATE: 0 TO MINUS 5 PERCENT.
- REFER TO SPECIFICATION SECTION 230593 AND CONTRACT DRAWINGS IN THEIR ENTIRETY FOR ADDITIONAL REQUIREMENTS.

# MECHANICAL DEMOLITION NOTES

- THE MECHANICAL CONTRACTOR SHALL VISIT SITE PRIOR TO BEGINNING WORK TO DETERMINE THE LEVEL OF DEMOLITION REQUIRED AND INCLUDE ALL NECESSARY PRICING IN THEIR BID.
- IT IS THE MECHANICAL CONTRACTORS RESPONSIBILITY TO FIELD VERIFY ALL EXISTING DUCTWORK AND PIPING. ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND MECHANICAL PLANS SHOULD BE BROUGHT TO THE ATTENTION OF THE MECHANICAL ENGINEER.
- M.C. SHALL VERIFY ALL EXISTING PIPING SYSTEMS TO REMAIN ARE INSULATED WITH VAPOR BARRIER INTACT. IF ANY PORTION OF THE PIPING SYSTEM IS MISSING INSULATION OR DETERMINED DURING ANY PHASE OF THE PROJECT AS DEFECTIVE, THAT PORTION SHALL BE PROVIDED WITH NEW INSULATION. MINOR TEARS ON EXISTING PIPING MAY BE REPAIRED WITH TAPES, ADHESIVE, OR SEALANT. EXISTING PIPING SYSTEMS SHALL INCLUDE CHILLED WATER, CONDENSER WATER, HOT WATER, STEAM & STEAM CONDENSATE, REFRIGERANT, AND A/C CONDENSATE DRAIN PIPING. THE MECHANICAL CONTRACTOR SHALL MAKE PROVISIONS IN THEIR BASE BID TO COVER ALL COSTS NECESSARY ACHIEVE A CONTINUOUS VAPOR BARRIER THROUGHOUT THESE EXISTING SYSTEMS. REFER TO SPECIFICATIONS SECTION 230700/ MECHANICAL GENERAL NOTES FOR INSULATION MATERIAL REQUIREMENTS.
- FOR ALL EXISTING HVAC EQUIPMENT AND DUCTWORK NOTED TO REMAIN AND SERVING AREA OF RENOVATION, MECHANICAL CONTRACTOR SHALL INSPECT EQUIPMENT (AND ANY ASSOCIATED CONTROLS, VALVES, DAMPERS, ETC.) TO VERIFY PROPER WORKING ORDER. MECHANICAL CONTRACTOR TO SERVICE AND CLEAN EXISTING HVAC UNITS TO ENSURE DESIGN AIRFLOW AND COOLING/HEATING CAPACITIES ARE OBTAINED. ANY EQUIPMENT FOUND TO BE INOPERABLE OR SHORT OF DESIGN CAPACITIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PROJECT COMPLETION. PROVIDE CLEAN FILTERS IN ALL UNITS AT COMPLETION OF PROJECT. DAMAGED DUCTWORK SHALL BE REPAIRED.

	ENERGY	CONS	SERV	AROLINA ATION C MECHANICAL SUM	ODE
ASHRAE 90.1-2		CE		COMCHECK PRO COMCHECK PRO ENERGY MODELI ATING SYSTEMS T	VIDED (90.1 NG DATA P
C406.2 EFFICII	EFFICIENCY PACK ENT MECH EQUIPM ED LTG DENSITY NCED LTG CONTRC	IENT		C406.5 ON-SITE R C406.6 DEDICATE C406.7 SERVICE W	D OA SYSTE
	COUNTY, NORTH	CAROLINA D	ESIGN CO	NDITIONS	
EXTERIOR wint sum sum INTERIOR wint	(ASHRAE 90.1-2013 er dry bulb mer dry bulb mer wet bulb (2018 NCECC SECT er dry bulb mer dry bulb			22° F. 94° F. 76° F. 72° F. 75° F.	
BUILDING HE BUILDING CO		AND EQUIPM	3) 4-	STEM SIZING 24,105 BTUH (pea 44,486 BTUH (pea /A - EXISTING TO	ak)
C403.2.3 & C406.2 SYSTEM DESCRIP		CREASED HVAC IPE BLOWER C TER COOLING ENCY COMPLI	C EQUIPM OILS WITH ANCE - TA	HOT WATER RE	ICE HEAT AND
EQUIP TYPE	SIZE CATEGORY (BTUH)	SUBCATEC	GORY	C403.2.3 MINIMUM EFFICIENCY (a)	10 INCRE EFF
TABLE C403.2.3(1)	- UNITARY AIR CO	ONDITIONERS	AND CON	DENSING UNITS	L.
AIR COND, WATER COOL	< 65,000	SPLIT SYST SINGLE PAG	-	12.1 EER 12.3 IEER	13.3 13.5
CONTROL, SEALING, P C403.2.12 - AIR SY ALL FANS II REQUIREMI	EMS ARE FULLY CO VENTILATION, ENE IPING INSULATION STEM DESIGN AND	RGY RECOVER , AND SYSTEM ) CONTROL PROJECT ARE CFM LIMITATIO	Y, DUCT A 1 COMPLE 5 HP OR I DNS SHOV	ND PLENUM INS TION. LESS AND ARE EX WN BELOW:	ULATION A
ALLOWABLE NAMEPLATE MOTOR HP	CONSTA VOLUM MINIMUN	1E	VC	RIABLE DLUME IMUM CFM	DES
7.5	6,818 CF			00 CFM	SEE S
10	9,091 CF			67 CFM	SEE S
15	13,636 CF			00 CFM	SEE S
20 25	18,182 CF 22,727 CF		-	33 CFM 67 CFM	SEE S
30	22,727 CF			00 CFM	SEE S
40	36,364 CI			67 CFM	SEE S
50	45,455 CI			33 CFM	SEE S
	MOTORS HAVE B	EEN SPECIFIED		-	IENCY REQ

NOT APPLICABLE.

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

# EQUIPMENT ABBREVIATIONS

AIR CONDITIONING UNIT	E	WH	ELECTRIC
AIR COOLED CONDENSER	F	CU	FAN COIL
AIR COOLING CONDENSING UNIT	F	P	FIRE PUMP
AIR HANDLING UNIT	(	GI	GREASE IN
AIR SEPARATOR	(	GRV	GRAVITY F
BOILER	ŀ	HWP	HEATING \
CHILLER	ŀ	ΗX	HEAT EXC
COOLING TOWER	ŀ	HRU	HEAT RECO
CABINET UNIT HEATER	F	PRV	POWER RC
CONDENSER WATER PUMP	F	RE	RETURN/E
CHILLED WATER PUMP	F	RTU	ROOFTOP
DOMESTIC WATER BOOSTER PUMP	9	SEP	SEWAGE E
DUCT MOUNTED COIL	9	SF	SUPPLY FA
DOMESTIC WATER CIRCULATING PUMP	o 9	SP	SUMP PUN
EXHAUST FAN	ι	JH	UNIT HEAT
ELECTRIC DUCT COIL	۱	NH	WATER HE
EXPANSION TANK			
	AIR COOLED CONDENSER AIR COOLING CONDENSING UNIT AIR HANDLING UNIT AIR SEPARATOR BOILER CHILLER COOLING TOWER CABINET UNIT HEATER CONDENSER WATER PUMP CHILLED WATER PUMP DOMESTIC WATER BOOSTER PUMP DUCT MOUNTED COIL DOMESTIC WATER CIRCULATING PUMP EXHAUST FAN ELECTRIC DUCT COIL	AIR COOLED CONDENSERFAIR COOLING CONDENSING UNITFAIR COOLING CONDENSING UNITFAIR HANDLING UNITFAIR SEPARATORFBOILERFCHILLERFCOOLING TOWERFCABINET UNIT HEATERFCONDENSER WATER PUMPFCHILLED WATER PUMPFDOMESTIC WATER BOOSTER PUMPFDUCT MOUNTED COILFDOMESTIC WATER CIRCULATING PUMPFEXHAUST FANFELECTRIC DUCT COILF	AIR COOLED CONDENSERFCUAIR COOLING CONDENSING UNITFPAIR COOLING CONDENSING UNITGIAIR HANDLING UNITGIAIR SEPARATORGRVBOILERHWPCHILLERHXCOOLING TOWERHRUCABINET UNIT HEATERPRVCONDENSER WATER PUMPRECHILLED WATER PUMPSEPDUCT MOUNTED COILSFDOMESTIC WATER CIRCULATING PUMPSPEXHAUST FANUHELECTRIC DUCT COILWH

# COMMISSIONING NOTE - 2018 NCECC C

THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR SYSTEM COMMISSIONING PER SECTION 408. MC SHALL HIRE A REGISTERED DESIGN PROFESSIONAL (ENGINEERED SE CERTIFIED COMMISSIONING PROFESSIONAL) TO PERFORM THE COMMISSIONING DUT SECTION C408, AND PROVIDE OWNER AND CODE OFFICIAL WITH A SEALED STATEMEI COMPLETION (APPENDIX C1). THE CONTRACTOR SHALL COORDINATE WITH COMMIS AND PROVIDE ALL NECESSARY TIME, MATERIALS, AND PROCEDURES REQUIRED FOR A COMMISSIONED PROJECT.

	MECHANICAL SHEET INDEX
SHEET NUMBER	SHEET NAME
M1-001	MECHANICAL LEGEND AND NOTES
M1-002	MECHANICAL SCHEDULES
M1-003	MECHANICAL CONTROLS SEQUENCE OF OPERATION
M1-102	CLASSROOM ADDITION MECHANICAL PLAN - NEW WORK
M1-103	MECHANICAL LOFT MECHANICAL DUCTWORK PLAN
M1-104	MECHANICAL LOFT MECHANICAL PIPING PLAN
M1-501	MECHANICAL DETAILS

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QUIREMENTS PER
YSTEM
C WATER HEATER
IP NTERCEPTOR ROOF VENTILATOR WATER PUMP CHANGER
COVERY UNIT ROOF VENTILATOR /EXHAUST FAN P UNIT EJECTOR PUMP
FAN JMP ATER IEATER
C408 R 2018 NCECC
EALED IN NC OR JTIES DESCRIBED IN ENT OF SSIONING AGENT A FULLY



<b></b>	E				
	VENTILATION CAL	CULATIONS (NCM PEOPLE O/A RATE	C 2018, SEC	<b>C 403):</b> <u>AHU</u> DEFAULT OCCUPANCY	-59 EX
	OCCUPANCY CLASSIFICATION	IN BREATHING ZONE (CFM/PERSON)	IN BREATHING ZONE (CFM/SQ. FT.)	DENSITY (PEOPLE/1000 SQ. FT.)	All (C
	CLASSROOMS (AGES-5-8)	7.5	0	25	Т
		PEOPLE O/A RATE	AREA O/A RATE	DEFAULT OCCUPANCY	-60 EX
Ю	CLASSIFICATION	IN BREATHING ZONE (CFM/PERSON) 7.5	IN BREATHING ZONE (CFM/SQ. FT.) 0	DENSITY (PEOPLE/1000 SQ. FT.)	AI (C
	CLASSROOMS (AGES-5-8)	1.5	0	25	T
	VENTILATION CAL		C 2018 SEC	Г 403): АНU	_61
		PEOPLE O/A RATE IN BREATHING ZONE	AREA O/A RATE	DEFAULT OCCUPANCY	EX
	CLASSIFICATION CLASSROOMS (AGES-5-8)	(CFM/PERSON)	(CFM/SQ. FT.)	(PEOPLE/1000 SQ. FT.) 25	(C
			1	-	T
	VENTILATION CAL	CULATIONS (NCM	C 2018, SEC	Г 403): AHU	-62
	OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE	AREA O/A RATE IN BREATHING ZONE	DEFAULT OCCUPANCY DENSITY	EX Al
	CLASSROOMS (AGES-5-8)	(CFM/PERSON) 7.5	(CFM/SQ. FT.) 0	(PEOPLE/1000 SQ. FT.) 25	(C
					1
	VENTILATION CAL	CULATIONS (NCM	C 2018, SEC	Г 403): <u>АНU</u>	-63
	OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EX AI (C
	CLASSROOMS (AGES-5-8)	7.5	0	25	т. Т
4					
	VENTILATION CAL			_	
	OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EX Al (C
	CLASSROOMS (AGES-5-8)	7.5	0	25	1
	VENTILATION CAL	CULATIONS (NCM PEOPLE O/A RATE	C 2018, SEC	<b>C 403):</b> <u>AHU</u> DEFAULT OCCUPANCY	-65 EX
	OCCUPANCY CLASSIFICATION	IN BREATHING ZONE (CFM/PERSON)	IN BREATHING ZONE (CFM/SQ. FT.)	DENSITY (PEOPLE/1000 SQ. FT.)	All (Cl
	CLASSROOMS (AGES-5-8)	7.5	0	25	1
	VENTILATION CAL			Г ИЛ2)• АЦЦ	66
		PEOPLE O/A RATE IN BREATHING ZONE	AREA O/A RATE	DEFAULT OCCUPANCY DENSITY	=00 EX
	CLASSIFICATION CLASSROOMS (AGES-5-8)	(CFM/PERSON) 7.5	(CFM/SQ. FT.)	(PEOPLE/1000 SQ. FT.) 25	(C
	VENTILATION CAL	CULATIONS (NCM	C 2018, SEC	Г 403): AHU	-67
က	OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE	AREA O/A RATE IN BREATHING ZONE	DEFAULT OCCUPANCY DENSITY	EX Al
	CLASSROOMS (AGES-5-8)	(CFM/PERSON) 7.5	(CFM/SQ. FT.) 0	(PEOPLE/1000 SQ. FT.) 25	(C
	VENTILATION CAL	CULATIONS (NCM PEOPLE O/A RATE	C 2018, SEC	<b>C 403):</b> <u>AHU</u> DEFAULT OCCUPANCY	- <u>68</u>
	OCCUPANCY CLASSIFICATION	IN BREATHING ZONE (CFM/PERSON)	IN BREATHING ZONE (CFM/SQ. FT.)	DENSITY (PEOPLE/1000 SQ. FT.)	AI (C
	CLASSROOMS (AGES-5-8)	7.5	0	25	
-					
		PEOPLE O/A RATE	AREA O/A RATE	DEFAULT OCCUPANCY	ΕX
	CLASSIFICATION CLASSROOMS (AGES-5-8)	IN BREATHING ZONE (CFM/PERSON) 7.5	IN BREATHING ZONE (CFM/SQ. FT.) 0	DENSITY (PEOPLE/1000 SQ. FT.) 25	AI (C
	VENTILATION CAL		C 2018 SECT	[ 403): AHU	-70
	OCCUPANCY	PEOPLE O/A RATE IN BREATHING ZONE	AREA O/A RATE IN BREATHING ZONE	DEFAULT OCCUPANCY DENSITY	EX AI
0	CLASSIFICATION CLASSROOMS (AGES-5-8)	(CFM/PERSON) 7.5	(CFM/SQ. FT.) 0	(PEOPLE/1000 SQ. FT.) 25	(C
					1
	VENTILATION CAL	CULATIONS (NCM	C 2018, SECT	Г 403): <u>АН</u>	-71
	OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE	AREA O/A RATE IN BREATHING ZONE	DEFAULT OCCUPANCY DENSITY	EX Al
	CLASSROOMS (AGES-5-8)	(CFM/PERSON) 7.5	(CFM/SQ. FT.) 0	(PEOPLE/1000 SQ. FT.) 25	(C
	VENTILATION CAL		_		
	OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EX Al (C
	CLASSROOMS (AGES-5-8)	7.5	0	25	1
	VENTILATION CAL	<b>`</b>	-	<b>,</b> <u> </u>	
	OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EX AI (C
	OFFICE TOILET	5	0.06	5	
_					T
1					

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9				
EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)
- TOTAL OUTSIDE AIR R	-		150	-
	L OUTSIDE AIR P		20	10
	AREA	CALCULATED	CALCULATED	CALCULATED
AIRFLOW RATE (CFM/SQ. FT.) -	(SQ. FT.) 800	OCCUPANCY (PEOPLE) 20	PEOPLE O/A (CFM) 150	AREA O/A (CFM) -
TOTAL OUTSIDE AIR R TOTA		E + AREA, CFM)	18	
1				
EXHAUST AIRFLOW RATE	AREA (SQ. FT.)	CALCULATED OCCUPANCY	CALCULATED PEOPLE O/A	CALCULATED AREA O/A
(CFM/SQ. FT.) -	832	(PEOPLE) 21	(CFM) 156	(CFM) -
TOTAL OUTSIDE AIR R TOTA	EQUIRED (PEOPL L OUTSIDE AIR P		19 20	
2				
EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)
- TOTAL OUTSIDE AIR R	545 EQUIRED (PEOPL	14 E + AREA, CFM)	105	
ΤΟΤΑ	L OUTSIDE AIR P	ROVIDED (CFM)	15	0
<u>3</u> exhaust		CALCULATED		CALCULATED
EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)
- TOTAL OUTSIDE AIR R	-		150 18	-
_	L OUTSIDE AIR P	κυνίμεμ (CFM)	20	JU
<u>4</u> exhaust		CALCULATED	CALCULATED	CALCULATED
AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	OCCUPANCY (PEOPLE)	PEOPLE O/A (CFM)	AREA O/A (CFM)
- TOTAL OUTSIDE AIR R TOTA	800 EQUIRED (PEOPL L OUTSIDE AIR P		150 18 20	-
5				
EXHAUST AIRFLOW RATE	AREA	CALCULATED OCCUPANCY	CALCULATED PEOPLE O/A	CALCULATED AREA O/A
(CFM/SQ. FT.)	(SQ. FT.) 946	(PEOPLE)	(CFM) 180	(CFM)
TOTAL OUTSIDE AIR R TOTA	EQUIRED (PEOPL L OUTSIDE AIR P		22 22	
6				
EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)		CALCULATED PEOPLE O/A	CALCULATED AREA O/A
- TOTAL OUTSIDE AIR R	946	(PEOPLE) 24 E + APEA CEM)	(CFM) 180 22	(CFM) -
	L OUTSIDE AIR P	. ,	22	-
7				
EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)
- TOTAL OUTSIDE AIR R	-		150 18	-
	L OUTSIDE AIR P	ROVIDED (CFM)	20	00
<u>B</u> exhaust		CALCULATED	CALCULATED	CALCULATED
AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	OCCUPANCY (PEOPLE)	PEOPLE O/A (CFM)	AREA O/A (CFM)
- TOTAL OUTSIDE AIR R TOTA	800 EQUIRED (PEOPL L OUTSIDE AIR P		150 18 20	-
9				
2 EXHAUST AIRFLOW RATE	AREA	CALCULATED OCCUPANCY	CALCULATED PEOPLE O/A	CALCULATED AREA O/A
(CFM/SQ. FT.)	(SQ. FT.) 545	(PEOPLE) 14	(CFM) 105	(CFM) -
TOTAL OUTSIDE AIR R TOTA	EQUIRED (PEOPL L OUTSIDE AIR P		13 15	
0				
EXHAUST AIRFLOW RATE	AREA (SQ. FT.)		CALCULATED PEOPLE O/A	CALCULATED AREA O/A
(CFM/SQ. FT.) - TOTAL OUTSIDE AIR P	832	(PEOPLE) 21 E + APEA CEM)	(CFM) 158	(CFM) -
TOTAL OUTSIDE AIR R TOTA	EQUIRED (PEOPL L OUTSIDE AIR P		19 20	-
1				
EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)
- TOTAL OUTSIDE AIR R	800 EQUIRED (PEOPL	20	150 18	-
	L OUTSIDE AIR P		20	00
2				
EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)
- TOTAL OUTSIDE AIR R			150 18	-
	L OUTSIDE AIR P	κυνίμεμ (CFM)	20	JU
<u>8</u> EXHAUST	AREA	CALCULATED	CALCULATED	CALCULATED
AIRFLOW RATE (CFM/SQ. FT.)	(SQ. FT.)	OCCUPANCY (PEOPLE)	PEOPLE O/A (CFM)	AREA O/A (CFM)
	255	2	10	15

				COOLING COIL								HEATING COIL								ELECTRICAL	ΠΑΤΑ			
	TOTAL	OUTSIDE		TOTAL CAPACITY	SENSIBLE CAPACITY		EWT	LWT		MAX. PD	RUNOU	TOTAL CAPACITY		EWT	LWT		MAX. PD							
SYMBOL	(CFM)	AIRFLOW (CFM)	ESP	(MBH)	(MBH)	GPM	(°F)	(°F)	# ROWS	(FT.)	Т	(MBH)	GPM	(°F)	(°F)	# ROWS	(FT.)	RUNOUT	FAN HP	VOLTAGE	РН	MANUFACTURER	MODEL	CON
AHU-59	900	180	0.50	43950	28850	8.1	44	56	6	10.0	1 1/4"	77380	4.5	160	140	2	5.0	1"	1.00 hp	480	3	TRANE	BCHD036	НС
AHU-60	1100	180	0.50	51370	34460	9.4	44	56	6	10.0	1 1/4"	86040	5.2	160	140	2	5.0	1"	1.00 hp	480	3	TRANE	BCHD036	НС
AHU-61	800	190	0.50	39950	26240	7.4	44	56	6	10.0	1 1/4"	76720	4.2	160	140	2	5.0	1"	1.00 hp	480	3	TRANE	BCHD036	НС
AHU-62	900	150	0.50	43950	28850	8.1	44	56	6	10.0	1 1/4"	77380	4.5	160	140	2	5.0	1"	1.00 hp	480	3	TRANE	BCHD036	нс
AHU-63	900	180	0.50	43950	28850	8.1	44	56	6	10.0	1 1/4"	77380	4.5	160	140	2	5.0	1"	1.00 hp	480	3	TRANE	BCHD036	HC
AHU-64	1150	180	0.50	53110	35750	9.7	44	56	6	10.0	1 1/4"	84490	5.4	160	140	2	5.0	1"	1.00 hp	480	3	TRANE	BCHD036	нс
AHU-65	1000	215	0.50	47790	31820	8.8	44	56	6	10.0	1 1/4"	80190	4.9	160	140	2	5.0	1"	1.00 hp	480	3	TRANE	BCHD036	но
AHU-66	1000	215	0.50	47790	31820	8.8	44	56	6	10.0	1 1/4"	80190	4.9	160	140	2	5.0	1"	1.00 hp	480	3	TRANE	BCHD036	нс
AHU-67	1200	215	0.50	54820	37040	10.0	44	56	6	10.0	1 1/4"	86690	5.5	160	140	2	5.0	1"	1.00 hp	480	3	TRANE	BCHD036	но
AHU-68	950	180	0.50	45830	30210	8.4	44	56	6	10.0	1 1/4"	77960	4.7	160	140	2	5.0	1"	1.00 hp	480	3	TRANE	BCHD036	но
AHU-69	900	150	0.50	43950	28850	8.1	44	56	6	10.0	1 1/4"	77380	4.5	160	140	2	5.0	1"	1.00 hp	480	3	TRANE	BCHD036	НО
AHU-70	800	190	0.50	39950	26240	7.4	44	56	6	10.0	1 1/4"	76720	4.2	160	140	2	5.0	1"	1.00 hp	480	3	TRANE	BCHD036	НО
AHU-71	1100	180	0.50	51370	34460	9.4	44	56	6	10.0	1 1/4"	86040	5.2	160	140	2	5.0	1"	1.00 hp	480	3	TRANE	BCHD036	НО
AHU-72	900	180	0.50	43950	28850	8.1	44	56	6	10.0	1 1/4"	77380	4.5	160	140	2	5.0	1"	1.00 hp	480	3	TRANE	BCHD036	НО
AHU-73	475	50	0.50	20870	14320	4.1	44	56	6	10.0	1"	33920	2.0	160	140	2	5.0	3/4"	0.50 hp	480	3	TRANE	BCHD018	НО

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, FILTERS (SEE NOTE 7), DISCHARGE DUCT COLLAR, VIBRATION ISOLATORS. 4. MECHANICAL CONTRACTOR SHALL PROVIDE TWO SPARE FAN COIL UNIT MOTORS FOR EACH SIZE MOTOR PROVIDED. MOTORS SHALL BE DELIVERED TO OWNER AT PROJECT COMPLETION.

5. CONTROLS CONTRACTOR SHALL PROVIDE INDIVIDUAL CONTROL POWER TRANSFORMER (120V) FOR EACH UNIT. POWER WILL BE FROM FAN COIL UNIT CIRCUIT.

6. PROVIDE FCU-XX WITH AN IONIZATION 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 MEC CONTRACTOR. 7. FAN COIL UNITS SHALL BE PROVIDED WITH TEMPORARY CONSTRUCTION FILTERS, REPLACED WITH DISPOSABLE FILTERS AT PROJECT COMPLETION.

						APPROX.			E				
SYMBOL	LOCATION	MANUFACTURER	MODEL NO.	TYPE	CFM	ESP	DRIVE TYPE	FAN RPM	WATTS	H.P.	VOLTAGE-PHASEØ	ACCESSORIES	
F-29	MECHANICAL LOFT	GREENHECK	SQ-120-A	INLINE	1350	0.500	DIRECT	1511	1180	0.50	120 V-1Ø	A,B,F,G	
<ul> <li>B. GRAY</li> <li>C. MOT</li> <li>D. PREF</li> <li>E. BIRD</li> <li>F. ACOU</li> <li>G. HAN</li> <li>H. WL, V</li> <li>I. RCC</li> <li>RJ R</li> <li>J. WAL</li> </ul>	IES: ONNECT SWITCH VITY BACKDRAFT DAMPER ORIZED BACKDRAFT DAMPER AB, ROOF CURB SCREEN USTICAL LINING GING BRACKETS WITH VIBRATION ISOI WALL LOUVER DISCHARGE OR GRS ROOF CAP (FLAT ROOF) OR OOF CAP (PITCHED ROOF) L MOUNTING COLLAR T GAURD	N. N O. E P. U Q. V R. C LATION S. II T. P	2" WASHABLE ALU MOTORSIDE FAN EXHAUST GRILLE J.L. 762 /ENTED ROOF CU COMBINATION KI NTERLOCK WITH PROVIDE DRAIN P ROOF SUPPORT R /FD	GUARD RB EXTENSION TCHEN HOOD F FUME HOOD LUG ACCESSOR	AN CURB		<ol> <li>WALL MOUN</li> <li>INTERLOCK V SERVED BY F.</li> <li>WALL MOUN</li> <li>WALL MOUN</li> <li>CONTROLLEE</li> <li>CONTROLLEE</li> <li>CONTROLLEE</li> </ol>	VITH ROOM L AN) TED ON/OFF TED MUSHRO D BY BUILDIN S OPERATION D BY THE FAC	IGHT SWITCH SWITCH WITI OOM PUSH BU G AUTOMATI I P AND FIREM	H (FAN SH H IDENTI UTTON S' ON SYST	IALL OPERATE WHEN L FICATION LABEL WITCH/STARTER WITH EM	IGHT IS ON IF ANY ROOM IS IDENTIFICATION LABEL TROL PANEL IN FIRE COMMAN MOKE CONTROL FANS	١D

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.

										NECK		INSTALLATION	OPTION
SYMBOL	DESCRIPTIC	N	M	ANUF.	MODEL	MATE	RIAL	FACE SIZE	SIZE	WIDTH	HEIGHT	BORDER TYPE	DAMPE DESCRIPT
Α	PLAQUE FACE DI	FFUSER	Т	ITUS	OMNI	STE	EL	12x12	4			TYPE 1 (SURFACE)	
В	PLAQUE FACE DI	FFUSER	Т	ITUS	OMNI	STE	EL	24x24	6			TYPE 3 (LAY-IN)	
С	PLAQUE FACE DI	FFUSER	Т	ITUS	OMNI	STE	EL	24x24	8			TYPE 3 (LAY-IN)	
D	LOUVERED DOUBLE DEFL	ECTION GRILLE	Т	ITUS	300FL	ALUM	INUM			14	10	TYPE 1 (SURFACE)	
F	LOUVERED DOUBLE DEFL	ECTION GRILLE	Т	ITUS	350FL	ALUM	INUM	24x24		20	16	TYPE 3 (LAY-IN)	
G	PERFORATED DI	FUSER	Т	ITUS	PAR	STE	EL	24x24	8			TYPE 3 (LAY-IN)	
н	PERFORATED DI	FUSER	Т	ITUS	PAR	STE	EL	24x24	10			TYPE 3 (LAY-IN)	
J	PERFORATED DI	FUSER	Т	ITUS	PAR	STE	EL	24x24	14			TYPE 3 (LAY-IN)	
К	LOUVERED GF	ILLE	Т	ITUS	4FL	ALUM	INUM	12x12	6				
L	LOUVERED GF	ILLE	Т	ITUS	4FL	ALUM	INUM	24x24	8				
				LINE	AR SL	OT D	IFFL	JSER	SCH	HEDL	JLE		
М	LINEAR SLOT DIFFUSER	Titus	FL-10	ALUMIN	IUM 1	1	4' -	0"	Yes		6	DEFAULT	
Ν	LINEAR SLOT DIFFUSER	Titus	FL-10	ALUMIN	IUM 1	1	4' -	0"	Yes		8	DEFAULT	

2. ALL DEVICES SHALL BE FURNISHED WITH FRAMES SUITABLE FOR THE TYPE OF INSTALLATION REQUIRED.

3. ALL LINEAR DIFFUSERS IN LAY-IN CEILINGS SHALL BE FURNISHED WITH END CAPS. ALL LINEAR DIFFUSERS IN HARD CEILINGS SHALL BE FURNISHED WITH END BORI ALL LINEAR SUPPLY DIFFUSERS SHALL BE PROVIDED WITH INTEGRAL AIRFLOW PATTERN ADJUSTMENT BARS FOR HORIZONTAL/VERTICAL PATTERN ADJUSTMENT A EACH SLOT. 4. ALL DOUBLE DEFLECTION SUPPLY GRILLES SHALL HAVE DAMPER BLADES ADJUSTED TO PROVIDE AIRFLOW PATTERN INDICATED BY FLOW ARROWS ON PLANS. DAM

SHALL BE ADJUSTED TO A 30 DEGREE POSITION UNLESS NOTED OTHERWISE ON PLANS.

		HVLS	FAN SC	HEDUL	E	
					ELI	ECTRICAL DATA
SYMBOL	LOCATION	TYPE	MAX. RPM	DRIVE	H.P.	VOLTAGE-PHASEØ
HVLS-1	COLLABORATION			DIRECT	0.25	110 V-0Ø
HVLS-2	COLLABORATION			DIRECT	0.25	110 V-0Ø

ALL FANS SHALL BE U.L. LISTED AND LABELED AND SHALL BE AMCA CERTIFIED FOR SOUND AND AIR FLOW. 2. ALL FANS SHALL BE SUPPLIED BY ONE MANUFACTURER UNLESS NOTED OTHERWISE.

MECHANICAL CONTRACTOR SHALL PROVIDE MAGNETIC STARTER WITH AUXILIARY CONTACTS AS REQUIRED. 4. PROVIDE HVF-1 AND HVF-2 WITH: A DIGITAL WALL CONTROLLER WITH FAULT CODE ACCESS, AVD FUSED DISCONNECT, NOISE DA INDUSTRIAL GRADE GEAR BOX, AIRFOIL RETAINERS, HUB CLIPS, SAFETY CABLES , GRADE 8 BOLTS, FIRE DELAY, 12-YEAR LIMITED W

COORDINATE SUPPORT REQUIREMENTS WITH MANUFACTURER. FANS SHALL SHUT-DOWN UPON SIGNAL FROM SPRINKLER MON INDICATING WATER FLOW IN THE SPRINKLER SYSTEM. BASIS OF DESIGN: MACROAIR AIRVOLUTION-DS.

ELECTRIC WALL HEATER SCHEDULE	L HEA	WAL	LECTRIC	Ε		
MOTOR MANUFACTURER	1					
BTUH KW VOLT PH (MARKEL)	v vo	кw	BTUH	CFM	LOCATION	SYMBOL
2560 0.75 120 V 1 E3321TD-RP	5 120	0.75	2560	175		EWH-01
2560 0.75 120 V 1 E3321TD-RP	5 120	0.75	2560	175		EWH-01
ON 65° F E.A.T. IERMOSTAT REQUIRED (WALL MOUNTED OR UNIT S SHOWN WITHOUT THERMOSTAT INDICATED SHALL MOUNTED THERMOSTAT. MOUNTED THERMOSTAT. MOUNTED THERMOSTAT. A. DISCONNE B. BUILT IN T C. WALL MOU D. RECESSED E. CEILING M F. ADJUSTAB G. PENCIL PR H. CABINET F		T THERMOS	RMOSTAT REQUI SHOWN WITHOU	TYPE OF THE NIT HEATERS VITH A UNIT	SEE PLANS FOF MOUNTED). U BE PROVIDED \	<u>NOTES:</u> 1. 2. 3.

# EQUIVALENT MANUFACTURERS LISTING

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

(ALPHABETICAL ORDER)

AIR DISTRIBUTION: CARNES, METAL\*AIRE, NAILOR, PRICE, TITUS, TUTTLE & BAILEY, KRUEGER ELECTRIC WALL/UNIT HEATERS: MARKEL, MODINE, RAYWALL, BERKO, QMARK

FANS: COOK, GREENHECK, PENN, TWIN CITY FAN COIL UNITS: CARRIER, INTERNATIONAL, TRANE, YORK/JOHNSON, MCQUAY, TEMSPE

FIRE DAMPERS: GREENHECK, NAILOR, RUSKIN, POTTORFF, NCA, SAFE-AIRE

LOUVER: GREENHECK, RUSKIN, SAFE-AIR, POTTORFF

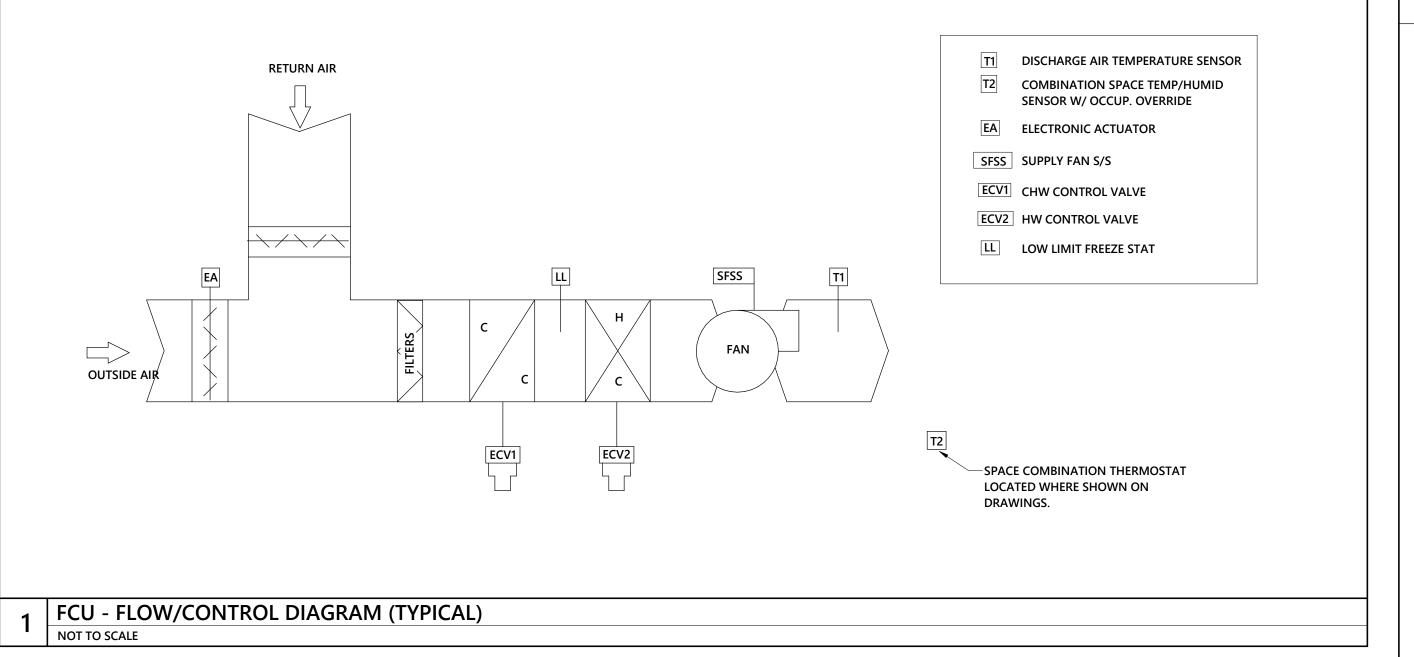
NOTE:

ALL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT TO COMPLY WITH BASIS OF DESIGN, INCLUDING PROVIDING MAINTEN CLEARANCE, PIPING, SHEET METAL, ELECTRICAL, REPLACEMENT OF SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC., SHAL ORIGINAL BASE BID. NO ADDITIONAL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT WILL BE APPROVED DURING CONSTRU WILL BE THE RESPONSIBILITY OF TH MECHANICAL CONTRACTOR.

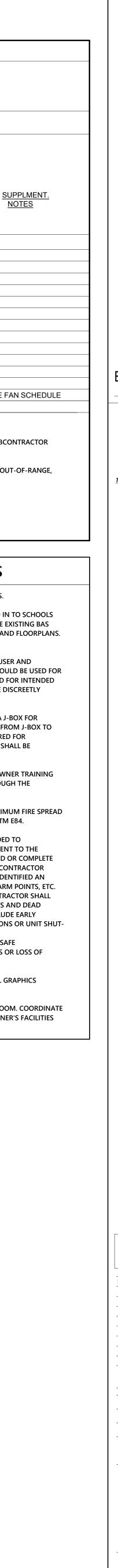
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ECHANIC	AL	
CONTR	OL TYPE 5	
TIONS MPER RIPTION  	NOTES	
RDERS. AT AMPERS MAN	UFACTURER	
M. MA	ACROAIR 08XL5506	
DAMPENI WARRAN		
ACCESSOR A,B,D A,B,D TER ACCE	SSORIES:	
CT SWITC HERMOST INTED TH WALL BO OUNTED LE DISCH/ DOF LOU	CH CAT ERMOSTAT X INSTALL BRACKETS ARGE LOUVERS	
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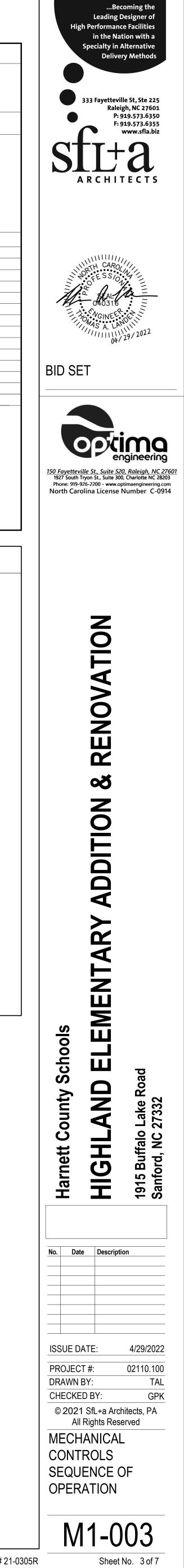
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BID SET	
ISO Fayetteville St., Suite 520 1927 South Tryon St., Suite 300 Phone: 919-926-2200 - www.op North Carolina License N	, Charlotte NC 28203 timaengineering.com
Harnett County Schools HIGHLAND ELEMENTARY ADDITION & RENOVATION	1915 Buffalo Lake Road Sanford, NC 27332
No.       Date       Description         No.       Date       Description         No.       Date       Description         ISSUE DATE:       ISSUE DATE:         PROJECT #:       DRAWN BY:         CHECKED BY:       © 2021 SfL+a Arch All Rights Reset         MECHANICAL SCHEDULES	4/29/2022 02110.100 TAL GPK hitects, PA erved
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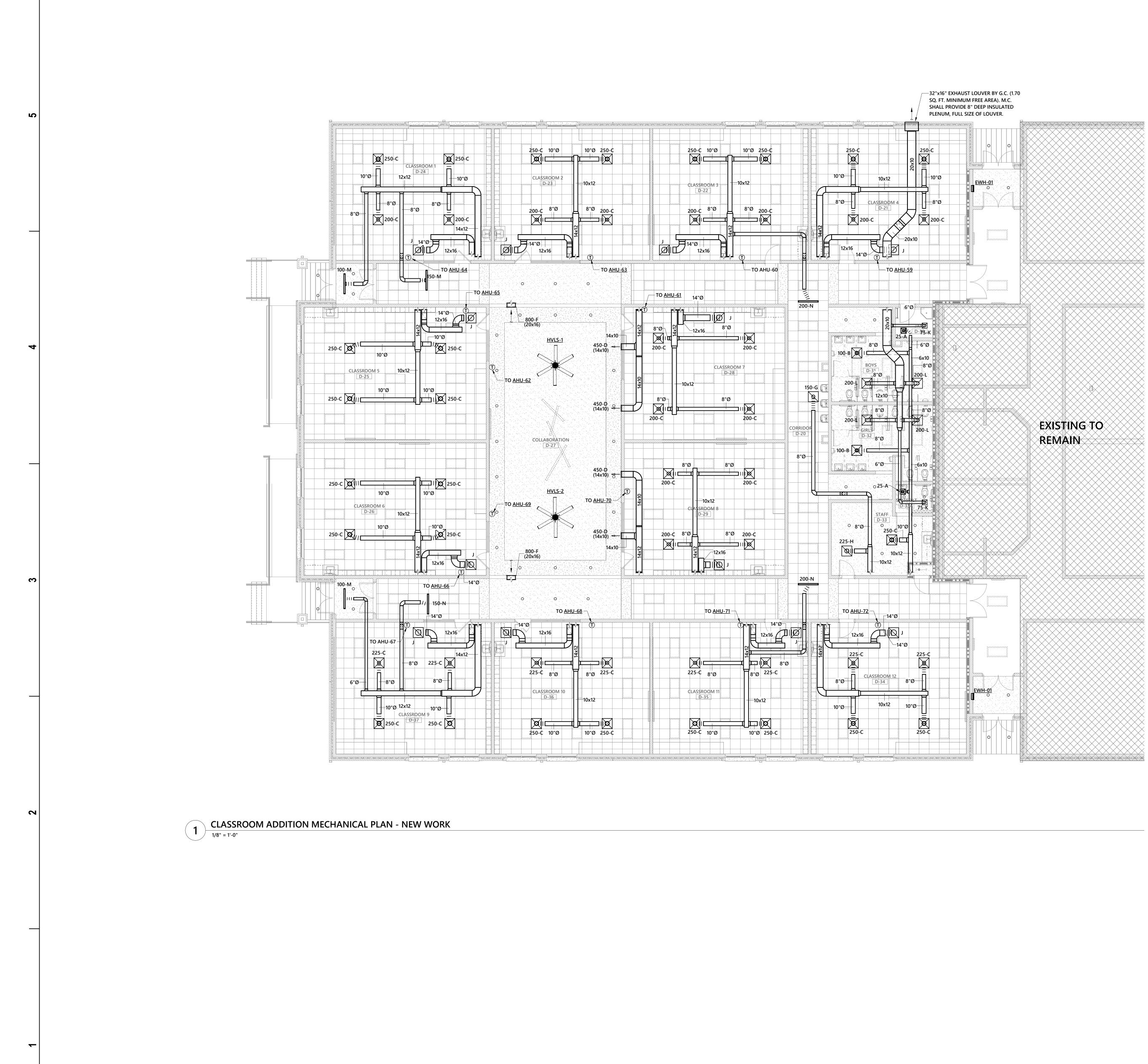
E	D	C	B	Α
		ACCORDANCE WITH THE SPECIFICATIONS (SECTION 230900) AND AS INTENDED ON THESE PLANS. ALL CONTROL POINTS AND VENT THAT THE VERBIAGE IS IN CONFLICT OR CONTRADICTS THE REQUIREMENTS LISTED HERE, THE QUESTION SHALL BE ASKEI		
4		S WITH EQUIPMENT VENDORS AND CONTROLS CONTRACTOR PRIOR TO PURCHASING EQUIPMENT AND PROVIDE ALL EQUIPM WE ADDITED TO PURCHASING EQUIPMENT AND PROVIDE ALL EVENTS AND THE PROFERED AND PROVIDE AND TAY PARAMENT AND PROVIDE AND TAY PARAMENT AND PROVIDE AND TAY PARAMENT AND PROVIDE AND PROPENTE AND PROVIDE AND PROPENTE	NENT WITH COMMUNICATION/INTERFACE CARDS AS REQUIRED FOR  INPUTS INPUTS ANALOG BINARY SYSTEM,	TRACTOR AND IS NOT INTENDED TO BE COMPLETE. IN THE CONTROLS SUBMITTAL, THE SUBCONTRARAMETERS, AND ALARM POINTS. THE CONTROLS S FROM SETPOINTS TO PREVENT EQUIPMENT FROM SHORT CYCLING WHEN NEAR TAKE CORRECTIVE ACTIONS OR EQUIPMENT SHUTDOWNS. TRANSMITTERS SHALL INCLUDE OUT-OF- D FAIL DE-ENERGIZER, HOLD LAST STATE, OR DEFAULT TO A
		RETURN AIR	T1       DISCHARGE AIR TEMPERATURE SENSOR         T2       COMBINATION SPACE TEMP/HUMID         SENSOR W/ OCCUP. OVERRIDE         EA       ELECTRONIC ACTUATOR         SFSS       SUPPLY FAN S/S         ECV1       CHW CONTROL VALVE	<ol> <li>SEE SPECIFICATIONS SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.</li> <li>1. SEE SPECIFICATIONS SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.</li> <li>2. HVAC CONTROLS FOR CLASSROOM ADDITION PROJECT TO BE INTEGRATED IN TO SUEXISTING BAS. ALL POINTS AND EQUIPEMENT TO BE ACCESSIBLE FROM THE EXISTING FRONT END AS INDICATED WITH ADDITIONAL GRAPHICS FOR EQUIPMENT AND FLOEXISTING CONTROLS BY RELIABLE CONTROLS CORPORATION.</li> <li>3. ALL CONTROL SETPOINTS SHALL BE ADJUSTABLE AND TRENDABLE BY THE USER AN MAINTENANCE DEPARTMENT. INDICATED SCHEDULES AND SETPOINTS SHOULD BE ORIGINAL SYSTEM SET-UP. ANY CHANGES IN SETPOINT SETTINGS REQUIRED FOR IN SYSTEM OPERATION SHALL BE APPROVED BY THE ENGINEER AND SHALL BE DISCRET</li> </ol>
ξ		EA SUBJICE AIR C C C C C C C C C C C C C	SPACE COMBINATION THERMOSTAT	<ul> <li>4. ELECTRICAL CONTRACTOR SHALL BE APPROVED BY THE ENGINEER AND SHALL BE DISCREDINDICATED ON THE AS-BUILT DRAWINGS.</li> <li>4. ELECTRICAL CONTRACTOR SHALL PROVIDE A DEDICATED 120V CIRCUIT IN A J-BOX FOR CONTROL POWER. CONTROLS CONTRACTOR SHALL EXTEND 120V POWER FROM J-CONTROL PANELS, DAMPER ACTUATORS, TRANSFORMERS, ETC. AS REQUIRED FOR INSTALLATION OF THE CONTROL SYSTEM. ALL CONTROL TRANSFORMERS SHALL B SEPARATELY INTERNALLY FUSED OR HAVE MANUAL RESETS.</li> <li>5. CONTROLS CONTRACTOR SHALL PROVIDE A MINIMUM OF 24 HOURS OF OWNER TH PROVIDED BY A FACTORY CERTIFIED REPRESENTATIVE. COORDINATE THROUGH TH MECHANICAL CONTRACTOR AND CONSTRUCTION MANAGEMENT FIRM.</li> <li>6. ALL CONTROL AND POWER WIRING SHALL BE PLENUM-RATED WITH A MINIMUM FIRATING OF 25 AND A MINIMUM SMOKE DEVELOPED RATING OF 50 PER ASTM E84.</li> <li>7. THE SEQUENCE OF OPERATION OF OPERATION AND POINTS LIST IS INTENDED TO COMMUNICATE THE MINIMUM REQUIREMENTS AND GENERAL DESIGN INTENT TO CONTROLS CONTRACTOR AND IS NOT INTENDED TO BE A FULLY DEVELOPED OR COMMUNICATE THE MINIMUM SMOKE DEVELOPED TO BE A FULLY DEVELOPED OR COMMUNICATE THE MINIMUM REQUIREMENTS AND GENERAL DESIGN INTENT TO CONTROLS CONTRACTOR AND IS NOT INTENDED TO BE A FULLY DEVELOPED OR COMMUNICATE THE MINIMUM SMOKE DEVELOPED TO BE A FULLY DEVELOPED OR COMMUNICATE THE MINIMUM REQUIREMENTS AND GENERAL DESIGN INTENT TO CONTROLS CONTRACTOR AND IS NOT INTENDED TO BE A FULLY DEVELOPED OR COMMUNICATE THE MINIMUM SMOKE DEVELOPED TO BE A FULLY DEVELOPED OR COMMUNICATE THE MINIMUM SMOKE DEVELOPED TO BE A FULLY DEVELOPED OR COMMUNICATE THE MINIMUM SMOKE DEVELOPED TO BE A FULLY DEVELOPED OR COMMUNICATE THE MINIMUM SMOKE DEVELOPED TO BE A FULLY DEVELOPED OR COMMUNICATE THE MINIMUM AND IS NOT INTENDED TO BE A FULLY DEVELOPED OR COMMUNICATE THE MINIMUM PROVIDES AND INTENDED TO BE A FULLY DEVELOPED OR COMMUNICATE THE MINIMUM FULLY DEVELOPED OR COMMUNICATE THE MINIMUM SMORE DEVELOPED TO BE A FULLY DEVELOPED OR COMMUNICATE THE MINIMUM FULLY DEVELOPED OR COMMUNICATE THE MINIMUM FULLY DEVELOPED OR</li></ul>
		1 FCU - FLOW/CONTROL DIAGRAM (TYPICAL) NOT TO SCALE	DRAWINGS.	<ul> <li>CONTROLS CONTRACTOR AND IS NOT INTENDED TO BE A FOLLY DEVELOPED OR CONTRACTOR AND IS NOT INTENDED TO BE A FOLLY DEVELOPED OR CONSEquence of operations for all systems identified shall fully develop the sequence of operations for all systems identified shall present all setpoints, control parameters, time delays, alarm points arequired to comply with the design intent. The controls contractor incorporate standard features such as minimum run time delays and the bands to prevent short cycling. All monitored points shall include each high/LOW alarm notifications prior to required corrective actions or downs.</li> <li>CONTROL CONTRACTOR SHALL SPECIFY IN THE CONTROL SUBMITTAL FAIL SAFE POSITION FOR OUT OF RANGE, FAIL SAFE POSITIONING FOR OPEN CIRCUITS OR LOS COMMUNICATION.</li> <li>ALARMS THROUGH THE BAS SYSTEM SHALL BE VISIBLE ON THE INDIVIDUAL GRAPH THEMSELVES, NOT ONLY ON THE SUMMARY PAGE.</li> <li>LOCATE MAIN CONTROL HUBS FOR ADDITION CONTROLS IN ELECTRICAL ROOM. CO EXACT LOCATION OF PANELS WITH ALL OTHER TRADES AND BUILDING OWNER'S FAULT ON THE SUMMARY PAGE.</li> </ul>
7				DEPARTMENT PRIOR TO INSTALLATION.
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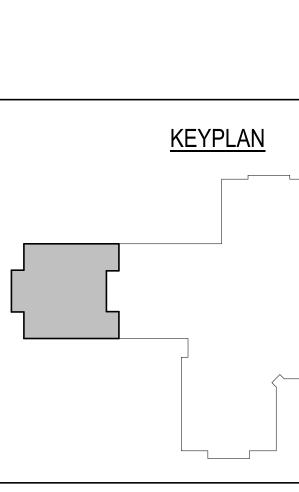


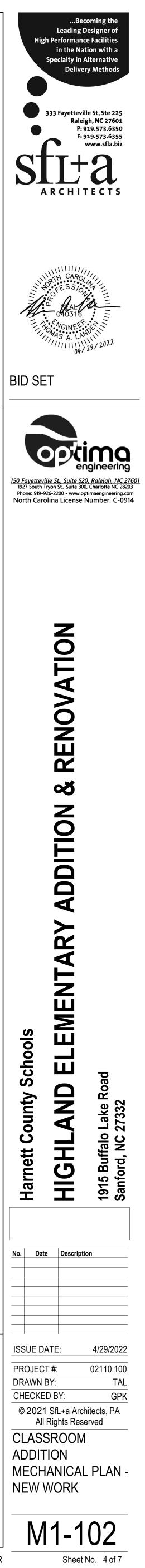


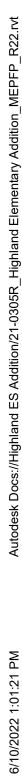
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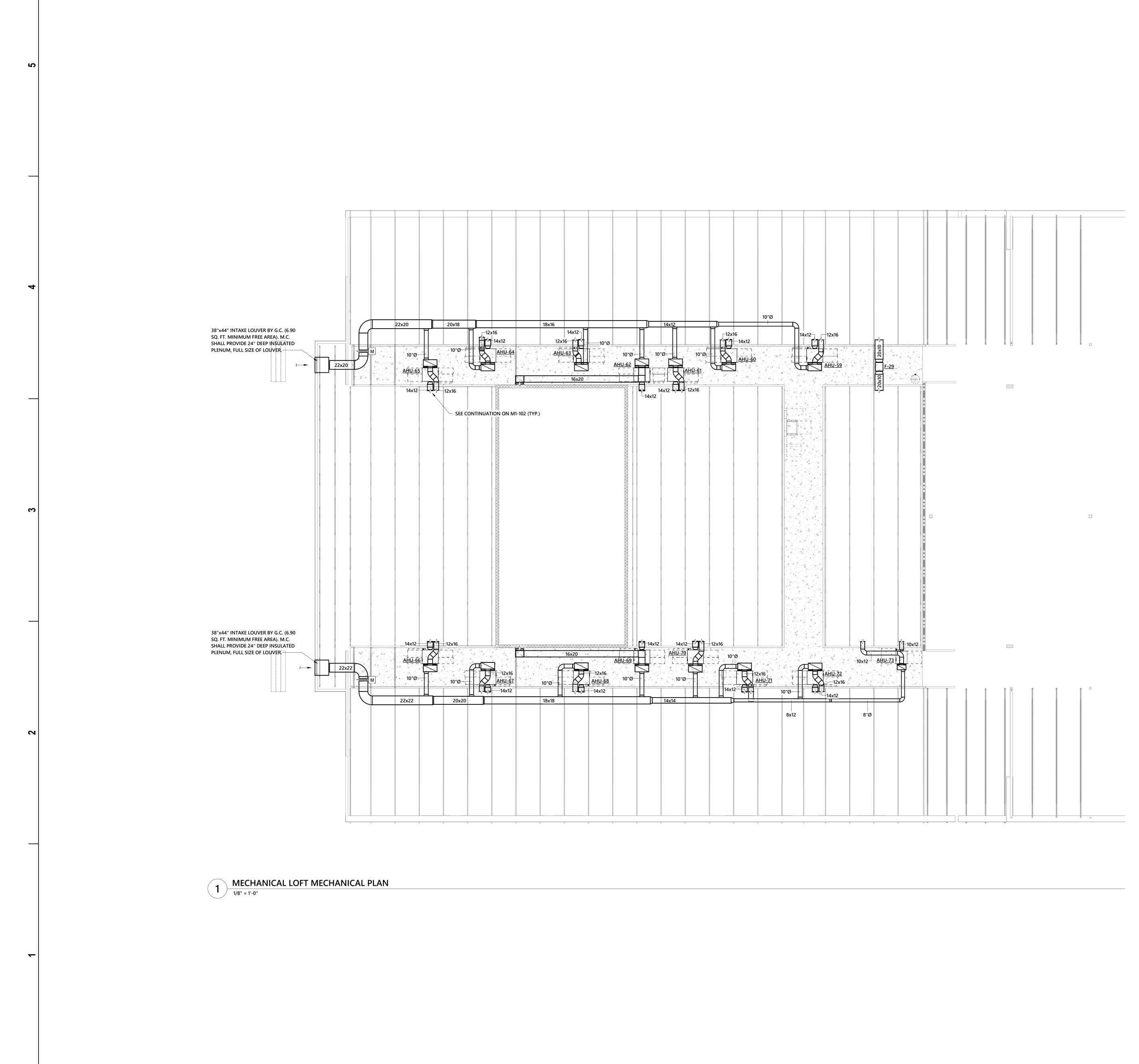
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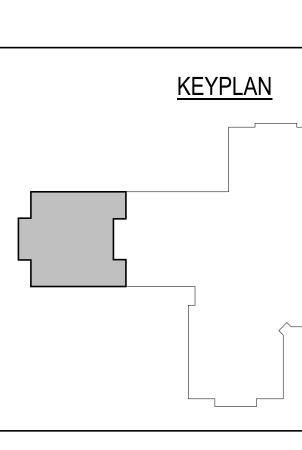


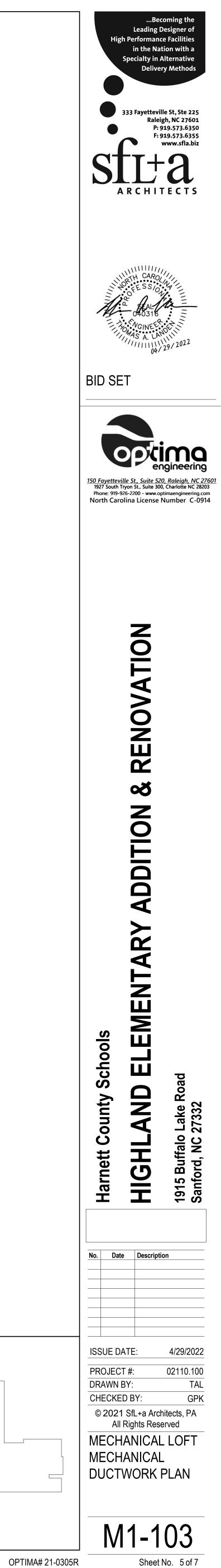


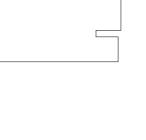


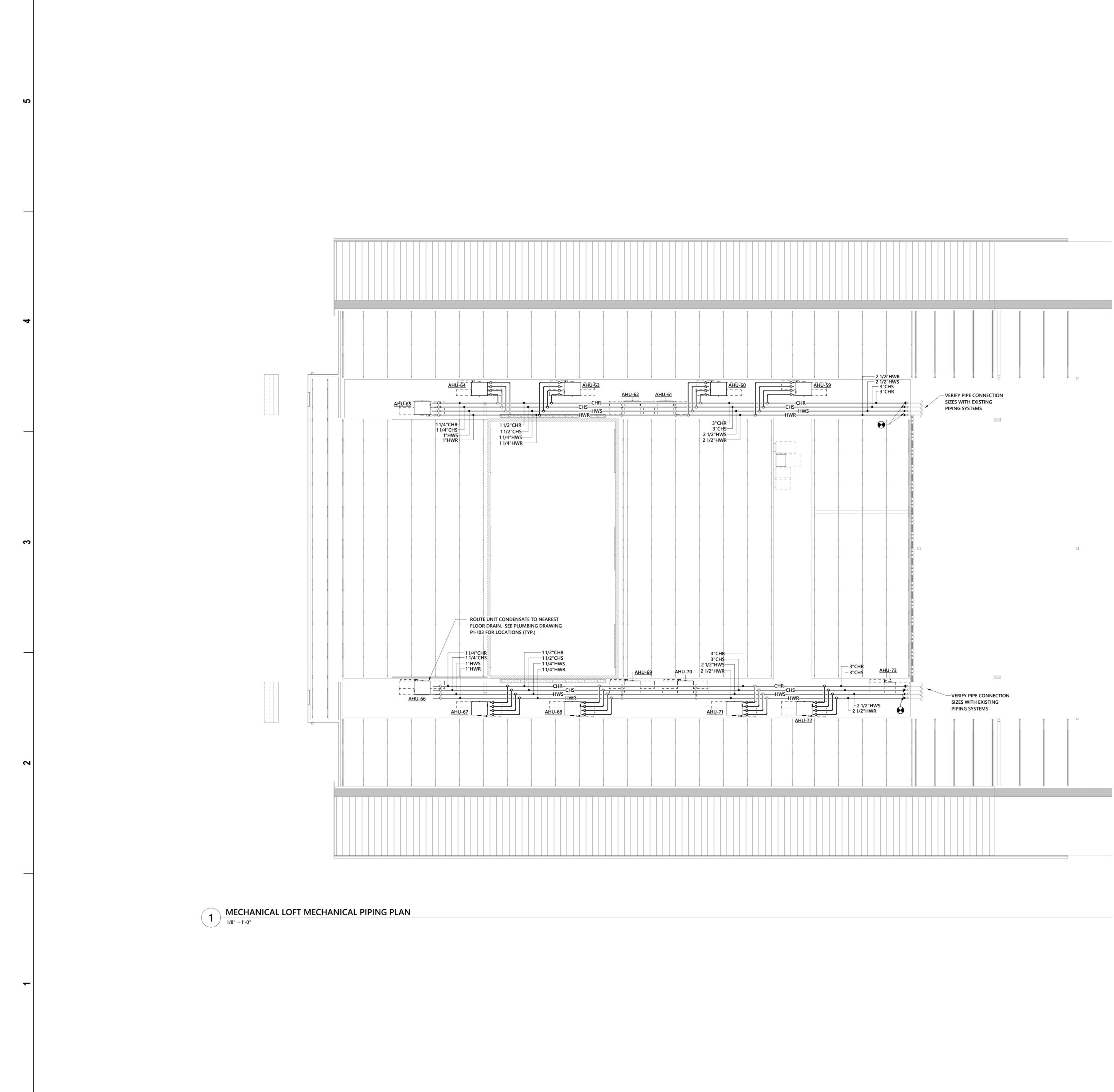
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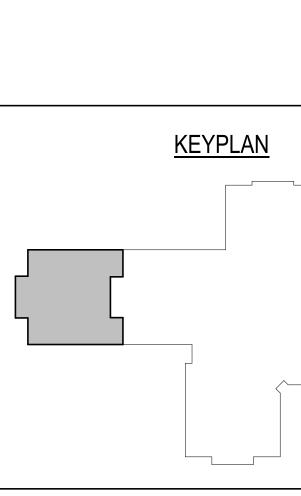


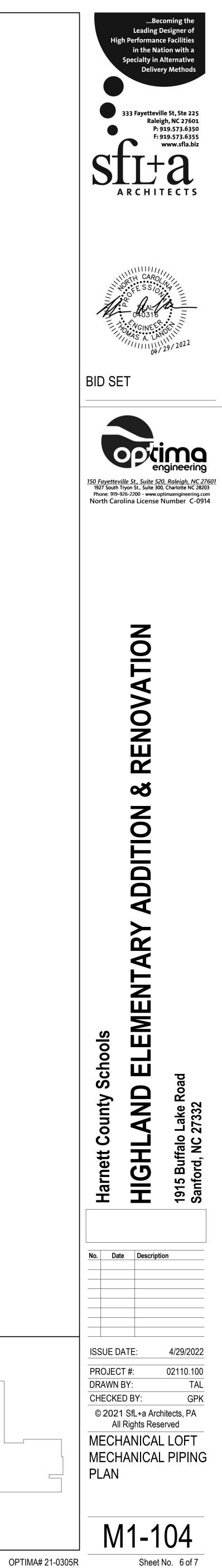


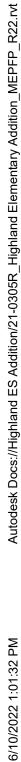




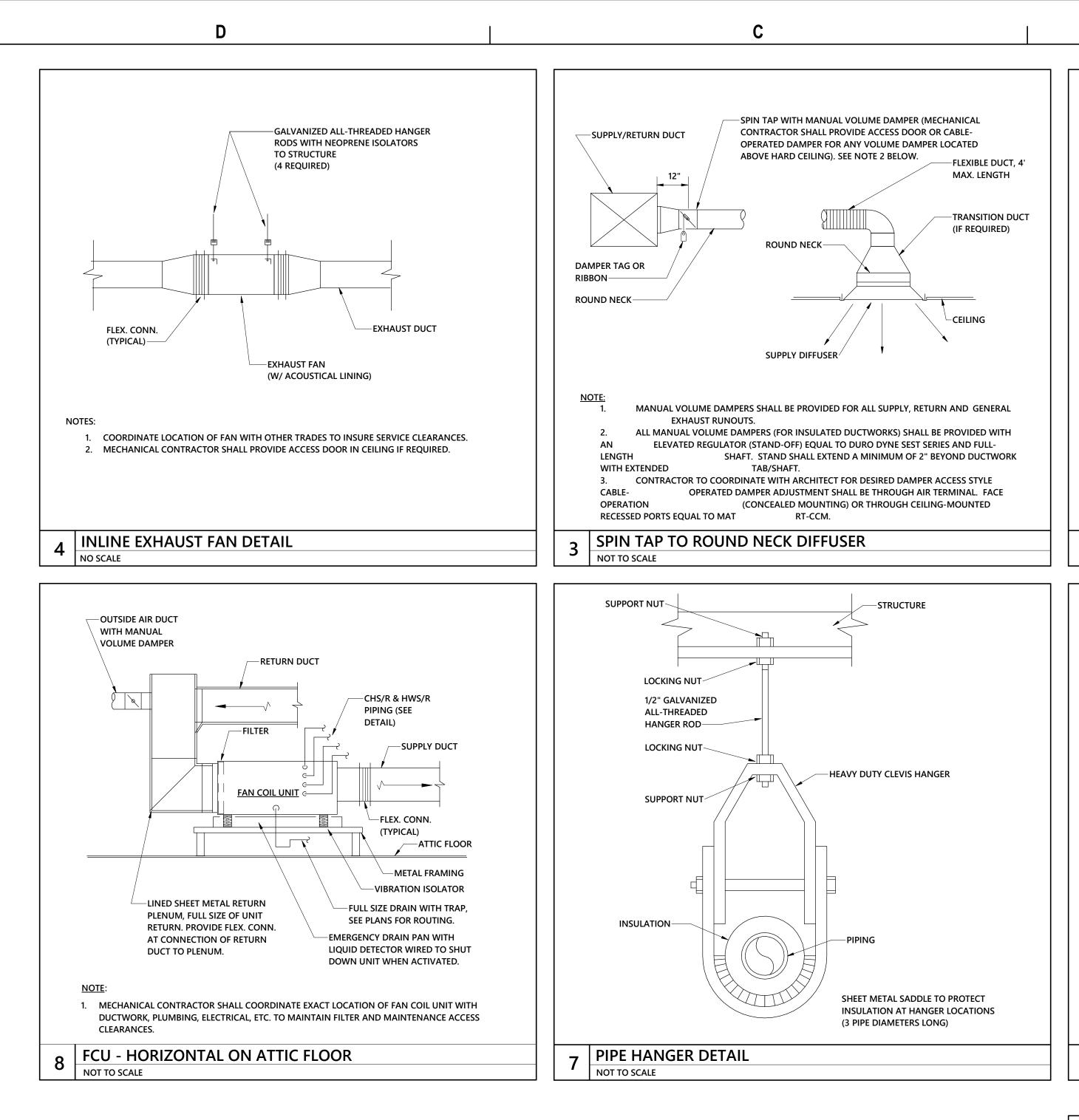
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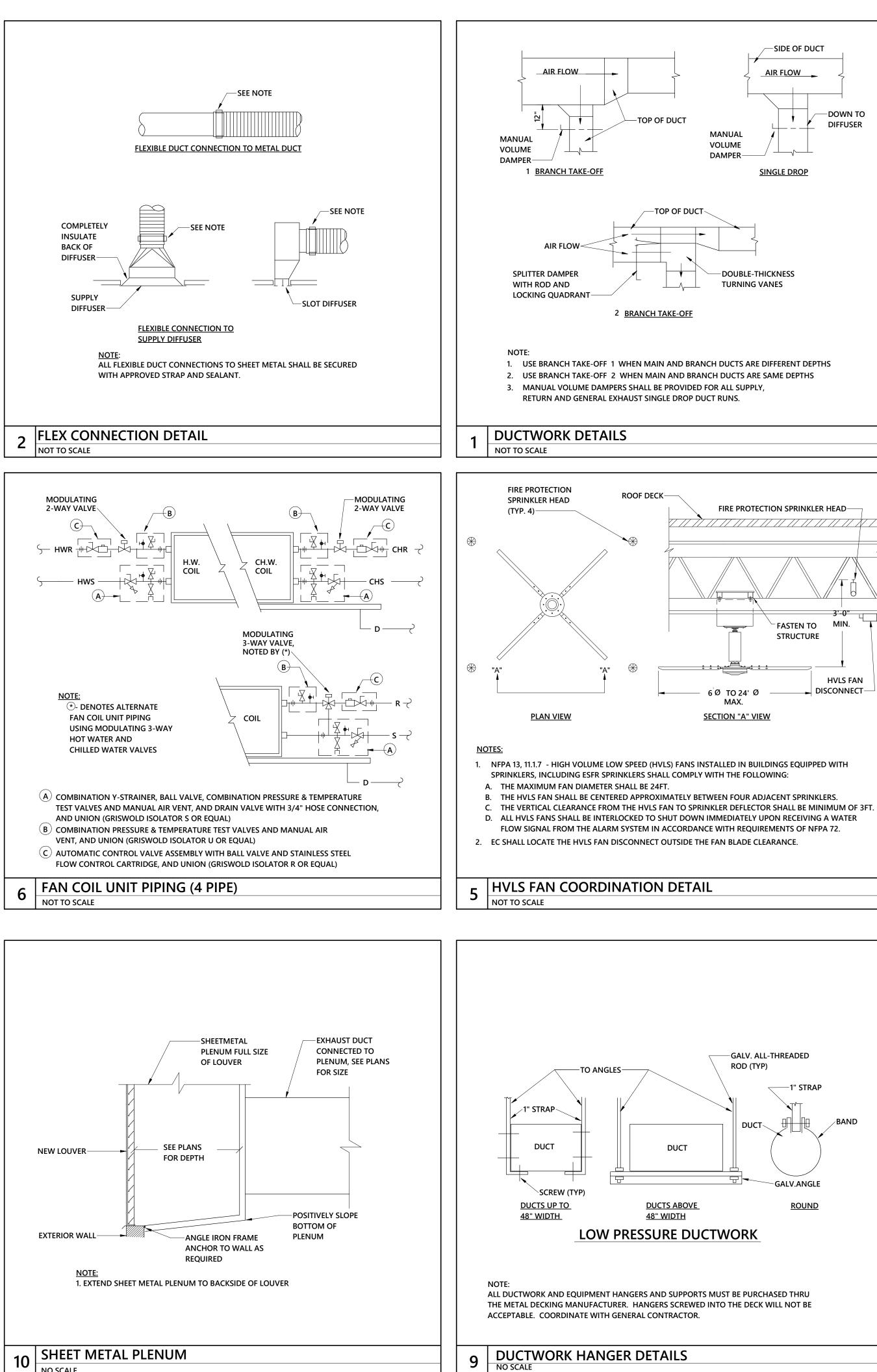




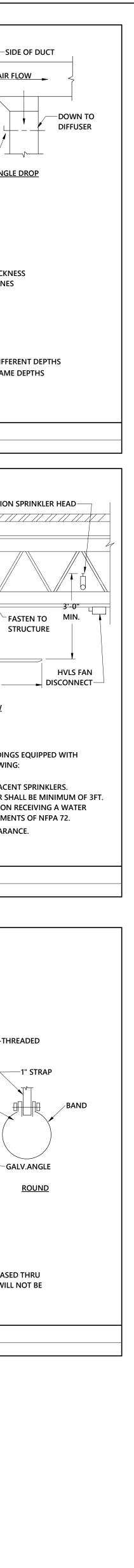


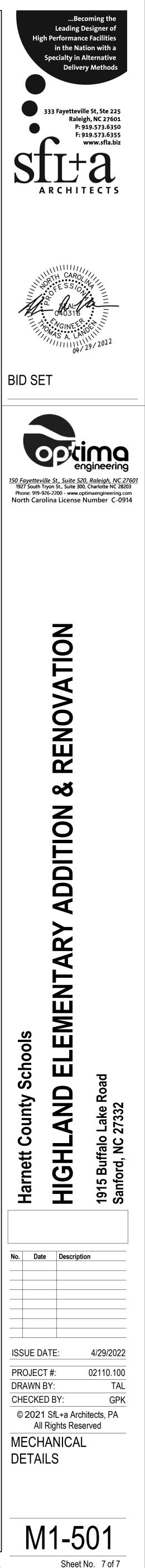
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2018 NORTH CAROLINA ENERGY CONSERVATION CODE COMMERCIAL ENERGY EFFICIENCY - ELECTRICAL SUMMARY
C401 METHOD OF COMPLIANCE         2018 NCECC CHAPTER 4       NC SPECIFIC COMCHECK PROVIDED         N/A BASED ON PROJECT SCOPE       ASHRAE 90.1-2013         C406 ADDITIONAL EFFICIENCY PACKAGE OPTIONS       C406.2 EFFICIENT MECH EQUIPMENT         C406.2 EFFICIENT MECH EQUIPMENT       C406.5 ON-SITE RENEWABLE ENERGY         C406.3 REDUCED LTG DENSITY       C406.6 DEDICATED OA SYSTEM         C406.4 ENHANCED DIGITAL LTG CNTLS       C406.7 HI-EFF SERVICE WTR HTG         NOT APPLICABLE BASED ON PROJECT SCOPE       C406.7.1 WTR HTG LOAD FRACTION
C405.2 - LIGHTING CONTROLS (MANDATORY REQUIREMENTS):  LIGHTING SYSTEMS ARE PROVIDED WITH CONTROLS AS REQUIRED PER SECTION C405.2, EXCEPT WHERE EXEMPT.  NOT APPLICABLE C405.3 - EXIT SIGNS (MANDATORY REQUIREMENTS):  INTERNALLY ILLUMINATED EXIT SIGNS DO NOT EXCEED 5 WATTS PER SIDE. NOT APPLICABLE C405.4 - INTERIOR LIGHTING POWER REQUIREMENTS (PRESCRIPTIVE) (NON-EXEMPT):
<ul> <li>NOT APPLICABLE PER 2018 NCECC C503.1, EXCEPTION 2.G.</li> <li>C405.4.1 - TOTAL CONNECTED INTERIOR LIGHTING POWER:         <ul> <li>8,440</li> <li>WATTS SPECIFIED</li> <li>40</li> <li>% REDUCTION OF SPECIFIED VS. ALLOWED (APPLICABLE IF C406.1.2 IS SELECTED)</li> </ul> </li> <li>C405.4.2 - TOTAL ALLOWABLE INTERIOR LIGHTING POWER:         <ul> <li>METHOD OF COMPLIANCE:</li> <li>BUILDING AREA METHOD</li> <li>14,045</li> <li>WATTS ALLOWED</li> </ul> </li> </ul>
C405.5.1 - EXTERIOR BUILDING LIGHTING POWER (NON-EXEMPT):   NOT APPLICABLE  TOTAL CONNECTED EXTERIOR LIGHTING POWER:
<ul> <li>UNIT IN GROUP R-2 BUILDINGS.</li> <li>NOT APPLICABLE</li> <li>C405.7 - ELECTRICAL TRANSFORMERS (MANDATORY REQUIREMENTS):</li> <li>ELECTRICAL TRANSFORMERS HAVE BEEN SPECIFIED TO MEET MINIMUM EFFICIENCY REQUIREMENTS PER C405.7, EXCEPT WHERE EXEMPT.</li> <li>NOT APPLICABLE</li> <li>C405.8 - ELECTRICAL MOTORS (MANDATORY REQUIREMENTS):</li> </ul>
<ul> <li>ELECTRICAL MOTORS HAVE BEEN SPECIFIED TO MEET MINIMUM EFFICIENCY REQUIREMENTS PER C405.8, EXCEPT WHERE EXEMPT.</li> <li>NOT APPLICABLE</li> <li>SYSTEM COMMISSIONING:</li> <li>PROJECT AREA IS LESS THAN 10,000 SQUARE FEET AND IS EXEMPT FROM THE SYSTEM COMMISSIONING REQUIREMENTS OF SECTION C408.</li> <li>PROJECT AREA IS GREATER THAN 10,000 SQUARE FEET AND REQUIRES SYSTEM COMMISSIONING PER SECTION C408.</li> </ul>

SWITCH FRAME SIZE (AMPERES) FUSE SIZE (AMPERES)

**ELECTRICAL ABBREVIATIONS LIST** 1P 1 POLE (2P, 3P, 4P, ETC.) DCP DOMESTIC WATER HT HEIGHT NEMA N CIRCULATING PUMP HTG HEATING M HTR HEATER DEPT DEPARTMENT AMPERE AS NFDS NC ABOVE COUNTER OR AIR AC DET DETAIL HV HIGH VOLTAGE CONDITIONER DIA DIAMETER HVAC HEATING, VENTILATING AND DIS NIC NOT ABOVE CEILING DISC DISCONNECT AIR CONDITIONING ACLG HWP HYDRONIC WATER PUMP NL NIG ADO AUTOMATIC DOOR OPENER DIST DISTRIBUTION AF AMP FRAME DN DOWN N.O. NOF ABOVE FINISHED FLOOR DPR DAMPER INTERRUPTING CAPACITY NPF NOF AFF IC ABOVE FINISHED GRADE SAFETY DISCONNECT SWITCH ISOLATED GROUND NTS NOT AFG DS IG ARC FAULT CIRCUIT DOUBLE THROW IMC INTERMEDIATE METAL CONDUIT AFI DT INTERRUPTER DWG DRAWING INCAND INCANDESCENT OH OVI **AIR HANDLING UNIT** IR INFRARED OL OVE AHU I/W INTERLOCK WITH ALUMINUM EC ELECTRICAL CONTRACTOR AL ELEC ELECTRIC, ELECTRICAL ALT ALTERNATE PA PU ELEV ELEVATOR J-BOX JUNCTION BOX AMP AMPERE PB PU AMPL AMPLIFIER EM EMERGENCY PE PN EMS ENERGY MANAGEMENT SYSTEM ANNUN ANNUNCIATOR PED KILOVOLT PE KV PF POV EMT ELECTRICAL METALLIC TUBING KVA APPROX APPROXIMATELY KILOVOLT-AMPERE KVAR KILOVOLT-AMPERE REACTIVE PH AQ-STAT AQUASTAT EP ELECTRIC PNEUMATIC PH/ KW KILOWATT ARCHITECT, ARCHITECTURAL EQUIP EQUIPMENT PIV ARCH PC ER EXISTING ITEM RELOCATED TO THIS KWH KILOWATT HOUR PNL AS AMP SWITCH PA LOCATION PP AT AMP TRIP PC EWC ELECTRIC WATER COOLER LOC LOCATE OR LOCATION ATS AUTOMATIC TRANSFER SWITCH PR PAI AUTO AUTOMATIC EXIST EXISTING LT LIGHT PRI PRIN AUX AUXILIARY EXH EXHAUST LTG LIGHTING PROJ PRO AUDIO VISUAL EXP EXPLOSION PROOF LTNG LIGHTNING PRV POV AV AMERICAN WIRE GAUGE LV LOW VOLTAGE PT POT AWG FA FIRE ALARM PVC POL BATT FABP FIRE ALARM BOOSTER POWER MAX MAXIMUM BATTERY (C PWR POW BOARD SUPPLY PANEL MAG.S MAGNETIC STARTER BD BUILDING FACP FIRE ALARM CONTROL PANEL M/C MOMENTARY CONTACT BLDG FCU FAN COIL UNIT BMS BUILDING MANAGEMENT MECHANICAL CONTRACTOR QUAN QU MC SYSTEM FIXT FIXTURE MCB MAIN CIRCUIT BREAKER RCPT RECE FLR FLOOR MCC MOTOR CONTROL CENTER CONDUIT FLUOR FLUORESCENT MDC MAIN DISTRIBUTION CENTER REQD REQ CAB CABINET FU FUSE MDP MAIN DISTRIBUTION PANEL RL EXIS CAT CATALOG FUDS FUSED SAFETY DISCONNECT MFR MANUFACTURER REL MFS MAIN FUSED DISCONNECT RM EXIS CATV CABLE TELEVISION SWITCH СВ CIRCUIT BREAKER SWITCH RSC RIGI CCTV CLOSED CIRCUIT TELEVISION GA GAUGE MH MANHOLE RTU ROC СКТ CIRCUIT GAL GALLON MIC MICROPHONE CLG CEILING GALV GALVANIZED MIN MINIMUM SC SUF COMB COMBINATION GC GENERAL CONTRACTOR MISC MISCELLANEOUS SEC SEC CMPR COMPRESSOR GEN GENERATOR MLO MAIN LUGS ONLY SHT SHE CONN CONNECTION GFI GROUND FAULT CIRCUIT MMS MANUAL MOTOR STARTER SIM SIM CONST CONSTRUCTION INTERRUPTER MOA MULTIOUTLET ASSEMBLY S/N SOL GFP GROUND FAULT PROTECTOR CONT CONTINUATION OR MSP MOTOR STARTER PANELBOARD SPEC SPEC CONTINUOUS GND GROUND MSBD MAIN SWITCHBOARD SPKR SPE CONTR CONTRACTOR GRS GALVANIZED RIGID STEEL MT MOUNT SP SPA MT.C EMPTY CONDUIT (CONDUIT) SR SUF CONV CONVECTOR GYP BD GYPSUM BOARD CIRCULATING PUMP MTS MANUAL TRANSFER SWITCH SS СР STA MTR MOTOR, MOTORIZED CRT CATHODE-RAY TUBE SSW SELE HOA HANDS-OFF-AUTOMATIC S/S STOP CURRENT TRANSFORMER СТ CTR N.C. NORMALLY CLOSED STA STAT CENTER SWITCH HORIZ HORIZONTAL STD STAN CU COPPER NEC NATIONAL ELECTRICAL CODE

HP HORSEPOWER

HPF HIGH POWER FACTOR

2

/F - P- $\overline{\phantom{a}}$ 

- NEMA RATING

NUMBER OF POLES

**ELECTRICAL DISCONNECT SIZE DISCRIPTION** 

IST			
NEMA	NATIONAL ELECTRICAL	SWBD	SWITCHBOARD
	MANUFACTURER'S	SYM	SYMMETRICAL
	ASSOCIATION	SYS	SYSTEM
NFDS	NON-FUSED SAFETY	TEL	TELEPHONE
NIDS	DISCONNECT SWITCH		TA TELEPHONE/DATA
NIC	NOT IN CONTRACT	TERM	TERMINAL
NL	NIGHT LIGHT	TL	TWIST LOCK
N.O.	NORMALLY OPEN	TR	TAMPER RESISTANT
NPF	NORMAL POWER FACTOR	T-STAT	
NTS	NOT TO SCALE	TTC	TELEPHONE TERMINAL
NIS	NOT TO SCALE	THC .	CABINET
ОН	OVERHEAD	τν	TELEVISION
OL	OVERLOADS	тутс	TELEVISION TERMINAL
0L	OVEREGADS	IVIC	CABINET
PA	PUBLIC ADDRESS	ТҮР	TYPICAL
PA	PULL BOX OR PUSHBUTTON	ITF	ITFICAL
PE	PNEUMATIC ELECTRIC	UC	UNDER COUNTER
PED	PEDESTAL	UE	UNDERGROUND ELECTRICAL
PED	POWER FACTOR	UG	UNDERGROUND
PH	PHASE	UH	UNIT HEATER
PIV	PHASE POST INDICATING VALVE	UT	UNDERGROUND TELEPHONE
PNL	PANEL	UTIL	UTILITY
PP	POWER POLE		UNIT VENTILATOR OR
PR	PAIR	00	ULTRAVIOLET
PRI	PRIMARY		ULIRAVIOLEI
PROJ	PROJECTION	v	VOLT
PRV	POWER ROOF VENTILATOR	VA	VOLT-AMPERES
PT	POTENTIAL TRANSFORMER	VA VDT	
PVC	POLYVINYL CHLORIDE	VERT	
PVC	(CONDUIT)	VERI	VARIABLE FREQUENCY DRIVE
PWR	POWER	VOL	VOLUME
FVIN	POWER	VOL	VOEDIVIE
QUAN	OUANTITY	w	WATT
QUAN	QUAITIT	W/	WITH
RCPT	RECEPTACLE	WG	
REQD	REQUIRED	WH	WATER HEATER
RL	EXISTING ITEM TO BE	W/O	WITHOUT
	RELOCATED	WP	WEATHERPROOF
RM	EXISTING TO REMAIN	•••	WEATHER ROOT
RSC	RIGID STEEL CONDUIT	XFMR	TRANSFORMER
RTU	ROOF TOP UNIT	XFR	TRANSFER
NI O		XIX	
SC	SURFACE CONDUIT		
SEC	SECONDARY		
SHT	SHEET		
SIM	SIMILAR		
S/N	SOLID NEUTRAL		
SPEC	SPECIFICATION	/ 4	NGLE
SPKR	SPEAKER	$\angle$	AT AT
SP	SPARE		DELTA
SR	SURFACE RACEWAY		EET
SS	STAINLESS STEEL		NCHES
SSW	SELECTOR SWITCH	•	IUMBER
53W S/S	STOP/START PUSHBUTTONS		PHASE
STA	STATION		ENTER LINE
STA	STANDARD		
	SURFACE MOUNTED	. r	
SW	SWITCH		
500	Stillen		

# SYMBOL SCHEDULE POWER

YMBOL	DESCRIPTION
<u></u>	WIRING SYSTEM CONCEALED IN WALL OR CEILING. WHEN SHOWN, CROSS LINES
	INDICATE NUMBER OF WIRES. (GROUND WIRES ARE NOT SHOWN)
~~	WIRING SYSTEM CONCEALED IN OR UNDER SLAB OR UNDERGROUND.
Ň	UNWITCHED LEG OF LIGHTING CIRCUIT WHEN SHOWN ON LIGHTING PLANS.
$\sim$	WIRING SYSTEM LOW VOLTAGE
	CONDUIT TURNED UP TO FLOOR ABOVE.
•	CONDUIT TURNED DOWN TO FLOOR BELOW.
	BRANCH CIRCUIT HOMERUN TO PANEL.

	SYMBOL SCHEDULE POWER LEGEND
ю	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.
⊦⊝≘	JUNCTION BOX FOR HAND DRYER CONNECTION; COORDINATE MOUNTING HEIGHTS WITH ARCHITECT. SEE DETAIL 2/ SHEET E-501 FOR REQUIREMENTS.
0.0 hp ∽	FRACTIONAL HORSEPOWER MANUAL MOTOR STARTER, WITH OVERLOAD PROTECTION
	RECTANGULAR DUCT MOUNTED MOTOR OPERATED DAMPER, INTERLOCK WITH FAN AS INDICATED. (DAMPER BY M.C.)
ELE	CTRICAL FIXTURES LEGEND - COMMERCIAL
ELE ==	TAMPER RESISTANT DUPLEX RECEPTACLE, 20 AMP, 120 VOLT
	TAMPER RESISTANT DUPLEX RECEPTACLE, 20 AMP, 120 VOLT         TAMPER RESISTANT GROUND FAULT RECEPTACLE. NEMA 5-20R DUPLEX. ALL RECEPTACLES
+ + = 5 5	TAMPER RESISTANT DUPLEX RECEPTACLE, 20 AMP, 120 VOLTTAMPER RESISTANT GROUND FAULT RECEPTACLE. NEMA 5-20R DUPLEX. ALL RECEPTACLES INSTALLED OUTSIDE, WITHIN 6' OF A SINK OR IN A KITCHEN SHALL BE GFCI.TAMPER RESISTANT DUPLEX RECEPTACLE, 20 AMP, 120 VOLT, MOUNTED ABOVE COUNTER BACKSPLASH, COORDINATE MOUNTING HEIGHTS WITH ARCHITECTURAL ELEVATIONS PRIOR TO
+ + = = = = = =	TAMPER RESISTANT DUPLEX RECEPTACLE, 20 AMP, 120 VOLT         TAMPER RESISTANT GROUND FAULT RECEPTACLE. NEMA 5-20R DUPLEX. ALL RECEPTACLES         INSTALLED OUTSIDE, WITHIN 6' OF A SINK OR IN A KITCHEN SHALL BE GFCI.         TAMPER RESISTANT DUPLEX RECEPTACLE, 20 AMP, 120 VOLT, MOUNTED ABOVE COUNTER         BACKSPLASH, COORDINATE MOUNTING HEIGHTS WITH ARCHITECTURAL ELEVATIONS PRIOR TO         ROUGH-IN.         TAMPER RESISTANT GROUND FAULT DUPLEX RECEPTACLE, NEMA 5-20R MOUNTED ABOVE         COUNTER BACKSPLASH, COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL ELEVATIONS
	TAMPER RESISTANT DUPLEX RECEPTACLE, 20 AMP, 120 VOLT         TAMPER RESISTANT GROUND FAULT RECEPTACLE. NEMA 5-20R DUPLEX. ALL RECEPTACLES INSTALLED OUTSIDE, WITHIN 6' OF A SINK OR IN A KITCHEN SHALL BE GFCI.         TAMPER RESISTANT DUPLEX RECEPTACLE, 20 AMP, 120 VOLT, MOUNTED ABOVE COUNTER BACKSPLASH, COORDINATE MOUNTING HEIGHTS WITH ARCHITECTURAL ELEVATIONS PRIOR TO ROUGH-IN.         TAMPER RESISTANT GROUND FAULT DUPLEX RECEPTACLE, NEMA 5-20R MOUNTED ABOVE COUNTER BACKSPLASH, COORDINATE MOUNTING HEIGHTS WITH ARCHITECTURAL ELEVATIONS PRIOR TO ROUGH-IN.
- - - - - - - - - - - - - -	TAMPER RESISTANT DUPLEX RECEPTACLE, 20 AMP, 120 VOLT TAMPER RESISTANT GROUND FAULT RECEPTACLE. NEMA 5-20R DUPLEX. ALL RECEPTACLES INSTALLED OUTSIDE, WITHIN 6' OF A SINK OR IN A KITCHEN SHALL BE GFCI. TAMPER RESISTANT DUPLEX RECEPTACLE, 20 AMP, 120 VOLT, MOUNTED ABOVE COUNTER BACKSPLASH, COORDINATE MOUNTING HEIGHTS WITH ARCHITECTURAL ELEVATIONS PRIOR TO ROUGH-IN. TAMPER RESISTANT GROUND FAULT DUPLEX RECEPTACLE, NEMA 5-20R MOUNTED ABOVE COUNTER BACKSPLASH, COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL ELEVATIONS PRIOR TO ROUGH-IN. TAMPER RESISTANT QUAD RECEPTACLE. TWO NEMA 5-20R DUPLEX RECEPTACLES. TAMPER RESISTANT GFI NEMA 5-20R QUAD RECEPTACLE FOR ELECTRIC WATER COOLER TO BE SUPPLIED BY GROUND FAULT BREAKER. COORDINATE LOCATION WITH PLUMBING

SPECIAL SYSTEMS LEGEND			
S	FLUSH-MOUNTED CEILING SPEAKER.		
НS	WALL-MOUNTED SPEAKER. 3/4" CONDUIT TO LOCAL CABLE TRAY.		
HS WP	EXTERIOR WEATHERPROOF SPEAKER; SEE DETAIL 1/ SHEET E1-503.		

	FLOOR BOX SYMBOL LEGEND
FB6	SIX GANG FLUSH MOUNTED FLOOR BOX WITH ACESSIBLE COVER FOR POWER AND COMMUNICATIONS. PROVIDE FIVE NEMA 5-20R DUPLEX RECEPTACLES AND ONE COMMUNICATIONS PLATE WITH PROVISION FOR SIX RJ45 CAT6 JACKS. EQUAL TO WIREMOLD RFB6E-OG-8CT. ARCHITECT TO SELECT FINISH. STUB FROM BOX TWO CONCEALED 1 1/2"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.

# EM./LS LIGHTING FIXTURE SYMBOLS AND DEVICES

SYMBOL

DESCRIPTION LED FIXTURE WITH EMERGENCY BATTERY DRIVER. PROVIDE 1100 LUMEN INVERTER RATED FOR 90 MINUTE OPERATION. SEE FIXTURE SCHEDULE FOR FIXTURE TYPE, EMERGENCY DEVICE SHALL SUPPLEMENT FIXTURE.

LIG	HTING FIXTURES SYMBOLS AND DEVICES
0	LED LIGHTING FIXTURE. SEE FIXTURE SCHEDULE. SUSPEND FOUR CORNERS WITH WIRE TO STRUCTURE. DO NOT ALLOW GRID ALONE TO SUPPORT FIXTURE.
<del>0</del>	LED STRIP LIGHT FIXTURE
•	RECESSED LED OR H.I.D. LIGHTING FIXTURE.
н⊗	EXIT LIGHT WITH ARROWS AND NUMBERS OF FACES AS INDICATED ON PLANS. 90 MIN BATTERY BACKUP. SEE LIGHTING FIXTURE SCHEDULE.
⇔ <sup>2</sup>	DOUBLE POLE SWITCH, 20 AMP, 120/277 VOLT, COOPER 1222, OR EQUAL.
ب م	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.
۴	KEY OPERATED SWITCH
ۍ D	DIMMER SWITCH. LUTRON SERIES, OR EQUAL. VERIFY LOAD ON CIRCUIT AND MATCH DIMMER SIZE TO LOAD AND DEVICE QUANTITY. PROVIDE DOUBLE GANG J-BOX WITH SINGLE GANG TRIM PLATE. PROVIDE DIMMING SWITCH AS RECOMMENDED BY LIGHTING MANUFACTURER. MATCH SWITCH TYPE TO SOURCE (LED, FLUORESCENT, OR INCANDESCENT,) WATTAGE, AND QUANTITY.
	CEILING MOUNTED OCCUPANCY SENSOR, DUAL TECHNOLOGY. SENSOR SWITCH CM PDT 10, WATT STOPPER #DT-300, COOPER OAC-DT OR EQUAL.
© DTC	WALL MOUNTED OCCUPANCY SENSOR, DUAL TECHNOLOGY. SENSOR SWITCH WV-PDT, WATT STOPPER #DT-200, LEVITON, GREENGATE OR EQUAL. CONICAL PATTERN, MOUNT AS CLOSE TO CORNER OF ROOM AS POSSIBLE. MOUNT 10' AFF OR 6" BELOW CEILING (IF LOWER THAN 10'.)
\$ <sup>00</sup>	WALL MOUNTED OCCUPANCY SENSOR AND SWITCH. INFRARED TECHNOLOGY WITH NEUTRAL, 120/277V RATED. WATT STOPPER #WS-250, OR EQUAL BY SENSOR SWITCH, AND LEVITON.
∽ <sup>L1</sup>	WALL MOUNTED LOW VOLTAGE ADDRESSABLE LIGHT CONTROL WALL SWITCH ON/OFF FOR 1 ZONE OF LIGHTING. HUBBELL NXSW SERIES OR EQUAL BY ACUITY NLIGHT OR WATTSTOPPER DLM. PROVIDE ON/OFF LABELS FOR EACH BUTTON.
\$ <sup>₽2</sup>	WALL MOUNTED LOW VOLTAGE ADDRESSABLE LIGHT CONTROL WALL SWITCH ON/OFF WITH DIMMING CONTROL FOR 2 ZONES OF LIGHTING. HUBBELL NXSW SERIES OR EQUAL BY ACUITY NLIGHT OR WATTSTOPPER DLM. PROVIDE ON/OFF LABELS FOR EACH BUTTON.
DD	CEILING MOUNTED OCCUPANCY SENSOR POWER PACK. SENSOR SWITCH PP-20, WATT STOPPER

PP #BZ-100, COOPER SP-20, OR EQUAL. ADDRESSABLE ROOM CONTROLLER HUBBELL NXRC OR EQUAL BY ACUITY NLIGHT, PP <sub>NX</sub> WATTSTOPPER DLM.

ADDRESSABLE ROOM CONTROLLER W/ 0-10V DIMMING, HUBBEL NXRC OR EQUAL BY ACUITY PP <sub>NXD</sub> NLIGHT, WATTSTOPPER DLM.

## **TELECOM LEGEND - ELECTRICAL** PLYWOOD TELEPHONE BACKBOARD. SIZE AS INDICATED ON RISER.

<b>4</b> #	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. COORDINATE MOUNTING HEIGHTS WITH ARCHITECT. CABLING TO BE PROVIDED BY STRUCTURED CABLING CONTRACTOR.
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. CABLING TO BE PROVIDED BY STRUCTURED CABLING CONTRACTOR.
HWAP	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. CABLING TO BE PROVIDED BY STRUCTURED CABLING CONTRACTOR.
	CONDUIT SLEEVE, 4" SLEEVE UNLESS OTHERWISE NOTED. PROVIDED BY ELECTRICAL CONTRACTOR.
CABLE TRAY	CABLE TRAY - WIRE MESH 12" WIDE X 4" DEEP (8" RUNG SPACING) SUSPENDED FROM CEILING STRUCTURE UNLESS OTHERWISE NOTED CABLE TRAY SHALL BE COORDINATED WITH MECHANICAL DUCTWORK IN FIELD PRIOR TO INSTALLATION; CONTRACTOR SHALL PRODUCE COORDINATION DRAWINGS AND FIELD ADJUST AS REQUIRED TO MEET INTENT OF DRAWINGS.
TGB	TELECOMMUNICATIONS GROUND BAR.
<ul><li>(1)</li></ul>	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. CABLING TO BE PROVIDED BY STRUCTURED CABLING CONTRACTOR.

## SECURITY DEVICES SYMBOL LEGEND - ELECTRICAL CEILING MOUNTED SECURITY CAMERA LOCATION. CAMERA AND CABLING PROVIDED AND INSTALLED BY OTHERS. PROVIDED JUNCTION BOX AS REQUIRED BY OTHERS. WALL MOUNTED SECURITY CAMERA LOCATION. CAMERA AND CABLING PROVIDED AND INSTALLED BY OTHERS. PROVIDED JUNCTION BOX AS REQUIRED BY OTHERS.

Д	INSTALLED BY OTHERS. TROVIDED JORCHON DOX AS REQUIRED BY OTHERS.
,	X=WP EXTERIOR WALL MOUNTED CAMERA REFER TO DETAIL 2 & 3/ SHEET E-503 FOR REQUIREMENTS.
DC	DOOR CONTACT, MINIMUM 1/2" CONDUIT. PROVIDE SINGLE GANG JUNCTION BOX AND PULL STRING. COORDINATE WITH SECURITY VENDOR; SEE DETAIL 9/ SHEET E-501.
MD	SECURITY MOTION DETECTOR. PROVIDE 1-GANG JUNCTION BOX. ROUTE (1) 1/2"C. FROM JUNCTION BOX TO NEAREST J-HOOK SYSTEM. PROVIDE PULL STRING.

# **EXISTING/DEMOLITION LEGEND**

SYMBOL DESCRIPTION HALFTONE SYMBOL INDICATES EXISTING  $\Rightarrow$ 

DASHED SYMBOL INDICATES REMOVED 

CAB

ELECTRICAL SHEET INDEX			
SHEET NUMBER	SHEET NAME		
E-001	ELECTRICAL LEGEND AND NOTES		
E-002	ELECTRICAL SPECIFICATIONS		
E-012	<b>OVERALL FIRST FLOOR POWER PLAN - NEW WORK</b>		
E-111	CAFETERIA EXPANSION POWER PLANS		
E-112	CLASSROOM ADDITION POWER PLANS		
E-113	MECHANICAL LOFT POWER PLAN		
E-211	CAFETERIA EXPANSION LIGHTING PLANS		
E-212	CLASSROOM ADDITION LIGHTING PLAN - NEW WORK		
E-213	MECHANICAL LOFT LIGHTING PLAN		
E-311	CAFETERIA EXPANSION SPECIAL SYSTEMS PLANS		
E-312	CLASSROOM ADDITION SPECIAL SYSTEMS PLAN - NEW WORK		
E-313	MECHANICAL LOFT SPECIAL SYSTEMS PLAN		
E-401	ENLARGED ELECTRICAL PLANS		
E-501	ELECTRICAL DETAILS		
E-502	ELECTRICAL DETAILS		
E-503	ELECTRICAL DETAILS		

ELECTRICAL SCHEDULES ELECTRICAL DIAGRAMS

E-601 E-701

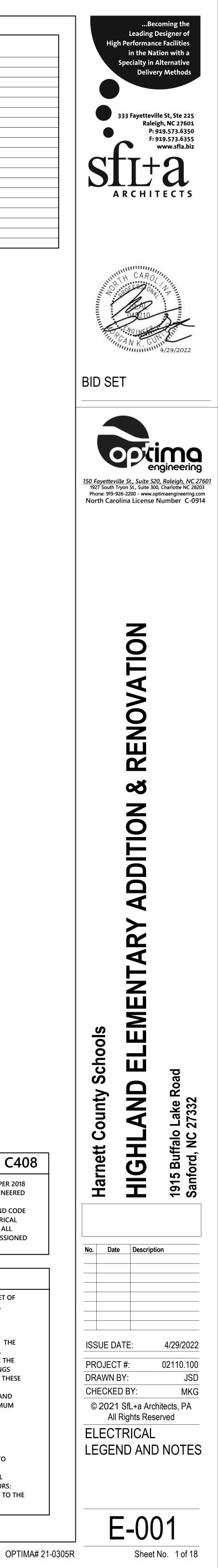
# COMMISSIONING NOTE - 2018 NCECC C408

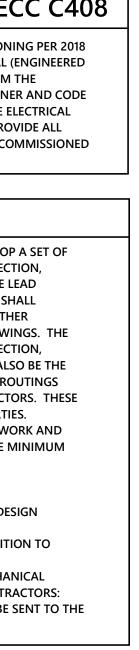
THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR SYSTEM COMMISSIONING PER 2018 NCECC SECTION 408. MC SHALL HIRE A REGISTERED DESIGN PROFESSIONAL (ENGINEERED SEALED IN NC OR CERTIFIED COMMISSIONING PROFESSIONAL) TO PERFORM THE COMMISSIONING DUTIES DESCRIBED IN SECTION C408, AND PROVIDE OWNER AND CODE OFFICIAL WITH A SEALED STATEMENT OF COMPLETION (APPENDIX C1). THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH COMMISSIONING AGENT AND PROVIDE ALL NECESSARY TIME, MATERIALS, AND PROCEDURES REQUIRED FOR A FULLY COMMISSIONED PROJECT.

# COORDINATION DRAWINGS

THE MECHANICAL CONTRACTOR SHALL ORGANIZE COORDINATION MEETINGS TO DEVELOP A SET OF DRAWINGS WITH ALL CONTRACTORS (ELECTRICAL, MECHANICAL, PLUMBING, FIRE PROTECTION, IT/DATA, AND GENERAL CONTRACTOR). 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) 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 FABRICATION AND INSTALLATION OF DUCTWORK AND PIPING SYSTEMS, OR PURCHASE OF EQUIPMENT. THE FOLLOWING ITEMS REPRESENT THE MINIMUM REQUIREMENTS FOR SHOP DRAWINGS AND COORDINATION DRAWINGS:

- 1, ALL SHOP AND COORDINAGION DRAWINGS WILL BE 1/4" = 1'-0" SCALE 2. DRAWINGS WILL BE ORIGINAL DRAWINGS AND NOT OVERLAYS OF THE CONTRACT/DESIGN
- 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, AND GENERAL. ADDITIONAL SETS WILL BE SENT TO THE OWNER, ARCHITECT, AND ENGINEER.





	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. ALL WORK SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, NFPA, STATE BUILDING CODE, AND ANY OTHER LOCAL REQUIREMENTS THAT MAY APPLY.	
	CONTRACTOR SHALL OBTAIN AND PAY FOR ALL ELECTRICAL PERMITS AND INSPECTION FEES. 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	
E.	AND RATING SHALL BE IDENTICAL AND OF THE SAME MANUFACTURER. 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, 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	
Н.	INCORPORATED INTO THE ON-SITE CONSTRUCTION PLANS AS THE JOB PROGRESSES. COMPLETELY ADEQUATE HOUSING SHALL BE PROVIDED FOR ALL MATERIALS STORED ON JOB SITE.	
I.	ONLY CONDUIT MAY BE STORED OUTSIDE, BUT NOT IN CONTACT WITH THE GROUND. 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.	
	WIRING SHALL BE TESTED FOR CONTINUITY AND GROUNDS BEFORE BEING ENERGIZED. FAULTY WIRING SHALL BE REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER.	
	PROVIDE ALL CUTTING AND PATCHING FOR INSTALLATION OF WORK AND REPAIR ANY DAMAGE DONE. 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	
N.	PROVIDED BY THE RESPECTIVE DISCIPLINE. ALL ELECTRICAL JUNCTION BOXES, SWITCHGEAR, CABLING, VOICE/DATA OUTLETS, LOW VOLTAGE CABINETS, EMERGENCY RECEPTACIES, ETC, SHALL BE LABELED ACCORDING TO BANEL/RACK AND	
0	CABINETS, EMERGENCY RECEPTACLES, ETC. SHALL BE LABELED ACCORDING TO PANEL/RACK AND CIRCUIT NUMBER. 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.	
Ρ.	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	
Q.	SHALL BE REPLACED WITHOUT ADDED COST TO THE PROJECT. 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	
R.	ALL NECESSARY ITEMS FOR A COMPLETE AND OPERATING SYSTEM. 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	
S.	PART OF THIS WORK TO COMPLETE THE INSTALLATION. 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.	
	CONTRACTOR SHALL COORDINATE THE ROUGH-IN OF ALL OUTLET LOCATIONS WITH ARCHITECTURAL FLOOR PLANS, ELEVATIONS, AND MILLWORK SHOP DRAWINGS PRIOR TO ROUGH-IN. ELECTRICAL CONTRACTOR SHALL NOT SCALE PLANS. CONTRACTOR SHALL REFER TO ARCHITECTURAL	
	PLANS AND ELEVATIONS FOR EXACT LOCATIONS OF ALL EQUIPMENT, UNLESS OTHERWISE NOTED. 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,	
W.	AND ANY OTHER LOCAL REQUIREMENTS THAT MAY APPLY. 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	
X.	OF THE WORK. 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	
Z.	UTILIZED WITHOUT WRITTEN PERMISSION FROM THE OWNER. COORDINATE LOCATION AND REQUIREMENTS FOR ELECTRICAL SERVICE WITH THE POWER COMPANY.	
AA.	WHERE MORE THAN ONE SERVICE IS SUPPLIED TO A BUILDING, PROVIDE IDENTIFICATION AT EACH SERVICE PER NEC 230-2(E). THE CONTRACTOR SHALL PROVIDE A MINIMUM TWO WEEK NOTICE FOR ANY PLANNED UTILITY	
	OUTAGES. WRITTEN AUTHORIZATION FROM THE OWNER SHALL BE PROVIDED PRIOR TO ANY OUTAGE. ALL PLANNED UTILITY OUTAGES SHALL BE COORDINATED WITH THE OWNER TO OCCUR DURING NON-	
	OPERATING TIMES, INCLUDING NIGHTS, WEEKENDS AND HOLIDAYS. ALL PLANNED UTILITY OUTAGES SHALL INCLUDE PROVISIONS FOR PROPER BACK-UP OF ALL LIFE-SAFETY SYSTEMS AND INCLUDE AN APPROVED FIRE-WATCH PROGRAM AS REQUIRED BY THE LOCAL FIRE MARSHALL.	
BB.	EACH BIDDER SHALL VISIT THE JOB SITE PRIOR TO BIDDING TO FAMILIARIZE THEMSELVES WITH EXISTING CONDITIONS AND TO ASCERTAIN THE EXTENT OF WORK REQUIRED. FAILURE TO VISIT SITE	
	SHALL NOT EXCUSE CONTRACTOR FROM PERFORMING REQUIRED WORK NOR SHALL IT BE AN ACCEPTABLE REASON FOR REQUESTING ADDITIONS TO THE CONTRACT.	
	<u>CEWAY:</u> CONDUIT SHALL BE MANUFACTURED BY ALLIED, WHEATLAND, REPUBLIC CONDUIT, WESTERN TUBE,	
	OR APPROVED EQUIVALENT. FOR INTERIOR WORK, CONDUIT SHALL BE ZINC COATED EMT EXCEPT WHERE NOT PERMITTED BY	
C	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. 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.	
	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	
F.	CONDUIT FOR ENTIRE LENGTH OF INACCESSIBILITY. 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 BE INSTALLED PRIOR TO BUILLING LOW/VOLTAGE CARLES	
G.	BUSHINGS SHALL BE BE INSTALLED PRIOR TO PULLING LOW-VOLTAGE CABLES. 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. SUPPORT ALL CONDUIT WITH STRAPS AND CLAMPS.	
	ALL CONDUIT SHALL BE RUN PARALLEL OR PERPENDICULAR TO BUILDING LINES, WHETHER EXPOSED OR NOT AND SUPPORTED FROM STRUCTURE AND PROPERLY SECURED.	
	WHERE CONDUITS PASS THROUGH A BUILDING EXPANSION JOINT, PROVIDE GALVANIZED EXPANSION FITTINGS WITH BONDING JUMPERS. 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. LIQUID-TIGHT METAL CONDUIT SHALL ONLY BE USED FOR FINAL CONNECTIONS TO EQUIPMENT AND	
N.	ALL OTHER ROTATING AND VIBRATING EQUIPMENT, MAXIMUM LENGTH OF 3'-0". FLEXIBLE METAL CONDUIT, MINIMUM SIZE 3/8", SHALL ONLY BE USED FOR FINAL CONNECTION TO LIGHTING FIXTURES, MAXIMUM LENGTH OF 6'-0".	
0.	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	
P.	PAVED AREAS, THEY SHALL BE RGS. ALL CONDUIT BENDS/ELBOWS EMERGING FROM UNDERGROUND SHALL BE IMC AND SHALL EXTEND A	
Q.	MINIMUM OF 18" BELOW GRADE. ALL UNDERGROUND RACEWAYS SHALL BE THOROUGHLY COATED WITH TWO COATS OF ASPHALTUM BITUMASTIC.	
R.	BITUMASTIC. ALL CONDUITS INSTALLED UNDERGROUND OR IN CONCRETE SHALL HAVE JOINTS MADE WATERTIGHT BY USE OF POLYETRA-FLUOROETHYLENE TAPE.	
	THE USE OF AC OR NM CABLE IS NOT PERMITTED. MC CABLE IS NOT ALLOWED, EXCEPT FOR FINAL CONNECTION TO LIGHT FIXTURES. PER NOT 2,N.	
	<u>TLET BOXES:</u> JUNCTION AND PULL BOXES SHALL BE CODE GAUGE GALVANIZED STEEL. ACCEPTED MANUFACTURERS	
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.	
C.	OUTLET BOXES SHALL NOT BE MOUNTED BACK TO BACK IN COMMON WALLS. ATTACH EMT WITH CONNECTORS HAVING INSULATED THROAT.	
	ATTACH BOXES TO STUD WORK USING CADDY BAR STRAPS THAT CONNECT TO TWO ADJACENT STUDS TO PREVENT TWISTING OF BOX IN WALL.	
	ALL OUTLET BOXES (INCLUDING TELEPHONE, CABLE TV, AND COMPUTER) SHALL HAVE COVER PLATES, BLANK IF NOT USED. ALL EXTERIOR BOXES SHALL BE WATER-TIGHT.	
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	CONDUCIC	JR SHALL BE GREEN ON AL	L STSTEIVIS.
	INSULATIO	N. THE USE OF COLORED 1	FAPE ON LA
F.	INSULATIO	N SHALL BE DUAL RATED T	YPE THHN/
	<b>FIXTURE TA</b>	APS SHALL BE #12 THHN/TH	IWN-2 IN FL
G.	ALL CONDU	JCTORS SHALL BE IN CONE	DUIT.
Н.		LIGHTING FIXTURES SHAL	
I.		E BRANCH CIRCUITS SHAL	
J.		#10 AWG AND SMALLER SH	
J.		G CAPS (NO TAPE) OR WIR	
		JT). LARGER WIRE SHALL U	
К.		G LUGS THROUGHOUT THE	
		RD/SWITCHBOARD LUGS, S	
		NG DEVICE TERMINALS, AN	
	WITH 75 DE	EGREE INSULATED CONDU	CTORS AT TH
	SELECTED T	O MATCH THE CONDUCTO	OR SIZE AND
L.	<b>CIRCUIT JO</b>	INTS SHALL NOT BE MADE	ON DEVICE
М.	WIRE WITH	IIN PANELBOARDS SHALL E	BE NEATLY T
N.	ALL SYSTEM	A FURNITURE CONNECTIO	NS SHALL CO
0.		LL EQUIPMENT PER NEC A	
		CONCENTRIC KNOCKOUTS	
		IG CONDUCTOR, #12 AWG	
		IG CONDUCTOR IN EACH C	
<b>_</b>			
Ρ.		JCTORS INSTALLED IN VER	IICAL RACE
_		PER NEC 300-19.	
Q.		RICAL CONTRACTOR SHALL	
		EDULE INDICATES, FOR SIZ	
	CONDUCTO	ORS) TO ALLOW A MAXIMU	JM OF 3% V
	FIRST DEVI	CE ON THE BRANCH CIRCU	IT AND ACH
	THE ENTIRE	E BRANCH CIRCUIT:	
	<b>VOLTAGE</b>	CONDUCTOR LENGTH *	BRANCH C
	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
			_
		NGTH IS MEASURED FROM	
	BRANC	CH CIRCUIT SERVES. WHER	E THE DISTA
WI	RING DEVICE	<u>S:</u>	
Α.	WIRING DE	VICES SHALL BE SPECIFICA	TION GRAD
	<b>BELOW OR</b>	AS MANUFACTURED BY H	UBBELL, LEG
	EQUAL, UN	LESS OTHERWISE NOTED:	
	SWITCHES	(120V) SHALL BE AS FOLLO	WS:
		, ,	
	SINGLE	-POLE 20 AMP	SEE SPECIF
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	FOUR-	WAY 20 AMP	SEE SPECIF
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CONDUCTORS: A. CONDUCTORS SHALL BE MANUFACTURED BY SOUTHWRRE (SIMPULL), ENCORE (SUPERSUCR), UNITED COPPER (SUR), CERRO (SUP), OR APPROVED EQUAL, "PRE-LUBRICATED" BY THE MANUFACTURER. B. ALL CONDUCTORS SHALL BE COPER, RATED 75" C WET/ORY EXCEPT WHERE OTHERWISE NOTED OR REQUIRED BY UL OR OTHER CODES. ALUMINUM CONDUCTOR MAY ONLY BE UTILED WHERE NOTED IN THE DRAWINGS. C. ALL CONDUCTORS SHALL BE SINGLE INSULATED CONDUCTOR, THAN/THWN-2, SIZES #0 AWG AND SMALLER SHALL BE SOULD, SIZES #0 AWG AND LARCER SHALL BE STRANDED. B. BRANCH CURUTS SHALL DE SIMALE THAN #12 AWG. CONTOL WINING MAY BE #14 AWG. E. CONDUCTORS SHALL BE COLOR CODED BLACK/RED/BLUE FOR 120/208 VOIT SYSTEMS FOR A, B, AND C PHASES, RESPERTIVEX. NEUTRA SHALL BE MARE THE FOR 120/208 VOIT SYSTEMS FOR A, B, AND C PHASES, RESPERTIVEX. NEUTRA SHALL BE MARE THE RATE FOR 120/208 VOIT SYSTEMS FOR A, B, AND C PHASES, RESPERTIVEX. NEUTRA SHALL BE MARE THE RATE FOR 120/208 VOIT SYSTEMS FOR A, B, AND C PHASES, RESPERTIVEX. NEUTRA SHALL BE MARE THE RATE FOR 120/208 VOIT SYSTEMS FOR A, B, AND C PHASES, RESPERTIVEX. NEUTRAL SHALL BE AS REQUIRED BY ULLABEL F. INSULATION SHALL BE OWNER SHALL INSTEMS. ALL CONDUCTORS SHALL HAVE COLOR-CODED INSULATION SHALL BE OWNER SHALL BAS REQUIRED BY ULLABEL F. MULTI-WIRE BRANCH CURCUTS SHALL NOT BE REQUIRED BY ULLABEL F. MULTI-WIRE BRANCH CURCUTS SHALL BAS REQUIRED BY ULLABEL F. MULTI-WIRE BRANCH CURCUTS SHALL BAS REQUIRED BY ULLABEL F. MULTI-WIRE BRANCH CURCUTS SHALL BAS SHALL INSTEM MARY DAY ON THEOROGY MITH JOINTS IMAL UNGTING SHALL BAS SHALL BAS REQUIRED BY ULLABEL F. MULTI-WIRE BRANCH CURCUTS SHALL BAS REQUIRED BY ULLABEL F. MULTI-WIRE BRANCH CURCUTS SHALL BAS REQUIRED BY ULLABEL F. MULTI-WIRE BRANCH CURCUTS SHALL BAS REQUIRED BY ULLABEL F. MULTI-WIRE BRANCH CURCUTT S SHALL BAS REQUIRED BY ULLABEL F. MULTI-WIRE BRANCH CURCUTT S SHALL BAS REQUIRED BY ULLABEL F. MULTI-WIRE BRANCH CURCUTT S SHALL BAS REQUIRED BY ULLABEL F. MULTI-WIRE BRANCH CURCUTT S SHALL BAS REQUIRED BY ULLABEL F. MULTI-WIRE BRANCH CURCUTT S SHALL BAS REQUIRED F. MARE	P. LIGHTING FIXTURES     A. TYPES AND MANUFACTURERS ARE SCHEDULED ON THE PLANS. EQUIVALENT FIXTURES BY OTHERS     MAY BE SUBMITTED OTURERS ARE SCHEDULED ON THE PLANS. EQUIVALENT FIXTURES SHOULD STHE     MANUFACTURES AND EXAMPLE OF LISTED AND LABELED.     C. DRIVERS SHALL BE AS INDICATED IN THE LIGHTING INTURE SCHEDULE OR AS OTHERWISE NOTED.     ALL INTURUS SHALL BE AS INDICATED IN THE LIGHTING INTURE SCHEDULE OR AS OTHERWISE NOTED.     ALL INTURUS SHALL BE AS INDICATED NOTES.     CONTACTON THE PLANS.     C. CATAGO NAMINES ARE FOR GRIENEL IDINITICATION OF FIXTURES ONLY. ALL RELATED PLANS,     SUCI AS PLANTER NIKGS, INNETON DOISSE OUTLESS, BIELDS, MOUNTINNETHES, CANOPES,     CONSTRUCTION, SHALL BE FUNNISHED AND INSTALLED BY INSC CONTACTORS CONTRACTORS SHALL     PROVIDE SUITABLE TEINS AND APPLITENANCES TO MOUNT INSTITUTES, CANOPES, CONTRACTORS SHALL     PROVIDE SUITABLE TEINS AND APPLITENANCES TO MOUNT INSTITUCTION, SHALL BE ASTENDO TO BOTH THE     CONSTRUCTION, SHALL BE RUBINABLE AND INSTALLED BARKS OF CATALOGN NUMBER GIVEN.     ALL INTURES SONALTED WITH FLEX THE RIGID RACEWAY PORTION OF THE WIRING SYSTEM SHALL     CARRY A GREEN BONDING UNDER PET THE NEC.     FRATURES CONNECTED WITH REY TO THE RIGID TACEWAY PORTION OF THE WIRING SYSTEM SHALL     CARRY A GREEN BONDING JUMPER WITHIN THE FLEX. THE JUMPER SHALL BE FASTENED TO BOTH THE     FRATURES CONNECTED WITH REY CONTACTORY AND REVEL DAVID CONDUCTORS UNIN IN LEX SHALL BE # 22 AWG MININUM. MAXIMUM FLEX LENGTH     SHALL BETTED CELLING PLANS FOR EXACL OLCOLTON OF PRITURES.     CONTRACTORS SHALL BE CETED CELLING PLANS FOR EXACL OLCOLTON OF PRITURES.     CONTRACTORS HUMBER AND SQUARE WITH ROWS ALIGNED.     SEE ACHTERCITUAL REPRESENTED AND SQUARE WITH ROWS ALIGNED.     SEE ACHTERCITUAL REPRESENTED AND SQUARE WITH ROWS ALIGNED.     SEE ACHTERCITUAL REPRESENTED AND SQUARE WITH ROWS ALIGNED.     CONTRACTOR SHALL BE CETED CELLING PLANS FOR EXACL OLCOLTON OF PRITURES.     ALLIGITING CONTROL SHALL BE THE ADALL BE AST AND GREATED HE ADALL BE SPECID OR THE PRIVES SHALL BE	14. <u>FIRE STOPPING:</u> A. ALL PENETR. E-814. B. PROVIDE FIR COMPLYING CONDITION: RATING EQU C. DEVICE(S) AU 15. <u>SEISMIC:</u> A. THE ELECTRI BRACING OF SYSTEM AS A LOCATION A APPLICABLE
<ul> <li>THE PART NUMBERS ABOVE ARE FOR WIRING DEVICE TYPE ONLY. SEE BELOW FOR WIRING DEVICE CLOR AND PLATE MATERIAL/COLOR.</li> <li>SEE MOUNTING HEIGHT ELEVATION DETAIL FOR STANDARD MOUNTING HEIGHTS OF ALL DEVICES, UNLESS OTHER/WISE NOTED.</li> <li>THE COLOR OF ALL WIRING DEVICES (SWITCHES AND RECEPTACES) SHALL BE AS DIRECTED BY THE ARCHITECY, UNLESS OTHER/WISE NOTED. ALL COVER PLATES INAL BE AS DIRECTED BY THE ARCHITECY, UNLESS OTHER/WISE NOTED. ALL COVER PLATES IN ALSONRY WALLS SHALL BE OVERSIZE TYPE.</li> <li>DE ACH DUPKT RECEPTACLE BY DIRECTED TO BY DEVICES SHALL BE AD AND TYPE.</li> <li>AND ADDACENT DEVICES SHALL HAVE A COMMON WALL PLATE.</li> <li>WIGHTERROOF COVERS SHALL BE WIREL-IN-USE'S OF ULIGS MAY BE INSTALLED WITHOUT COMPROMISING THE WF FUNCTION. COOPER WILL 2D DUBLE-GANG WITH CLEAR COVER OR APPROVED EQUAL.</li> <li>A MAXIMUM OF 10 GENERAL PURPOSE RECEPTACLES SHALL BE AD ENACH BRANCH CIRCUIT.</li> <li>ALL WAL MOUNTED OCCURDACY/VACANCY SENSORS/WITCHES SHALL BE PROVIDED FOR ALL LOCATIONS PER NOCE 2003.</li> <li>G GROUND-FULL CIRCUIT-INTERRIPTER (GFC) PROTECTION FOR PERSONNEL SHALL BE PROVIDED FOR ALL LOCATIONS PER NEC 2103, INSTALLED WITHOUT ACCESSIBLE LOCATION. WHERE A DEVICE LOCATION IN THE DEVICE.</li> <li>ALL OCATIONS PER NEC 2103, INSTALLED IN A READIL A COESSIBLE LOCATION. WHERE A DEVICE LOCATION IN THE DEVICE.</li> <li>ALL OCATIONS SHALL THE OCY OPROVIDED FOR ALL READS PEN WERE ON THE LEARD OF THE ADDIL TO MONTORING / SELF-TEST FUNCTION AND REVERSE LINE. LOCATION IN AND MEET ALL REQUIREMENTS OF ULISS OTHESS OTHESS</li></ul>	<ol> <li>DISCONNECTS:</li> <li>DISCO</li></ol>	

ALL PENETRATIONS OF RATED ASSEMBLIES SHALL BE SEALED WITH RATED MATERIALS MEETING ASTM

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. DEVICE(S) AND/OR SYSTEM(S) SHALL BE BY HILTI, 3M OR EQUIVALENT.

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.

- 16. 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.

17. DEMOLITION NOTES:

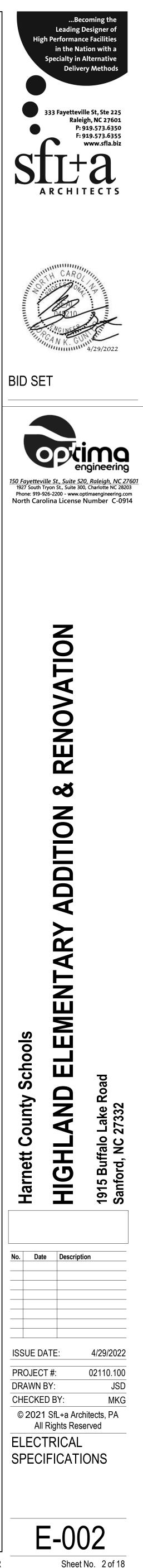
- A. PARTIAL AND TOTAL DEMOLITION OF PORTIONS SHALL BE PERFORMED ALONG WITH ALL NECESSARY MODIFICATIONS TO THAT PORTION OF THE EXISTING BUILDING WHICH SHALL REMAIN SO THAT IT CONTINUES TO FUNCTION UNAFFECTED BY THE DEMOLITION AND ASSOCIATED NEW CONSTRUCTION. B. WHERE INCLUDED AS PART OF THE CONTRACT DOCUMENTS, THE DRAWINGS INDICATE THE GENERAL AREAS OF WORK INVOLVED. HOWEVER, THE ELECTRICAL CONTRACTOR SHALL PERFORM WORK
- OUTSIDE THOSE AREAS SHOWN AS IS NECESSARY TO COMPLY WITH THE INTENT OF THIS SECTION. C. THE ELECTRICAL CONTRACTOR SHALL FAMILIARIZE THEMSELVES WITH THE EXISTING BUILDING AND WITH THE WORK OF ALL OTHER TRADES AND INCLUDE ALL WORK NECESSARY TO COMPLY WITH THE INTENT OF THE DEMOLITION.
- D. IT SHALL BE UNDERSTOOD THAT FIELD CONDITIONS MAY BE ENCOUNTERED DURING THE EXECUTION OF THIS CONTRACT WHICH WILL REQUIRE EXTENSION OR RELOCATION OF EXISTING SYSTEMS OR EQUIPMENT WHICH ARE NOT SPECIFICALLY SHOWN ON THE DRAWINGS, BUT WHICH ARE REQUIRED TO MEET THE STATED INTENT THAT THE BUILDING CONTINUE TO FUNCTION UNAFFECTED BY THE DEMOLITION AND ASSOCIATED NEW CONSTRUCTION. THE ELECTRICAL CONTRACTOR SHALL INCLUDE SUCH WORK AS WOULD NORMALLY BE EXPECTED IN AN EXISTING BUILDING OF THIS AGE AND TYPE. E. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL TOOLS, EQUIPMENT, LABOR, ETC. IN ORDER TO
- ACCOMPLISH THE DEMOLITION PORTION OF THE PROJECT. F. THE DEMOLITION OF CERTAIN AREAS OF THE EXISTING BUILDING SHALL BE PERFORMED BY THE GENERAL CONTRACTOR. IT SHALL BE THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH THE GENERAL CONTRACTOR TO DIFFERENTIATE THE SCOPE OF WORK BETWEEN
- SEPARATE TRADES. G. THE ELECTRICAL CONTRACTOR SHALL INCLUDE COORDINATION WITH THE GENERAL CONTRACTOR AND SUCH DEMOLITION OF THE EXISTING ELECTRICAL SYSTEMS AS IS NECESSARY SO THAT THE DEMOLITION WORK OF THE GENERAL CONTRACTOR SHALL NOT DAMAGE THOSE PORTIONS OF THE ELECTRICAL SYSTEMS WHICH ARE TO REMAIN IN SERVICE, ARE TO BE REUSED, OR ARE TO BECOME THE PROPERTY OF THE OWNER.
- H. TURN OVER TO OWNER, UPON REQUEST OR AS NOTED, ITEMS SHOWN AS BEING REMOVED AND NOT REINSTALLED. ITEMS NOT DIRECTED OR REQUESTED TO BE TURNED OVER TO THE OWNER SHALL BE DISPOSED OF BY THE ELECTRICAL CONTRACTOR.
- . EQUIPMENT OR MATERIALS WHICH ARE TO BE REUSED OR TURNED OVER TO THE OWNER SHALL BE CAREFULLY REMOVED, CLEANED, AND STORED IN A CLEAN AND DRY AREA. SHOULD THE ELECTRICAL CONTRACTOR ENCOUNTER SUCH EQUIPMENT WHICH IS NOT IN SATISFACTORY CONDITION FOR REUSE AND NOT IN WORKING ORDER, THE ELECTRICAL CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER IMMEDIATELY.
- J. DISCONNECT ELECTRICAL SERVICES TO ALL EQUIPMENT REQUIRING REMOVAL. CONDUIT SHALL BE REMOVED BACK TO THE POINT WHERE IT WILL BE CONCEALED AT THE COMPLETION OF THIS CONTRACT. WIRE AND CABLE SHALL BE REMOVED BACK TO THE FIRST OUTLET BOX, CABINET, OR TERMINATION POINT WHICH IS TO REMAIN. CIRCUITS WHICH ARE NOT REUSED SHALL BE REMOVED BACK TO THE SOURCE IN THEIR ENTIRETY.
- K. REMOVE AND REINSTALL CEILINGS IN THE EXISTING BUILDING AS REQUIRED FOR THE WORK. COORDINATE WITH THE GENERAL CONTRACTOR. IN SUCH AREAS, REMOVE AND REINSTALL ALL ELECTRICAL DEVICES WHICH ARE TO REMAIN IN OR ON THE CEILING.
- L. WHERE NEW CEILINGS CONFLICT WITH EXISTING ELECTRICAL WORK WHICH IS TO REMAIN, RELOCATE THE ELECTRICAL WORK INVOLVED TO CLEAR THE NEW CONSTRUCTION. M. WHERE NEW WALL OR FLOOR FINISHES CONFLICT WITH EXISTING ELECTRICAL WORK WHICH IS TO REMAIN, RELOCATE THE ELECTRICAL WORK INVOLVED OR PROVIDE BOX EXTENSIONS OR SIMILAR
- DEVICES AND REINSTALL ON THE NEW FINISH. N. WHERE EXISTING BRANCH CIRCUITS AND SYSTEMS ARE INTERRUPTED BY NEW WORK OR SYSTEMS (ELECTRICAL, MECHANICAL, PLUMBING, FIRE PROTECTION, ETC.), EXTEND AND RECONNECT THOSE EXECUTION OF THIS CONTRACT, PROVIDE TEMPORARY CONNECTIONS UNTIL FINAL CONNECTIONS ARE COMPLETE.
- 18. COORDINATION DRAWINGS:

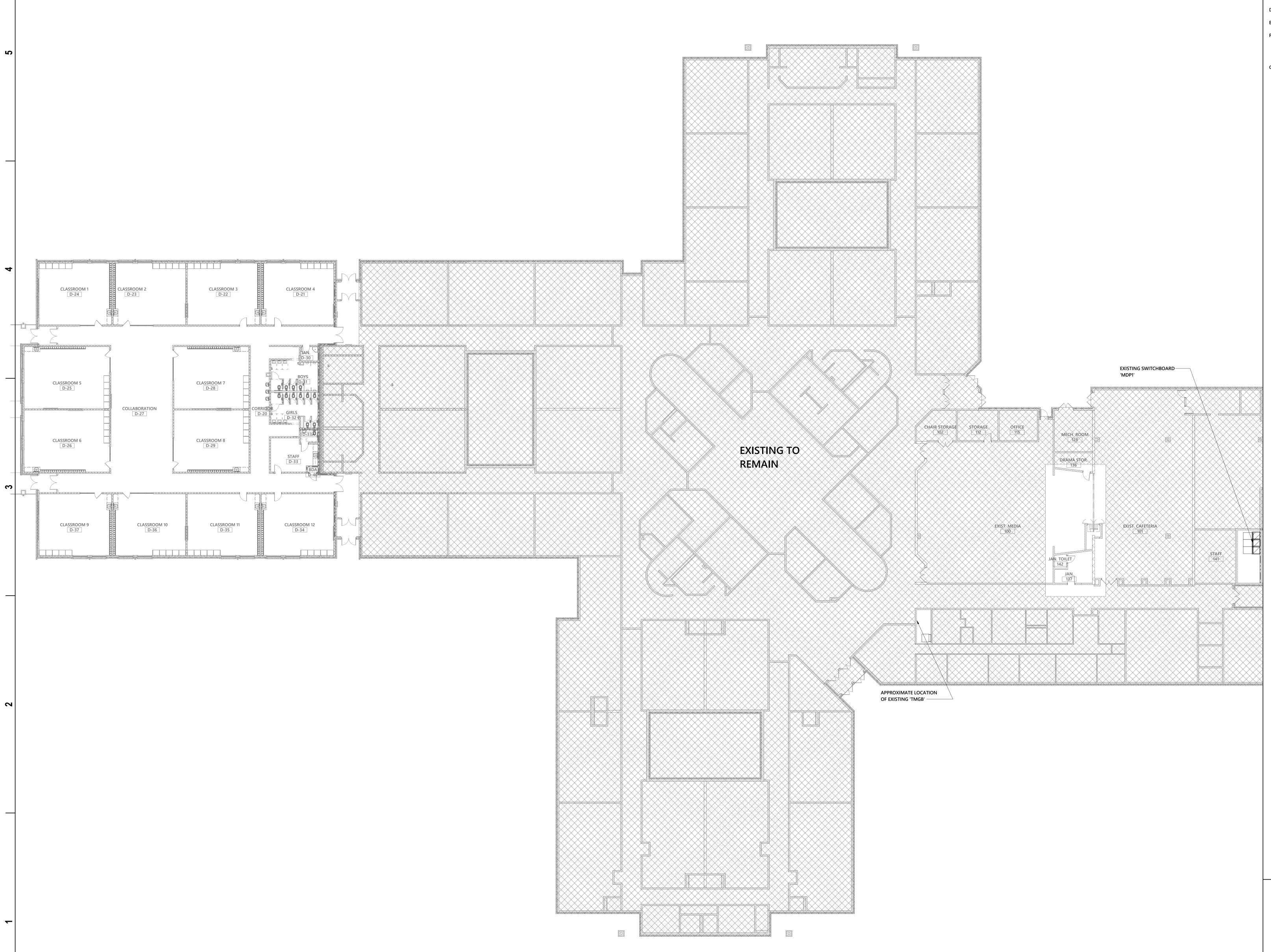
A. THE MECHANICAL CONTRACTOR SHALL ORGANIZE COORDINATION MEETINGS TO DEVELOP A SET OF DRAWINGS WITH ALL CONTRACTORS (ELECTRICAL, MECHANICAL, PLUMBING, FIRE PROTECTION, IT/DATA, SECURITY AND GENERAL). THE MECHANICAL CONTRACTOR WILL HAVE THE LEAD RESPONSIBILITY FOR THE COORDINATION DRAWINGS. THE MECHANICAL 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.
- 19. TESTING AND DOCUMENTATION:

A. TESTING AND DOCUMENTATION SHALL BE PROVIDED AS FOLLOWS: 1. GFCI EQUIPPED BREAKERS SHALL BE PERFORMANCE TESTED. 2. LIGHTING CONTROL SYSTEMS SHALL BE TESTED FOR PROPER OPERATION OF SETPOINTS.

20. COMMISSIONING: A. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR EQUIPMENT/SYSTEM START-UP AND TESTING. THE ELECTRICAL CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR EQUIPMENT/SYSTEM COMMISSIONING AS DIRECTED BY THE COMMISSIONING AUTHORITY (CxA). THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE COMMISSIONING AUTHORITY AND PROVIDE ALL NECESSARY TIME, EQUIPMENT, MATERIALS, AND PROCEDURES REQUIRED FOR A FULLY COMMISSIONED PROJECT.





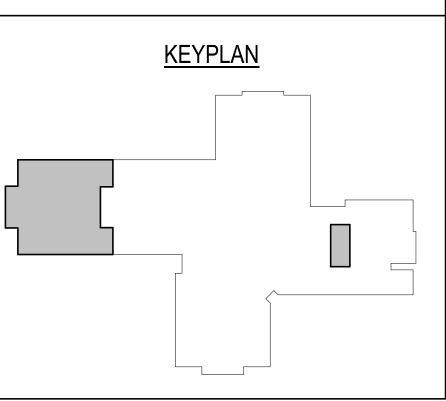
OVERALL FIRST FLOOR POWER PLAN - NEW WORK 1/16" = 1'-0"

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# **GENERAL NOTES**

- A. REFER TO DRAWING E-000 FOR LEGEND, SYMBOLS AND GENERAL NOTES. B. REFER TO ARCHITECTURAL DRAWINGS INCLUDING BUT NOT LIMITED TO, MOUNTING NOTES, MOUNTING DETAILS AND EXACT LOCATIONS OF ALL DEVICES.
- C. ALL DEVICES SHALL BE FLUSH MOUNTED, UNLESS NOTED OTHERWISE, WITH NO EXPOSED CONDUIT. D. BACK TO BACK BOX INSTALLATION SHALL NOT BE ALLOWED. WHERE DEVICES ARE SHOWN BACK TO BACK, DEVICE SHALL BE OFFSET 3".
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- OCCUPANCIES INCLUDING PLACES OF AWAITING TRANSPORTATION/GYMNASIUM/AUDITORIUMS.
- G. RECEPTACLE AND DATA OUTLETS SHALL NOT BE MOUNTED IN TRIM OF WINDOWS. LOCATE WHERE FULL WALL IS AVAILABLE.

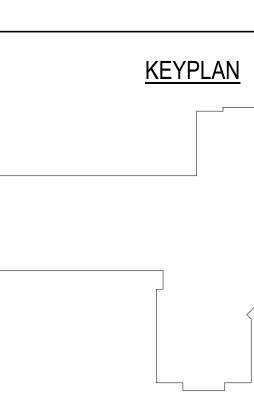


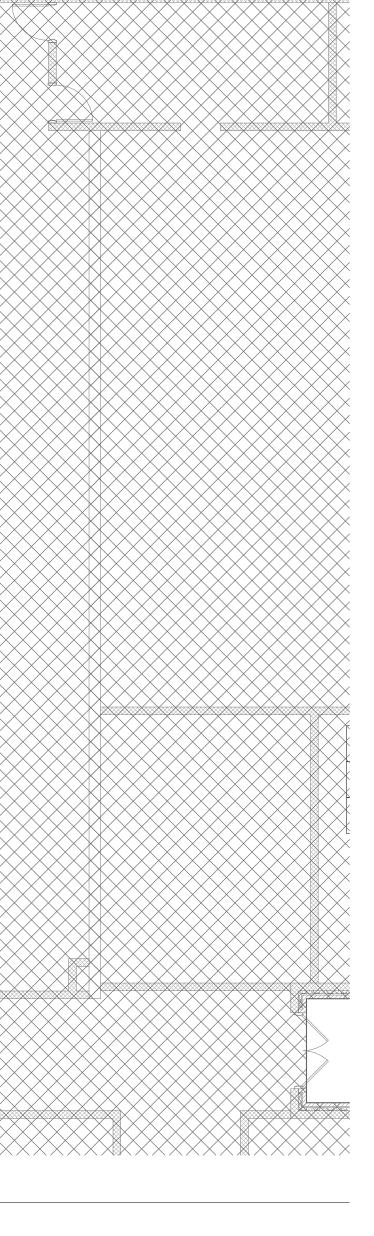


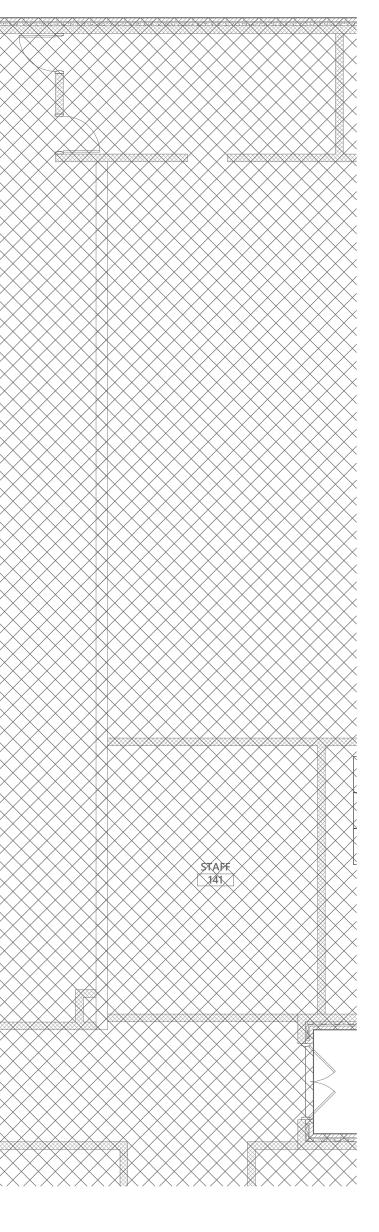


# ...Becoming the **GENERAL NOTES** Leading Designer of High Performance Facilities A. REFER TO DRAWING E-000 FOR LEGEND, SYMBOLS AND GENERAL NOTES. in the Nation with a B. SWITCHBOARDS, PANELBOARDS, METER SOCKET ENCLOSURES AND pecialty in Alternative MOTOR CONTROL CENTERS SHALL BE FIELD MARKED TO WARN QUALIFIED **Delivery Methods** PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS. THE MARKING SHALL BE LOCATED SO AS TO BE CLEARLY VISIBLE TO QUALIFIED PERSONS BEFORE EXAMINATION, ADJUSTMENT SERVICING, OR MAINTENANCE OF FOR ALL RELOCATED MECHANICAL EQUIPMENT, RELOCATE ASSOCIATED 333 Fayetteville St, Ste 225 Raleigh, NC 27601 ELECTRICAL CONNECTIONS AND EXTEND FEEDERS AS REQUIRED TO NEW P: 919.573.6350 EQUIPMENT LOCATIONS. SEE NEW WORK PLAN FOR NEW LOCATIONS. F: 919.573.6355 D. DASHED ARCHITECTURAL LINES INDICATE DEMOLITION. DISCONNECT AND www.sfla.biz REMOVE EXISTING ELECTRICAL DEVICES IN WALLS AND CEILINGS. TYPICAL IN ALL AREAS UNLESS OTHERWISE NOTED. COORDINATE WITH OTHER TRADES AS REQUIRED TO FACILITATE COMPLETE DEMOLITION. ELECTRICAL DEVICES THAT ARE OUTSIDE AREA OF WORK THAT ARE ARCHITECTS . MAINTAIN CONTINUITY OF BRANCH CIRCUITRY ASSOCIATED WITH ALL G. MAINTAIN CONTINUITY OF BRANCH CIRCUITRY ASSOCIATED WITH ALL H. MAINTAIN CONTINUITY OF BRANCH CIRCUITRY ASSOCIATED WITH ALL EXISTING POWER DEVICES TO REMAIN. REFER TO ARCHITECTURAL DRAWINGS INCLUDING BUT NOT LIMITED TO, MOUNTING NOTES, ALL DEVICES SHALL BE FLUSH MOUNTED, UNLESS NOTED OTHERWISE, BACK TO BACK BOX INSTALLATION SHALL NOT BE ALLOWED. WHERE DEVICES ARE SHOWN BACK TO BACK, DEVICE SHALL BE OFFSET 3". K. TYPICAL CLASSROOM IS SHOWS AND SHALL BE ROTATED, MIRRORED, ETC TAMPER-RESISTANT RECEPTACLES SHALL BE PROVIDED FOR ALL AREAS PER NEC 406.12, INCLUDING ELEMENTARY EDUCATION FACILITIES, BUSINESS OFFICES/CORRIDORS/WAITING ROOMS AND THE LIKE, ASSEMBLY M. RECEPTACLE AND DATA OUTLETS SHALL NOT BE MOUNTED IN TRIM OF **BID SET KEYNOTES** EXISTING RAISED SLAB TO BE REMOVED. REMOVE EXISTING FLOOR BOXES. REMOVE ASSOCIATED CONDUITS AND CONDUCTORS BACK TO SOURCE. ina 150 Fayetteville St., Suite 520, Raleigh, NC 2760 1927 South Tryon St., Suite 300, Charlotte NC 28203 Phone: 919-926-2200 - www.optimaengineering.com North Carolina License Number C-0914 L A **RENOV** õ **ADDITION** LEMENTARY ш 5 S ntv NC NC C HOH ett ġ, Ω Harn 1915 Sanfo No. Date ISSUE DATE: 4/29/2022 <u>KEYPLAN</u> 02110.100 PROJECT #: JSD DRAWN BY: MKG CHECKED BY: © 2021 SfL+a Architects, PA All Rights Reserved CAFETERIA **EXPANSION POWER** PLANS

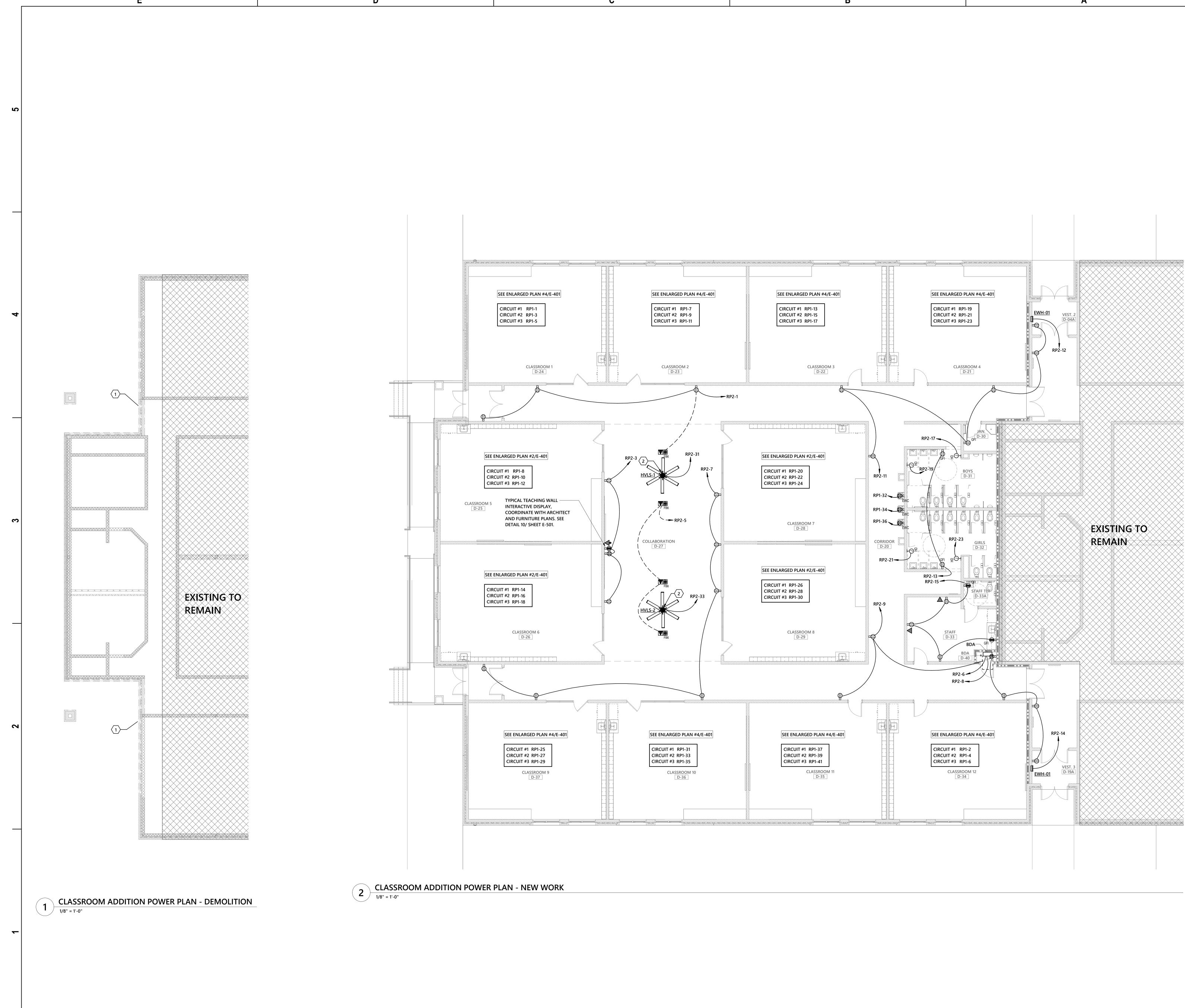
- THE EQUIPMENT.
- . CONTRACTOR SHALL MAKE SURE TO MAINTAIN CONTINUITY OF INTENDED TO REMAIN ENERGIZED.
- EXISTING LIGHT FIXTURES TO REMAIN.
- FIRE ALARM DEVICES TO REMAIN.
- MOUNTING DETAILS AND EXACT LOCATIONS OF ALL DEVICES. WITH NO EXPOSED CONDUIT.
- TO FIT EACH RESPECTIVE CLASSROOM IN A SIMILAR MANNER.
- OCCUPANCIES INCLUDING PLACES OF AWAITING
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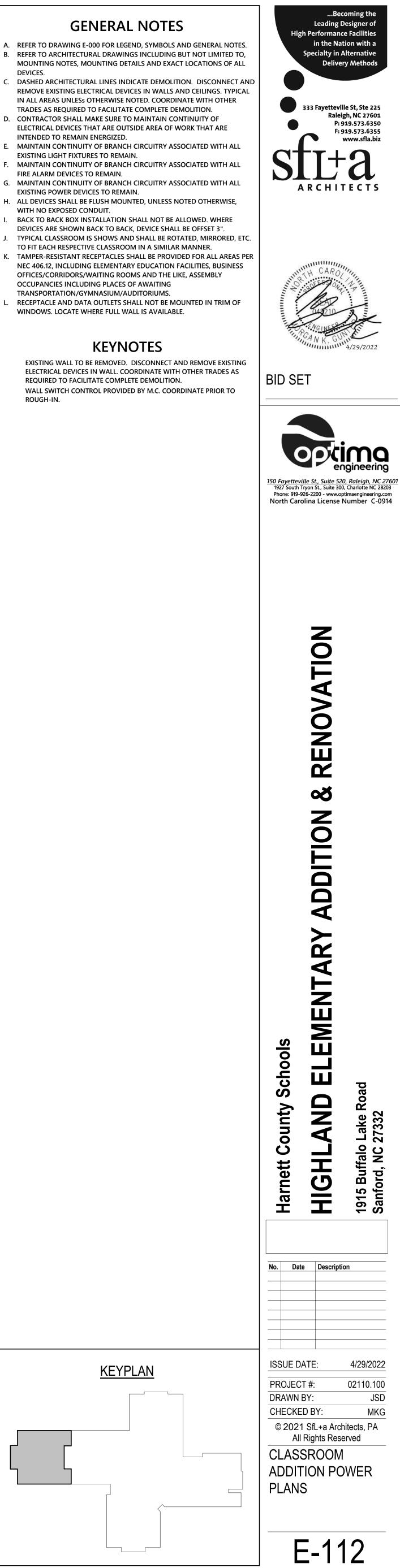




	ABBREVIATIONS
RE	EXISTING ITEM RELOCATED TO THIS LOCATION.
RL	EXISTING ITEM TO BE RELOCATED.
RM	EXISTING ITEM TO REMAIN.
RP	EXISTING ITEM TO BE REPLACED.
RV	EXISTING ITEM TO BE REMOVED.

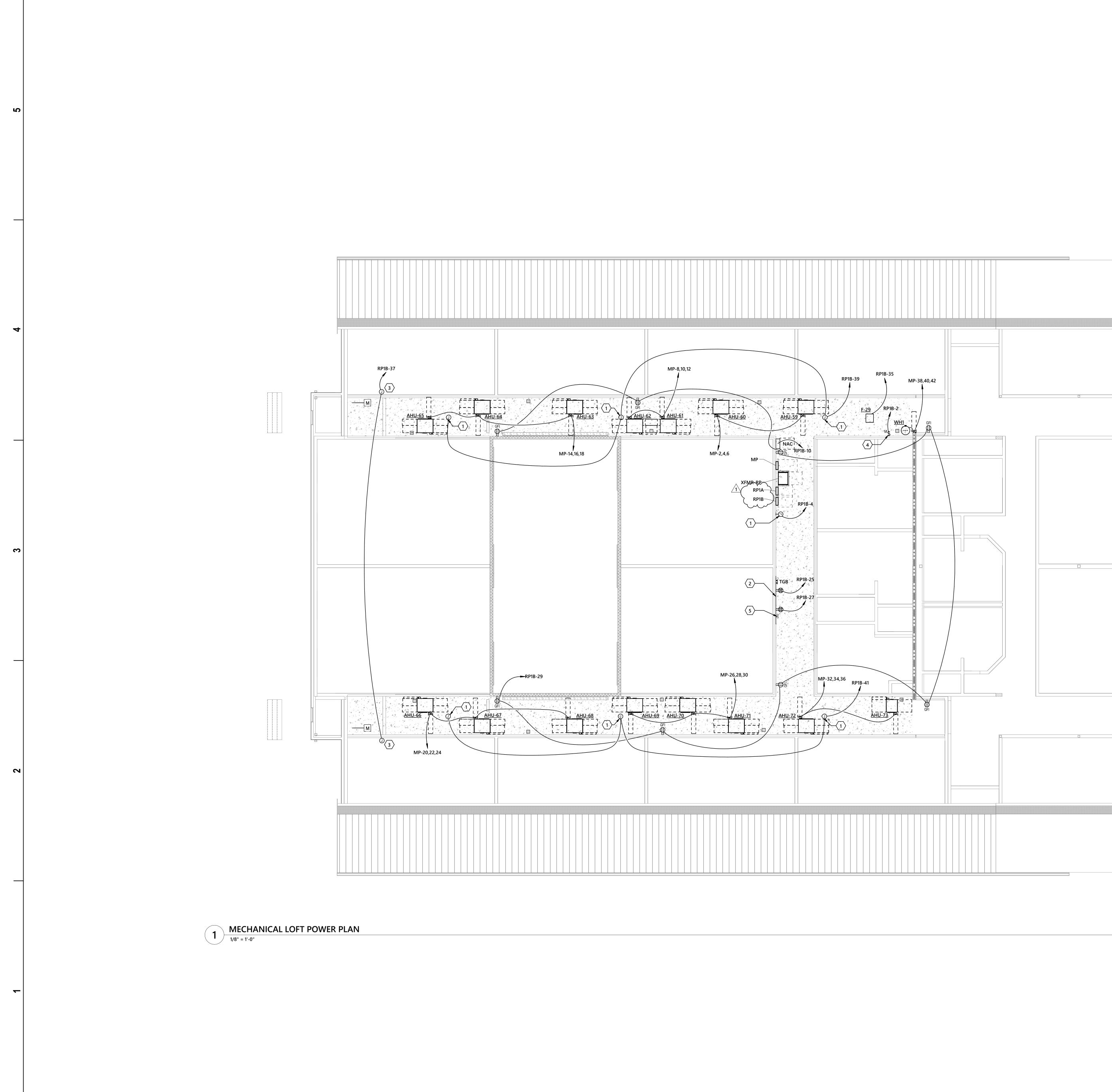


- INTENDED TO REMAIN ENERGIZED.
- FIRE ALARM DEVICES TO REMAIN.
- EXISTING POWER DEVICES TO REMAIN. WITH NO EXPOSED CONDUIT.



OPTIMA# 21-0305R

Sheet No. 5 of 18



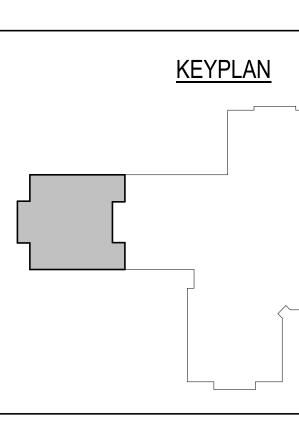
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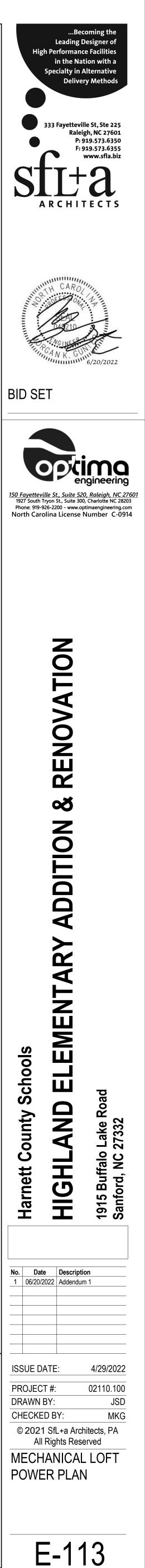
# **GENERAL NOTES**

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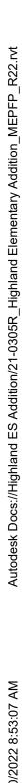
# **KEYNOTES**

- PROVIDE 120V CONNECTION FOR MECHANICAL CONTROLS. COORDINATE WITH MECHANICAL CONTROLS CONTRACTOR PRIOR TO ROUGH-IN. PROVIDE 3/4" FIRE RETARDANT PLYWOOD BACKBOARD FROM FLOOR TO
- CEILING INSTALLED VERTICALLY STARTING AT 6"AFF. PAINT WITH TWO COATS OF COLOR WHITE FIRE RETARDANT PAINT. PROVIDE 120V CONNECTION FOR MOTORIZED DAMPER. COORDINATE
- EXACT REQUIREMENTS WITH MC. PROVIDE 120V CONNECTION WITH MOTOR RATED SWITCH FOR CIRCULATION PUMP CP1. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH PLUMBING CONTRACTOR.
- ROUTE (2) 4" TO CABLE TRAY BELOW. STUB 6" ABOVE SLAB AT MECHANICAL PLATFORM.





Sheet No. 6 of 18

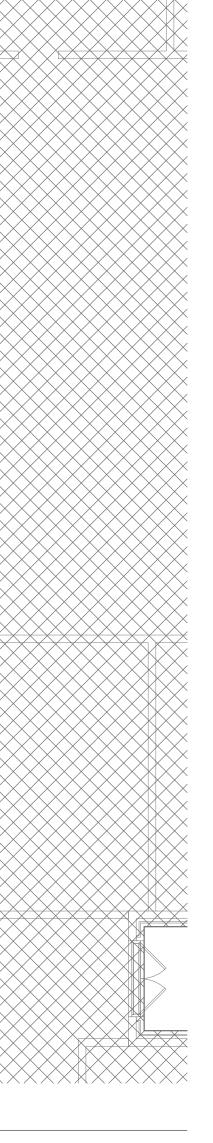


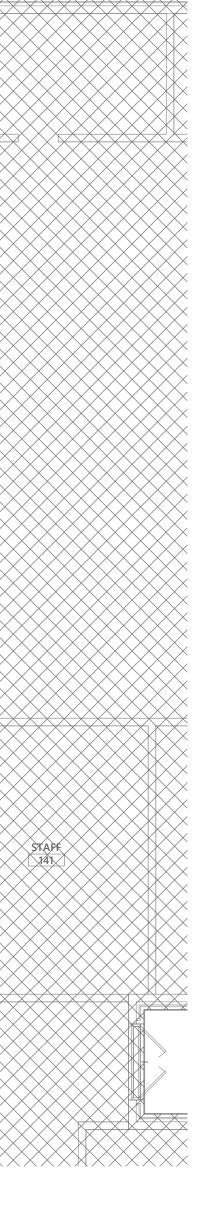


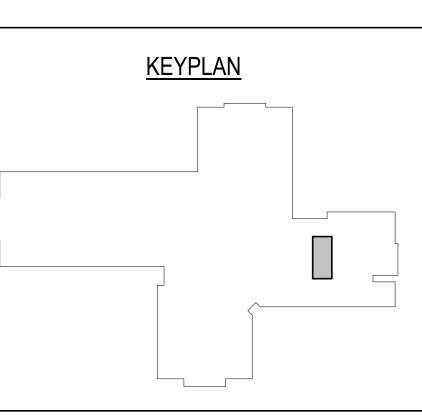
# **GENERAL NOTES**

- WITH 6'-0" LONG FLEXIBLE METAL CONDUIT. B. SEE ARCHITECTURAL EXTERIOR ELEVATIONS FOR MOUNTING HEIGHTS OF
- EXTERIOR LIGHTING FIXTURES. C. CONNECT EMERGENCY EXIT SIGNS AND THE UNSWITCHED INPUT OF BATTERY PACKS TO LOCAL LIGHTING CIRCUIT, AHEAD OF SWITCHING. D. DASHED ARCHITECTURAL LINES INDICATE DEMOLITION. DISCONNECT AND
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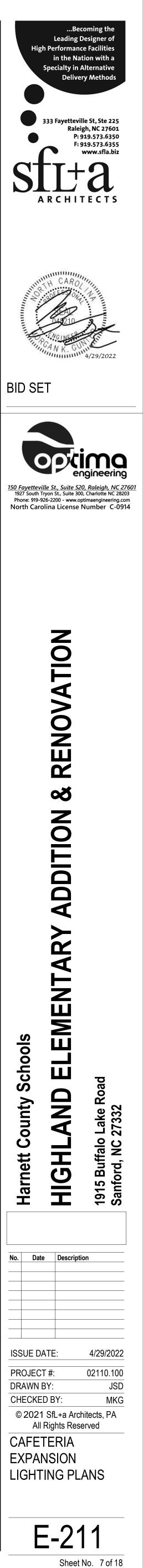
**KEYNOTES** CONNECT TO EXISTING 277V LIGHTING CIRCUIT AND CONTROLS SERVING THIS AREA. TOTAL LOAD ON EXISTING CIRCUIT SHALL NOT EXCEED 4400 WATTS.



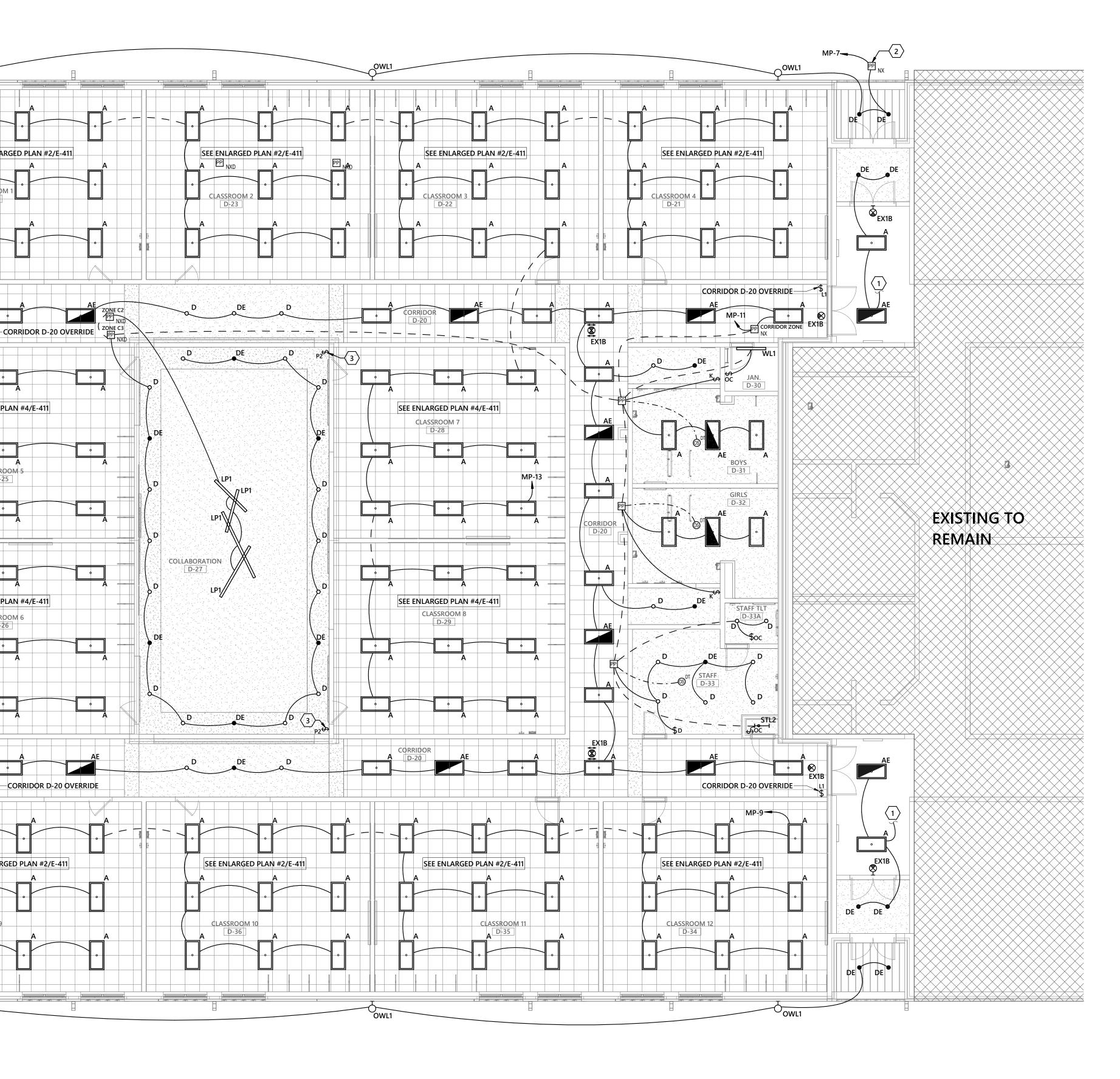




A. ALL RECESSED LIGHTING FIXTURES IN LAY-IN CEILING SHALL BE INSTALLED





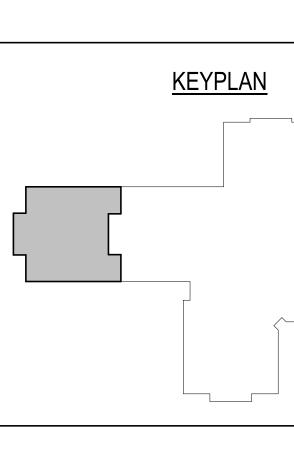


# **GENERAL NOTES**

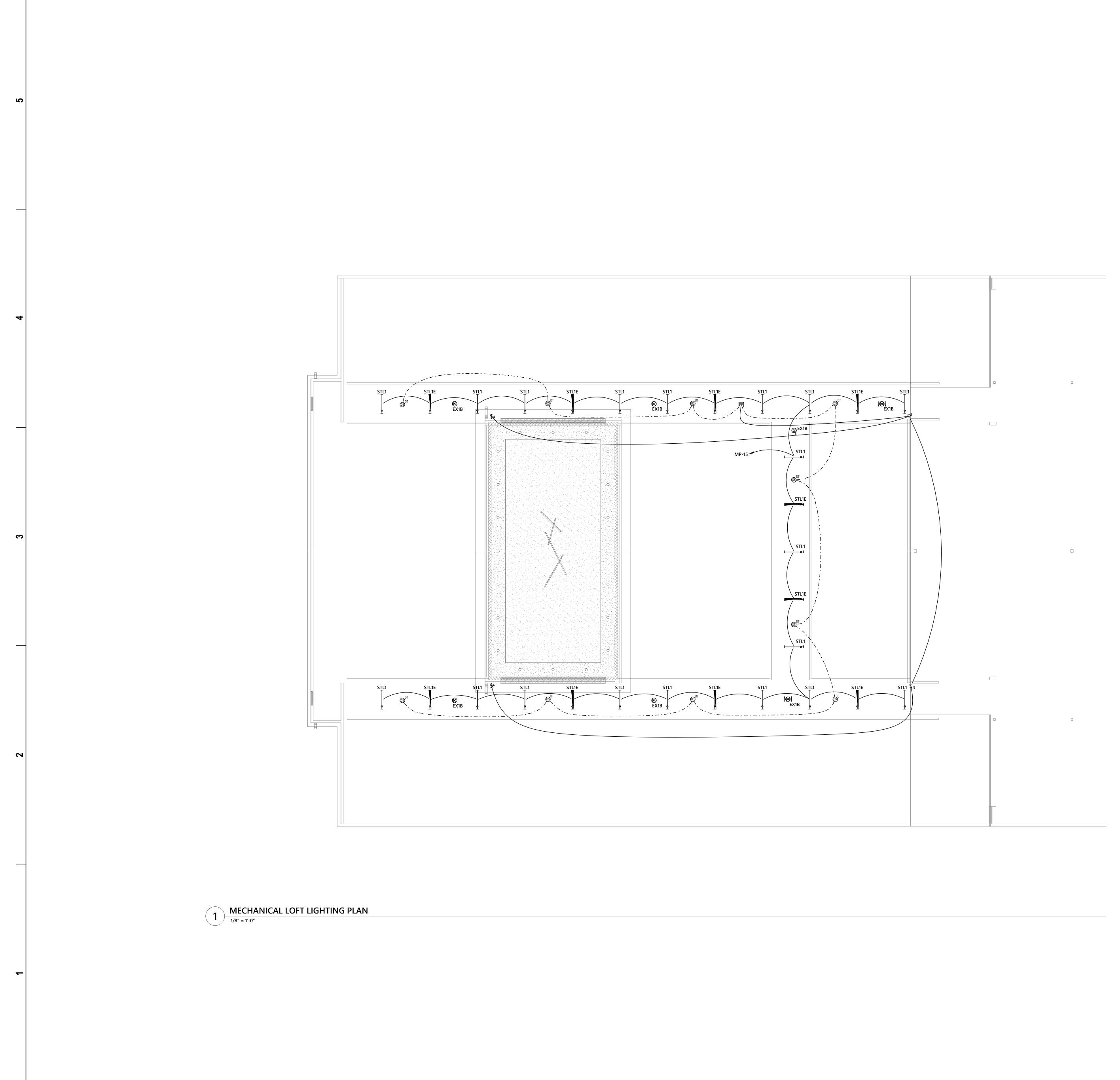
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**KEYNOTES** CONNECT TO EXISTING 277V LIGHTING CIRCUIT AND CONTROLS SERVING THIS AREA. TOTAL LOAD ON EXISTING CIRCUIT SHALL NOT EXCEED 4400 MOUNT POWER PACK IN MECHANICAL LOFT ADJACENT TO PANEL 'MP'.

- WATTS.
- 2 ZONE OVERRIDE SWITCH. DIMMING CONTROL FOR ZONES C2 & C3 IN COLLABORATION D-27.





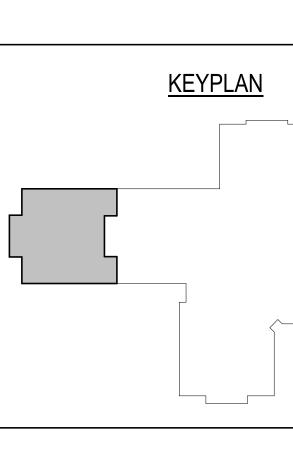


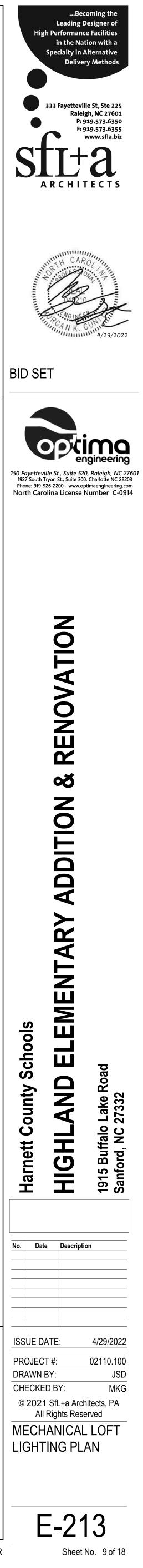
D

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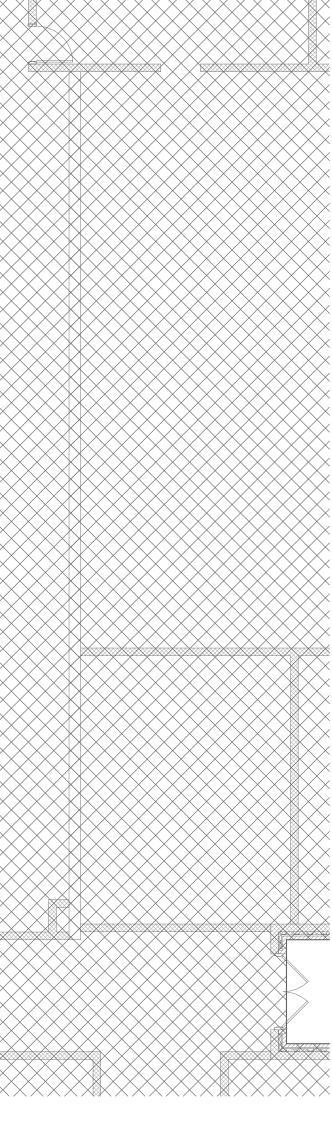


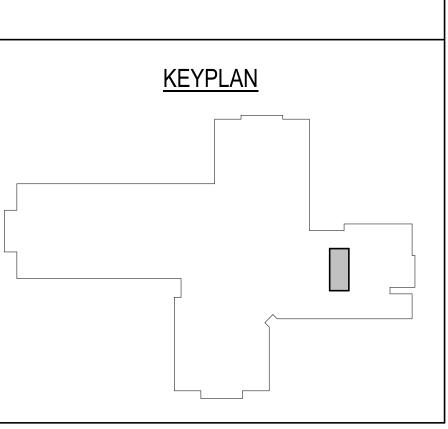


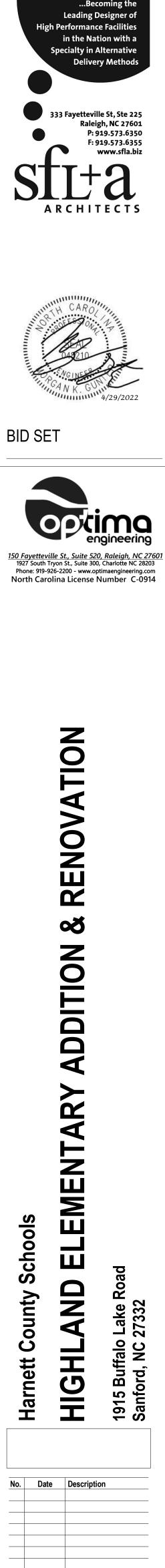
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# **KEYNOTES**







E-311 Sheet No. 10 of 18

4/29/2022

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PROJECT #:

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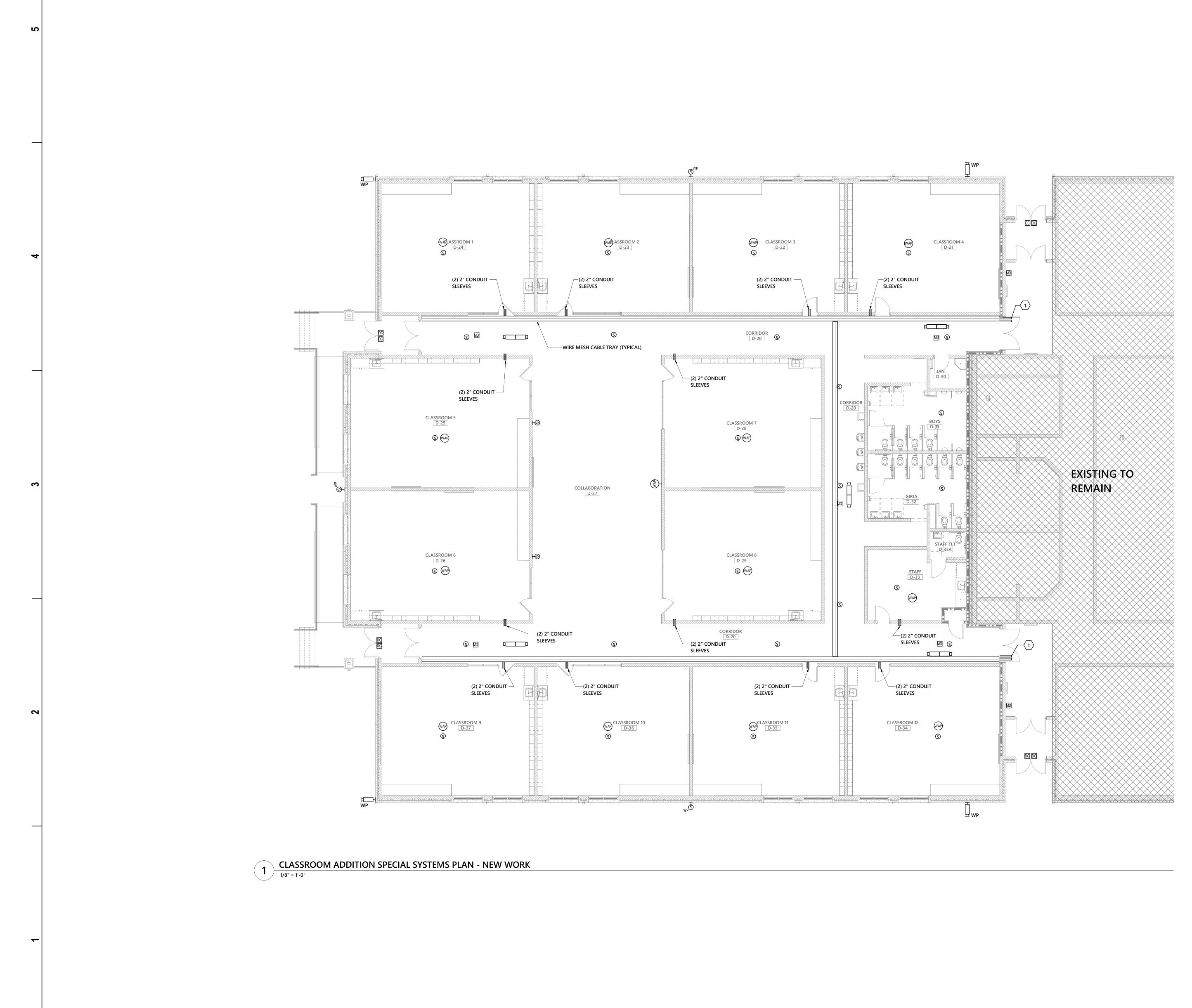
EXPANSION

PLANS

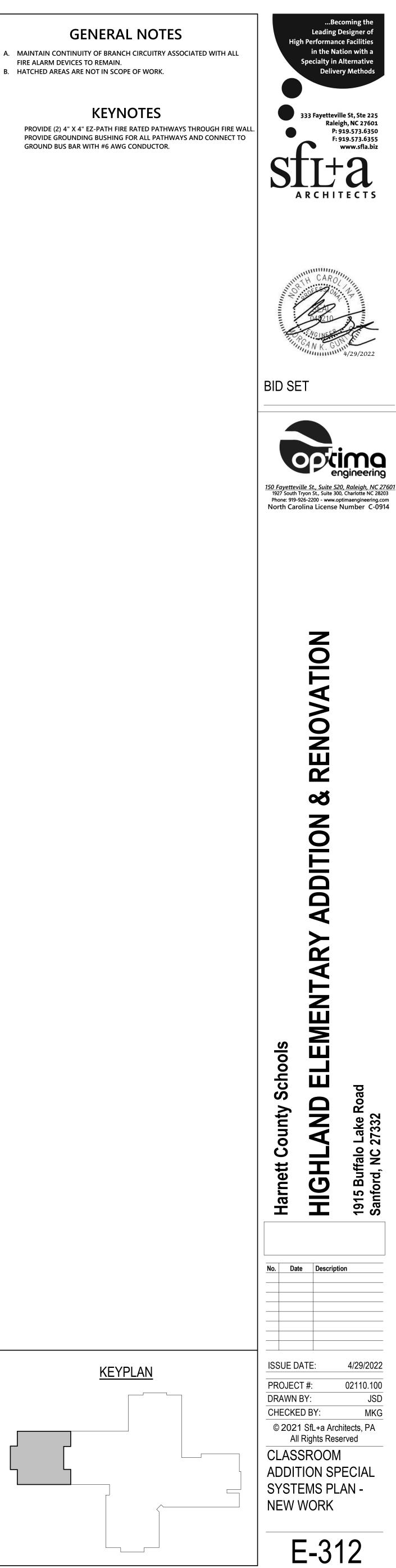
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SPECIAL SYSTEMS

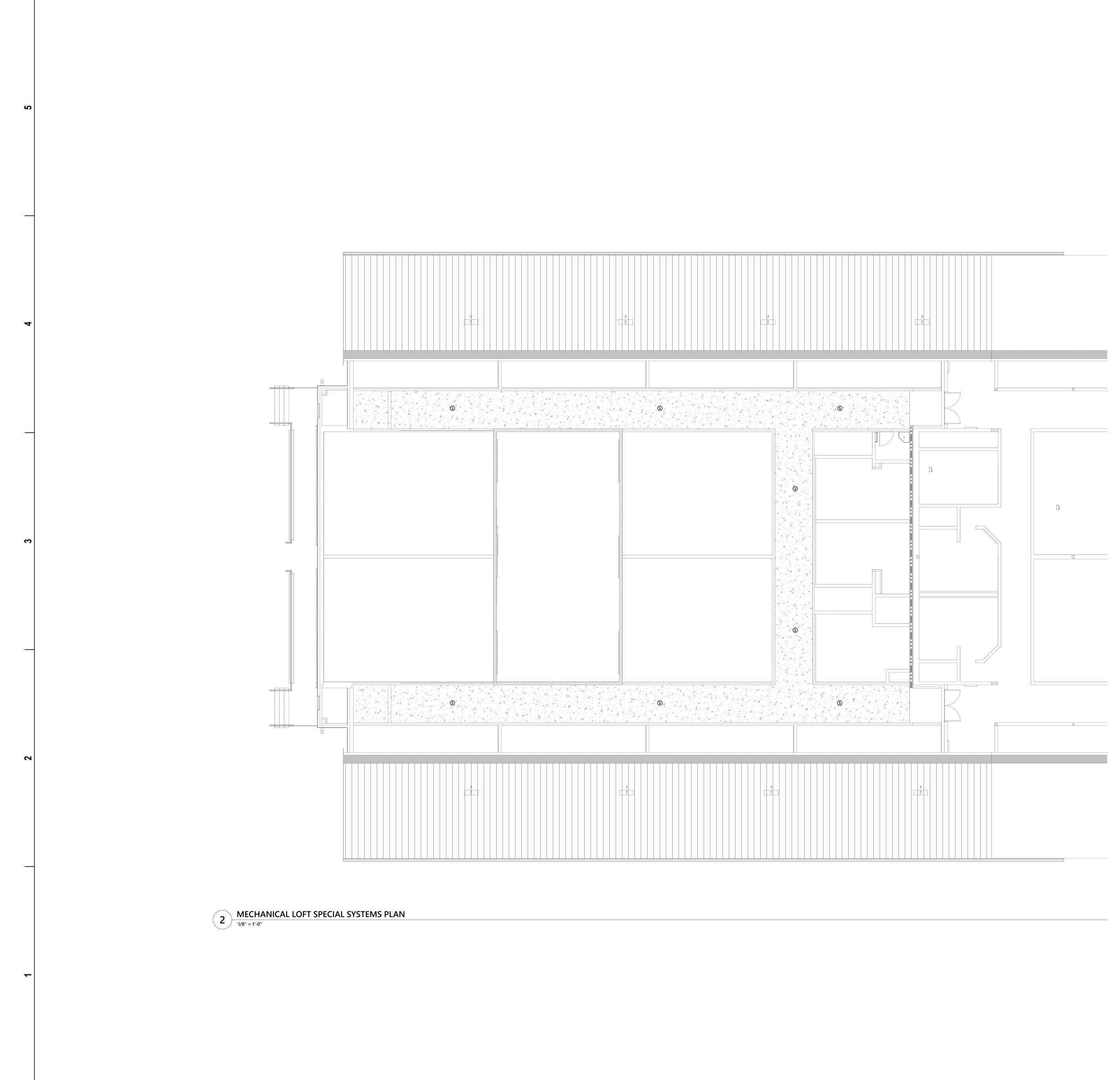


FIRE ALARM DEVICES TO REMAIN. B. HATCHED AREAS ARE NOT IN SCOPE OF WORK.



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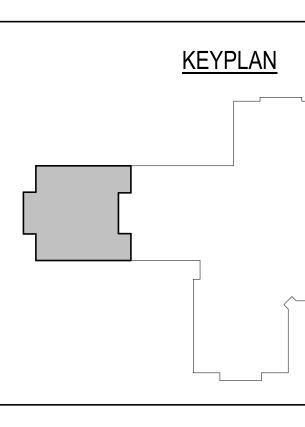
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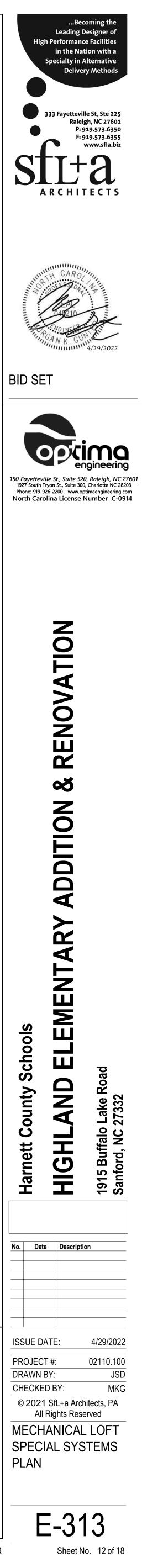
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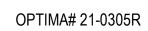


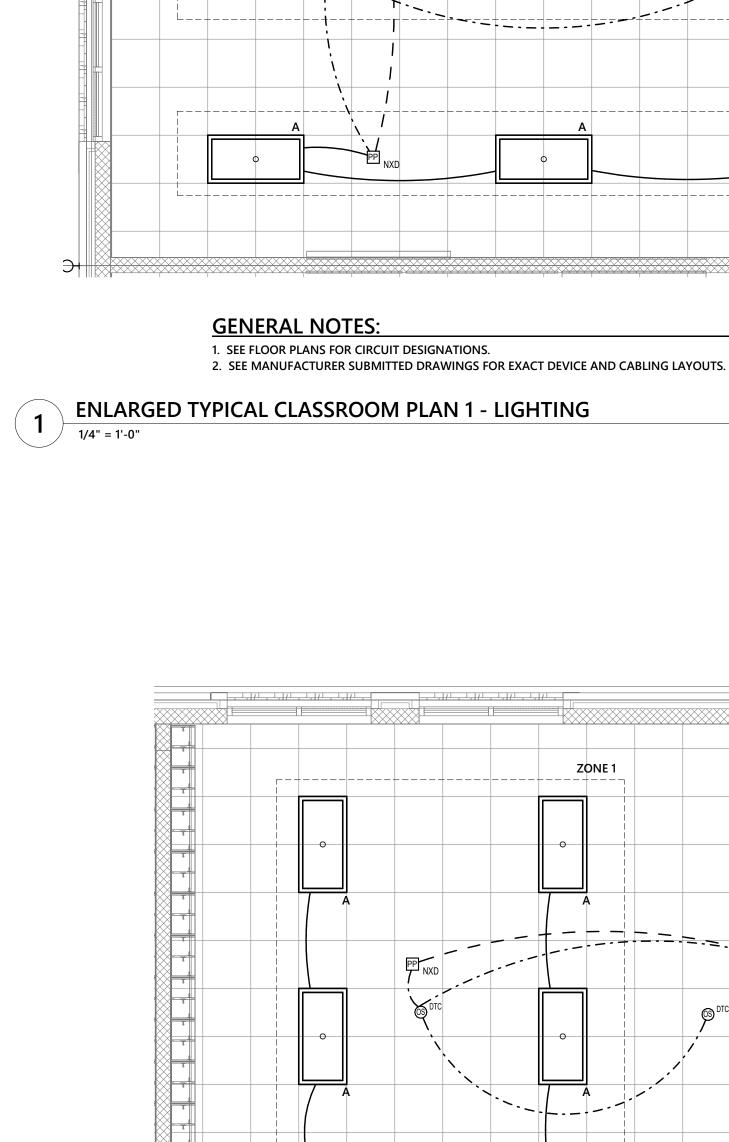
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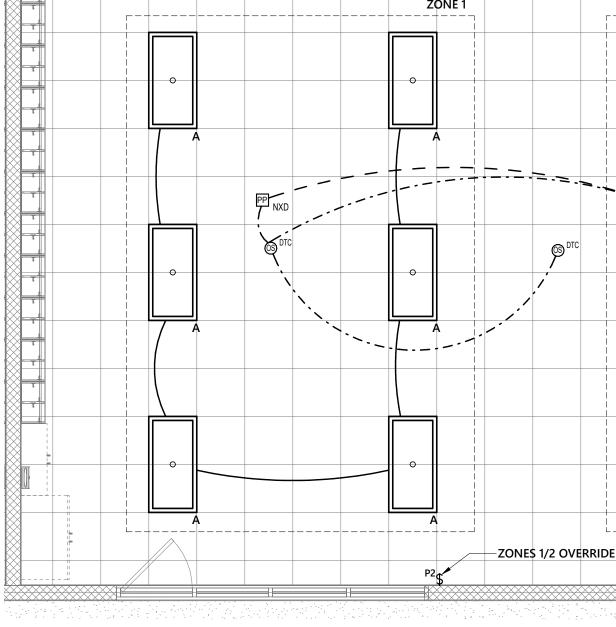


B. HATCHED AREAS ARE NOT IN SCOPE OF WORK.









# **GENERAL NOTES**:

1. SEE FLOOR PLANS FOR CIRCUIT DESIGNATIONS. 2. SEE MANUFACTURER SUBMITTED DRAWINGS FOR EXACT DEVICE AND CABLING LAYOUTS.



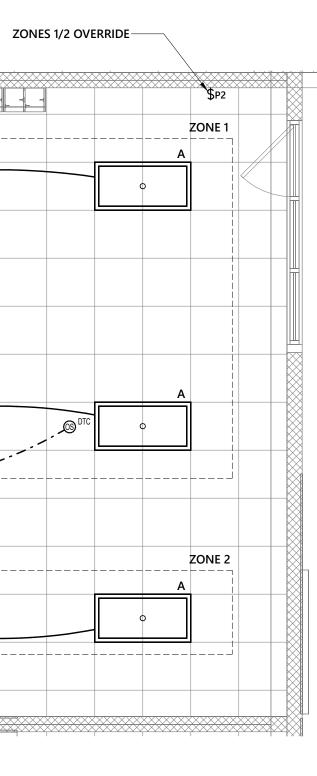
ENLARGED TYPICAL CLASSROOM PLAN 2 - LIGHTING 3 ENLARG

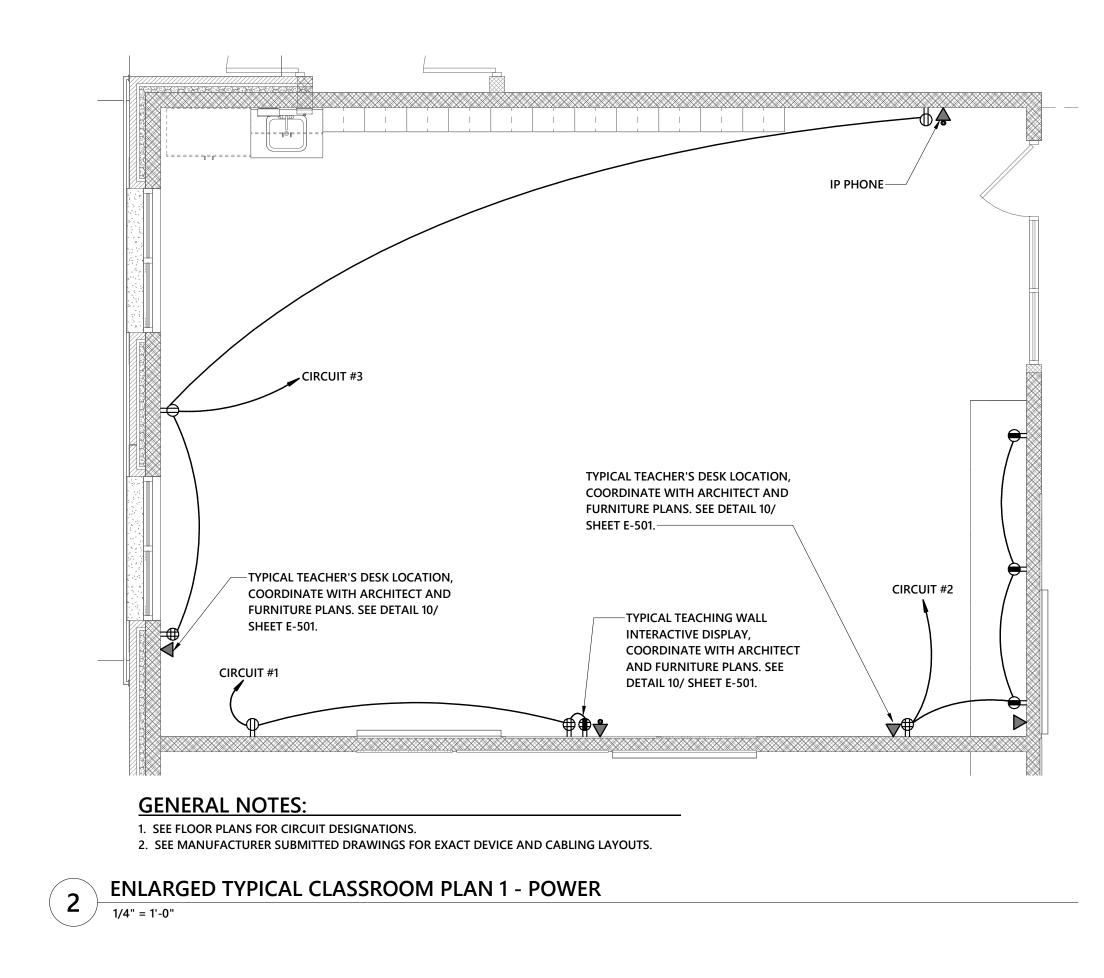
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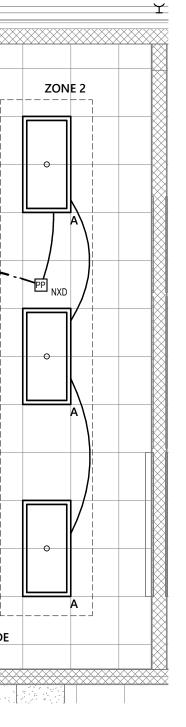
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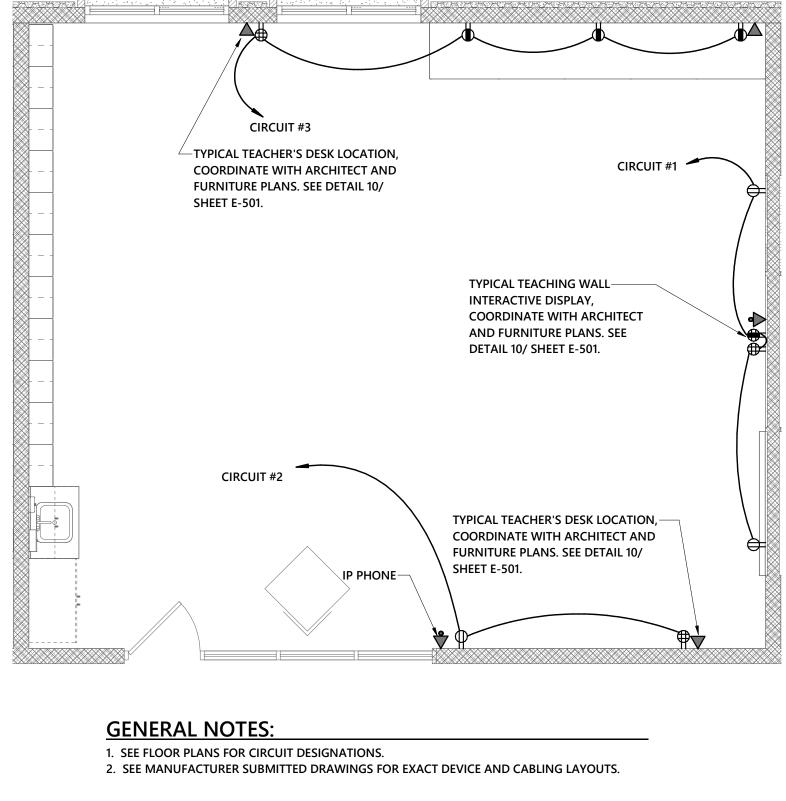
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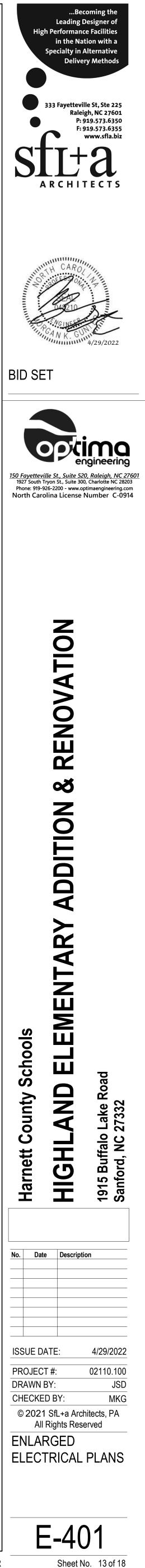


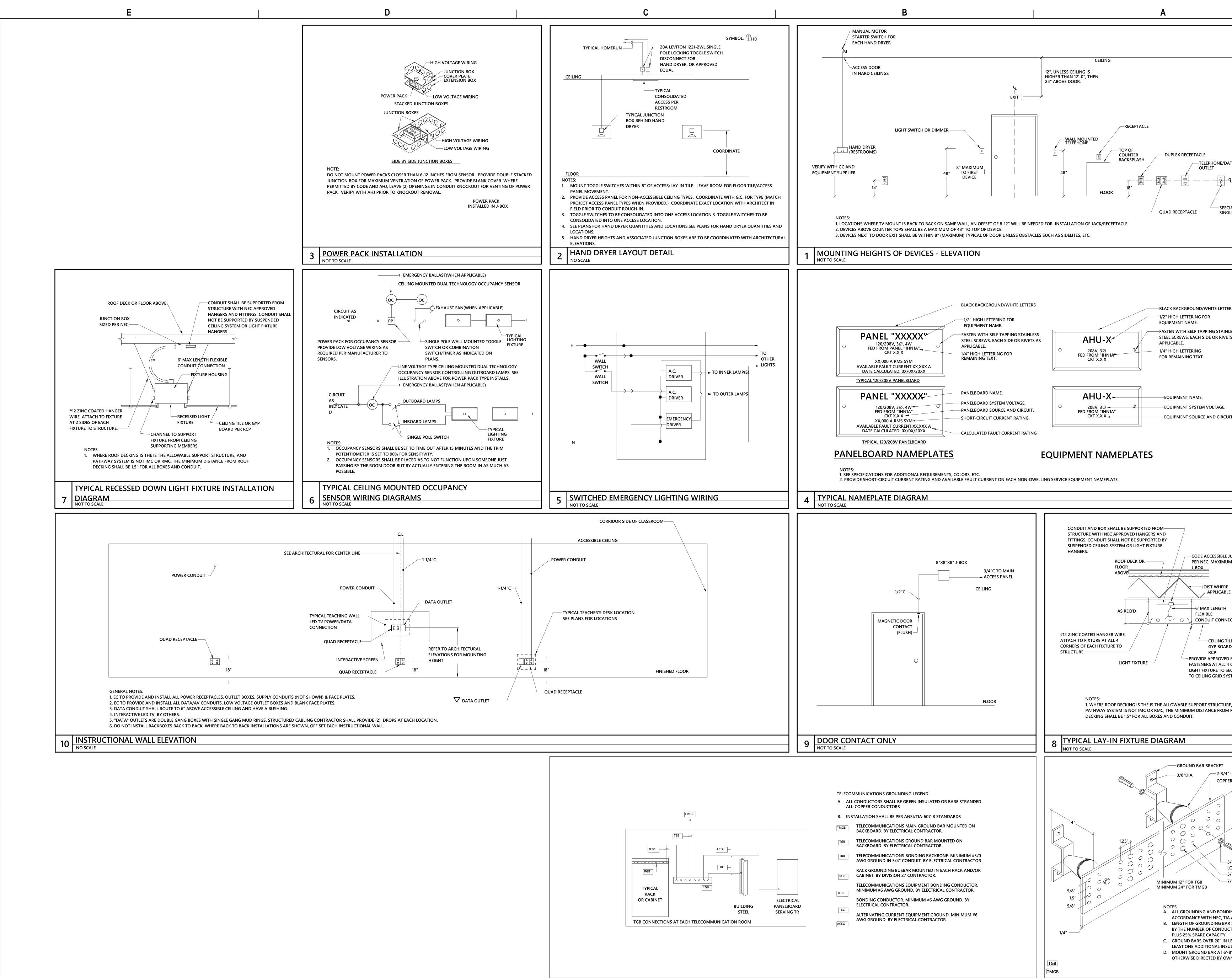
4 ENLARGED TYPICAL CLASSROOM PLAN 2 - POWER

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# **GENERAL NOTES**

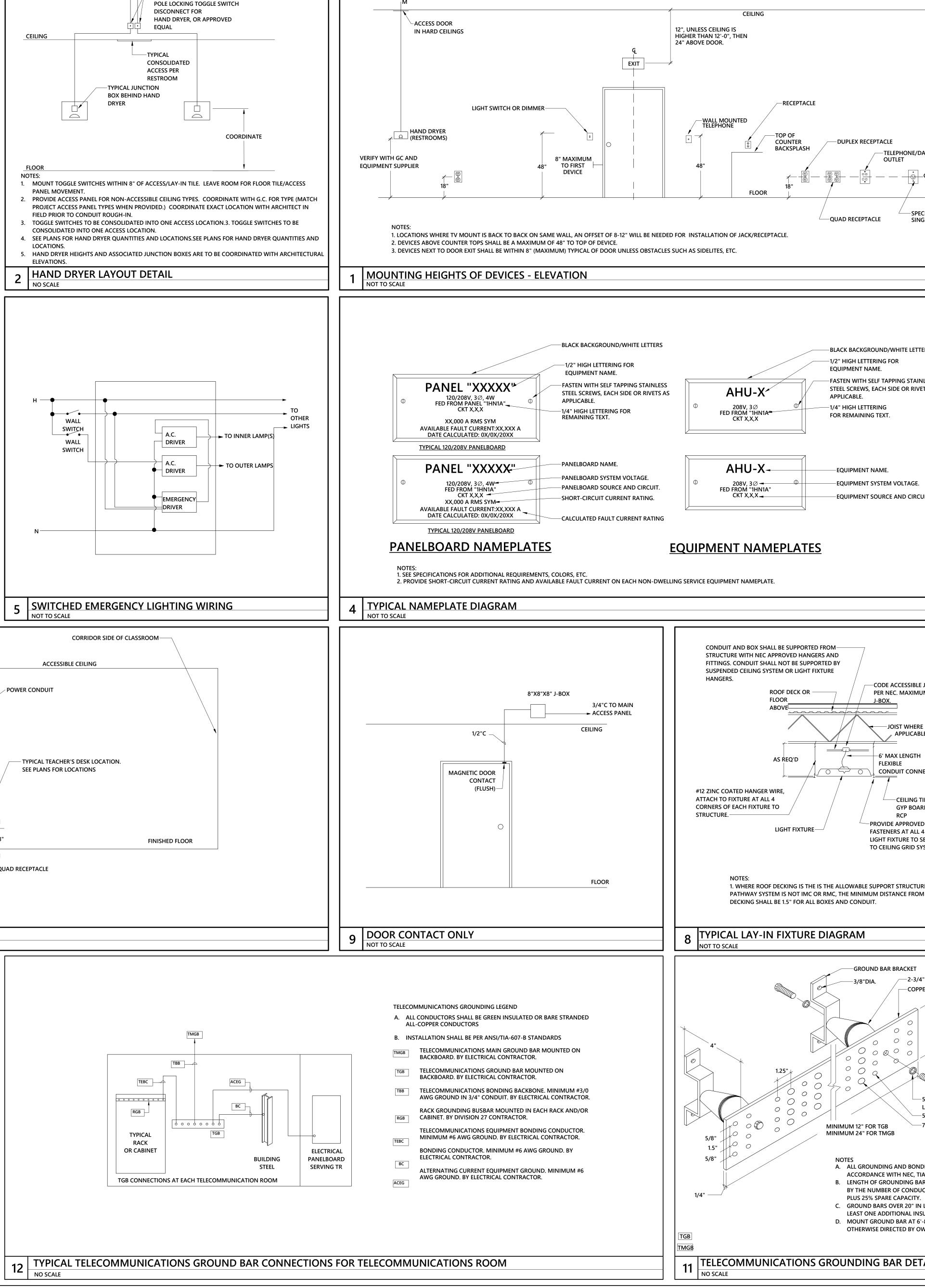
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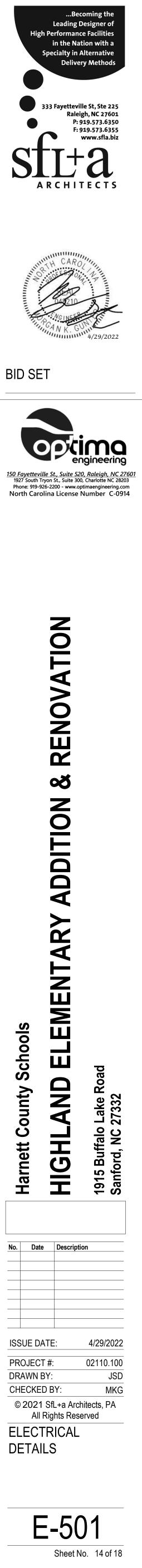
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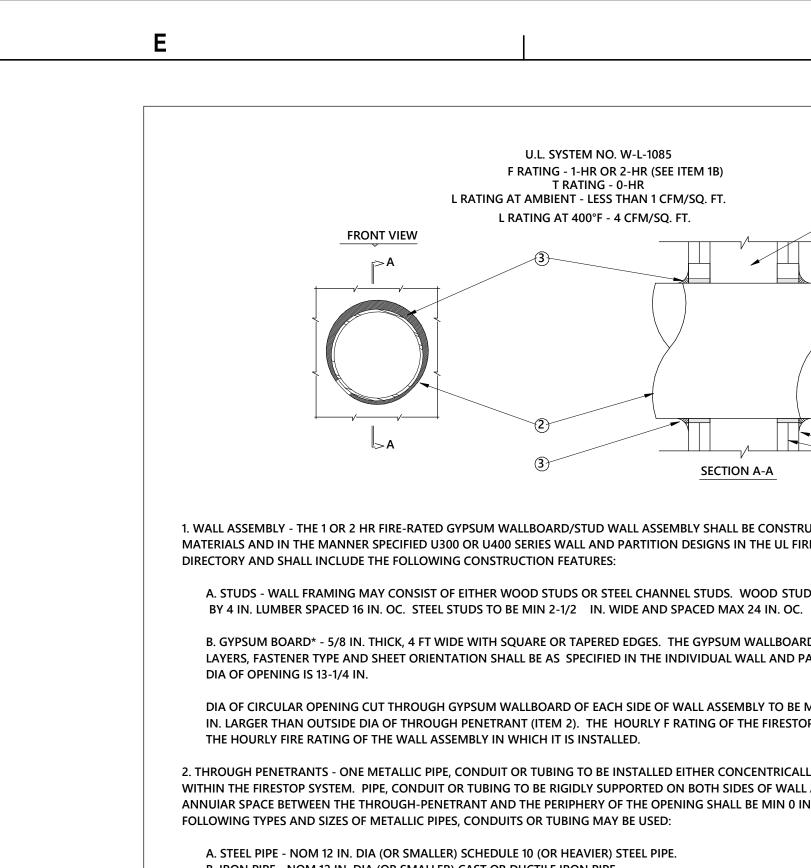


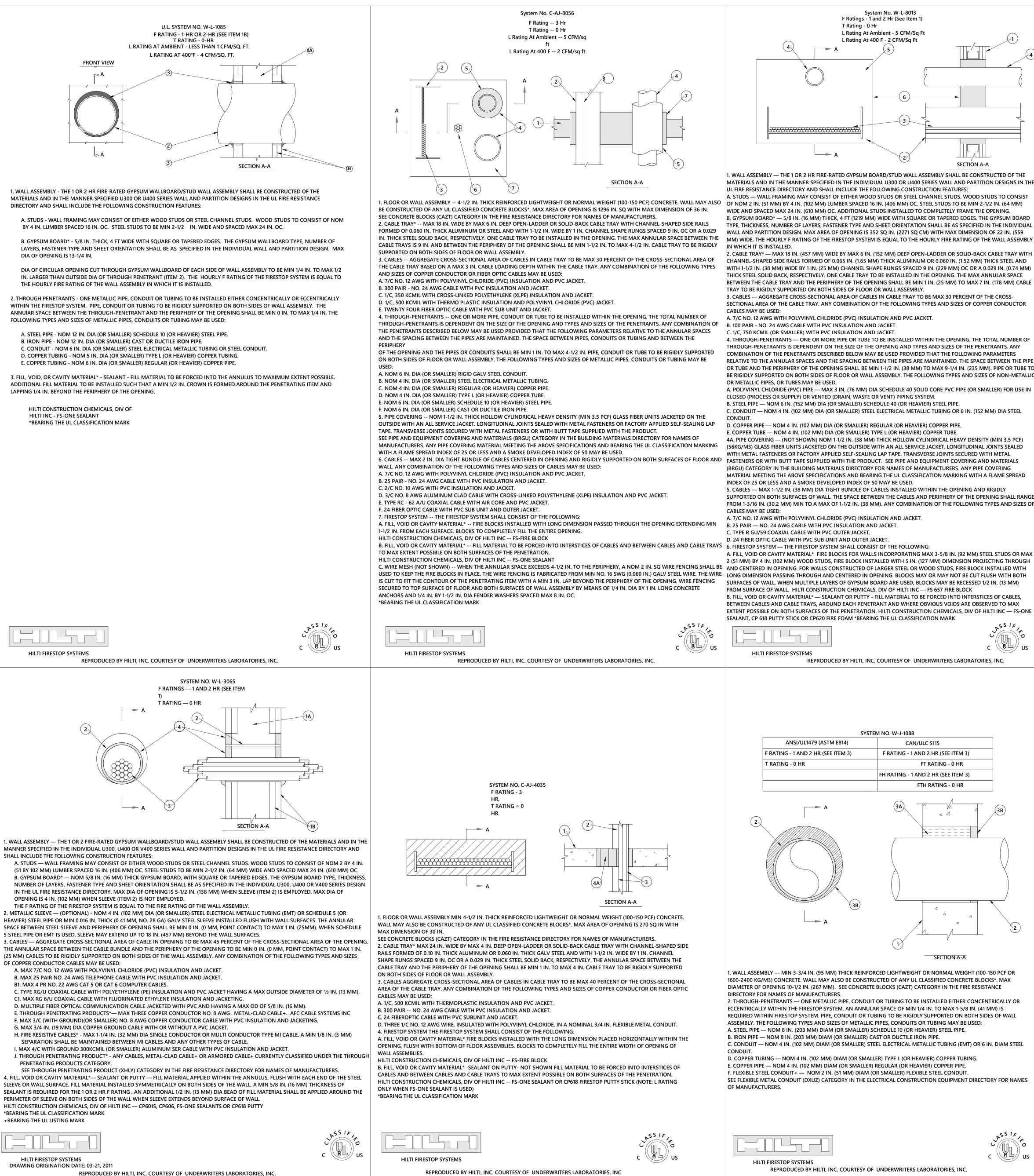


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7/16"DIA	
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VNER.	
AIL	

OPTIMA# 21-0305R







SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

5 STEEL PIPE OR EMT IS USED, SLEEVE MAY EXTEND UP TO 18 IN. (457 MM) BEYOND THE WALL SURFACES

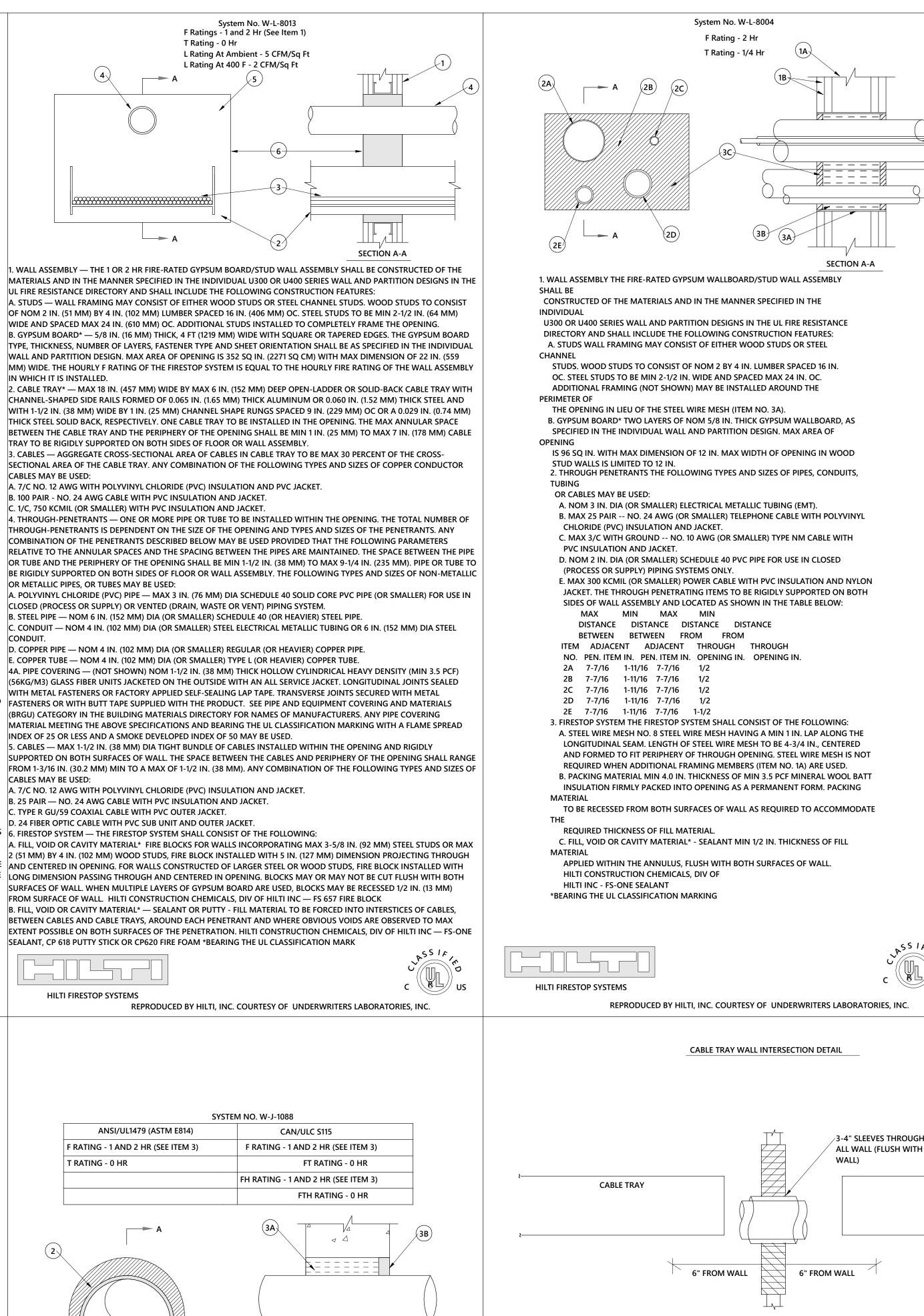
PERIMETER OF SLEEVE ON BOTH SIDES OF THE WALL WHEN SLEEVE EXTENDS BEYOND SURFACE OF WALL. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP601S, CP606, FS-ONE SEALANTS OR CP618 PUTTY \*BEARING THE UL CLASSIFICATION MARK



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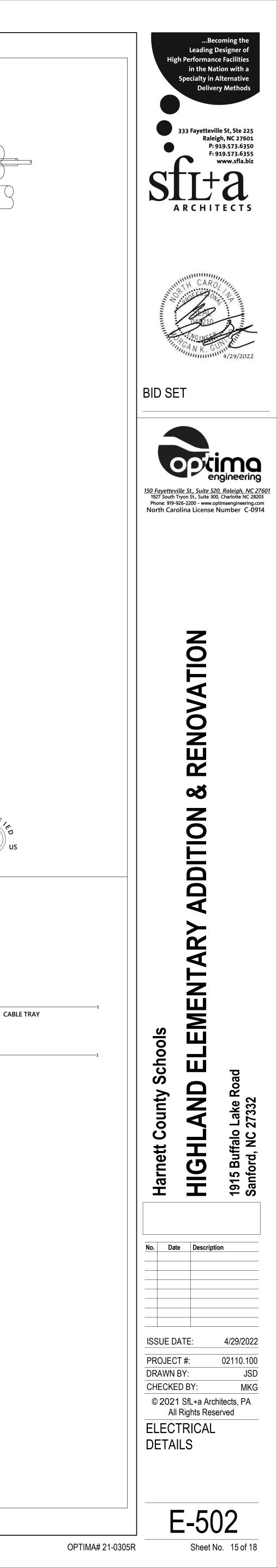


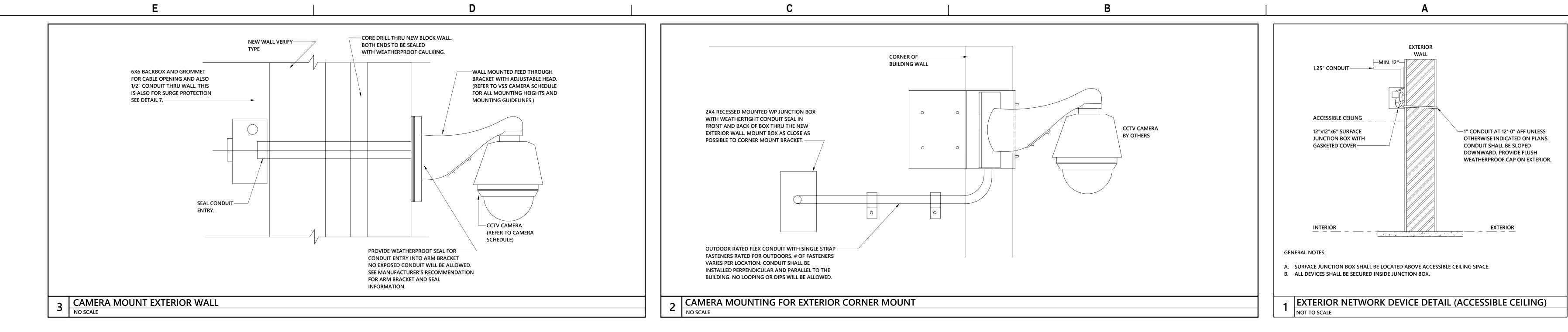
SECTION A-A 1. WALL ASSEMBLY — MIN 3-3/4 IN. (95 MM) THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF OR 1600-2400 KG/M3) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS\*. MAX DIAMETER OF OPENING 10-1/2 IN. (267 MM). SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE 2. THROUGH-PENETRANTS — ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. AN ANNULAR SPACE OF MIN 1/4 IN. TO MAX 1-5/8 IN. (41 MM) IS

ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED: A. STEEL PIPE — NOM 8 IN. (203 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE. B. IRON PIPE — NOM 8 IN. (203 MM) DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE. C. CONDUIT — NOM 4 IN. (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING (EMT) OR 6 IN. DIAM STEEL

D. COPPER TUBING — NOM 4 IN. (102 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING. E. COPPER PIPE — NOM 4 IN. (102 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

SEE FLEXIBLE METAL CONDUIT (DXUZ) CATEGORY IN THE ELECTRICAL CONSTRUCTION EQUIPMENT DIRECTORY FOR NAMES







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VOLTAGE: 480Y/277 3Ø MOUNTING: SURFACE ENCLOSURE: NEMA1	PANEL: MP MAIN TYPE: MLO PHASE: 3	FED MSB1 FROM: MSB1 MFR: SQUARE D TYPE: NF			
MAIN: 150 A	WIRE: 4	AIC: 42 KAIC			-
Abbr Load Served Wire Trip Ckt No Pole	10.13 0.06	Ckt     LC       e     No     Trip       2     NOTE			
F     XFMR-RP     NOTE 7     70 A     1       LE     LIGHTING - EXTERIOR     12     20 A     7     1	0.59 0.96 17.09 0.96	2         A         NOTE         AHU-59, AHU-60         M           6         8			
L         CLASSROOM LIGHTING         12         20 A         9         1           L         LIGHTING CORRIDOR         12         20 A         11         1	2.07         0.96         3           2.07         1.44         2.67         0.96	10         20 A         NOTE         AHU-61, AHU-62         M           12         14			
L         LOFT LIGHTING         12         20 A         15         1           Sp         SPARE         -         20 A         17         1		16         20 A         NOTE         AHU-63, AHU-64, AHU-65         M           18         8         AHU-63, AHU-64, AHU-65         M			
Sp         SPARE         -         20 A         21         1           Sp         SPARE         -         20 A         23         1	0.00         1.44         3           0.00         1.44         0.00         1.44           0.00         1.44         0.00         1.44	20         20         NOTE         AHU-66. AHU-67, AHU-68         M           24         24         AHU-66. AHU-67, AHU-68         M           26         20 A         NOTE         AHU-69, AHU-70, AHU-71         M			
Sp       SPARE       -       20 A       29       1         Sp       SPARE       -       20 A       31       1         Sp       SPARE       -       20 A       33       1	0.00         0.75         0.00         1.44           0.00         0.75         3	30         0           32         34         20 A         NOTE 8         AHU-72, AHU-73         M			
Sp         SPARE         -         20 A         35         1	0.00         0.75           0.00         2.00	36         8         NOTE         WATER HEATER         WH			
Sp SPARE - 20 A 41 1	0.00 2.00	40 1077 8 WATERCHEATER WIT			
LOADConnected LoadDemandLLIGHTS8.22 kVA125.0LELIGHTING - EXTERIOR0.37 kVA125.0	2. SHALL BE FULL	IE SHALL BE AS REQ'D PER PANEL AIC RATING. Y RATED - SERIES RATINGS NOT ALLOWED. NCL GND AND NEUTRAL, SHALL BE COPPER.			
H         HEATING         1.50 kVA         100.0           C         COOLING         0.00 kVA         0.00           V         VENTUATION         1.40 kVA         100.0	00%1.50 kVA4. ALL INCOMING F0%0.00 kVA5. PROVIDE HINGE6. PROVIDE METAL	PANEL & BRKR LUGS SHALL MATCH FEEDERS. ED DOOR-IN-DOOR WITH OUTER DOOR LOCK. L DIRECTORY FRAME.			
V         VENTILATION         1.18 kVA         100.0           M         MOTORS         21.37 kVA         101.6           K         KITCHEN         0.00 kVA         0.00	68% 21.73 kVA 8. REFER TO MECI	GRAM/ SHEET E-701 FOR WIRE & CONDUIT SIZE. HANICAL SCHEDULE SHEET E-601 FOR WIRE SIZE.			
R         RECEPTACLES         38.70 kVA         62.9           WH         WATER HEATER         6.00 kVA         100.0           MI         MISC.         9.78 kVA         100.0	00% 6.00 kVA				
S         Spare         0.00 kVA         0.00           E         ELEVATOR         0.00 kVA         0.00           LD         LAUNDRY         0.00 kVA         0.00	0% 0.00 kVA 0% 0.00 kVA				
	SE: (CONNECTED)	N ABBREVIATIONS (CONT.) N STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.			
TOTAL KVA (DEMAND):         75.27 kVA         111.8 A         99.6           TOTAL AMP         105 A         100 A <td< td=""><td>A 104.4 A F - FEEDER FOR DOWN</td><td>N STREAM PANEL, LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.</td><td></td><td></td><td></td></td<>	A 104.4 A F - FEEDER FOR DOWN	N STREAM PANEL, LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.			
VOLTAGE: 208Y/120 3Ø MOUNTING: SURFACE		FED XFMR-RP FROM: MFR: SQUARE D	VOLTAGE: 208Y/120 3Ø MOUNTING: SURFACE	PANEL: RP1B	FED FROM: RP1A MFR: SQUARE D
ENCLOSURE: NEMA1 MAIN: 150 A	PHASE: 3 WIRE: 4	TYPE: NQ AIC: 10 KAIC	ENCLOSURE: NEMA1 MAIN: 150 A	PHASE: 3 WIRE: 4	TYPE: NQ AIC: 10 KAIC
LC AbbrLoad ServedWireTripCktRRECEPTACLES CLASSROOM 1 D-241220 A11		Ckt     -     -     LC       e     No     Trip     Wire     Load Served     Abbr       2     20 A     12     RECEPTACLES CLASSROOM 12 D-34     R	Load Served Wire Trip	Ckt         Pole         A         B         C           1         1         0.72         0.50         Image: Constraint of the second secon	Ckt     King     King       Pole     No     Trip     Wire     Load Served       1     2     20 A     -     CP1 (NOTE 8)
R         RECEPTACLES CLASSROOM 1 D-24         12         20 A         3         1           R         RECEPTACLES CLASSROOM 1 D-24         12         20 A         5         1	0.72         0.72         1           0.72         0.72         0.72         1	420 A12RECEPTACLES CLASSROOM 12 D-34R620 A12RECEPTACLES CLASSROOM 12 D-34R820 A12RECEPTACLES CLASSROOM 5 D-25R	RTEACHING WALL COLLAB D-271220 ARFLR BOXES COLLAB D-271220 A	3 1 1.08 1.00	1     4     20 A     12     BAS       1     6     20 A     12     BDA (NOTE 9)       1     8     20 A     12     BDA (NOTE 9)
R         RECEPTACLES CLASSROOM 2 D-23         12         20 A         9         1           R         RECEPTACLES CLASSROOM 2 D-23         12         20 A         11         1	0.72         0.72         1           0.72         0.72         0.72         1	1020 A12RECEPTACLES CLASSROOM 5 D-25R1020 A12RECEPTACLES CLASSROOM 5 D-25R1220 A12RECEPTACLES CLASSROOM 5 D-25R1420 A12RECEPTACLES CLASSROOM 6 D-26R	RRECEPTACLES CORRIDOR D-201220 ARRECEPTACLES CORRIDOR D-201220 A	9 1 1.26 0.00	1 10 20 A - NAC (NOTE 9)
R         RECEPTACLES CLASSROOM 3 D-22         12         20 A         15         1           R         RECEPTACLES CLASSROOM 3 D-22         12         20 A         17         1	0.72         0.72         1           0.72         0.72         0.72         1	16         20 A         12         RECEPTACLES CLASSROOM 6 D-26         R           18         20 A         12         RECEPTACLES CLASSROOM 6 D-26         R	R         RECEPTACLES STAFF D-33         12         20 A           MS         HAND DRYER BOYS 161 (NOTE 7)         12         20 A	15         1         0.90         0.00         100           17         1         1         1.00         0.00	1         16         20 A         -         SPARE           1         18         20 A         -         SPARE
R         RECEPTACLES CLASSROOM 4 D-21         12         20 A         21         1           R         RECEPTACLES CLASSROOM 4 D-21         12         20 A         23         1		2020 A12RECEPTACLES CLASSROOM 7 D-28R2220 A12RECEPTACLES CLASSROOM 7 D-28R2420 A12RECEPTACLES CLASSROOM 7 D-28R	MS         HAND DRYER GIRLS 160 (NOTE 7)         12         20 A           MS         HAND DRYER GIRLS 160 (NOTE 7)         12         20 A	23 1 1.00 0.00	
R         RECEPTACLES CLASSROOM 9 D-37         12         20 A         27         1           R         RECEPTACLES CLASSROOM 9 D-37         12         20 A         29         1		26         20 A         12         RECEPTACLES CLASSROOM 8 D-29         R           28         20 A         12         RECEPTACLES CLASSROOM 8 D-29         R           30         20 A         12         RECEPTACLES CLASSROOM 8 D-29         R	MS         TBB         12         20 A           R         LOFT RECEPTACLES         12         20 A	29 1 1.44 0.00	1         26         20 A         -         SPARE           1         28         20 A         -         SPARE           1         30         20 A         -         SPARE
R         RECEPTACLES CLASSROOM 10 D-36         12         20 A         33         1           R         RECEPTACLES CLASSROOM 10 D-36         12         20 A         35         1		32         20 A         12         EWC (NOTE 9)         MS           34         20 A         12         EWC (NOTE 9)         MS           36         20 A         12         EWC (NOTE 9)         MS	V         HLVS-2 (NOTE 8)         -         20 A           V         F-29 (NOTE 8)         -         20 A	35 1 1.18 0.00	1         32         20 A         -         SPARE           1         34         20 A         -         SPARE           1         36         20 A         -         SPARE
R         RECEPTACLES CLASSROOM 11 D-35         12         20 A         37         1           R         RECEPTACLES CLASSROOM 11 D-35         12         20 A         39         1           R         RECEPTACLES CLASSROOM 11 D-35         12         20 A         41         1		38         20 A         -         SPARE         Sp           40         20 A         -         SPARE         Sp           42         20 A         -         SPARE         Sp	MMOTORIZED DAMPERS1220 AMSMECH CONTROLS1220 AMSMECH CONTROLS1220 A		1       38       20 A       -       SPARE         1       40       20 A       -       SPARE         1       42       20 A       -       SPARE
LOADConnected LoadDemandLLIGHTS0.00 kVA0.00LELIGHTING - EXTERIOR0.00 kVA0.00	2. SHALL BE FULL	IE SHALL BE AS REQ'D PER PANEL AIC RATING. Y RATED - SERIES RATINGS NOT ALLOWED.	LOAD         Connected Load           L         LIGHTS         0.00 kVA           LE         LIGHTING - EXTERIOR         0.00 kVA	2. SHALL BE F	RAME SHALL BE AS REQ'D PER PANEL AIC RATING. ULLY RATED - SERIES RATINGS NOT ALLOWED.
H         HEATING         1.50 kVA         100.0           C         COOLING         0.00 kVA         0.00	00%       1.50 kVA       4. ALL INCOMING F         0%       0.00 kVA       5. PROVIDE HINGE         6. PROVIDE METAI	NCL GND AND NEUTRAL, SHALL BE COPPER. PANEL & BRKR LUGS SHALL MATCH FEEDERS. ED DOOR-IN-DOOR WITH OUTER DOOR LOCK. L DIRECTORY FRAME.	HHEATING1.50 kVACCOOLING0.00 kVA	100.00%         1.50 kVA         4. ALL INCOMI           0.00%         0.00 kVA         5. PROVIDE H           6. PROVIDE M         6. PROVIDE M	G, INCL GND AND NEUTRAL, SHALL BE COPPER. NG PANEL & BRKR LUGS SHALL MATCH FEEDERS. NGED DOOR-IN-DOOR WITH OUTER DOOR LOCK. ETAL DIRECTORY FRAME.
V         VENTILATION         1.18 kVA         100.0           M         MOTORS         0.40 kVA         112.5           K         KITCHEN         0.00 kVA         0.00	50% 0.45 kVA 8. LOAD TOTAL INC	-THRU LUGS. CLUDES FEED-THRU SECTIONS. S A GFI (6mA PERSONNEL) BRKR (250' MAX).	VVENTILATION1.18 kVAMMOTORS0.40 kVAKKITCHEN0.00 kVA	112.50% 0.45 kVA 8. REFER TO I	LASS A GFI (6mA PERSONNEL) BRKR (250' MAX). /IECHANICAL SCHEDULE SHEET E-601 FOR WIRE SIZE. REAKER WITH HANDLE LOCK ON DEVICE.
R         RECEPTACLES         38.70 kVA         62.90           WH         WATER HEATER         0.00 kVA         0.00           MI         MISC.         9.78 kVA         100.00	0% 0.00 kVA		RRECEPTACLES8.46 kVAWHWATER HEATER0.00 kVAMIMISC.8.70 kVA	100.00%         8.46 kVA           0.00%         0.00 kVA           100.00%         8.70 kVA	
S         Spare         0.00 kVA         0.00           E         ELEVATOR         0.00 kVA         0.00           LD         LAUNDRY         0.00 kVA         0.00	0% 0.00 kVA		S         Spare         0.00 kVA           E         ELEVATOR         0.00 kVA           LD         LAUNDRY         0.00 kVA	0.00% 0.00 kVA 0.00% 0.00 kVA 0.00% 0.00 kVA	
TOTAL KVA 51.56 kVA TOTAL PER PHA	SE: (CONNECTED)		TOTAL KVA 20.24 kVA TOTAL F	PER PHASE: (CONNECTED)	TION ABBREVIATIONS (CONT.)
TOTAL KVA (DEMAND):         37.26 kVA         161.7 A         127.8           TOTAL AMP         143 A         103 A <t< td=""><td>8 A 144.7 A F - FEEDER FOR DOWN</td><td>N STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.</td><td>TOTAL KVA (DEMAND):20.29 kVA48.4 ATOTAL AMP56 ATOTAL AMP. (DEMAND):56 A</td><td>53.5 A 68.1 A F - FEEDER FOR</td><td>DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUM</td></t<>	8 A 144.7 A F - FEEDER FOR DOWN	N STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.	TOTAL KVA (DEMAND):20.29 kVA48.4 ATOTAL AMP56 ATOTAL AMP. (DEMAND):56 A	53.5 A 68.1 A F - FEEDER FOR	DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUM
ELECTRICAL DATA	DISCONNECT CONDUIT		EXHAUST FAN SCHEDULE	DISCONNECT CONDUIT AND	
SYMBOL FAN HP VOLTAGE PH MANUFACTURER	MODEL         DESCRIPTION         CONDUCTO           BCHD036         30A/F15A-3P-1         4#12, 1#12G., 3	B/4"C.         F-29         MECHANICAL LOFT           B/4"C.	MANUFACTURERMODEL NO.WATTSH.P.VOLTAGE-PGREENHECKSQ-120-A11800.50120 V-1		
AHU-60         1.00 hp         480         3         TRANE	BCHD036 30A/F15A-3P-1 4#12, 1#12G., 3				
AHU-60         1.00 hp         480         3         TRANE           AHU-61         1.00 hp         480         3         TRANE           AHU-62         1.00 hp         480         3         TRANE           AHU-62         1.00 hp         480         3         TRANE           AHU-63         1.00 hp         480         3         TRANE	BCHD036         30A/F15A-3P-1         4#12, 1#12G., 3	B/4"C. HVLS FA	N SCHEDULE		
AHU-60         1.00 hp         480         3         TRANE           AHU-61         1.00 hp         480         3         TRANE           AHU-62         1.00 hp         480         3         TRANE           AHU-62         1.00 hp         480         3         TRANE           AHU-63         1.00 hp         480         3         TRANE           AHU-64         1.00 hp         480         3         TRANE           AHU-65         1.00 hp         480         3         TRANE	BCHD036         30A/F15A-3P-1         4#12, 1#12G., 3           BCHD036         30A/F15A-3P-1         4#12, 1#12G., 3	B/4"C. B/	CONNECT DESCRIPTION CONDUIT AND CONDUCTOR SIZE		
AHU-60         1.00 hp         480         3         TRANE           AHU-61         1.00 hp         480         3         TRANE           AHU-62         1.00 hp         480         3         TRANE           AHU-62         1.00 hp         480         3         TRANE           AHU-63         1.00 hp         480         3         TRANE           AHU-64         1.00 hp         480         3         TRANE           AHU-65         1.00 hp         480         3         TRANE           AHU-65         1.00 hp         480         3         TRANE           AHU-65         1.00 hp         480         3         TRANE           AHU-66         1.00 hp         480         3         TRANE           AHU-66         1.00 hp         480         3         TRANE           AHU-67         1.00 hp         480         3         TRANE           AHU-68         1.00 hp         480         3         TRANE	BCHD036         30A/F15A-3P-1         4#12, 1#12G, 3	B/4"C.       B/4"C.         B/4"C.       ELECTRICAL DATA         B/4"C.       SYMBOL       H.P.         VOLTAGE-PHASEØ       DISC         HVLS-1       0.25       110 V-0Ø         HVLS-2       0.25       110 V-0Ø			
AHU-60         1.00 hp         480         3         TRANE           AHU-61         1.00 hp         480         3         TRANE           AHU-62         1.00 hp         480         3         TRANE           AHU-62         1.00 hp         480         3         TRANE           AHU-63         1.00 hp         480         3         TRANE           AHU-64         1.00 hp         480         3         TRANE           AHU-65         1.00 hp         480         3         TRANE           AHU-64         1.00 hp         480         3         TRANE           AHU-65         1.00 hp         480         3         TRANE           AHU-65         1.00 hp         480         3         TRANE           AHU-66         1.00 hp         480         3         TRANE           AHU-67         1.00 hp         480         3         TRANE           AHU-68         1.00 hp         480         3         TRANE           AHU-69         1.00 hp         480         3         TRANE           AHU-70         1.00 hp         480         3         TRANE           AHU-71         1.00 hp         480	BCHD036         30A/F15A-3P-1         4#12, 1#12G, 3	B/4"C.       B/4"C.         B/4"C.       ELECTRICAL DATA         B/4"C.       SYMBOL       H.P.         VOLTAGE-PHASEØ       DISG         HVLS-1       0.25       110 V-0Ø         B/4"C.       HVLS-2       0.25       110 V-0Ø         B/4"C.       B/4"C.       B/4"C.       B/4"C.	CONNECT DESCRIPTIONCONDUIT AND CONDUCTOR SIZEVIDED BY MC2#12, 1#12G., 3/4"C.		
AHU-60         1.00 hp         480         3         TRANE           AHU-61         1.00 hp         480         3         TRANE           AHU-62         1.00 hp         480         3         TRANE           AHU-62         1.00 hp         480         3         TRANE           AHU-63         1.00 hp         480         3         TRANE           AHU-63         1.00 hp         480         3         TRANE           AHU-64         1.00 hp         480         3         TRANE           AHU-65         1.00 hp         480         3         TRANE           AHU-65         1.00 hp         480         3         TRANE           AHU-66         1.00 hp         480         3         TRANE           AHU-66         1.00 hp         480         3         TRANE           AHU-67         1.00 hp         480         3         TRANE           AHU-68         1.00 hp         480         3         TRANE           AHU-69         1.00 hp         480         3         TRANE           AHU-70         1.00 hp         480         3         TRANE	BCHD036         30A/F15A-3P-1         4#12, 1#12G, 3	B/4"C.       B/4"C.         B/4"C.       ELECTRICAL DATA         B/4"C.       SYMBOL       H.P.         VOLTAGE-PHASEØ       DISC         HVLS-1       0.25       110 V-0Ø         B/4"C.       HVLS-2       0.25       110 V-0Ø         B/4"C.       B/4"C.       B/4"C.       B/4"C.         B/4"C.       SYMBOL       DESCRIPTION	CONNECT DESCRIPTION       CONDUIT AND CONDUCTOR SIZE         VIDED BY MC       2#12, 1#12G., 3/4"C.         VIDED BY MC       2#12, 1#12G., 3/4"C.         WATER HEATER SCHEDULE         ELECTRICAL         N       ELECTRICAL         KW       V       PH	CONDUIT AND CONNECT SIZE	
AHU-60         1.00 hp         480         3         TRANE           AHU-61         1.00 hp         480         3         TRANE           AHU-62         1.00 hp         480         3         TRANE           AHU-62         1.00 hp         480         3         TRANE           AHU-63         1.00 hp         480         3         TRANE           AHU-63         1.00 hp         480         3         TRANE           AHU-64         1.00 hp         480         3         TRANE           AHU-65         1.00 hp         480         3         TRANE           AHU-66         1.00 hp         480         3         TRANE           AHU-66         1.00 hp         480         3         TRANE           AHU-67         1.00 hp         480         3         TRANE           AHU-68         1.00 hp         480         3         TRANE           AHU-69         1.00 hp         480         3         TRANE           AHU-70         1.00 hp         480         3         TRANE           AHU-71         1.00 hp         480         3         TRANE           AHU-72         1.00 hp         480	BCHD036         30A/F15A-3P-1         4#12, 1#12G, 3           BCHD036         30A/F15A-3P-1         4#12, 1#12G, 3	B/4"C.       B/4"C.         B/4"C.       ELECTRICAL DATA         S/4"C.       SYMBOL       H.P.         VOLTAGE-PHASEØ       DISC         HVLS-1       0.25       110 V-0Ø         B/4"C.       HVLS-2       0.25       110 V-0Ø         B/4"C.       B/4"C.       B/4"C.       B/4"C.	CONNECT DESCRIPTION       CONDUIT AND CONDUCTOR SIZE         VIDED BY MC       2#12, 1#12G., 3/4"C.         VIDED BY MC       2#12, 1#12G., 3/4"C.         WATER HEATER SCHEDULE         ELECTRICAL         N       ELECTRICAL         KW       V       PH		
AHU-60         1.00 hp         480         3         TRANE           AHU-61         1.00 hp         480         3         TRANE           AHU-62         1.00 hp         480         3         TRANE           AHU-63         1.00 hp         480         3         TRANE           AHU-63         1.00 hp         480         3         TRANE           AHU-64         1.00 hp         480         3         TRANE           AHU-65         1.00 hp         480         3         TRANE           AHU-66         1.00 hp         480         3         TRANE           AHU-66         1.00 hp         480         3         TRANE           AHU-66         1.00 hp         480         3         TRANE           AHU-67         1.00 hp         480         3         TRANE           AHU-69         1.00 hp         480         3         TRANE           AHU-70         1.00 hp         480         3         TRANE           AHU-73         0.50 hp         480         3         TRANE           AHU-73         0.50 hp         480         3         TRANE           AHU-73         0.50 hp         480	BCHD036       30A/F15A-3P-1       4#12, 1#12G, 3	B/4"C.       B/4"C.         B/4"C.       ELECTRICAL DATA         B/4"C.       SYMBOL       H.P.         VOLTAGE-PHASEØ       DISC         HVLS-1       0.25       110 V-0Ø         B/4"C.       HVLS-2       0.25       110 V-0Ø         B/4"C.       B/4"C.       B/4"C.       B/4"C.         B/4"C.       SYMBOL       DESCRIPTION	CONNECT DESCRIPTION       CONDUIT AND CONDUCTOR SIZE         VIDED BY MC       2#12, 1#12G., 3/4"C.         VIDED BY MC       2#12, 1#12G., 3/4"C.         WATER HEATER SCHEDULE         ELECTRICAL         N       ELECTRICAL         KW       V       PH	CONNECT SIZE CONDUCTOR SIZE	
AHU-60       1.00 hp       480       3       TRANE         AHU-61       1.00 hp       480       3       TRANE         AHU-62       1.00 hp       480       3       TRANE         AHU-63       1.00 hp       480       3       TRANE         AHU-64       1.00 hp       480       3       TRANE         AHU-65       1.00 hp       480       3       TRANE         AHU-66       1.00 hp       480       3       TRANE         AHU-66       1.00 hp       480       3       TRANE         AHU-66       1.00 hp       480       3       TRANE         AHU-67       1.00 hp       480       3       TRANE         AHU-68       1.00 hp       480       3       TRANE         AHU-70       1.00 hp       480       3       TRANE         AHU-71       1.00 hp       480       3       TRANE         AHU-72       1.00 hp       480       3       TRANE         AHU-73       0.50 hp       480       3       TRANE	BCHD036       30A/F15A-3P-1       4#12, 1#12G, 3	B/4"C.       B/4"C.         B/4"C.       ELECTRICAL DATA         B/4"C.       SYMBOL       H.P.         VOLTAGE-PHASEØ       DISC         HVLS-1       0.25       110 V-0Ø         B/4"C.       HVLS-2       0.25       110 V-0Ø         B/4"C.       B/4"C.       B/4"C.       B/4"C.         B/4"C.       SYMBOL       DESCRIPTION	CONNECT DESCRIPTION VIDED BY MC 2#12, 1#12G., 3/4"C. VIDED BY MC 2#12, 1#12G., 3/4"C. WATER HEATER SCHEDULE N ELECTRICAL DISC KW V PH 050 6 480 3 30	CONNECT SIZE CONDUCTOR SIZE	

D	6"
DE	SA M
EX1B	Tŀ
LP1	D
OWL1	V
STL1	4
STL1E	SA M
STL2	2
WL1	4

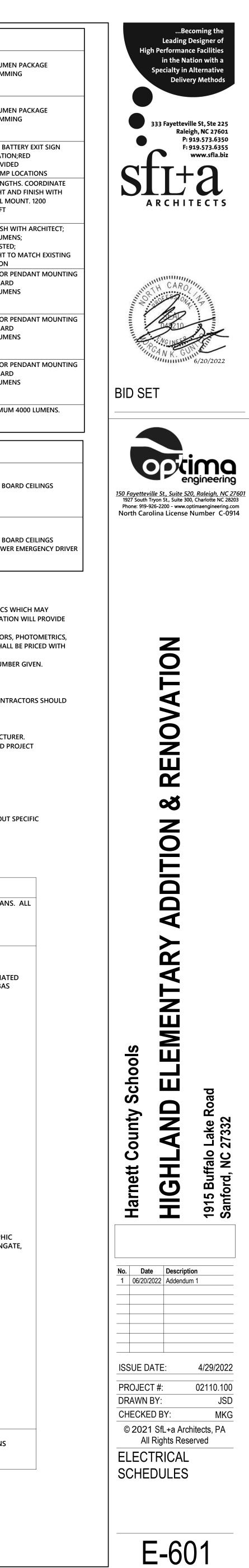
A	2X
AE	2X PR

	В						Α	
		LIG	HTING	g fixtu	RE SCHE	DULE		
" RECESSED LED DOWNLIGHT	LED	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	25 W	277V	GOTHAM PATHWAY JUNO COOPER	EVO 20 6AR LS MVOLT APPROVED EQUAL APPROVED EQUAL APPROVED EQUAL		6" APERATURE MINIMUM 2000 LUMEN MINIMUM 10% DIMMIN CLEAR SPECULAR
AME AS TYPE 'DL1' EXCEPT PROVIDE WITH 90 /INUTE BATTERY BACKUP	LED	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	25 W	277V	GOTHAM PATHWAY JUNO	EVO 20 6AR LS MVOLT EL APPROVED EQUAL APPROVED EQUAL		6" APERATURE MINIMUM 2000 LUMEN MINIMUM 10% DIMMIN
HERMOPLASTIC EXIT SIGN	LED	INTEGRAL LED DRIVER	5 W	UNIV	SPECTRUM LITHONIA HUBBELL	APPROVED EQUAL QUANTUM LQM S W R 120/277 EL N APPROVED EQUAL		CLEAR SPECULAR NICKEL CADMIUM BATT 90 MINUTE OPERATION
ECORATIVE LINEAR PENDANT FIXTURE	LED	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	NG)     JUNO     APPROVED EQUAL SPECTRUM     APPROVED EQUAL APPROVED EQUAL APPROVED EQUAL APPROVED EQUAL APPROVED EQUAL APPROVED EQUAL APPROVED EQUAL SPECTRUM     APPROVED EQUAL APPROVED EQUAL APPROVED EQUAL SPECTRUM       VAL LED DRIVER     5 W     UNIV     LITHONIA     QUANTUM LOM S W R 1 APPROVED EQUAL APPROVED EQUAL SPECTRUM       VAL LED DRIVER     5 W     UNIV     LITHONIA     QUANTUM LOM S W R 1 APPROVED EQUAL APPROVED EQUAL COLUMBIA APPROVED EQUAL COLUMBIA APROVED EQUAL COLUMBIA APPROVED EQUAL COLUMBIA APROVED EQUAL	APPROVED EQUAL S274_+L_+_+ APPROVED EQUAL		TEST SWITCH PROVIDED UL LISTED FOR DAMP LO SEE PLANS FOR LENGTH MOUNTING HEIGHT AN ARCHTECT. SWIVEL MO		
					VISA LIGHTING			LUMENS/FT. 12W/FT
VALL PACK TRAPEZOID LED	2-MODULE LED	INTEGRAL LED DRIVERS (2)	47 W	277V	HUBBELL JUNO	APPROVED EQUAL APPROVED EQUAL		COORDINATE FINISH W MINIMUM 6000 LUMEN WET LOCATION LISTED; MOUNTING HEIGHT TO LIGHTING LOCATION
FT. LED STRIP	LED	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	40 W	277V	COLUMBIA CREE	APPROVED EQUAL APPROVED EQUAL	BOCRI	PROVIDE CHAIN FOR PE PROVIDE WIRE GUARD 4000 MINIMUM LUMEN LENSED
AME AS TYPE 'STL1' EXCEPT PROVIDE WITH 90 /INUTE BATTERY BACKUP	LED	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	EGRAL LED DRIVER       40 W       277V       LITHONIA       CUL LED LAB SOOUL SEE FDL MVOLT GZ10 B0CRI       PROV         MING)       COUMBIA       APPROVED EQUAL       APPROVED EQUAL       APPROVED EQUAL         JDAY-BRITE       APPROVED EQUAL       APPROVED EQUAL       APPROVED EQUAL         MING)       COUMBIA       APPROVED EQUAL       APPROVED EQUAL         JDAY-BRITE       APPROVED EQUAL       APPROVED EQUAL       LENSI         APPROVED EQUAL       APPROVED EQUAL       APPROVED EQUAL       APPROVED EQUAL         MING)       CILUMBIA       APPROVED EQUAL       APPROVED EQUAL       APPROVED EQUAL         APPROVED EQUAL       APPROVED EQUAL       APPROVED EQUAL       APPROVED EQUAL       LENSI         APPROVED EQUAL       APPROVED EQUAL       APPROVED EQUAL       PROV         SCALUED DRIVER       20 W       277V       LITHONIA       CLX LED L24 300LM SEF FDL MVOLT GZ10 MCIL GZ10 _K 80CRI       PROV         EGRAL LED DRIVER       20 W       277V       LITHONIA       CLX LED L24 300LM SEF FDL MVOLT GZ10 MCIL GZ10 _K 80CRI       PROVED EQUAL         APPROVED EQUAL       APPROVED EQUAL       APPROVED EQUAL       PROVED EQUAL       PROVED EQUAL         GERAL LED DRIVER       40 W       UNIV       LITHONIA       CX 24 4000LM MINIO			PROVIDE CHAIN FOR PE PROVIDE WIRE GUARD 4000 MINIMUM LUMEN		
FT. LED STRIP	LED	INTEGRAL LED DRIVER (STANDARD 0-10V	20 W	277V	DAY-BRITE LITHONIA COLUMBIA	APPROVED EQUAL CLX LED L24 3000LM SEF FDL MVOLT GZ10 APPROVED EQUAL	_K 80CRI	PROVIDE CHAIN FOR PE
FT. LED WALL MOUNT STRIP	LED	DIMMING) INTEGRAL LED DRIVER	40 W	UNIV	COOPER DAY-BRITE LITHONIA	APPROVED EQUAL APPROVED EQUAL BLPW4 40L ADSM GZ10 LP840		3000 MINIMUM LUMEN LENSED DLC LISTED. MINIMUM 4
	LIGH	ITING FIXTU	JRE SC	HEDULI	E - PREFF	ERED BRAND ALT.		
X4 LED FLAT PANEL	LED	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	38 W	277V	BRAND ALTERNATE: LITHONIA WILLIAMS	APPROVED EQUAL	UL LISTED DAI	
X4 LED FLAT PANEL - SAME AS TYPE 'A' EXCEPT ROVIDE WITH 90 MINUTE BATTERY BACKUP	LED	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	38 W	277V	PREFERRED BRAND ALTERNATE:	APPROVED EQUAL	UL LISTED DAI PROVIDE FLAM	
<ol> <li>14. CONTRACTOR SHALL FURNISH A COM</li> <li>15. PROVIDE DIMMING DRIVER/MODULE F</li> <li>16. ELECTRICAL VALUE ENGINEERING SHALL</li> </ol>	PLETE SET OF FOR FIXTURES LL BE BILLED VILL REQUIRE LIZE BEST JUD ERIOR FIXTUR	PLANS TO HIS SUPPLIER S INDICATED ON PLANS A AT AN HOURLY RATE BY SPECIAL LEVELS OF DIM DGEMENT AND LATER CH RES SHALL BE 4000K. THE	TO ASSURE L AS BEING CON ENGINEERING MING SHALL H ANGES WILL F COLOR TEMP	IGHTING PACKA NTROLLED VIA D G FOR SUBMITTA HAVE THIS REQU BE AT THE EXPE PERATURE OF AI	AGE IS COMPLETE. DIMMING DEVICE. AL REVIEWS. UIREMENT BROUGH NSE OF THE OWNE			FINAL PLANS. WITHOUT S
CONTROL POINTS AND EQUIPMENT SE	TING CONTR EQUENCES O	OL SYSTEM SHALL BE IN F OPERATION LISTED IN	NSTALLED IN N SPECIFICAT	ION SECTION	260923 SHALL BE	FICATIONS (SECTION 260923 AND 26094 CONSIDERED IN ADDITION TO THOSE LIS TO BIDDING OR THE MORE STRINGENT S	TED HERE. IN TH	
<u>SYSTEM DESCRIPTION:</u> LIGHTING CONTROLS ARE BASED INDIVIDUAL ADDRESS LOCATIO OF THE ETHERNET BASED CON SHALL BE INDEPENDENT AND N	ONS FOR PRO TROLS ARE S	OGRAMMING AND CON STAND ALONE OCCUPA	ITROL. INDE NCY SENSOR	PENDENT	AND D	<u>EDULES:</u> CHEDULES ARE TO BE DETERMINED BY THE IRECTED BY OWNER AND INPUT BY THE LI AMMER. SEE THE BELOW INITIAL SETTING	GHTING PROGR	RAMMER AND THE BAS
SENSORS 1. CEILING MOUNTED OCCUPANCY ETHERNET BASED SYSTEM AND 2. WALL MOUNTED NON SWITCH PART OF THE ETHERNET BASED 3. ALL OCCUPANCY SENSORS SHA	AS STAND A TYPE OCCUP SYSTEM.	ALONE CONTROLS AS S PANCY/VACANCY SENS	HOWN ON T ORS SHALL O	THE PLANS. OPERATE AS	B. INITIAL MOND SATUR SUNDA	TIME SCHEDULES SHALL BE: AY - FRIDAY: 6AM ON, 7 PM OFF DAY 8AM ON, 4 PM OFF AL AREAS INTENT OF CONTROL:		
AND AUTOMATIC OFF. 4. ALL VACANCY SENSORS SHALL 5. LARGE PUBLIC SPACES SHALL BI <u>TIMER SETTINGS</u> :					VOLTAGE O (PUBLIC AR - GROUP RE INFRARED.)	RRIDORS/HALLWAYS: TIME SCHEDULE ZO VERRIDE IN LOCAL CORRIDOR. CORRIDOF EAS) DURING "NORMAL OPERATING HOU STROOMS: ON/OFF WALL SWITCH VACAN OCCUPANCY SENSORS SHALL OPERATE N	R SWITCHES SHA RS." NCY SENSORS (P	ALL BE LOCKED OUT
A. WALL SWITCH PASSIVE INFR STORAGE ROOMS. B. CLASSROOMS VACANCY: 15 C. WALL SWITCH VACANCY SEN D. OTHER SPACES NOT LISTED:	MINUTES. NSORS OFFIC		. RESTROOM	S AND	- INDIVIDU INFRARED.) - UTILITY RC WITH MANI - STORAGE I	Y FIXTURES IN THIS AREA. AL RESTROOMS: ON/OFF WALL SWITCH V OOMS, ETC.: ON/OFF WALL SWITCH OCCUI UAL OVERRIDE FOR PERSONNEL SAFETY. S ROOMS: ON/OFF WALL SWITCH VACANCY OMS: 2 ZONES. ZONE ONE IS ON/OFF WIT	PANCY SENSORS EE PLANS SENSORS (PASS	S SIVE INFRARED.)
<u>BAS INTEGRATION</u> : A. EXTERIOR LIGHTING ZONES, B. INTERIOR LIGHTING: - CORRIDORS - CLASSROOMS - OFFICES	TIME SCHED	DULE AND PHOTOCELL (	CONTROL.			VITH FULL DIMMING. ZONES WORK INDEF		•
COMMISSIONING AND COORDIN 1. BAS CONTROL SHALL BE THE PR 2. LIGHTING SYSTEM SHALL ALSO SYSTEM. 3. LIGHTING SYSTEM IS CONNECTI	IORITY SYST BE INDEPEN ED TO THE B	EM WITH LOCAL OVERF DENTLY CONTROLLED E AS VIA BACNET PROTO	BY A SOFTWA	AL.	1. SYSTEM A 2. SYSTEM I MANUFA WALL PC OR ACUI	YSTEM NOTES: RCHITECTURE SHALL BE DESIGNED BY RES S BASED ON NX DISTRIBUTED INTELLIGEN ACTURERS SHALL PROVIDE EQUIPMENT TO DDS FOR EXAMPLE.) APPROVED EQUALS: N TY NLIGHT.	CE, BY HUBBELL O MEET THE DES WATTSTOPPER D	ALL ALTERNATE SIGN INTENT. (GRAPHIC DLM, COOPER GREENGAT
COORDINATE LANGUAGE REQU SUPPLYING BUILDING AUTOMA LIGHTING COORDINATION AND C 1. ELECTRICAL CONTRACTOR SHAL SUPPLIER PRIOR TO CONDUIT I GENERAL LIGHTING CONTROL 2. ELECTRICAL CONTRACTOR SHAL SUPPLIER TO IDENTIFY LINE AN	ATION SYSTE QUALITY CON LL HAVE A PF ROUGH-IN T STRATEGY FO LL HAVE A PO	EM. <u>ITROL</u> : RE-CONSTRUCTION MEI O VERIFY BOXES, COND OR INSTALLATION. OST-SUBMITTAL MEETII	ETING WITH DUIT PATHS, A NG WITH CO	CONTROLS AND NTROLS	4. PROVIDE	OR DRAWINGS/DETAILS FOR ALL 0-10V D DEVICE LAYOUT AS PART OF LIGHTING CO OCATIONS, CABLING, EQUIPMENT, ETC.		
EXTERIOR LIGHTING CONTROL A. EXTERIOR LIGHTING CONTROL:	RAL CONSTR	UCTION STRATEGIES.						

A. EXTERIOR LIGHTING CONTROL IS VIA SCHEDULED TIME CONTROL AND PHOTOCELL.

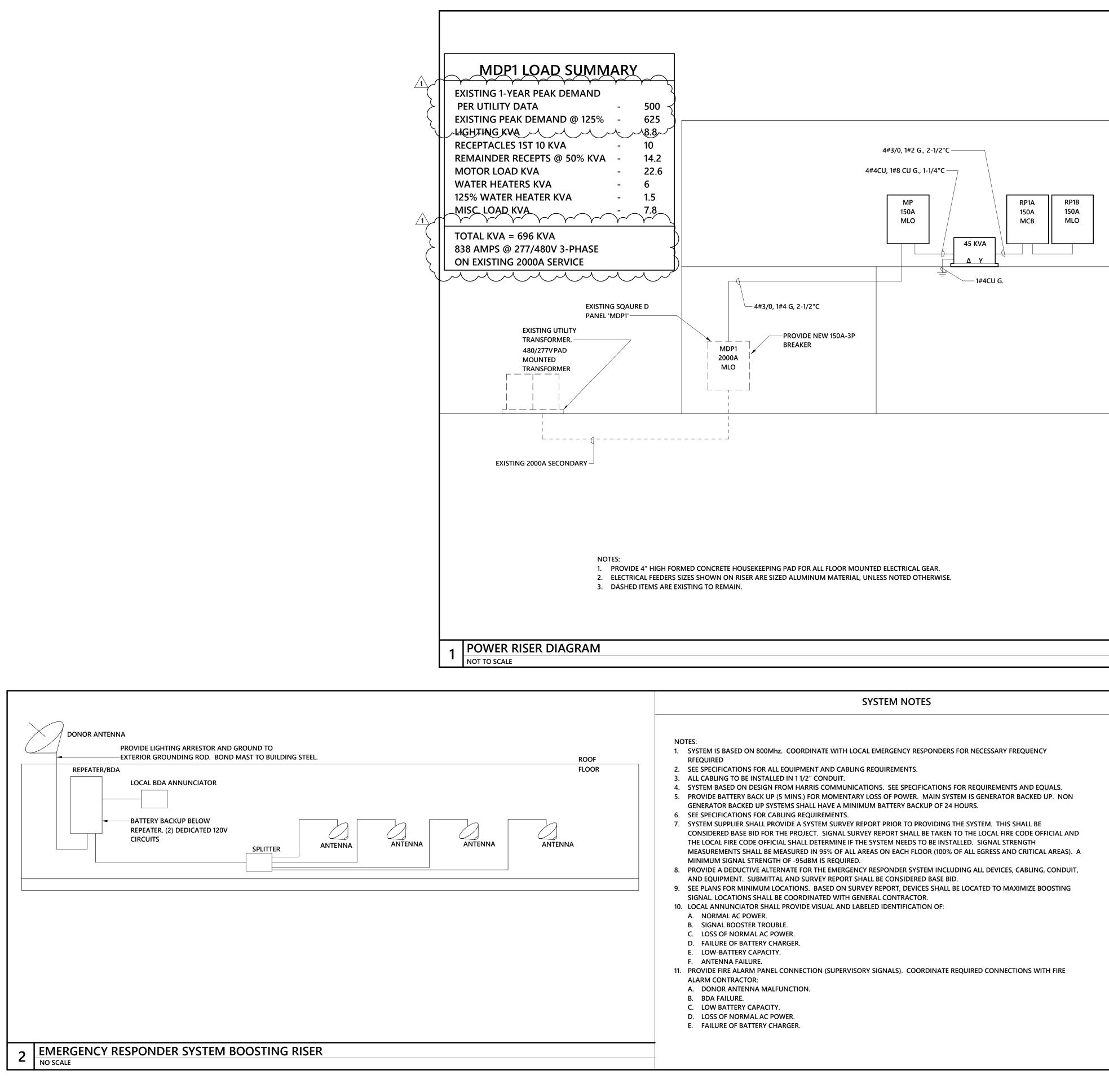
OTHER SYSTEM INTEGRATION: 1. UPON A FIRE ALARM EVENT, ALL CORRIDOR ZONES SHALL SWEEP ON.

FIXTURE NOTES: A. ARCHITECT TO APPROVE ALL EXTERIOR FIXTURE LOCATIONS. E.C. TO MARK OFF LOCATIONS WITH TEMPORARY "CHALK" OUTLINE AND PLAN FOR ARCHITECT ON-SITE APPROVAL OF LOCATIONS BEFORE INSTALLATION. E.C. TO CONTACT ARCHITECT WITH (1) WEEK PRIOR NOTICE.

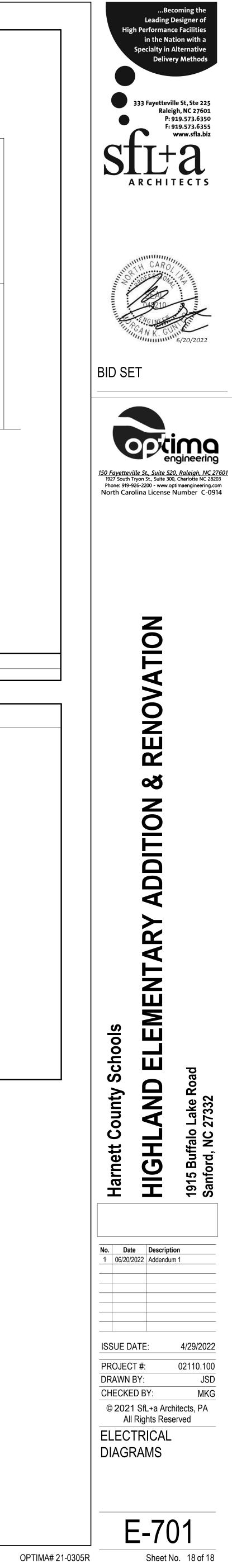


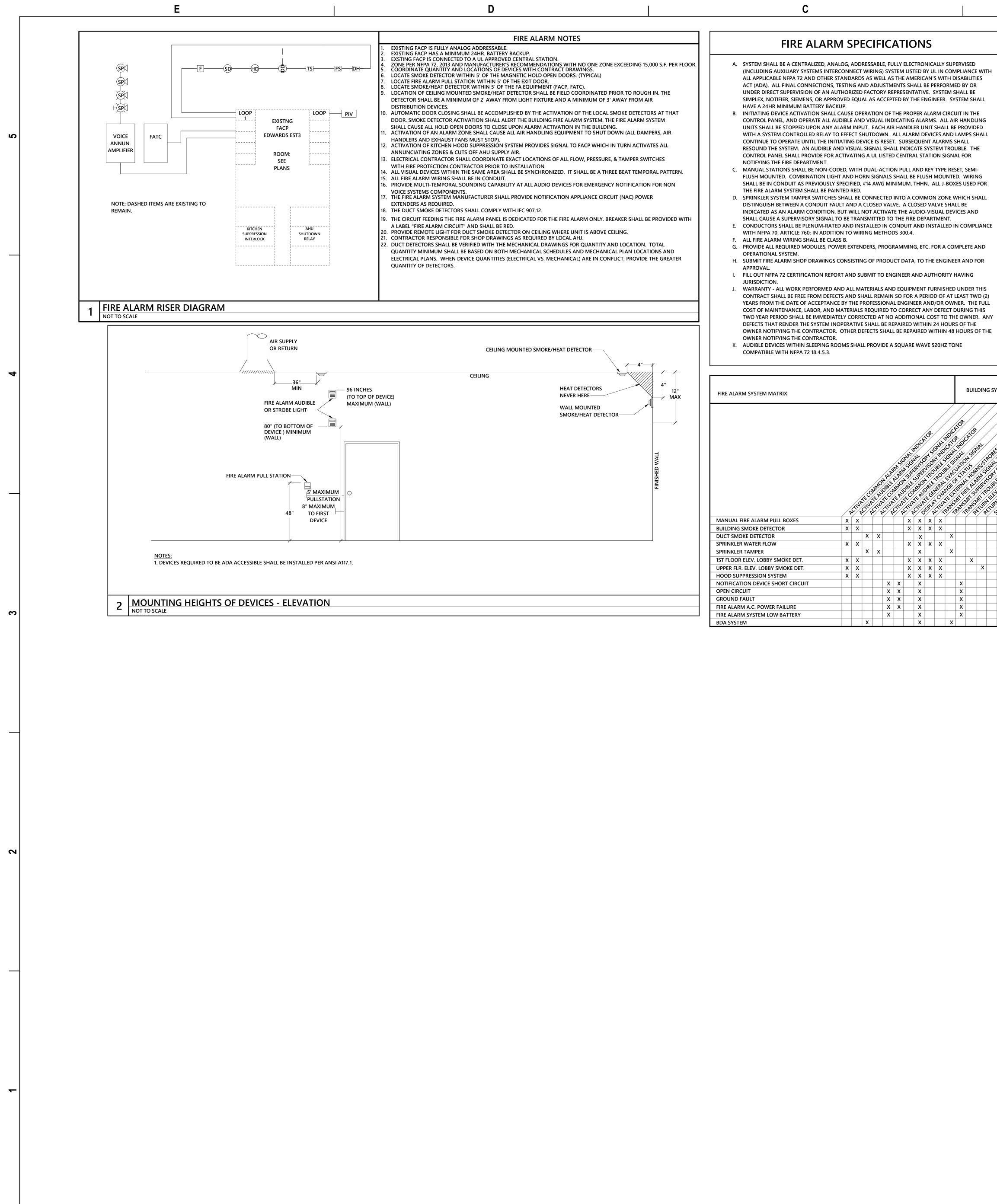
Sheet No. 17 of 18

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<b>—</b>							
ΤĻ	IIS DRAWING IS AN INSTRUMENT OF SEF	RVICE THE DRAWING AND THE INF	ORMATION THEREON IS T	THE PROPERTY OF OPTIMA ENG		OTHER THAN THE INTENDED	PROJECT WITHOUT THE WP









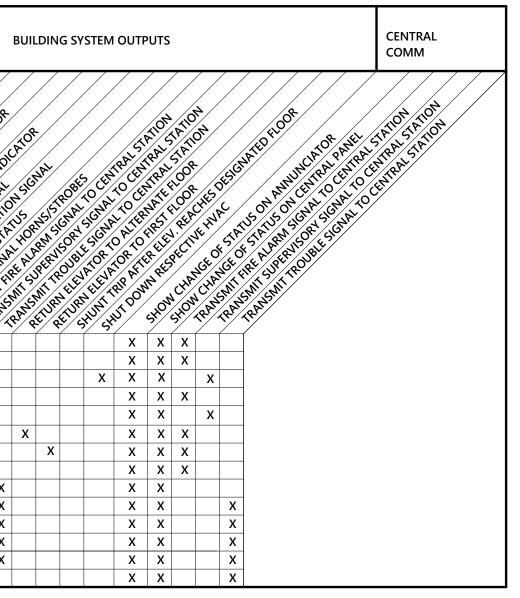
## D. SPRINKLER SYSTEM TAMPER SWITCHES SHALL BE CONNECTED INTO A COMMON ZONE WHICH SHALL DISTINGUISH BETWEEN A CONDUIT FAULT AND A CLOSED VALVE. A CLOSED VALVE SHALL BE INDICATED AS AN ALARM CONDITION, BUT WILL NOT ACTIVATE THE AUDIO-VISUAL DEVICES AND SHALL CAUSE A SUPERVISORY SIGNAL TO BE TRANSMITTED TO THE FIRE DEPARTMENT. E. 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. G. PROVIDE ALL REQUIRED MODULES, POWER EXTENDERS, PROGRAMMING, ETC. FOR A COMPLETE AND H. SUBMIT FIRE ALARM SHOP DRAWINGS CONSISTING OF PRODUCT DATA, TO THE ENGINEER AND FOR I. FILL OUT NFPA 72 CERTIFICATION REPORT AND SUBMIT TO ENGINEER AND AUTHORITY HAVING J. 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 K. AUDIBLE DEVICES WITHIN SLEEPING ROOMS SHALL PROVIDE A SQUARE WAVE 520HZ TONE

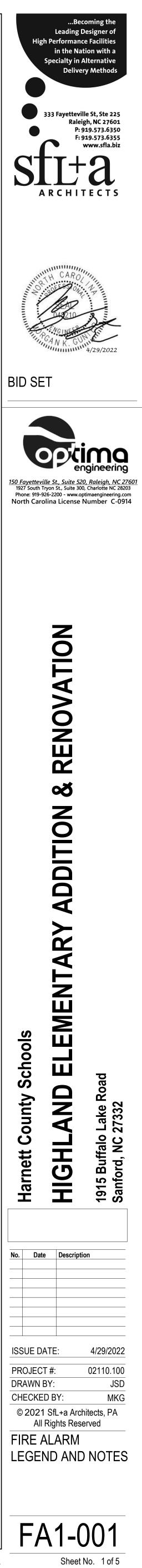
FIRE ALARM SYSTEM MATRIX											BUII	DIN	G SY		
	8	CTWP P	CTUP C	The AL	A A A A A A A A A A A A A A A A A A A	ALAN SI ALAN ALAN ALAN ALAN ALAN ALAN ALAN ALA	A SUP CO	AND CHARTER AND CH	X OR ALLON A	JAN DE LE DE	UNCONNEL CONNEL CONNEC CONNEL CONNEL CONNEL CONNEL CONNEC	AND	A DO LAND AND AND AND AND AND AND AND AND AND	AND STAND	Contraction of the second seco
MANUAL FIRE ALARM PULL BOXES	X	X					X	X	X	X					/
BUILDING SMOKE DETECTOR	X	Х					Х	Х	Х	Х					
DUCT SMOKE DETECTOR			Х	Х				Х			X				
SPRINKLER WATER FLOW	X	Х					Х	Х	Х	Х					
SPRINKLER TAMPER			X	Х				X			X				
1ST FLOOR ELEV. LOBBY SMOKE DET.	X	Х					Х	Х	Х	Х			Х		
UPPER FLR. ELEV. LOBBY SMOKE DET.	X	Х					Х	Х	Х	Х				Х	
HOOD SUPPRESSION SYSTEM	X	Х					Х	Х	Х	Х					
NOTIFICATION DEVICE SHORT CIRCUIT					Х	Х		Х				Х			
OPEN CIRCUIT					Х	Х		Х				Х			
GROUND FAULT					Х	Х		Х				Х			
FIRE ALARM A.C. POWER FAILURE					Х	Х		Х				Х			
FIRE ALARM SYSTEM LOW BATTERY					Х			Х				Х			
BDA SYSTEM			Х					Х			Х				

# NFPA FIRE ALARM LEGEND

FACP	FIRE ALARM CONTROL PANEL
NAC	NOTIFICATION APPLIANCE CIRCUIT POWER EXTENDER
BDA	BI-DIRECTIONAL AMPLIFIER SYSTEM
	FIRE ALARM SPEAKER W/STROBE (CANDELAS), WHITE FINISH
	FIRE ALARM SPEAKER W/STROBE (CANDELAS), WHITE FINISH
Ø	FIRE ALARM SPEAKER ONLY, WHITE FINISH
(ACM)	ADDRESSABLE CONTROL MONITOR
$\langle \mathfrak{d} \rangle$	SMOKE DETECTOR/SENSOR (DEFAULT PHOTOELECTRIC TYPE)
۵,	HEAT DETECTOR/SENSOR. X=TYPE
	BLE DEVICES WITHIN SLEEPING ROOMS SHALL BE SUBJECT TO LOW FREQUENCY REQUIREMENTS. AVE 520HZ TONE COMPATIBLE WITH NFPA 72 18.4.5.3. COORDINATE WITH LOCAL CODES AND TS.

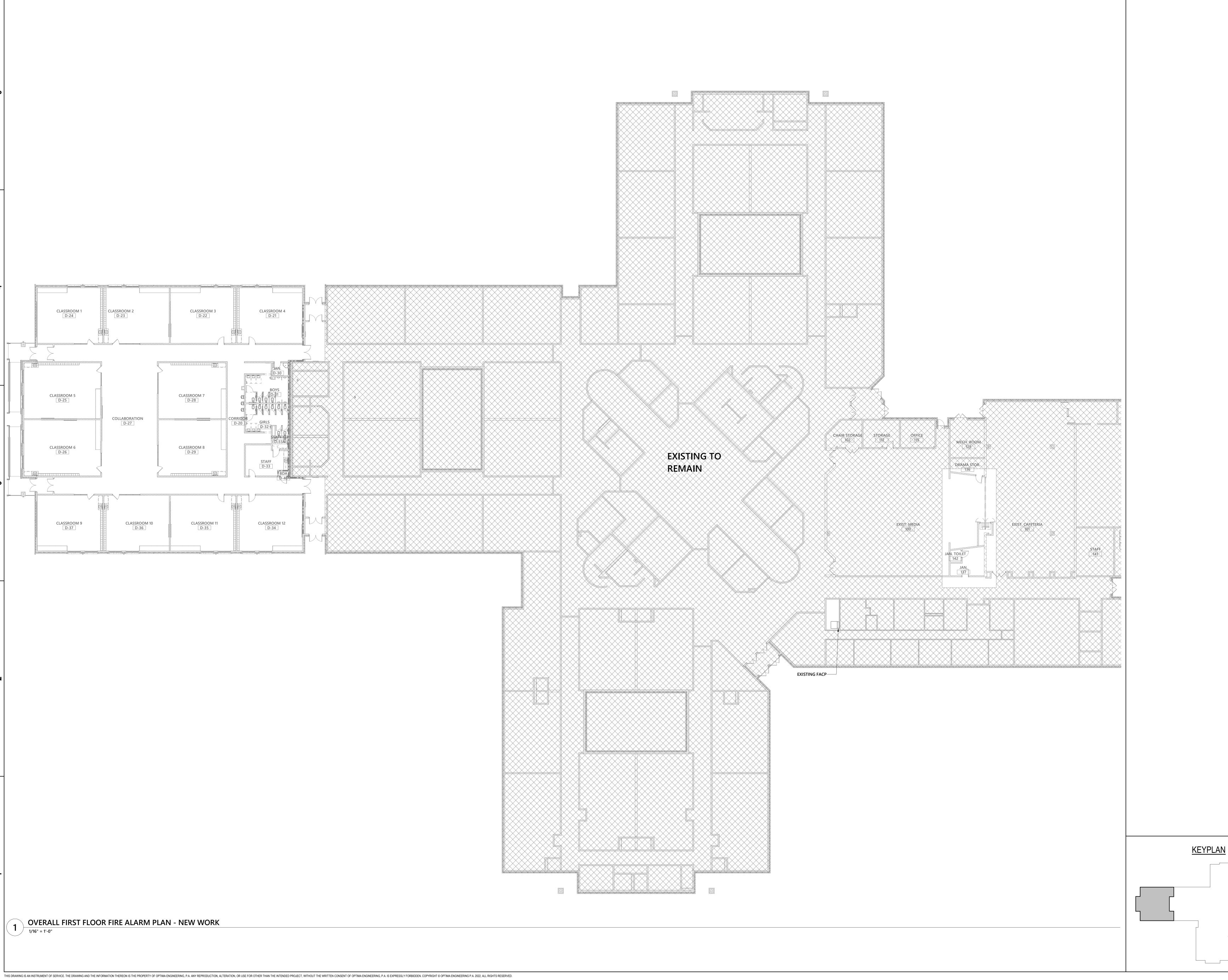
FIRE ALARM SHEET INDEX								
SHEET NUMBER	SHEET NAME							
FA1-001	FIRE ALARM LEGEND AND NOTES							
FA1-101	OVERALL FIRE ALARM PLAN - NEW WORK							
FA1-111	CAFETERIA EXPANSION FIRE ALARM PLANS							
FA1-112	CLASSROOM ADDITION FIRE ALARM PLAN - NEW WORK							
FA1-113	MECHANICAL LOFT FIRE ALARM PLAN							



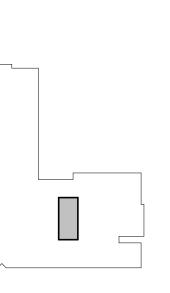




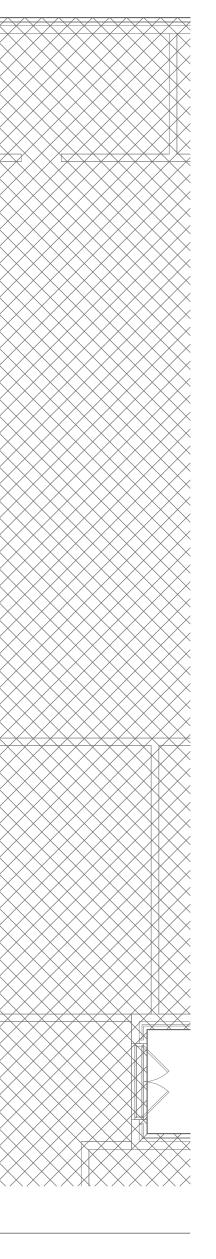
OVERALL FIRST FLOOR FIRE ALARM PLAN - NEW WORK 1/16" = 1'-0"

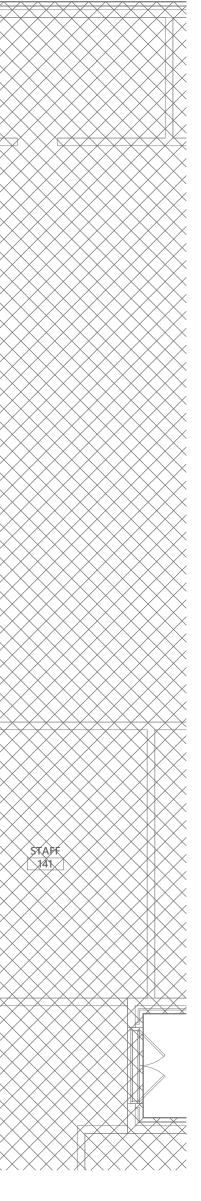






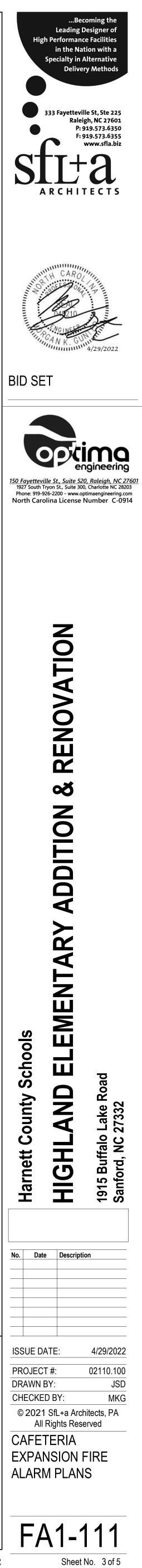


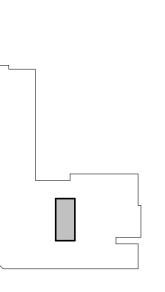


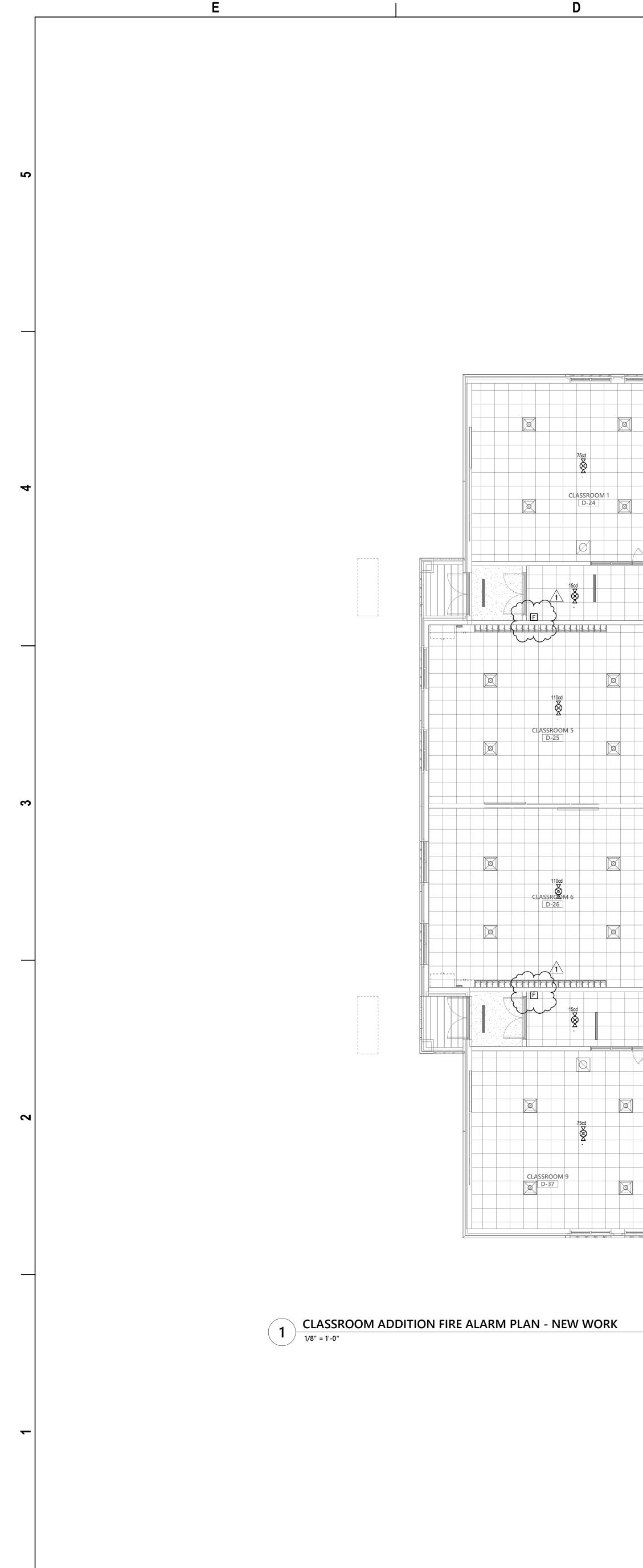


	ABBREVIATIONS
RE	EXISTING ITEM RELOCATED TO THIS LOCATION.
RL	EXISTING ITEM TO BE RELOCATED.
RM	EXISTING ITEM TO REMAIN.
RP	EXISTING ITEM TO BE REPLACED.
RV	EXISTING ITEM TO BE REMOVED.

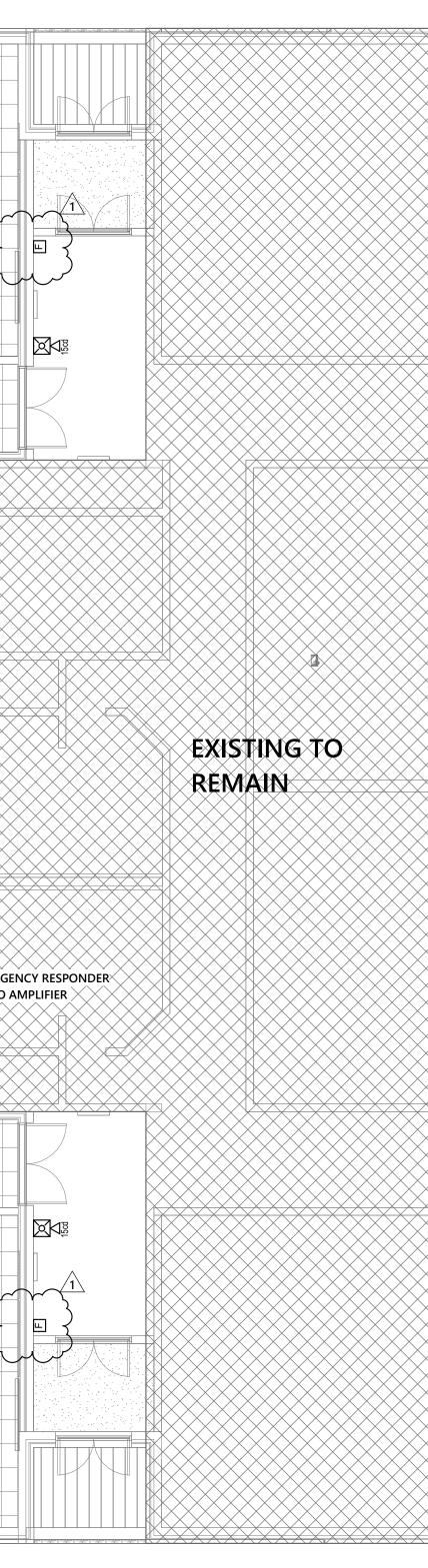
# <u>KEYPLAN</u>

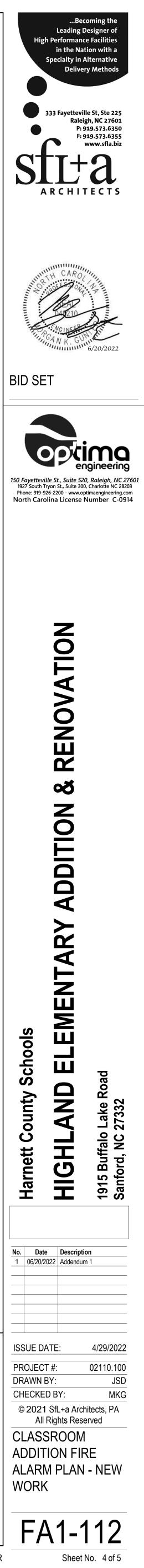


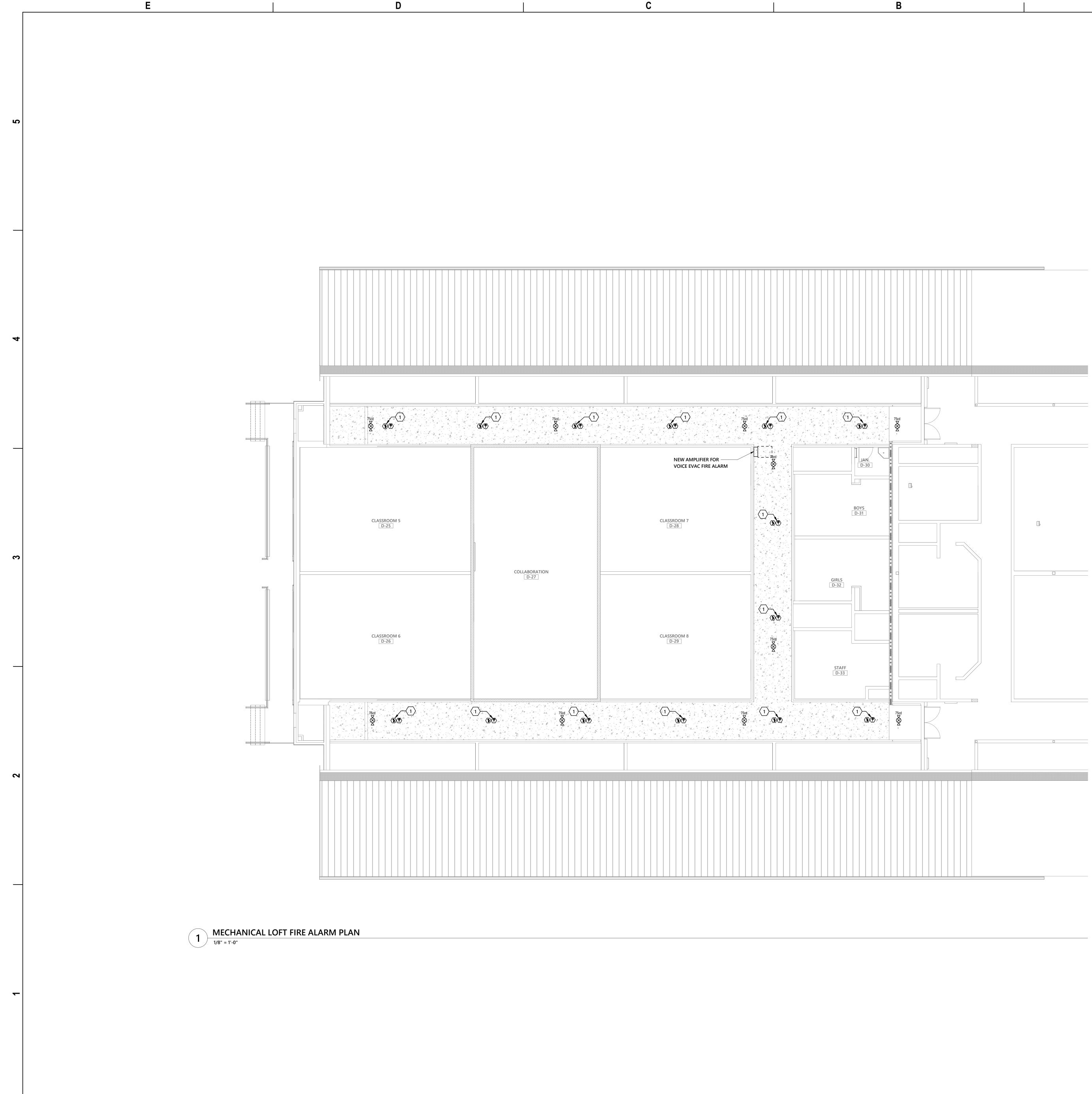




1		75cd	CLAS	SSROOM 3		CLAS	75cd	
						15cd	15cd	
		SHUT DOWN <u>HVLS-1</u> UPON ACTIVATION OF FIRE ALARM. COORDINATE WITH MC.					BOYS D-31	
			CLASSROOM 7 D-28					
	COLLABORAT				CORRIDOR			
		SHUT DOWN <u>HVLS-2</u> UPON ACTIVATION OF FIRE ALARM. COORDINATE WITH MC.	CLASSROWM 8			15cd		EMERGEN
					15cd	STAFF D-33		
			CORRIDOR D-20					
		75cd	CLASSRO( D-35				OOM 12	

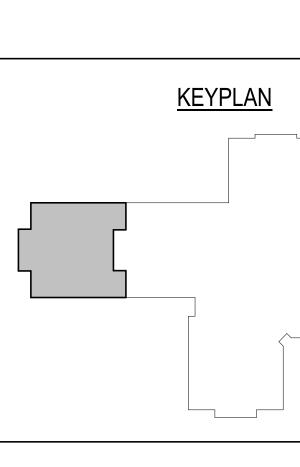




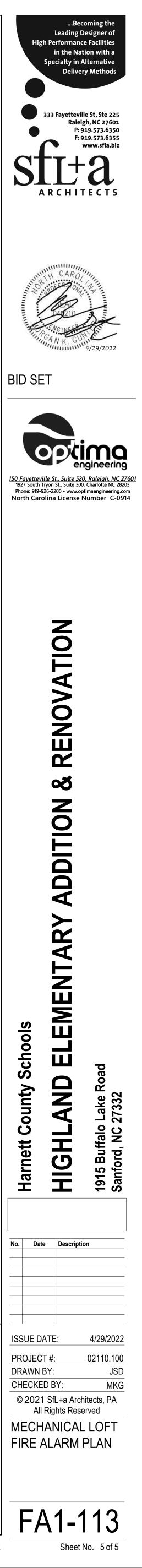




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PROVIDE COMBINATION SMOKE AND HEAT DETECTOR.



OPTIMA# 21-0305R