PIPE MATERIAL

1.	SANITARY SEWER , VENT AND STORM DRAIN PIPING BELOW GROUND :	NO-HUB CAST IRON PIPE & FITTINGS WITH STAINLESS STEEL NO-HUB COUPLINGS. WRAP ALL UNDERGROUND PIPE AS SPECIFIED.
2.	SANITARY SEWER, VENT & STORM DRAIN PIPING ABOVE GROUND :	SERVICE WEIGHT NO-HUB CAST IRON PIPE & FITTINGS CONFORMING TO THE REQUIREMENTS OF CISPI STANDARD 301, ASTM A888 OR ASTM A74 WITH TYPE 304 STAINLESS STEEL STANDARD DUTY NO-HUB COUPLINGS.
3.	DOMESTIC WATER BELOW GROUND :	TYPE 'K' COPPER WITH BRAZED JOINTS.
4.	DOMESTIC WATER ABOVE GROUND :	TYPE "L" COPPER TUBING WITH SOLDERED JOINTS. DOMESTIC WATER PIPING SHALL UTILIZE LEAD-FREE MATERIAL AND SOLDER.
5.	CONDENSATE AND INDIRECT DRAIN PIPING :	TYPE "M" COPPER PIPE & FITTINGS WITH SOLDERED JOINTS. CONDENSATE DRAIN PIPING ABOVE CEILINGS SHALL BE INSULATED WITH "AP ARMAFLEX" CLOSED-CELL ELASTOMERIC PLENUM RATED FOAM INSULATION. FLAME-SPREAD INDEX OF 25 OR LESS & SMOKE-DEVELOPED INDEX OF 50 OR LESS. 1/2" THICK FOR PIPING UP TO 1", AND 1" THICK FOR PIPING 11/4" AND LARGER.
6.	NATURAL GAS PIPING ABOVE GROUND:	SCHEDULE 40 BLACK STEEL PIPE WITH IRON SCREWED FITTING.
7.	NATURAL GAS PIPING BELOW GROUND :	APPROVED POLYETHYLENE (PE) PIPE WITH FUSION JOINTS. SPIRAL WRAP ALL UNDERGROUND PIPE W/AWG 14 ELECTRIC TRACER WIRE.
8.	INSULATION OF HOT WATER SUPPLY & RETURN PIPING :	GLASS FIBER PIPE INSULATION WITH FACTORY APPLIED WHITE JACKET; "-JM" MICRO-LOK 750AP. HOT WATER PIPE INSULATION SHALL HAVE A MINIMUM WALL THICKNESS OF NOT LESS THAN 1" FOR 3/4 IN. PIPE, 11/2 IN. FOR 1 IN. THRU 11/4 IN. PIPE AND NOT LESS THAN 2 IN. FOR PIPE 2" DIA. AND LARGER.
9.	LAB WASTE AND LAB VENT PIPING ABOVE GRADE IN NON-PLENUM WALLS & SHAFT :	SCHEDULE 40 CPVC TYPE IV, GRADE 1 PIPE AND FITTINGS AS MANUFACTURED BY CHARLOTTE PIPE AND FOUNDRY UNDER THE TRADE NAME OF "CHEMDRAIN" WITH SOLVENT CEMENTED JOINTS. INSTALL PER MANUFACTURER'S INSTRUCTIONS.
10.	LAB WASTE AND LAB VENT PIPING ABOVE GRADE IN RETURN AIR PLENUM:	IAPMO LISTED SCHEDULE 40, FLAME RETARDANT FR-PVDF PIPE AND FITTINGS WITH ELECTROFUSION SOCKET FUSION JOINTS AS MANUFACTURED BY IPEX. SURFACE BURING CHARCTERISTICS GREATER THAN OR EQUAL TO A FLAME SPREAD 25 AND SMOKE DEVELOPEMENT 50. ALL PIPE AND FITTINGS SHALL BE IPEX "PLENUMLINE " INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
11.	ALL OF THE ABOVE SHALL COMPLY WITH THE SPECIFICATIONS.	

LEAD-FREE NOTE:

ALL PIPE, FITTINGS, FIXTURES, ETC. THAT CONTACT POTABLE WATER FOR HUMAN CONSUMPTION SHALL SHOW APPROVAL TO NSF 61, ANNEX "G". EFFECTIVE JANUARY 1, 2010, THE LEAD CONTENT OF THE WETTED SURFACE AREA OF THE PIPES, FITTINGS AND FIXTURES CONVEYING POTABLE WATER FOR HUMAN CONSUMPTION, OF NOT MORE THAN 0.25%, SHALL BE DETERMINED PURSUANT TO A PRESCRIBED FORMULA AS DETERMINED BY THIRD PARTY CERTIFIERS TO NSF STANDARD 61, ANNEX "G". FOR SOLDER AND FLUX, THE LEAD CONTENT SHALL BE NOT MORE THAN 0.2 PERCENT WHERE USED IN PIPING SYSTEMS THAT CONVEY OR DISPENSE WATER FOR HUMAN CONSUMPTION. REFERENCE SECTION 604.02, CALIFORNIA PLUMBING CODE, 2016 EDITION, AND HEALTH & SAFETY CODE SECTION 116875.

TITLE 24 MANDATORY MEASURES

APPLICABLE	
	EQUIPMENT AND SYSTEMS EFFICIENCY
Yes	ANY APPLIANCE FOR WHICH THERE IS A CALIFORNIA STANDARD ESTABLISHED IN THE APPLIANCE EFFICIENCY STANDARDS MAY BE INSTALLED ONLY IF THE MANUFACTURER HAS CERTIFIED TO THE COMMISSION, AS SPECIFIED IN THOSE REGULATIONS, THAT THE APPLIANCE COMPLIES WITH THE APPLICABLE STANDARD FOR THAT APPLIANCE.
Yes	PIPING SYSTEMS SHALL BE INSULATED IN ACCORDANCE WITH REQUIREMENTS OF THE TITLE 24 STANDARDS AND ALL CODES HAVING THE JURISDICITON.
	SERVICE WATER HEATING SYSTEMS
Yes	THE FOLLOWING SERVICE WATER HEATING SYSTEMS AND EQUIPMENT MAY BE INSTALLED ONLY IF THE MANUFACTURER HAS CERTIFIED THAT THE EQUIPMENT MEETS OR EXCEEDS ALL APPLICABLE EFFICIENCY REQUIREMENTS LISTED IN 113 OF THE ENERGY EFFICIENCY STANDARDS: GAS-FIRED NON-STORAGE TYPES >200,000 BTU/HR.
Yes	UNFIRED SERVICE WATER HEATER STORAGE TANKS AND BACKUP TANKS FOR SOLAR WATER HEATING SYSTEMS SHALL HAVE EITHER; EXTERNAL INSULATION WITH AN INSTALLED R-VALUE OF AT LEAST R-12, INTERNAL AND EXTERNAL INSULATION WITH A COMBINED R-VALUE OF AT LEAST R-15, OR SUFFICIENT INSULATION SO THAT THE HEAT LOSSO FHTE TANK SURFACE BASED ON AN 80°F WATER-AIR TEMPERATURE DIFFERENCE SHALL BE LESS THAN 6.5 BTU/HR/SF.
Yes	IF A CIRCULATING HOT WATER SYSTEM IS INSTALLED, IT SHALL HAVE A CONTROL CAPABLE OF AUTOMATICALLY TURNING OFF THE CIRCULATING PUMP (S) WHEN HOT WATER IS NOT REQUIRED.
	LAVATORIES IN RESTROOMS OF PUBLIC FACILITIES SHALL BE EQUIPED WITH:
Yes	OUTLET DEVICES THAT LIMIT THE FLOW OF HOT WATER TO MAXIMUM OF 0.5 GALLONS PER MINUTE
Yes	FOOT ACTUATED CONTROL VALVES, AND OUTLET DEVICES THAT LIMIT THE FLOW OF HOT WATER TO A MAXIMUM OF 0.75 GALLONS PER MINUTE.
No	PROXIMITY SENSOR ACTUATED CONTROLS VALVES, AND OUTLET DEVICES THAT LIMIT THE FLOW OF HOT WATER TO A MAXIMUM OF 0.75 GALLONS PER MINUTE.
Yes	SELF-CLOSING VALVES, AND OUTLET DEVICES THAT LIMIT THE FLOW OF HOT WATER TO A MAXIMUM OF 2.5 GALLONS PER RMINUTE, AND 0.25 GALLONS/CYCLE (CIRCULATING SYSTEM).
Yes	SELF-CLOSING VALVES, AND OUTLET DEVICES THAT LIMIT THE FLOW OF HOT WATER TO A MAXIMUM OF 2.5 GALLONS PER RMINUTE, AND 0.50 GALLONS/CYCLE (NON-CIRCULATING SYSTEM)
No	SELF-CLOSING VALVES, AND OUTLET DEVICES THAT LIMIT THE FLOW OF HOT WATER TO A MAXIMUM OF 2.5 GALLONS PER RMINUTE, AND 0.75 GALLONS/CYCLE (FOOT SWITCHES AND PROXIMITY SENSOR CONTROLS).
No	LAVATORIES IN RESTROOM OF PUBLIC FACILITIES SHALL BE EQUIPPED WITH CONTROLS TO LIMIT THE OUTLET TEMPERATRURE TO 110° F.

PLUMBING GENERAL NOTES

1. SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF ALL PLUMBING FIXTURES, DRAINS AND EQUIPMENT.
2. COORDINATE ALL LOCATIONS, SIZES AND ELEVATIONS OF ALL SLEEVES THROUGH BEAMS, SLABS AND FOOTINGS WITH STRUCTURAL AND ARCHITECTURAL DRAWINGS.
3. ALL HORIZONTAL WASTE LINES SHALL BE RUN AT A MINIMUM SLOPE OF 1/4" PER FOOT UNLESS OTHERWISE NOTED ON PLAN.
4. ALL HORIZONTAL STORM DRAINS AND OVERFLOW DRAIN LINES SHALL BE RUN AT A SLOPE OF 1/8" PER FOOT UNLESS OTHERWISE NOTED ON PLAN.
5. COORDINATE AND VERIFY EXACT LOCATION, SIZE, POINTS OF CONNECTION AND INVERT ELEVATIONS OF UTILITY SERVICE PIPING BEFORE TRENCHING OR INSTALLATION.
6. COORDINATE WITH ARCHITECTURAL DRAWINGS FOR WALL AND PARTITION CONSTRUCTION AND THICKNESS WHERE PLUMBING PIPING OR EQUIPMENT IS INDICATED.
7. THE LOCATION AND ELEVATION OF ALL PLUMBING PIPING SHALL BE VERIFIED AND COORDINATED WITH ALL OTHER TRADES, STRUCTURAL CONDITIONS AND BUILDING CONSTRUCTION PRIOR TO START OF INSTALLATION.
8. ALL VALVES AND COCKS SHALL BE LOCATED TO BE READILY ACCESSIBLE. WHERE VALVES ARE INSTALLED WITHIN OR BEHIND WALLS, PARTITIONS OR CEILINGS, AN ACCESS PANEL SHALL BE INSTALLED.
9. ALL OUTLETS FOR FUTURE CONNECTIONS SHALL BE INSTALLED SO AS TO PERMIT EASY CONNECTION - COORDINATE WITH DUCT WORK, STRUCTURAL CONDITIONS AND ARCHITECTURAL LAYOUT.
10. ALL PLUGGED OR CAPPED WASTE OUTLETS FOR FUTURE CONNECTIONS SHALL BE INSTALLED ABOVE CEILING WITH PIPE INVERT + 4 INCHES ABOVE THE CEILING.
11. ALL PLUGGED OR CAPPED VENT OUTLETS FOR FUTURE CONNECTIONS SHALL BE INSTALLED ABOVE CEILING WITH PIPE INVERT 12" FROM BOTTOM OF SLAB.
12. SEE RISER DIAGRAMS FOR ALL PIPE SIZING FOR ALL PLUMBING SYSTEMS.
13. FIRE PROTECTION PIPING AND EQUIPMENT SHOWN IS FOR REFERENCE ONLY. FOR FIRE PROTECTION PIPING SEE FIRE SPRINKLER SHOP DRAWINGS. FIRE SPRINKLER DESIGN/BUILD CONTRACTOR SHALL COORDINATE HIS WORK DURING SHOP DRAWING PHASE, WITH ROOF DRAINS AND LINES AS SHOWN AND SHALL MAKE PROVISIONS FOR FUTURE DUCTWORK AND FINISHED CEILINGS.
14. FIRE RISERS SUBJECT TO FIRE AUTHORITY APPROVAL.
15. ALL WALL MOUNTED ACCESS PANELS AND WALL CLEANOUTS SHALL BE MOUNTED AS LOW AS POSSIBLE UNLESS NOTED OTHERWISE OR AS INDICATED IN ARCHITECTURAL PLANS OR AS REQUIRED. CONTRACTOR SHALL GET ARCHITECT AND ENGINEER APPROVAL FOR ALL LOCATIONS PRIOR TO INSTALLATION OF WALL GYPSUM BOARD.
16. THESE DRAWINGS ARE DIAGRAMMATIC . THE LOCATION & ELEVATION OF ALL PLUMBING PIPING IS APPROXIMATE AND SHALL BE VERIFIED AND COORDINATED WITH ALL OTHER TRADES, STRUCTURAL CONDITIONS AND BUILDING CONSTRUCTION PRIOR TO START OF INSTALLATION.
17. PENETRATIONS OF PIPES, ETC , IN WALLS REQUIRING PROTECTED OPENINGS SHALL BE FIRE STOPPED. FIRE STOP MATERIAL SHALL BE A TESTED ASSEMBLY APPROVED BY THE STATE FIRE MARSHAL.
18. ALL HOT AND COLD WATER PIPE SHALL BE INSULATED INCLUDING PIPING IN THE WALLS.
19. ALL REQUIRED CLEANOUTS SHALL BE INSTALLED AS PER SECTION 707.0 OF THE PLUMBING CODE.
20. ROOF DRAIN AND OVERFLOW PIPING WITHIN THE BUILDING SHALL UTILIZE APPROVED DRAINAGE FITTINGS.
21. CLEANOUTS FOR BUILDING STORM DRAINS SHALL COMPLY WITH THE REQUIREMENTS OF SECTION 719.0 OF THE PLUMBING CODE.
22. NEW BUILDING STORM DRAINAGE SYSTEM AND PARTS OF EXISTING SYSTEMS THAT HAVE BEEN ALTERED, EXTENDED OR REPAIRED SHALL BE TESTED AS DESCRIBED IN SECTION 1109.0 OF THE PLUMBING CODE.
23. DIELECTRIC UNIONS SHALL BE USED AT ALL POINTS OF CONNECTION WHERE THERE IS A DISSIMILARITY OF METALS.
24. ALL VENTS THROUGH ROOF SHALL MAINTAIN A MINIMUM OF 25 FT. CLEARANCE AND 3 FEET ABOVE OF ANY WINDOW, DOOR, OPENING, AIR INTAKE OR VENT SHAFT. (FOR NON-OSHPD-3 BLDGS

ANCHORAGE & BRACING NOTES

MEP COMPONENT ANCHORAGE NOTE

ALL MECHANICAL, PLUMBING AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON THE DSA APPROVED CONSTRUCTION DOCUMENTS. WHERE NO DETAIL IS INDICATED, THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENTS PRESCRIBED IN THE 2022 CBC, SECTIONS 1616A.1.18 THROUGH 1616A.1.26 AND ASCE 7-10 CHAPTERS 13, 26 AND 30.

1. ALL PERMANENT EQUIPMENT AND COMPONENTS.
2. TEMPORARY OR MOVABLE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARDWIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS OR WATER. PERMANENTLY ATTACHED SHALL INCLUDE ALL ELECTRICAL CONNECTIONS EXCEPT PLUGS FOR 110/220 VOLT RECEPTACLES HAVING A FLEXIBLE CABLE.
3. TEMPORARY, MOVABLE OR MOBILE EQUIPMENT WHICH IS HEAVIER THAN 400 POUNDS OR HAS A CENTER OF MASS LOCATED 4 FEET OR MORE ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMONENT IS REQUIRED TO BE RESTRAINED IN A MANNER APPROVED BY DSA.

THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE, BUT NEED NOT DEMONSTRATE DESIGN COMPLINCE WITH THE REFERENCES NOTED ABOVE NOR BE DETAILED ON THE PLANS. THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT. FLEXIBLE CONNECTIONS MUST ALLOW MOVEMENT IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTIONS.

A. COMPONENTS WEIGHING LESS THAN 400 POUNDS AND HAVE A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT.
B. COMPONENTS WEIGHING LESS THAN 20 POUNDS, OR IN THE CASE OF DISTRIBUTED SYSTEMS, LESS THAN 5 POUNDS PER FOOT, WHICH ARE SUSPENDED FROM A ROOF OR FLOOR OR HUNG FROM A WALL.

THE ANCHORAGE OF ALL MECHANICAL, ELECTRICAL AND PLUMBING COMPONENTS SHALL BE SUBJEST TO THE APPROVAL OF THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE OR STRUCTURAL ENGINEER DELEGATED RESPONSIBILITY AND ACCEPTANCE BY DSA. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH THE ABOVE REQUIREMENTS.

MEP DISTRIBUTION SYSTEM BRACING NOTE FOR PIPNG,DUCTWORK, AND ELECTRICAL CONDUIT

PIPING, DUCTWORK AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7 SECTION 13.3 AS DEFINED IN ASCE 7 SECTION 13.3 AS DEFINED IN ASCE 7-10 SECTION 13.6.5.6, 13.6.7, 13.6.8, AND 2016 CBC, SECTIONS 1616A.1.24, 1616A.1.25 AND 1616A.1.26.

THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEM ARE AS NOTED BELOW. THE MEP DESIGN PROFESSIONAL ENGINEER RESPONSIBLE FOR CONTENT ON THESE SHEETS HAS VERIFIED THAT THE DESIGN METHODS INDENTIFIED BELOW ARE IN ACCORDANCE WITH DSA IR 16-13.

MECHANICAL PIPING (MP), MECHANICAL DUCTS (MD), PLUMBING PIPNIG (PP), ELECTRICAL DISTRIBUTION SYSTEMS (E):

MP ☐ MD ☐ PP ☒ E ☐ OPTION 1: DETAILED ON THE APPROVED DRAWINGS WITH PROJECT SPECIFIC NOTES AND DETAILS.

MP ☐ MD ☐ PP ☐ E ☐ OPTION 2: DESIGN BASED ON OSHPD OPM, WITHIN PROJRCT SUBMITTAL.

MP ☐ MD ☐ PP ☐ E ☐ OPTION 3: DESIGN BASED ON OSHPD OPM, DEFERRED SUBMITTAL.

DESIGN PROFESSIONAL USER NOTE (DO NOT COPY USER NOTE TO THE PLANS):

MEP DESIGN PROFESSIONALS: IDENTIFY WHICH OPTIONS APPLY FOR YOUR PROJECT. IF OPTION 1 IS CHOSEN, PROVIDE PROJECT SPECIFIC DETAILS COORDINATED WITH A STRUCTURAL ENGINEER AND PRESENTED ON THE DRAWINGS IN ACCORDANCE WITH IR 16-13 SCTION 2.1. FOR OPTION 2, VERIFY THAN AN OPM PACKAGE HAS BEEN PREPARED IN ACCORDANCE WITH IR 16-13 SECTION 2.2 AND IS INCLUDED WITHIN THE ORIGINAL PROJECT SUBMITTAL. FOR OTION 3, VERIFY THAT ALL OF THEREQUIREMENTS FOR THE DEFERRE SUBMITTAL HAVE BEEN SATISFIED PRIOR TO THE PLAN SUBMITTAL IN ACCORDANCE WITH IR 16-13 SECTION 2.2.6 FOR ALL OPTIONS VERIFY THAT THE SEOR HAS VERFIFIED THE ADEQUACY OF THE STRUCTURE TO SUPPORT ALL HANGAR AND BRACE LOADS.

LEGEND

LEGEND	ABBR.	DESCRIPTION
	S OR W	SOIL OR WASTE ABOVE FLOOR OR GRADE
	S OR W	SOIL OR WASTE BELOW FLOOR OR GRADE
SD	SD	STORM DRAIN ABOVE FLOOR OR GRADE
SD	SD	STORM DRAIN BELOW FLOOR OR GRADE
OD	OD	OVERFLOW DRAIN ABOVE FLOOR OR GRADE
OD	OD	OVERFLOW DRAIN BELOW FLOOR OR GRADE
	V	SANITARY VENT
	CW	DOMESTIC COLD WATER
	HW	DOMESTIC HOT WATER
	HWR	DOMESTIC HOT WATER RETURN
D	D	INDIRECT DRAIN
CD	CD	CONDENSATE DRAIN
PCD	PCD	PUMPED CONDENSATE DRAIN
SCD	SCD	SECONDARY CONDENSATE DRAIN
MG	MG	MEDIUM PRESSURE FUEL GAS
G	G	FUEL GAS
TP	TP	TRAP PRIMER
		DIRECTION OF FLOW
	P.G.	PRESSURE GAUGE W/PETE COCK
	G.C.	GAS COCK
	P.R.V.	PRESSURE REDUCING VALVE
	C.V.	CHECK VALVE
	L.B.V.	LOCKING BALL VALVE
	B.V.	BALL VALVE
	G.V.	GATE VALVE
	FCO	FLOOR CLEANOUT
	WCO	WALL CLEANOUT
		DOWN
		RISE
		UNION
		SLOPE IN DIRECTION OF FLOW
		WATER HAMMER ARRESTOR
	P.O.C.	POINT OF CONNECTION
	WHA	WATER HAMMER ARRESTOR
	RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
	ABV	ABOVE
	AFF	ABOVE FINISHED FLOOR
	AP	ACESS PANEL
	BEH	BEHIND
	BEL	BELOW
	CLG	CEILING
	CONT.	CONTINUATION
	CO.	CLEAN OUT
	EXIST. (E)	EXISTING
(E)	FIN.	FINISHED
	F.F.E.	FINISHED FLOOR ELEVATION
	FLR.	FLOOR
	FR.	FROM
	G.P.F.	GALLONS PER FLUSH
	GR	GRADE
	HDR	HEADER
	I.E.	INVERT ELEVATION
	VTR	VENT THROUGH ROOF

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P4.10	DETAILS

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SONORA HIGH SCHOOL
SCIENCE CLASSROOMS MODERNIZATION

401 S PALM STREET
LA HABRA, CA 90631

Developed for
FULLERTON JOINT UNION HIGH SCHOOL DISTRICT

Revision	Date

Submittal	Date
SCHEMATIC DESIGN	03/13/2025
50% DESIGN DEVELOPMENT	06/16/2025
100% DESIGN DEVELOPMENT	09/05/2025
50% CD SET	10/30/2025
DSA SUBMITTAL	11/21/2025
DSA BACK CHECK	01/27/2026

Job Number	32433
Checked By	Checker
Scale	12" = 1'-0"

LEGEND, SCHEDULES & NOTES

P0.01

ELECTRIC WATER HEATER

UNIT NO.	MANUFACTURER & MODEL NO.	LOCATION	SERVICE	STORAGE CAPACITY	REC. @ 100° T.R.	INLET TEMP °F	OUTLET TEMP °F	ELECTRICAL				OPER. WEIGHT	REMARKS
								KW	V	PH	HZ		
EWH-1	A.O. SMITH #DEL-20S-4	JANITOR'S ROOM	DOMESTIC HOT WATER	20 GAL.	16 GPH	60°	120°	4.0	208	3	60	239.6 LBS	MOUNT UP HIGH ON WALL
EWH-2	EEMAX SPEX8208T	CLASSROOM ROOM	DOMESTIC HOT WATER	-	-	60°	120°	8	208	1	60	4 LBS	MOUNT BELOW SINK

GAS PIPE SIZING

TDL = 200 FT. CPC TABLE 1216.2 (1)
2 PSI INLET PRESSURE

PIPE SIZE	CFH	PIPE SIZE	CFH
1/2"	34	2 1/2"	1270
3/4"	71	3"	2240
1"	134	4"	4560
1 1/4"	275		
1 1/2"	412		
2"	794		

NATURAL GAS LOADS

LAB SINKS	QTY	CFH	TOTAL CFH	
DOUBLE GAS TURRET	32	6	192	192 X .5 = 96 CFH

DIVERSITY FACTORS FOR CLASSROOM GAS OUTLETS

NO. OF OUTLETS	SIMULTANEOUS USE FACTOR
1-10	.8
11-25	.6
26-100	.5
101-350	.4

GAS PIPE SIZING IS BASED ON THE REQUIREMENTS OF THE 2022 CPC CHAPTER 12 TABLE 1216.2 SCHEDULE 40 STEEL PIPE FOR A DEVELOPED LENGTH OF 200 FT.

GAS PIPING SHALL BE SLOPED NOT LESS THAN 1/4" IN 15 FEET TO PREVENT TRAPS (CPC 1210.2.2)

EMERGENCY GAS SHUT-OFF VALVE WITH SIGNAGE SHALL BE LOCATED AT THE TEACHER'S DESK ADJACENT TO THE LABORATORY'S EGRESS. (NFPA 54:7.9.2.4)(2022 CPC CHAPTER 12 SECTION 1210.11.3

WATER SYSTEM CALCULATION

PRESSURE BETWEEN ROOMS 427 AND 428: HYDRAULIC GRADE LINE = XX
2"PIPE, 40.5 FU, 49 GPM

COMMON BUILDING FINISHED FLOOR ELEVATION = 338.50'
350-109.6 = 240.4 x 0.433 = 104.1 PSI

EQUIVALENT LENGTH FROM METER TO PRESSURE REGULATING VALVE (PRV) = 50 FT + 25% FOR FITTINGS = 62.5 FT.

LOSSES (METER TO PRV)

2"METER	4 PSI
2\"RPBP	12 PSI
FRICTION = 63 FT. x 6.47/ 100 x 0.433 =	1.76 PSI
	18 PSI

104.1 PSI - 18 PSI = 86.1 PSI

PRV SET: 78 PSI, 75 PSI

LOSSES (PRV TO MOST REMOTE FIXTURE)

PRV	10 PSI
RESIDUAL (W.C.)	25 PSI
STATIC = (5 FT. x 0.433) =	2 PSI
	37 PSI

75 PSI - 37 PSI = 38 PSI

EQUIVALENT LENGTH FROM PRV TO MOST REMOTE FIXTURE = 360 FT x 25% FOR FITTINGS = 450 FT.

ALLOWABLE AVERAGE LOSS DUE TO FRICTION PER 100 FT OF PIPE = 38 PSI/ 450 FT x 100 FT = 8.44 PSI. PIPE SIZES BASED ON 3 PSI LOSS PER 100' OR 8 FT. PER SECOND VELOCITY, WHICHEVER RESTRICTION IS GREATER.
5FT. PER SECOND (HOT)

PIPE SIZING SCHEDULE

(BASED ON 3 PSI / 100 FT.)

SIZE	FIXTURE UNITS			VELOCITY (FPS)	G.P.M.
	FLUSH TANK HW	FLUSH TANK CW	FLUSH VALVE		
1/2"	0	0	0	2.6	1.9
3/4"	4	4	0	3.2	4.9
1"	12	12	0	3.9	10
1 1/4"	24	24	0	4.4	17.4
1 1/2"	46	46	10	4.9	27
2"	119	155	63	5.9	56
2 1/2"	245	380	245	6.7	100
3"	406	665	596	7.5	160

PLUMBING FIXTURE SCHEDULE

UNIT NO.	DESCRIPTION	CONNECTION SIZES					REMARKS
		TRAP	W	V	CW	HW	
LS-1	LAB SINK (STUDENT)	1-1/2"	2"	1-1/2"	1/2"	-	ORION #ARLS-15, 20.25" X 17.5" X 12" CORROSION RESISTANT LAB SINK, CHICAGO FAUCET #927-317XKCP, SWING GOOSENECK SPOUT WITH 4" VANDAL PROOF WRIST BLADE HANDLES, 1.5 GPM. GRID DRAIN WITH CHROME-PLATED TAILPIECE. MCGUIRE LFH2165LK LEAD-FREE ANGLE STOPS AND SUPPLIES. SUPPLY WITH CHICAGO #982-VR909AGVCP DECK MOUNTED DOUBLE GAS TURRET.
LS-2	LAB SINK (STUDENT / ACCESSIBLE)	1-1/2"	2"	1-1/2"	1/2"	-	ORION #ARLS-15-ADA, 20.25" X 17.5" X 6" CORROSION RESISTANT LAB SINK, CHICAGO FAUCET #927-317XKCP, SWING GOOSENECK SPOUT WITH 4" VANDAL PROOF WRIST BLADE HANDLES, 1.5 GPM. GRID DRAIN WITH CHROME-PLATED TAILPIECE. MCGUIRE LFH2165LK LEAD-FREE ANGLE STOPS AND SUPPLIES. SUPPLY WITH CHICAGO #982-VR909AGVCP DECK MOUNTED DOUBLE GAS TURRET.
LS-3	LAB SINK (TEACHER / ACCESSIBLE)	1-1/2"	2"	1-1/2"	1/2"	1/2"	ORION #ARLS-15-ADA, 20.25" X 17.5" X 6" CORROSION RESISTANT LAB SINK, CHICAGO FAUCET #927-317XKCP, SWING GOOSENECK SPOUT WITH 4" VANDAL PROOF WRIST BLADE HANDLES, 1.5 GPM. GRID DRAIN WITH CHROME-PLATED TAILPIECE. MCGUIRE LFH2165LK LEAD-FREE ANGLE STOPS AND SUPPLIES. SUPPLY WITH CHICAGO #980-VR909AGVCP DECK MOUNTED DOUBLE GAS TURRET.
S-1	SINK	1-1/2"	2"	1-1/2"	1/2"	1/2"	ELKAY LUSTERTONE MODEL LRAD 21955, STAINLESS STEEL, SINGLE HOLE, REAR CENTER DRAIN, 22"x 19 1/2"x5", ADA COMPLIANT, WULK-99 DRAIN TYPE 304 STAINLESS STEEL BODY STRAINER, CHICAGO FAUCET MODEL 116.769.AB.1T, 1.5 GPM LAMINAR FLOW RATE, CHROME FINISH CHICAGO FAUCETS MODEL 1017-ABCP LOOSE KEY STOPS W/ WALL FLANGES
DT-1	DILUTION TRAP	2"	2"	2"	1/2"	1/2"	ORION STYLE #10 1 1/2-GALLON TANK; WITH 2" OUTLET WITH COMPLETE ACID-RESISTANT TRAP ARM EXTENSION
EEW-1	EMERGENCY EYEWASH (DECK MOUNT)	--	--	--	3/4"	--	GUARDIAN G5022 DECK MOUNTED EYE/FACE WASH WITH TWO SPRAY HEADS. SUPPLIED WITH AN INTEGRAL FLOW CONTROL.
MS-1	MOP (SERVICE) SINK	3"	3"	2"	3/4"	3/4"	AMERICAN STANDARD #7745.811 MOP SINK 28" X 28" X 13" DEEP WITH AMERICAN STANDARD 8344.212.004 WALL MOUNTED FAUCET.
ECV-1	EMERGENCY CONTROL VALVE (GAS)	-	-	-	-	-	ISIMET NATURAL GAS SERVICE PANEL, INTERNAL JUINCTION BOX W/120-VAC LINE VOLTAGE ALONG WITH TRANSFORMER AND CIRCUIT BOARD.
HB-1	HOSE BIBB	-	-	-	3/4"	-	ACORN 8120CP-LF HOSE VALVE, HEAVY ROUGH BRASS BODY, FURNISHED WITH A LOCKSHIELD BONNET AND REMOVABLE LOOSE KEY WHEEL HANDLE.
HB-2	HOSE BIBB (ROOF)	-	-	-	3/4"	-	ACORN 8125CR-LF HOSE VALVE, HEAVY ROUGH BRASS BODY, FURNISHED WITH A LOCKSHIELD BONNET AND REMOVABLE LOOSE KEY WHEEL HANDLE.
RR-1	ROOF RECEPTOR	3"	3"	2"	-	-	J.R. SMITH FIG 3980Y DUCO CAST IRON RECEPTOR WITH SOLID WATER DAM AND CAST IRON DOME BOTTOM STRAINER SECURED WITH STAINLESS STEEL VANDAL PROOF SCREWS
RD-1	ROOF DRAIN	-	-	-	-	-	J.R. SMITH FIG 1010YCU DUCO CAST IRON RECEPTOR WITH COMBINED FLASHING CLAMP AND GRAVEL STOP AND CAST IRON DOME.
OD-1	OVERFLOW DRAIN	-	-	-	-	-	J.R. SMITH FIG 1080YCU DUCO CAST IRON RECEPTOR WITH EXTERNAL WATER DAM AND CAST IRON DOME BOTTOM STRAINER.

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Plumbing Lead - Ron Brick
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Revision	Date

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SCHEMATIC DESIGN	03/13/2025
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DSA BACK CHECK	01/27/2026

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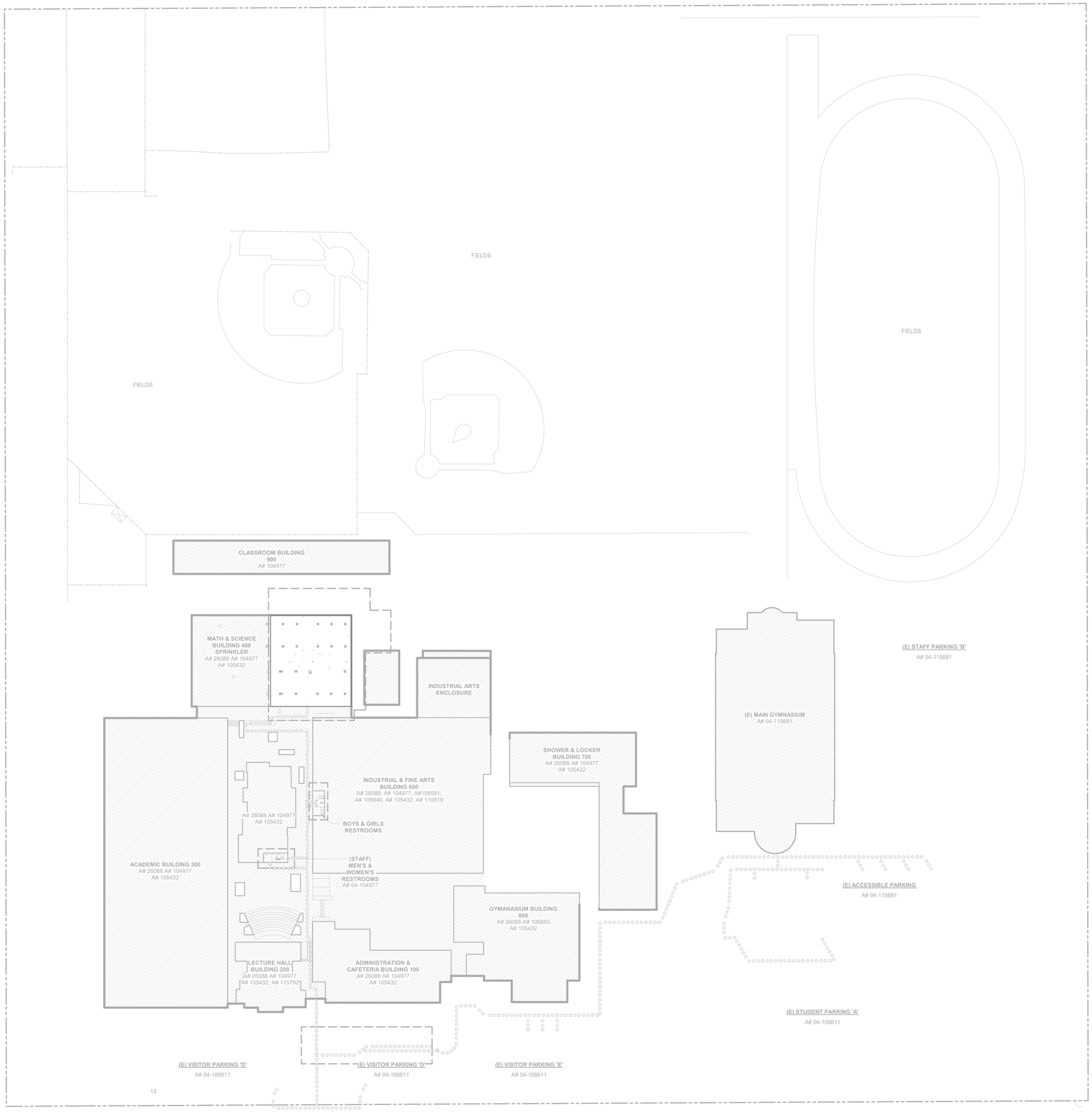
Scale	12" = 1'-0"

EQUIPMENT SCHEDULES

P0.02



KEYNOTES

PLUMBING SITE PLAN | 1" = 50'-0" | P1.00 | 1

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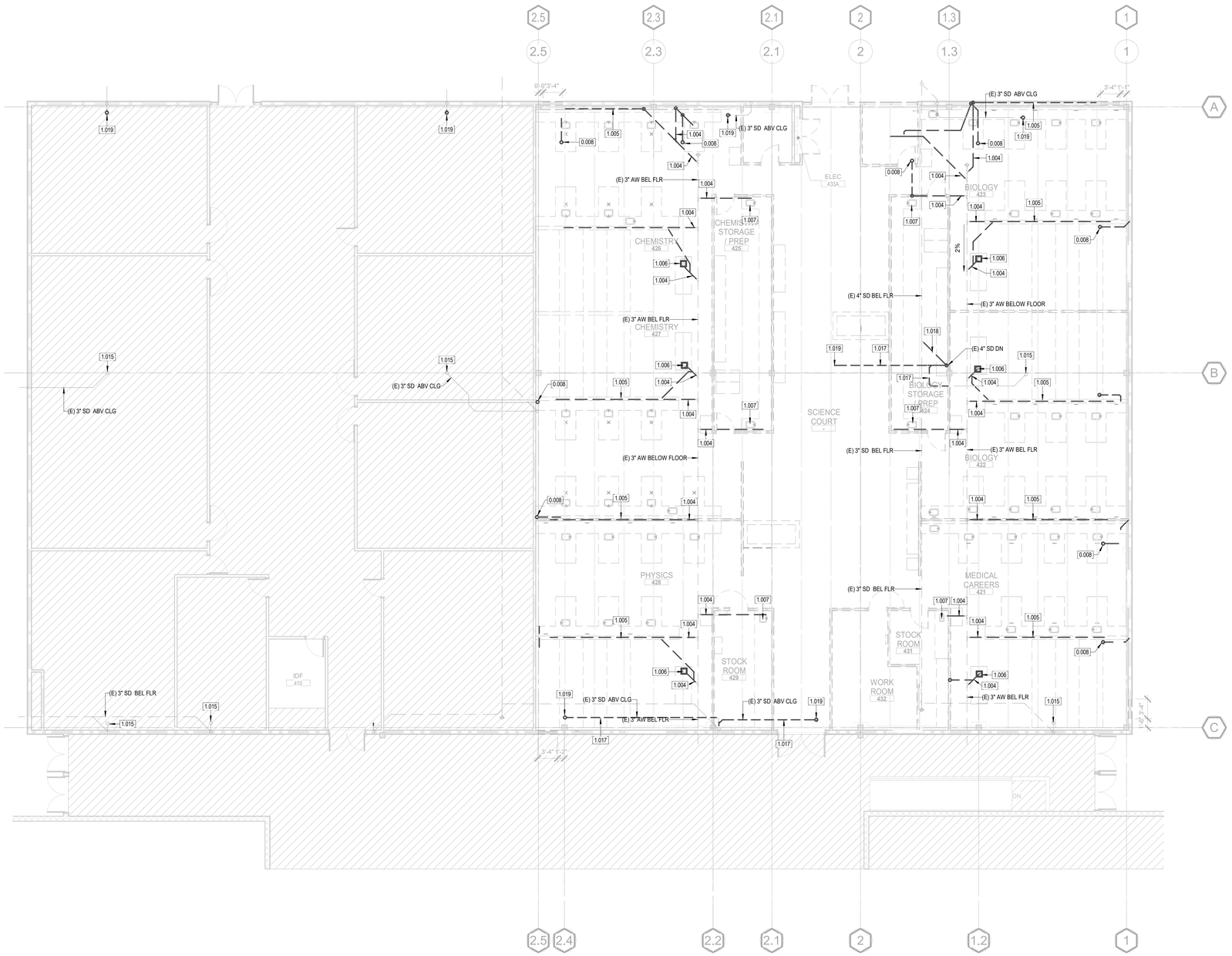
PLUMBING SITE PLAN

P1.00



KEYNOTES

0.008	EXISTING 1 1/2" VENT UP THRU ROOF TO BE REMOVED.
1.004	REMOVE EXISTING WASTE LINE AND PLUG AT MAIN CONNECTION.
1.005	REMOVE EXISTING WASTE AND VENT PIPING IN WALL.
1.006	REMOVE EXISTING FLOOR SINK, WASTE AND VENT PIPING UP IN WALL.
1.007	REMOVE EXISTING SINK, WASTE AND VENT PIPING UP IN WALL.
1.015	EXISTING 3" STORM DRAIN UP TO EXISTING ROOF DRAIN.
1.017	REMOVE EXISTING STORM DRAIN PIPING ABOVE CEILING AND CAP.
1.018	REMOVE EXISTING STORM DRAIN PIPING BELOW FLOOR AND CAP.
1.019	REMOVE EXISTING STORM DRAIN PIPING UP TO EXISTING ROOF DRAIN.

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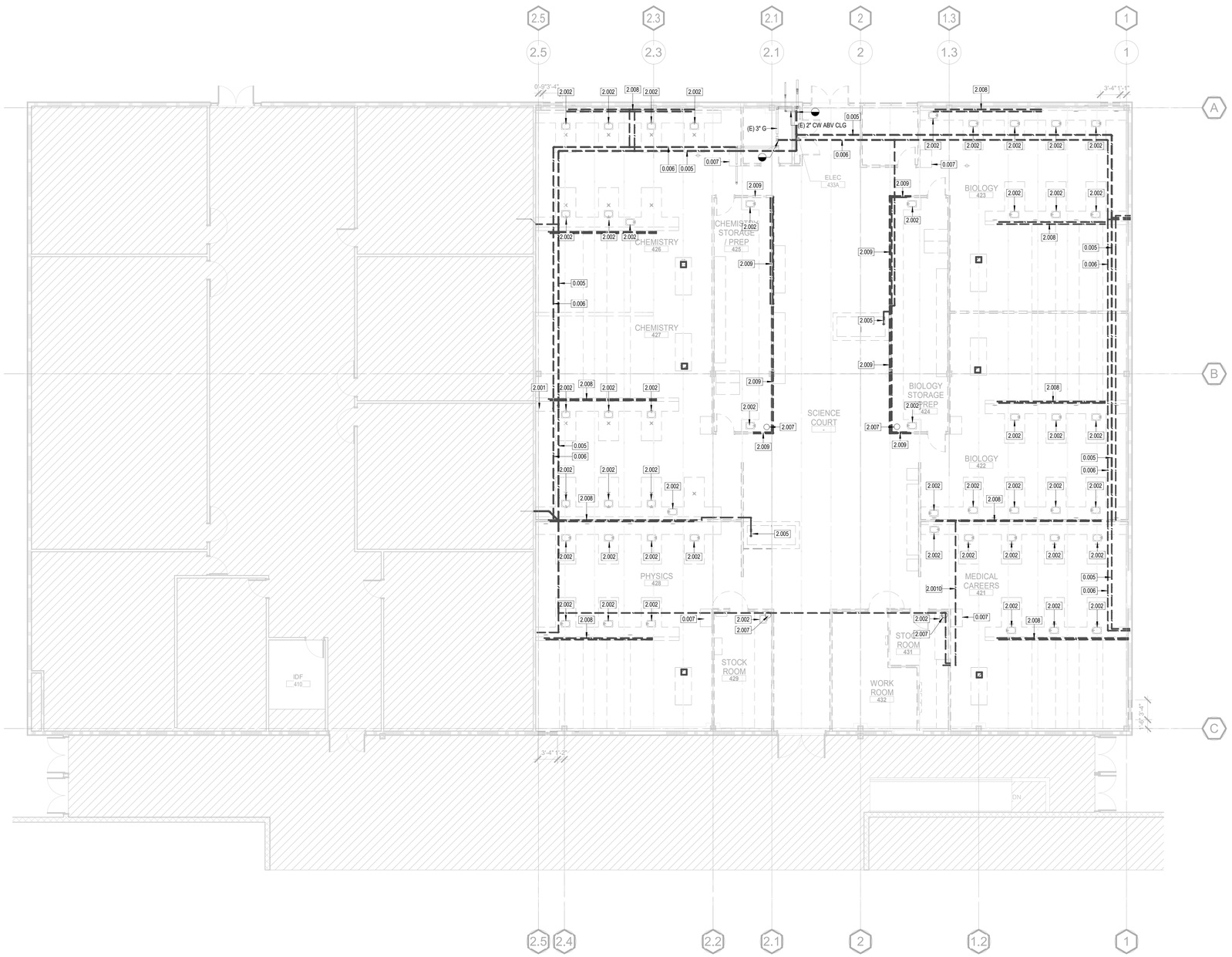
Scale	1/8" = 1'-0"

PLUMBING DEMOLITION
PLAN W & V

P1.02



PLUMBING DEMOLITION PLAN PRESSURE PIPING | 1/8" = 1'-0" | P1.03 | 1

KEYNOTES

0.005	EXISTING COLD WATER PPE ABOVE CEILING TO REMAIN.
0.006	EXISTING GAS PIPE ABOVE CEILING TO BE REMOVED.
0.007	EXISTING FUME HOOD TO BE REMOVED. CAP EXISTING GAS AND COLD WATER ABOVE CEILING.
2.001	CAP EXISTING GAS AND COLD WATER ABOVE CEILING.
2.002	REMOVE EXISTING SINK, GAS, GAS TURRETS & COLD WATER PIPING IN WALL.
2.005	REMOVE EXISTING HOSE BIBB & COLD WATER PIPING.
2.007	REMOVE EXISTING HOT WATER HEATER & WATER PIPING.
2.008	REMOVE EXISTING GAS & COLD WATER PIPING IN WALL ABOVE FLOOR.
2.009	REMOVE EXISTING GAS & HOT AND COLD WATER PIPING IN WALL ABOVE FLOOR.
2.0010	REMOVE EXISTING HOT WATER PIPING ABOVE CEILING.

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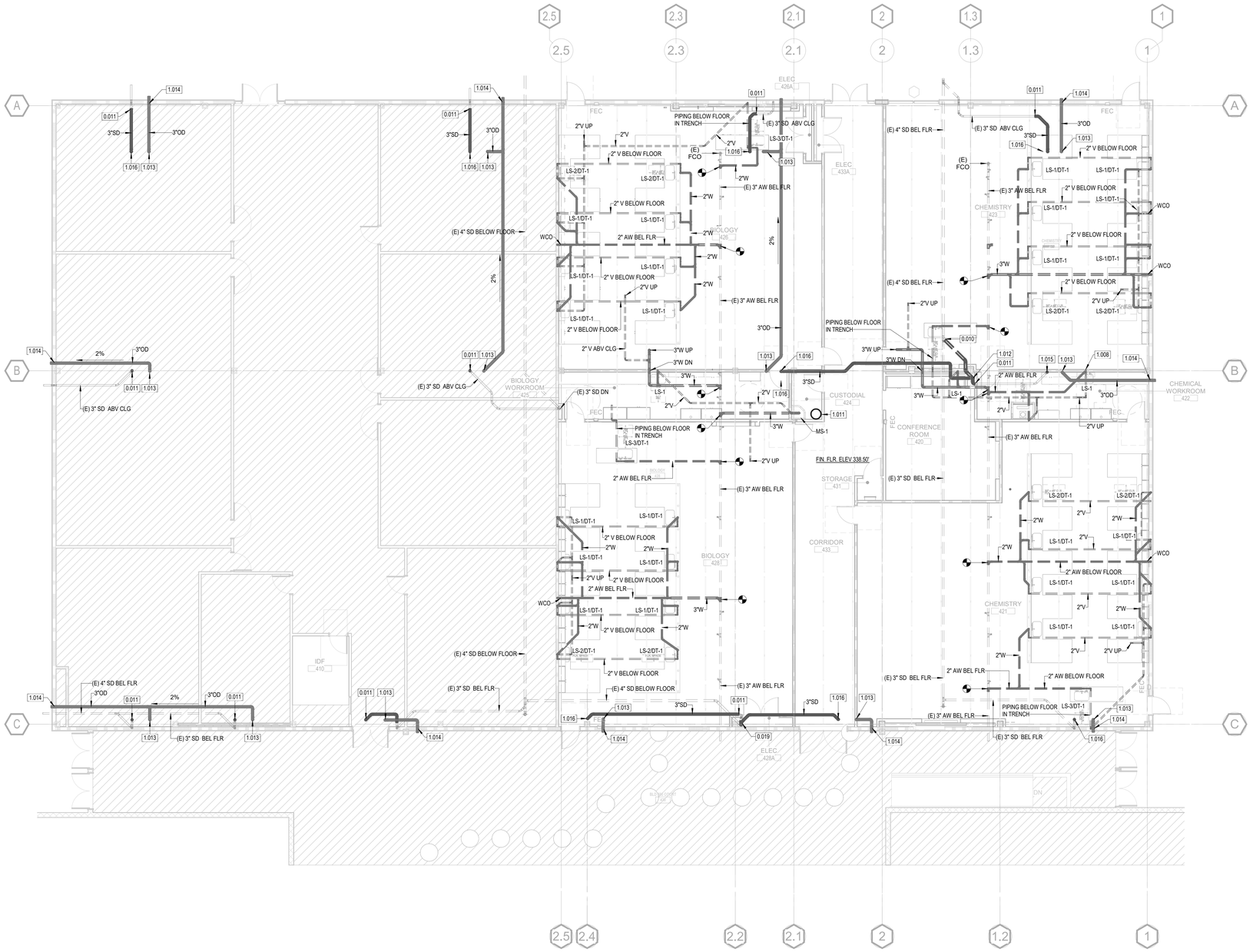
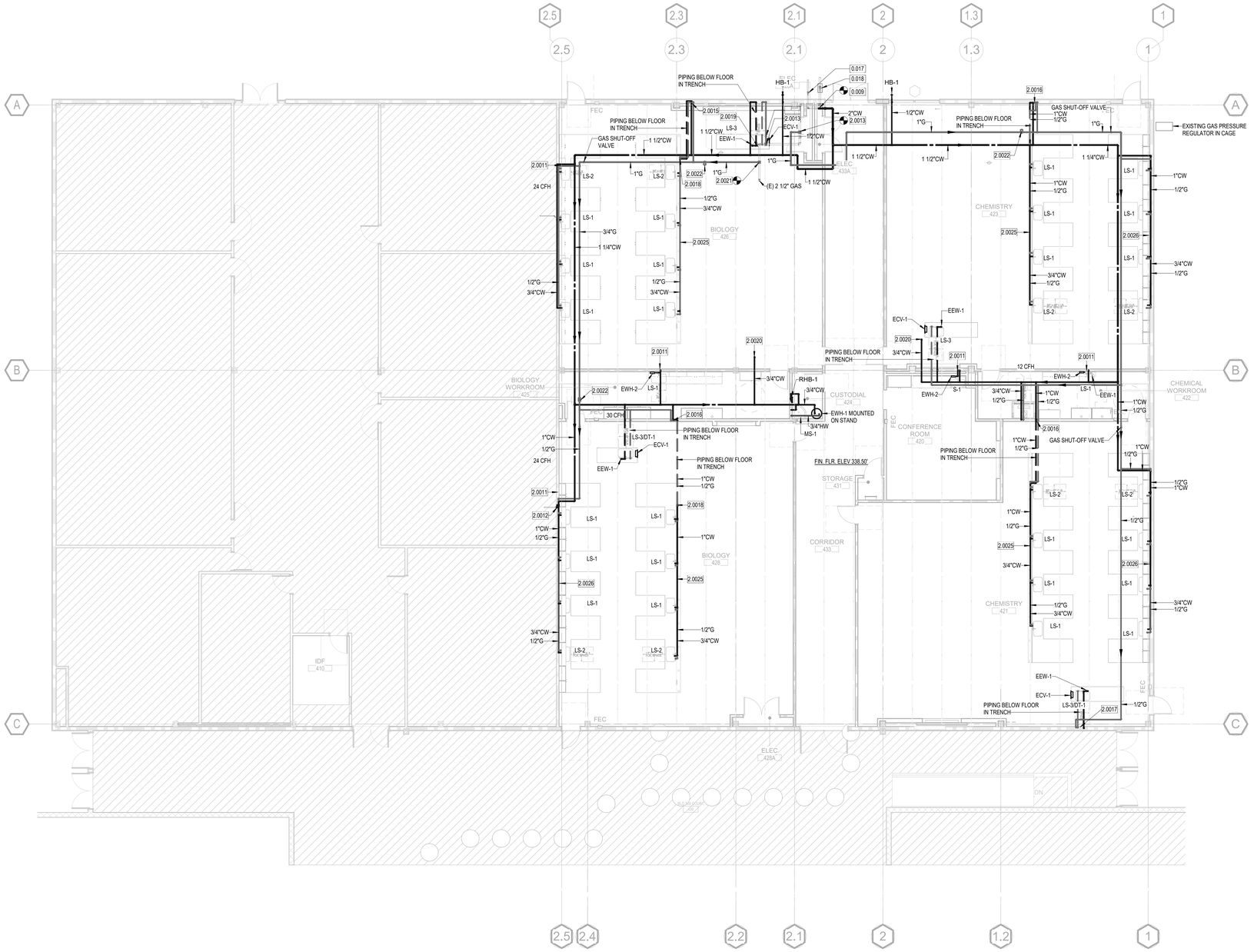
Scale	1/8" = 1'-0"

PLUMBING DEMOLITION PLAN PRESSURE PIPING

P1.03


2.5
2.3
2.1
2
1.3
1
A
B
C
ELEC 426A
FEC
PIPING BELOW FLOOR IN TRENCH
(E) 3" SD ABV CLG
LS-3/DT-1
(E) FCO
2"V UP
2"V
2" V BELOW FLOOR
LS-2/DT-1
2"W
(E) 3" AW BEL FLR
LS-1/DT-1
BIOLOGY 425
(E) 4" SD BELOW FLOOR
WCO
2" AW BEL FLR
2%
3"OD
3"W UP
3"W DN
3"W
3"SD
LS-1
(E) 3" SD DN
BIOLOGY WORKROOM 425
(E) 3" SD ABV CLG
CUSTODIAL 424
MS-1
CONFERENCE ROOM 420
FIN. FLR. ELEV 338.50'
STORAGE 431
CORRIDOR 433
BIOLOGY 428
IDF 410
ELEC 428A
(E) 3" SD BEL FLR
(E) 4" SD BEL FLR
CHEMISTRY 423
CHEMICAL WORKROOM 422
CHEMISTRY 421
2" AW BELOW FLOOR
PIPING BELOW FLOOR IN TRENCH
LS-3/DT-1
(E) 3" AW BEL FLR
(E) 3" SD BEL FLR
(E) 4" SD BEL FLR
(E) 3" SD ABV CLG
(E) 3" AW BEL FLR
(E) 3" SD BEL FLR
(E) 4" SD BEL FLR
(E) 3" SD BEL FLR
(E) 3" AW



KEYNOTES

0.009	POINT OF CONNECTION TO EXISTING 2" DOMESTIC COLD WATER ABOVE THE CEILING WITH SHUT-OFF VALVE.
0.017	EXISTING DOMESTIC WATER SHUT OFF VALVE PER EXISTING AS-BUILTS.
0.018	EXISTING GAS SHUT OFF VALVE PER EXISTING AS-BUILTS.
2.0011	1" COLD WATER AND 1/2" GAS DOWN TO SINK(S).
2.0012	3/4" COLD WATER DOWN AND CONNECT TO EXISTING 3/4" COLD WATER BELOW FLOOR.
2.0013	POINT OF CONNECTION TO EXISTING 3" GAS ABOVE CEILING.
2.0015	3/4" GAS WITH SHUT-OFF VALVE TO MECHANICAL UNIT.
2.0016	3/4" CW & 1/2" GAS DN TO BELOW FLOOR.
2.0017	3/4" CW, 3/4" HW & 1/2" GAS DOWN TO BELOW FLOOR.
2.0018	1" CW & 1/2" GAS UP FROM BELOW FLOOR.
2.0019	3/4" CW & 1/2" GAS & 1/2" HW UP FROM BELOW FLOOR.
2.0020	3/4" CW UP TO HOSE BIBB ON ROOF.
2.0021	POINT OF CONNECTION TO EXISTING 2 1/2" GAS ABOVE CEILING.
2.0022	PROVIDE GAS SOLENOID VALVE ABOVE CEILING. WIRE TO ECV-1 AT TEACHERS DESK.
2.0025	INSTALL COLD WATER AND GAS LINES HORIZONTALLY WITHIN THE PONY WALL ONE ON TOP OF THE OTHER.
2.0026	INSTALL COLD WATER AND GAS LINES HORIZONTALLY WITHIN THE WALL ONE ON TOP OF THE OTHER.

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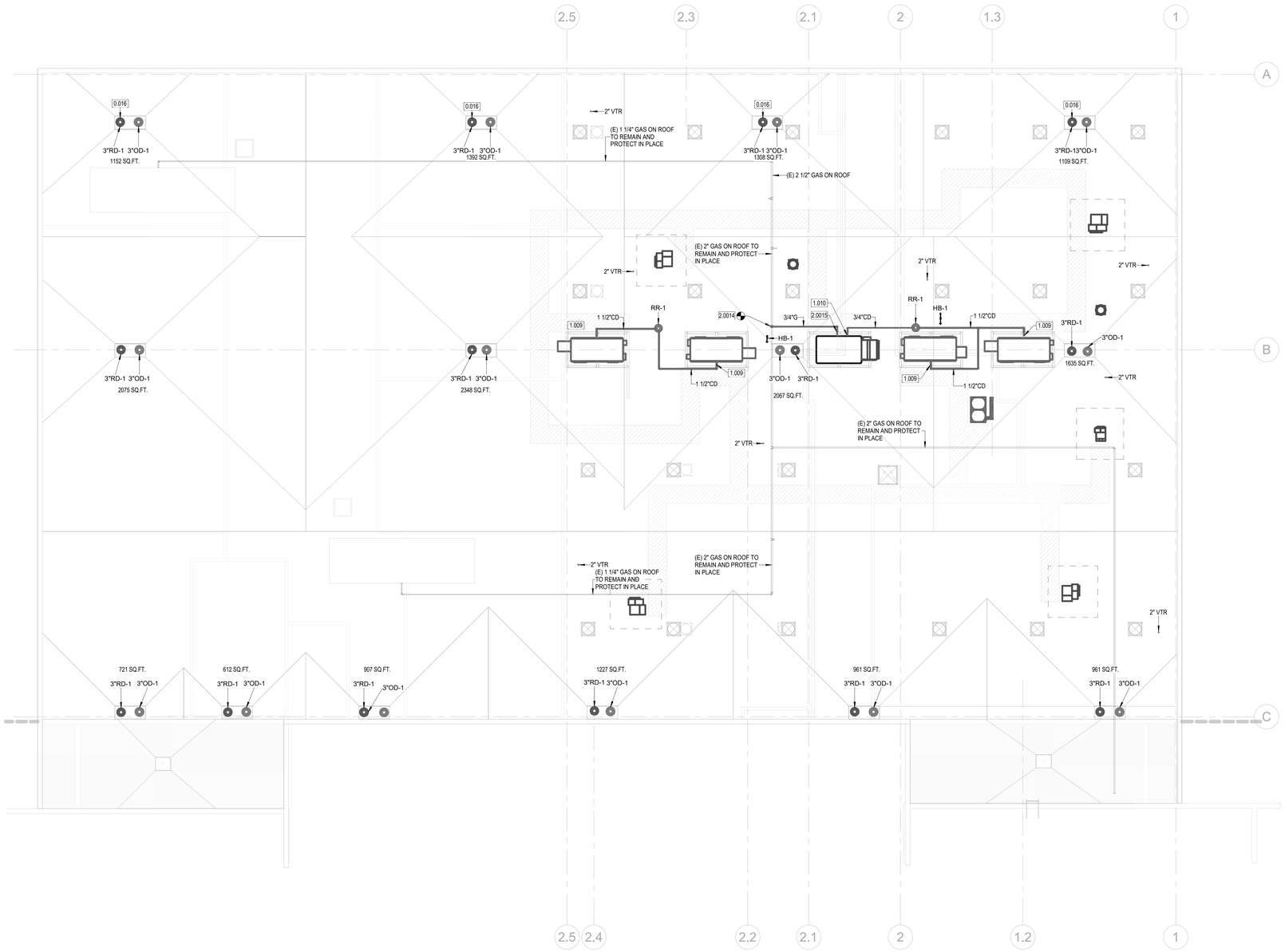
PLUMBING FLOOR PLAN
PRESSURE PIPING

P2.11



PLUMBING ROOF PLAN | 1/8" = 1'-0" | P2.20 | 1

KEYNOTES

0.016	NEW LOCATION FOR NEW ROOF DRAIN.
1.009	1 1/2" CONDENSATE DRAIN. TRAP AT UNIT AND RUN ON ROOF AND SPILL INTO ROOF RECEPTOR WITH 1" AIR GAP.
1.010	3/4" CONDENSATE DRAIN. TRAP AT UNIT AND RUN ON ROOF AND SPILL INTO ROOF RECEPTOR WITH 1" AIR GAP.
2.0014	POINT OF CONNECTION TO EXISTING 2 1/2" GAS ON ROOF.
2.0015	3/4" GAS WITH SHUT-OFF VALVE TO MECHANICAL UNIT.

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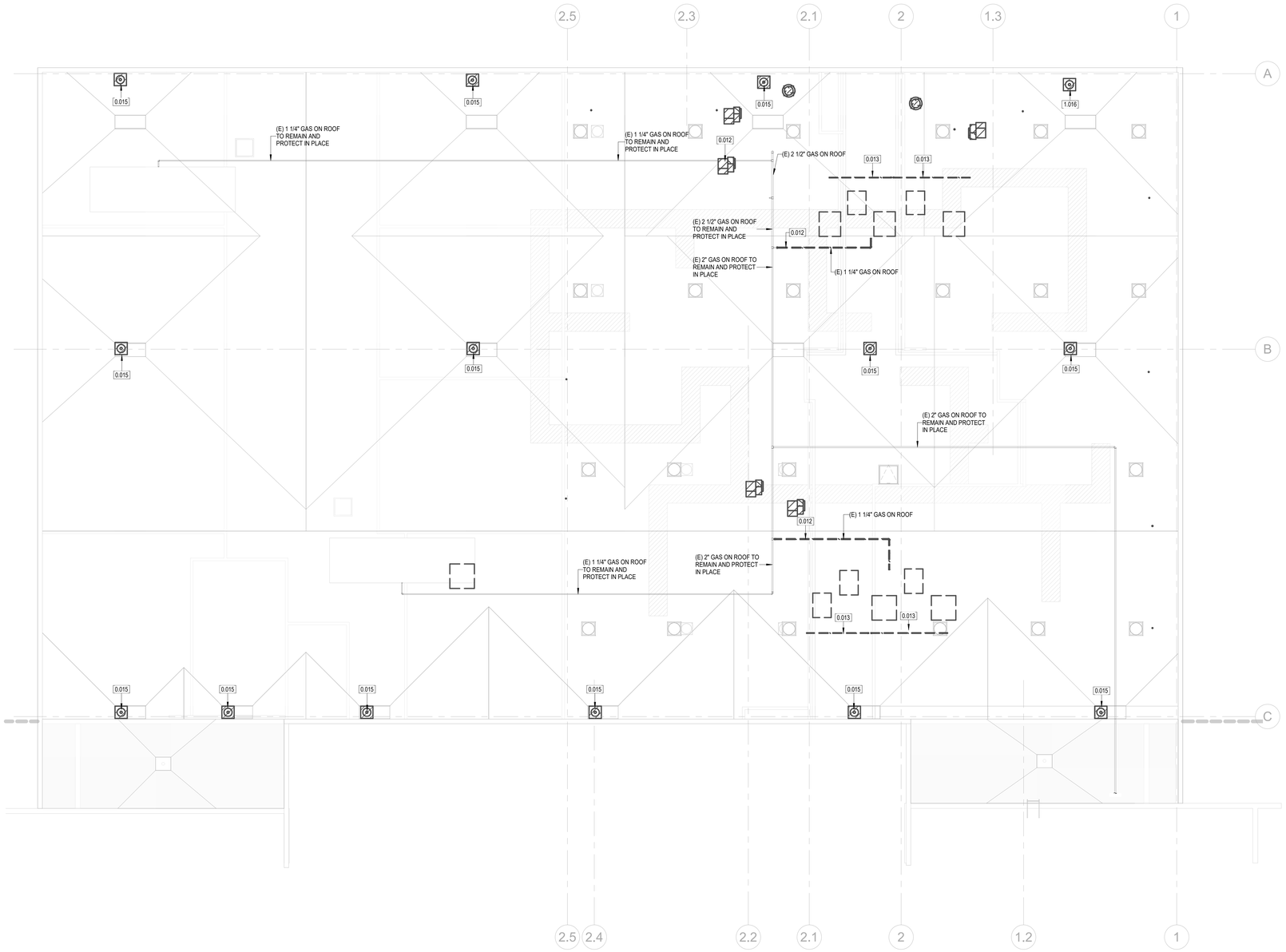
PLUMBING ROOF PLAN

P2.20



KEYNOTES

0.012	EXISTING GAS PIPE ON ROOF TO BE REMOVED AND CAPPED.
0.013	EXISTING CONDENSATE DRAIN PIPE ON ROOF TO BE REMOVED AND CAPPED.
0.015	EXISTING ROOF DRAIN TO BE REMOVED.
1.016	3" STORM DRAIN UP TO NEW ROOF DRAIN ON ROOF.

GENERAL NOTE
CONTRACTOR TO VERIFY ALL ROOF DRAIN LOCATIONS BEFORE STARTING CONSTRUCTION.

PLUMBING DEMOLITION ROOF PLAN | 1/8" = 1'-0" | P2.21 | 1

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DSA BACK CHECK	01/27/2026

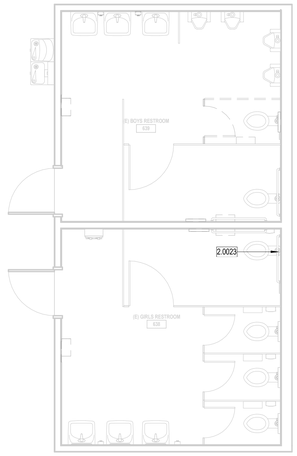
Job Number	32433
Checked By	Checker
Scale	1/8" = 1'-0"

PLUMBING DEMOLITION ROOF PLAN

P2.21

KEYNOTES

2.0023 REMOVE EXISTING FLUSH VALVE.



1 BLDG 600 PLUMBING RESTROOMS FLOOR PLAN DEMOLITION PRESSURE PIPING

SCALE: 1/4" = 1'-0"

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Plumbing Lead - Ron Brick
WSP Job #:US0043159.0992

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SCIENCE CLASSROOMS MODERNIZATION

401 S PALM STREET
LA HABRA, CA 90631

Developed for
FULLERTON JOINT UNION HIGH SCHOOL DISTRICT

Revision	Date

Submittal	Date
SCHEMATIC DESIGN	03/13/2025
50% DESIGN DEVELOPMENT	06/16/2025
100% DESIGN DEVELOPMENT	07/07/2025
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DSA BACK CHECK	01/27/2026

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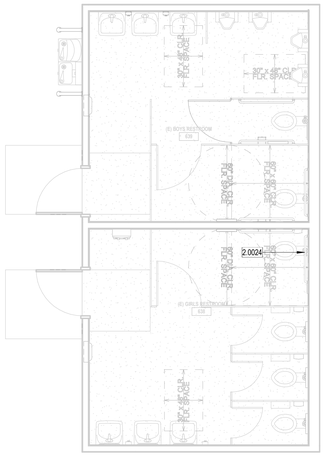
Checked By	Checker
Scale	1/4" = 1'-0"

BLDG 600 RESTROOMS
FLOOR PLAN
DEMOLITION PRESSURE
PIPING

P2.22

KEYNOTES

2.0024 INSTALL NEW FLUSH VALVE ON THE RIGHT SIDE OF WATER CLOSET.



1 BLDG 600 PLUMBING RESTROOMS FLOOR PLAN REMODEL PRESSURE PIPING

SCALE: 1/4" = 1'-0"

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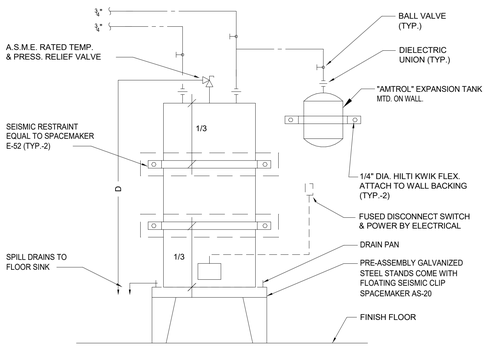
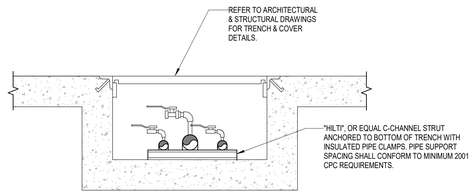
BLDG 600 RESTROOMS
FLOOR PLAN REMODEL
PRESSURE PIPING



9 ELECTRIC WATER HEATER DETAIL

SCALE: 12" = 1'-0"



8 TYPICAL PIPE SUPPORT IN TRENCH

SCALE: NONE

ALL PIPING MUST BE SUPPORTED, BRACED AND SECURED TO RESIST THRUSTING FORCES AND MINIMIZED MOVEMENT.

ALL PIPING MUST BE BRACED PER ACORNVAC SPECS OR PER LOCAL CODE REQUIREMENTS WHICHEVER IS MORE RESTRICTIVE.

ALL BRACING ASSEMBLIES MUST BE ATTACHED TO STRUCTURAL STEEL, RIGID STUDS, OR WOODEN BACKINGS. DRYWALL, THIN SHEET METAL CASE BACKING, AND HVAC DUCT WORK ARE NOT ACCEPTABLE ANCHOR POINTS.

BRACING OF HORIZONTAL PIPING SHOULD BE IN FIVE FOOT INTERVALS WHEN INSTALLATION IS DONE IN PVC, AND EIGHT FOOT INTERVALS FOR COPPER, OR AS REQUIRED BY LOCAL CODE.

SAGGING OF THE PIPING BETWEEN SUPPORTS IS NOT PERMITTED. 1/4" PER FOOT OF SLOPE IS TO BE MAINTAINED AT ALL TIMES.

LATERAL OR SEISMIC BRACING SHOULD BE ADDED EVERY 25' WHEN THE HANGER ASSEMBLY IS GREATER THAN 36" LONG, OR AS REQUIRED BY LOCAL CODE.

WHEN A UNI-STRUT TRAPEZE IS USED, PIPING MUST BE CLAMPED DOWN SECURELY.

VERTICAL LIFTS ARE TO BE SECURED IN SIX FOOT INTERVALS.

BRACING IS REQUIRED AT THE TOP OF ALL VERTICAL LIFTS.

AN APPROVED BRACING ASSEMBLY MUST BE INSTALLED WITHIN ONE FOOT OF EVERY DIRECTIONAL CHANGE, ON BOTH SIDES OF THE FITTING.

AN APPROVED BRACING ASSEMBLY MUST BE INSTALLED WITHIN ONE FOOT OF EVERY EXTRACTION VALVE, ON BOTH THE INLET AND THE OUTLET SIDE.

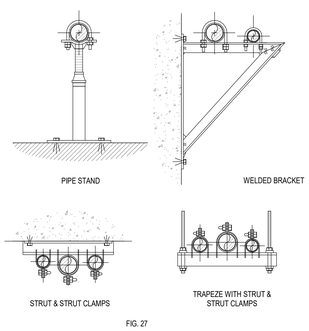
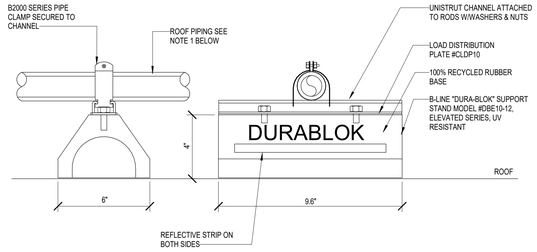


FIG. 27

7 TYPICAL BRACING DETAILS

SCALE: NONE

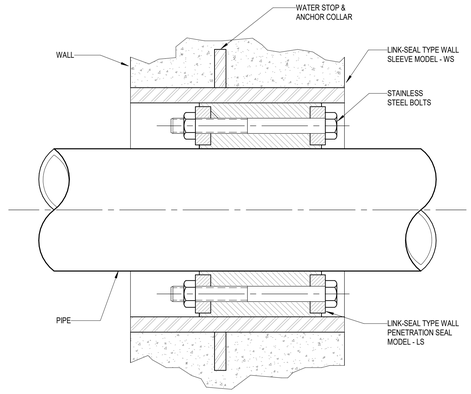


NOTES:

1. 1 ½" AND SMALLER COPPER CONDENSATE AND SCHDULE 40 BLACK STEEL GAS PIPING ONLY.
2. STRUT ASSEMBLY IS ALL HOT DIPPED GALVANIZED STEEL.
3. DURABLOK ROOF SUPPORT SET PER MANUFACTURERS RECCOMDATIONS NOT TO EXCEED 10'-0" ON CENTER & 2'-0" FROM CHANGE OF DIRECTION, SUPPORT SET IN MASTIC TO PREVENT MOVEMENT.

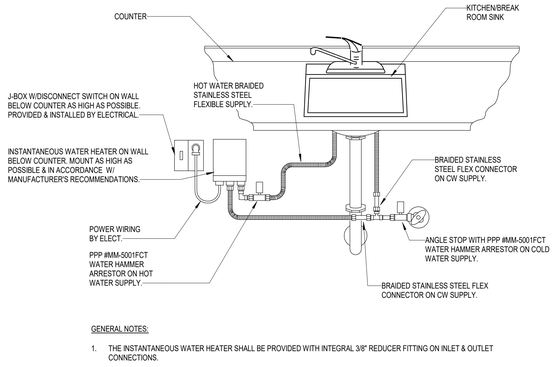
6 ROOF PIPE SUPPORT - GAS PIPING

SCALE: 12" = 1'-0"



5 MECHANICAL SEAL

SCALE: NONE

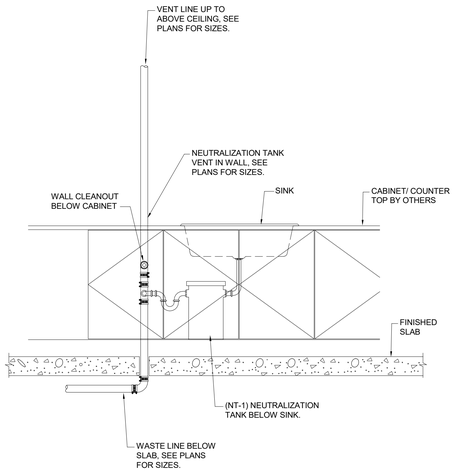


GENERAL NOTES:

1. THE INSTANTANEOUS WATER HEATER SHALL BE PROVIDED WITH INTEGRAL 3/8" REDUCER FITTING ON INLET & OUTLET CONNECTIONS.

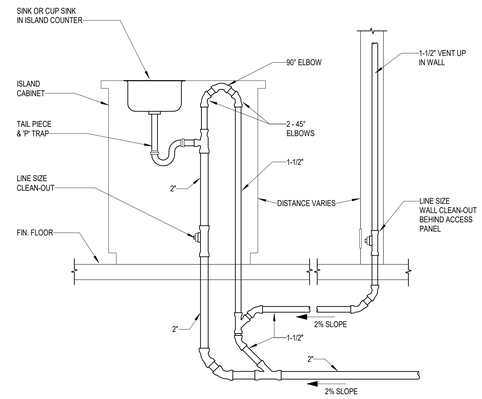
4 INSTANTANEOUS WATER HEATER-SINK

SCALE: NONE



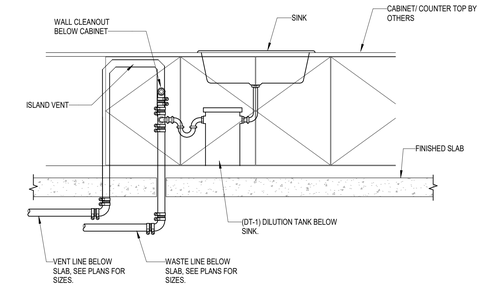
3 ACID DILUTION TANK BELOW SINK

SCALE: 12" = 1'-0"



2 ISLAND VENT

SCALE: NONE



1 ACID DILUTION TANK BELOW SINK

SCALE: NONE

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DETAILS

P4.10

LIGHTING SYMBOLS

SITE LIGHTING FIXTURE SYMBOLS DEPICTED WITH CAPITAL LETTER(S) ADJACENT TO RESPECTIVE SYMBOL(S) INDICATE(S) LIGHT FIXTURE MOUNTING BASE DETAIL(S). SEE LIGHTING FIXTURE SCHEDULE FOR FIXTURE SYMBOL INFORMATION.

1a — LIGHTING FIXTURE CALL OUT, NUMBER(S) AND/OR UPPER CASE LETTER(S) (i.e. "1") INDICATES FIXTURE TYPE (REFER TO LIGHTING FIXTURE SCHEDULE). LOWER CASE LETTER (i.e. "a") ADJACENT TO FIXTURE TYPE INDICATES BALLAST OPTION (SEE GENERAL LIGHTING FIXTURE SCHEDULE NOTES).

J — INDICATES FINAL CONNECTION TO A LIGHTING FIXTURE, NUMBER OF CONDUCTORS AS REQUIRED.

LIGHTING CONTROL SYMBOLS

SEE THE DISTRIBUTED LIGHTING CONTROL (DLCS) SPECIFICATIONS AND SEQUENCE OF OPERATIONS (SOO) FOR MORE INFORMATION.

LOW VOLTAGE WIRING INTERCONNECTING DLCS COMPONENTS AS REQUIRED. SEE DLCS SPECIFICATIONS FOR MORE INFORMATION.

WALL MOUNTED DIMMER. SEE SINGE POLE SWITCH SYMBOL FOR RELATED SUBSCRIPTS. QUANTITY OF ADJACENT LOWER CASE LETTERS INDICATES QUANTITY OF DIMMERS REQUIRED. PROVIDE DIMMER TYPE TO MATCH INDICATED BALLAST TYPE AND CONTROL REQUIREMENTS.

⊗_{y} — WALL MOUNTED STAND ALONE OCCUPANCY SENSOR.

⊙^{H}_{y} — WALL MOUNTED SYSTEM-BASED OCCUPANCY SENSOR.

$\text{⊙}^{H,AV,DM,P}_{y}$ — 1-WAY DIRECTIONAL CEILING MOUNTED, SYSTEM-BASED OCCUPANCY SENSOR.

$\text{⊙}^{H,AV,DM,P}_{y}$ — 2-WAY DIRECTIONAL CEILING MOUNTED, SYSTEM-BASED OCCUPANCY SENSOR.

$\text{E}^{K,V}_{y}$ — LOW VOLTAGE MOMENTARY SWITCHES, WALL MOUNTED, FOR MANUAL ON/OFF SWITCHING, DIMMING, AND OVERRIDE CONTROL OF LIGHTING.

Ⓢ_{y*} — AUTOMATIC SWITCHING/STEP-DIMMING DAYLIGHTING CONTROLLER USED TO SWITCH OFF LIGHTS WHEN SUFFICIENT NATURAL LIGHT IS PRESENT. REFER TO THE DLCS SOO FOR TARGET ILLUMINATION VALUE.

Ⓓ_{y*} — AUTOMATIC CONTINUOUS DIMMING DAYLIGHTING CONTROLLER USED TO DIM LIGHTS WHEN SUFFICIENT NATURAL LIGHT IS PRESENT. REFER TO THE DLCS SOO FOR TARGET ILLUMINATION VALUE.

LIGHTING CONTROL SYMBOL SUPERSCRIPT & SUBSCRIPT KEY:

1. "y" INDICATES THAT SWITCH LEG "y" TO BE CONFIGURED PER THE SOO. ADJACENT LOWER CASE LETTERS INDICATES QUANTITY OF SWITCHLEGS TO BE CONTROLLED. EXACT CONTROL FUNCTION IS DETERMINED BY THE BALLAST/DRIVER/FIXTURE TYPE.
2. ADJACENT UPPER CASE LETTER(S) TO INDICATE THE FOLLOWING:
   - AV INDICATES CONNECTION TO A/V CONTROL SYSTEM.
   - DM INDICATES DUAL MODE CONTROL AT CORRIDORS, STAIRWELLS AND WAREHOUSE AISLEWAYS
   - H INDICATES CONNECTION TO HVAC SYSTEM CONTROLS VIA CONTROLLED DRY-CONTACT CLOSURE.
   - K INDICATES LOCKING SWITCH FOR THE SUBSEQUENT LOWER CASE LETTER.
   - P INDICATES CONNECTION TO MOVEABLE PARTITION INTERFACE, SENSOR AND STATUS INDICATOR.
   - V INDICATES VANDAL RESISTANT SWITCH.
3. ADJACENT LOWER CASE LETTER(S) INDICATE SWITCH LEG(S) CONTROLLED EXCEPT WHERE "DM" INDICATES DUAL MODE CONTROL SWITCH.
4. ADJACENT "+, ++ AND "" INDICATES PORTION OF SWITCHLEG CONTROLLED BY SENSOR WHERE "+" INDICATES PRIMARY SIDELIT DAYLIT ZONE, "++" INDICATES SECONDARY SIDELIT DAYLIT ZONE, AND "" INDICATES SKYLIT DAYLIT ZONE.

MISCELLANEOUS SYSTEM SYMBOLS

- ICP — INVERTER CONTROL PANEL - SEE INVERTER SPECIFICATIONS.
- IAP — INVERTER ANNUNCIATOR PANEL - SEE INVERTER SPECIFICATIONS.
- GAP — GENERATOR ANNUNCIATOR PANEL - SEE GENERATOR SYSTEM SPECIFICATIONS FOR MORE INFORMATION.
- IDCS — INTEGRATED DIMMING CONTROL STATION (IDCS) PANEL - WALL MOUNTED. SEE IDCS SYSTEM SPECIFICATIONS FOR MORE INFORMATION.
- DPCS — DIMMING PANEL CONTROL STATION (DPCS) PANEL - WALL MOUNTED. SEE DPCS SYSTEM SPECIFICATIONS FOR MORE INFORMATION.
- L — LIGHTING CONTROL SYSTEM LOCAL SWITCH - WALL MOUNTED. SEE LIGHTING CONTROL SYSTEM SPECIFICATIONS FOR MORE INFORMATION.
- O — LIGHTING CONTROL SYSTEM OVERRIDE SWITCH - WALL MOUNTED. SEE LIGHTING CONTROL SYSTEM SPECIFICATIONS FOR MORE INFORMATION.
- M — LIGHTING CONTROL SYSTEM MASTER SWITCH - WALL MOUNTED. SEE LIGHTING CONTROL SYSTEM SPECIFICATIONS FOR MORE INFORMATION.
- R — IDCS/DPCS SYSTEM REMOTE STATION SWITCH - WALL MOUNTED. SEE IDCS SYSTEM AND/OR DPCS SYSTEM SPECIFICATIONS FOR MORE INFORMATION.
- P — IDCS/DPCS SYSTEM PARTITION STATION SWITCH - WALL MOUNTED. SEE IDCS SYSTEM AND/OR DPCS SYSTEM SPECIFICATIONS FOR MORE INFORMATION.

BRANCH CIRCUIT SYMBOLS

A-1,3,5 — HOMERUNS WITH INDIVIDUAL HASH MARKS PER CIRCUIT REPRESENT SHARED NEUTRAL FOR UP TO THREE CIRCUITS PER HOMERUN. NOTE, BREAKERS FOR CIRCUITS SHARING A NEUTRAL CONDUCTOR SHALL BE FURNISHED WITH HANDLE-TIE OR MLTI-POLE BREAKERS SHALL BE USED IN COMPLIANCE WITH CEC-210.4(B).

A-1&3&5 — HOME RUN TO PANEL. LETTER DESIGNATES PANEL, NUMBERS INDICATE CIRCUITS WITH SEPARATE NEUTRALS. "&" INDICATES SEPARATE NEUTRALS.

A-1+3+5 — HOME RUN TO PANEL. LETTER DESIGNATES PANEL, NUMBERS INDICATE CIRCUITS. "+" INDICATES SEPARATE #10 NEUTRAL THROUGHOUT BRANCH CIRCUIT. HASH MARK " " INDICATES AN ISOLATED GROUND CONDUCTOR.

HOMERUNS WITH ARROWS ONLY ARE THE SAME AS ABOVE, EXCEPT EACH AROW REPRESENTS A CIRCUIT IN PLACE OF EACH PAIR OF HASH MARKS.

CONCEALED CONDUIT OR BRANCH CIRCUIT UNLESS OTHERWISE NOTED. 1/2" CONDUIT MINIMUM, (2) #12 AWG CONDUCTORS MINIMUM.

CONDUIT OR BRANCH CIRCUIT CONCEALED BELOW GRADE, 3/4" CONDUIT MINIMUM WITH (2) 12 AWG CONDUCTORS MINIMUM AND A CODE SIZED EQUIPMENT GROUND.

SURFACE-MOUNTED CONDUIT OR BRANCH CIRCUIT UNLESS OTHERWISE NOTED. 1/2" CONDUIT MINIMUM, (2) #12 AWG CONDUCTORS MINIMUM.

TANDEM WIRING CONNECTION.

CONDUIT STUB OUT, CAP, MARK AND RECORD ON AS-BUILT DRAWINGS

CONDUIT CONTINUATION.

2 — FLEXIBLE CONNECTION AS REQUIRED. NUMBER OF CONDUCTORS AS REQUIRED. VERIFY CONNECTION REQUIREMENTS WITH MANUFACTURER PRIOR TO ROUGH-IN.

CONDUIT/ BRANCH CIRCUIT/FEEDER CONTINUATION DOWN WALL TO FLOOR BELOW OR CONDUIT STUB DOWN.

CONDUIT/ BRANCH CIRCUIT/FEEDER CONTINUATION UP WALL TO FLOOR ABOVE OR CONDUIT STUB UP.

FLOOR BOX / SPECIALTY WALL BOX / PEDESTAL BOX SYMBOLS

SINGLE SERVICE IN FLOOR BOX. PROVIDE DEVICES PER PLAN. SEE FLOOR BOX DETAILS AND SPECIFICATIONS FOR MORE INFORMATION.

TWO SERVICE IN FLOOR BOX. PROVIDE DEVICES PER PLAN. SEE FLOOR BOX DETAILS AND SPECIFICATIONS FOR MORE INFORMATION.

THREE SERVICE IN FLOOR BOX. PROVIDE DEVICES PER PLAN. SEE FLOOR BOX DETAILS AND SPECIFICATIONS FOR MORE INFORMATION.

FOUR SERVICE IN FLOOR BOX. PROVIDE DEVICES PER PLAN. SEE FLOOR BOX DETAILS AND SPECIFICATIONS FOR MORE INFORMATION.

SIX SERVICE IN FLOOR BOX. PROVIDE DEVICES PER PLAN. SEE FLOOR BOX DETAILS AND SPECIFICATIONS FOR MORE INFORMATION.

AV — 7-GANG AV FLOOR BOX. PROVIDE DEVICES PER PLAN. SEE FLOOR BOX DETAILS AND SPECIFICATIONS FOR MORE INFORMATION.

— ON-GRADE FLOOR BOX. PROVIDE DEVICES PER PLAN. SEE FLOOR BOX SCHEDULE, DETAILS AND SPECIFICATIONS FOR MORE INFORMATION.

— ABOVE GRADE POKE-THRU DEVICE. PROVIDE DEVICES PER PLAN. SEE FLOOR BOX SCHEDULE, DETAILS AND SPECIFICATIONS FOR MORE INFORMATION

AV — RECESSED, ADJUSTABLE DEPTH, FLAT PANEL TV/DISPLAY WALL BOX WITH FLUSH GROMMETED COVER PANEL (CHIEF #PAC525F) AND MINIMUM OF (1) 1-1/4"C.O. FROM TOP-MOUNTED L.V. CONDUIT ENTRY BOX TO ACCESSIBLE CEILING. SEE PLANS FOR ANY ADDITIONAL CONDUIT REQUIREMENTS. PROVIDE ADDITIONAL L.V. AND LINE VOLTAGE CONDUIT ENTRY BOXES AS REQUIRED TO ACCOMPLISH WALL BOX CONFIGURATION DEPICTED ON PLANS. FLUSH GROMMETED COVER SHALL BE WHITE, BLACK OR CUSTOM COLOR PER ARCHITECT. WHEN FIELD CONDITIONS PROHIBIT INSTALLATION OF THIS DEVICE (SUCH AS WALL STUD/CAVITY DEPTH OF LESS THAN 2.5" ETC), CONFIRM VIA WRITTEN RFI THE INSTALLATION OF A TRADITIONAL POWER AND DATA RECEPTACLE INSTALLATION ALONG SIDE CCTV/AV JUNCTION BOX CONSISTING OF 2-GANG DEEP JUNCTION BOX/2-GANG RING WITH 1-1/4"C.O. TO ACCESSIBLE CEILING IN ADDITION TO ANY OTHER CONDUIT REQUIREMENTS DEPICTED ON PLANS. REFER TO ARCHITECTURAL PLANS AND ELEVATIONS FOR MOUNTING HEIGHT.

SINGLE OR DUAL SERVICE RECESSED EXTERIOR WALL BOX - TYPE "WP-A". PROVIDE DEVICES PER PLAN. EACH L.V OR UNUSED COMPARTMENT SHALL BE EQUIPPED WITH A 1"CO TO THE NEAREST ACCESSIBLE CEILING SPACE U.O.N. SEE EXTERIOR DETAILS AND SPECIFICATIONS FOR MORE INFORMATION.

SINGLE OR DUAL SERVICE EXTERIOR PEDESTAL - TYPE "WP-C". PROVIDE DEVICES PER PLAN. SEE EXTERIOR DETAILS AND SPECIFICATIONS FOR MORE INFORMATION. ARROW DENOTES DEVICE DOOR LOCATION.

POWER SYMBOLS

ALL RECEPTACLE OUTLETS SHOWN WITH A DIAGONAL SLASH SHALL BE CONTROLLED BY OCCUPANCY SENSOR OR LIGHTING CONTROL PANEL. SEE DISTRIBUTED LIGHTING CONTROLS FOR ADDITIONAL REQUIREMENTS. WHERE DOUBLE DUPLEX RECEPTACLE OUTLETS ARE INDICATED AS CONTROLLED, ONLY A SINGLE DUPLEX RECEPTACLE OUTLET (NON-IG, NON-GCFI TYPE) SHALL BE CONTROLLED. WITHIN ANY CONTROLLED DUPLEX RECEPTACLE OUTLET, ONLY ONE RECEPTACLE SHALL BE CONTROLLED. NOTE THAT FOR FLOOR BOXES OR POKE-THRU DEVICES, THE ASSOCIATED CONTROL RELAY MAY NEED TO BE LOCATED WITHIN THE ELECTRICAL ROOM WHERE THE CONTROLLED CIRCUIT ORIGINATES.

(R)a — OCCUPANCY SENSOR/LIGHTING CONTROL SYSTEM CONTROLLED RECEPTACLE RELAY. WHERE LETTER DESIGNATION "a" REPRESENTS OCCUPANCY SENSOR/LIGHTING CONTROL SYSTEM CONTROL ZONE. SEE THE DISTRIBUTED LIGHTING CONTROL SPECIFICATION FOR MORE INFORMATION.

DUPLEX RECEPTACLE, WALL MOUNTED.

DOUBLE DUPLEX RECEPTACLE, WALL MOUNTED.

DUPLEX, GFCI RECEPTACLE, WALL MOUNTED. WP INDICATES WEATHERPROOF, A, B OR C INDICATES THE TYPE OF COVER, REFER TO THE GENERAL PRODUCT SPECIFICATIONS.

DOUBLE DUPLEX, WALL MOUNTED, WITH (1) GFCI RECEPTACLE AND (1) DUPLEX RECEPTACLE CONNECTED ON LOAD SIDE OF GFCI. WP INDICATES WEATHERPROOF, A, B OR C INDICATES THE TYPE OF COVER, REFER TO THE GENERAL PRODUCT SPECIFICATIONS.

DUPLEX RECEPTACLE, ONE HALF SWITCHED, WALL MOUNTED.

DUPLEX, ISOLATED GROUND RECEPTACLE, WALL MOUNTED.

1,3 1,3a — COMBINATION DOUBLE DUPLEX: ONE ISOLATED GROUND DUPLEX RECEPTACLE AND ONE DUPLEX RECEPTACLE, WALL MOUNTED.

COMBINATION DOUBLE DUPLEX: TWO ISOLATED GROUND RECEPTACLES, WALL MOUNTED.

SIMPLEX RECEPTACLE, WALL MOUNTED.

SPECIAL RECEPTACLE, WALL MOUNTED. REFER TO PLAN NOTES.

DUPLEX RECEPTACLE FLUSH IN CEILING - MOUNT FLUSH IN FLOOR WHEN INDICATED IN A FLOOR BOX SYMBOL.

DOUBLE DUPLEX RECEPTACLE FLUSH IN CEILING - MOUNT FLUSH IN FLOOR WHEN INDICATED IN A FLOOR BOX SYMBOL.

DUPLEX RECEPTACLE, ONE HALF SWITCHED, FLUSH IN CEILING - MOUNT FLUSH IN FLOOR WHEN INDICATED IN A FLOOR BOX SYMBOL.

DUPLEX, ISOLATED GROUND RECEPTACLE, FLUSH IN CEILING - MOUNT FLUSH IN FLOOR WHEN INDICATED IN A FLOOR BOX SYMBOL.

1,3 1,3a — COMBINATION DOUBLE DUPLEX: ONE ISOLATED GROUND DUPLEX RECEPTACLE AND ONE DUPLEX RECEPTACLE, MOUNTED FLUSH IN CEILING - MOUNT FLUSH IN FLOOR WHEN INDICATED IN FLOOR BOX SYMBOL.

COMBINATION DOUBLE DUPLEX FLUSH IN CEILING: TWO ISOLATED GROUND RECEPTACLES - MOUNT FLUSH IN FLOOR WHEN INDICATED IN FLOOR BOX SYMBOL.

SIMPLEX RECEPTACLE FLUSH IN CEILING - MOUNT FLUSH IN FLOOR WHEN INDICATED IN A FLOOR BOX SYMBOL.

SPECIAL RECEPTACLE FLUSH IN CEILING - MOUNT FLUSH IN FLOOR WHEN INDICATED IN A FLOOR BOX SYMBOL.

DUPLEX RECEPTACLE, WALL MOUNTED AT 6-INCHES COUNTER OR SPLASH.

DOUBLE DUPLEX RECEPTACLE, WALL MOUNTED AT 6-INCHES COUNTER OR SPLASH.

DUPLEX, GFCI RECEPTACLE, WALL MOUNTED AT 6-INCHES COUNTER OR SPLASH. WP INDICATES WEATHERPROOF, A, B OR C INDICATES THE TYPE OF COVER, REFER TO THE GENERAL PRODUCT SPECIFICATIONS.

DOUBLE DUPLEX, WALL MOUNTED, WITH (1) GFCI RECEPTACLE AND (1) DUPLEX RECEPTACLE CONNECTED ON LOAD SIDE OF GFCI. WP INDICATES WEATHERPROOF, A, B OR C INDICATES THE TYPE OF COVER, REFER TO THE GENERAL PRODUCT SPECIFICATIONS.

DUPLEX RECEPTACLE, BOTTOM HALF SWITCHED, WALL MOUNTED AT 6-INCHES ABOVE COUNTER OR SPLASH.

DUPLEX, ISOLATED GROUND RECEPTACLE, WALL MOUNTED AT 6-INCHES ABOVE COUNTER OR SPLASH.

1,3 1,3a — COMBINATION DOUBLE DUPLEX: ONE ISOLATED GROUND DUPLEX RECEPTACLE AND ONE DUPLEX RECEPTACLE, WALL MOUNTED AT 6-INCHES ABOVE COUNTER OR SPLASH.

COMBINATION DOUBLE DUPLEX: TWO ISOLATED GROUND DUPLEX RECEPTACLES, WALL MOUNTED AT 6" ABOVE COUNTER OR SPLASH.

SIMPLEX RECEPTACLE, WALL MOUNTED AT 6-INCHES ABOVE COUNTER OR SPLASH.

SPECIAL RECEPTACLE, WALL MOUNTED AT 6-INCHES ABOVE COUNTER OR SPLASH. REFER TO PLAN NOTES.

WP-B — WET LOCATION-LISTED (RAINTITE-IN-USE) RECEPTACLE - SEE ELECTRICAL SPECIFICATION FOR ADDITIONAL INFORMATION.

WP-D — DAMP LOCATION-LISTED (NOT-RAINTITE-IN-USE) RECEPTACLE - SEE ELECTRICAL SPECIFICATION FOR ADDITIONAL INFORMATION.

DUPLEX RECEPTACLES WITH TWO 5V, 3.6A USB CHARGING PORTS. PROVIDE COLOR AS REQUIRED IN 15A OR 20A CONFIGURATION AND/OR TAMPER RESISTANT AND/OR HOSPITAL GRADE AS REQUIRED BY PLANS AND THE WIRING DEVICES SECTION OF THE GENERAL ELECTRICAL SPECIFICATIONS. (PASS & SEYMOUR OR EQUAL BY HUBBELL OR LEVITON.)

QUAD RECEPTACLES WITH TWO 5V, 3.6A USB CHARGING PORTS. PROVIDE COLOR AS REQUIRED IN 15A OR 20A CONFIGURATION AND/OR TAMPER RESISTANT AND/OR HOSPITAL GRADE AS REQUIRED BY PLANS AND THE WIRING DEVICES SECTION OF THE GENERAL ELECTRICAL SPECIFICATIONS. (PASS & SEYMOUR OR EQUAL BY HUBBELL OR LEVITON.)

J — JUNCTION BOX, WALL MOUNTED AT +18-INCHES A.F.F. OR AS NOTED. 4S/DP MINIMUM OR AS REQUIRED BY N.E.C. OR CEC, WHERE ADOPTED.

J — JUNCTION BOX, MOUNTED IN ACCESSIBLE CEILING FOR APPLICATION DENOTED ON PLAN. 4S/DP MINIMUM OR AS REQUIRED BY N.E.C. OR CEC, WHERE ADOPTED.

JD — JUNCTION BOX, WALL MOUNTED AT 6-INCHES ABOVE COUNTER OR SPLASH. 4S/DP MINIMUM OR AS REQUIRED BY N.E.C. OR CEC WHERE ADOPTED.

J J — JUNCTION BOX, 4S MINIMUM OR AS REQUIRED BY N.E.C., OR CEC, WHERE ADOPTED. MOUNTED IN ACCESSIBLE CEILING SPACE PER PLAN FOR FLEXIBLE CONNECTION TO PRE-WIRED FURNITURE SYSTEM. MOUNT FLUSH IN FLOOR WHEN INDICATED IN A FLOOR BOX SYMBOL. WHEN SHOWN WITH A DIAGONAL SLASH, THE LAST GENERAL RECEPTACLE CIRCUIT ON THE HOME-RUN CALL OUT SHALL BE CONTROLLED BY THE OCCUPANCY SENSOR. COORDINATE CONTROLLED CIRCUIT CONNECTION REQUIREMENTS WITH FURNITURE SYSTEM MANUFACTURER PRIOR TO ROUGH-IN. SEE DISTRIBUTED LIGHTING CONTROLS FOR ADDITIONAL REQUIREMENTS.

JD JX — JUNCTION BOX, WALL MOUNTED AT +18(\C4;-INCHES) A.F.F., 4S/DP MINIMUM OR AS REQUIRED BY N.E.C., OR CEC, WHERE ADOPTED, FOR FLEXIBLE CONNECTION TO PREWIRED FURNITURE SYSTEM. WHEN SHOWN WITH A DIAGONAL SLASH, THE LAST GENERAL RECEPTACLE CIRCUIT ON THE HOME-RUN CALLOUT SHALL BE CONTROLLED BY THE OCCUPANCY SENSOR. COORDINATE CONTROLLED CIRCUIT CONNECTION REQUIREMENTS WITH FURNITURE SYSTEM MANUFACTURER PRIOR TO ROUGH-IN. SEE DISTRIBUTED LIGHTING CONTROLS FOR ADDITIONAL REQUIREMENTS.

SURFACE MOUNTED MULTI-OUTLET ASSEMBLY. REFER TO GENERAL PRODUCT SPECIFICATIONS. PROVIDE ALL COMPONENTS NECESSARY FOR A COMPLETE INSTALLATION.

T — THERMOSTAT OUTLET BOX, PROVIDE 1/2"C.O. TO RESPECTIVE MECHANICAL UNIT.

EXHAUST FAN, OR MOTOR LOAD. REFER TO MECHANICAL, PLUMBING OR KITCHEN DRAWINGS FOR SPECIFIC LOAD REQUIREMENTS OR AS NOTED.

FLUSH MOUNTED ELECTRICAL PANELBOARD OR LOAD CENTER. REFER TO PANEL SCHEDULE.

SURFACE MOUNTED ELECTRICAL PANELBOARD OR LOAD CENTER. REFER TO PANEL SCHEDULE.

DISTRIBUTION SWITCHBOARD. REFER TO SINGLE LINE DIAGRAM.

T — TRANSFORMER, REFER TO SINGLE LINE DIAGRAM.

F — FUSED DISCONNECT SWITCH, HP RATED, OR COMBINATION MOTOR STARTER/DISCONNECT SWITCH WITH FUSES PER EQUIPMENT MANUFACTURER AND WEATHERPROOF AS REQUIRED. PROVIDE FINAL CONNECTION TO UNIT EQUIPMENT. SEE MOTORIZED EQUIPMENT SCHEDULE FOR DISCONNECT AND STARTER SIZES.

NON-FUSED DISCONNECT SWITCH, HP RATED AND WEATHERPROOF AS REQUIRED. PROVIDE FINAL CONNECTION TO UNIT EQUIPMENT. SEE MOTORIZED EQUIPMENT SCHEDULE FOR DISCONNECT SIZES.

M — UTILITY COMPANY METER. PROVIDE "CTs" AND "PTs" AS REQUIRED, REFER TO SINGLE LINE DIAGRAM.

A B C — CIRCUIT BREAKER: "A" REPRESENTS CIRCUIT BREAKER AMPERE RATING, "B" REPRESENTS NUMBER OF POLES AND "C" REPRESENTS MISCELLANEOUS BREAKER FEATURES.

- SHUNT= PROVIDE SHUNT TRIP MECHANISM
- GFP= GROUND FAULT PROTECTION
- CLCB= CURRENT LIMITING CIRCUIT BREAKER
- SS= PROVIDE SOLID STATE CIRCUIT BREAKER
- LO= PROVIDE PERMANENT LOCK-OPEN (OFF) HARDWARE
- LC= PROVIDE PERMANENT LOCK-CLOSED (ON) HARDWARE

* A B C D — FUSIBLE SWITCH: "A" REPRESENTS SWITCH / FRAME AMPERE RATING, "B" REPRESENTS THE FUSE AMPERE RATING, "C" INDICATES NUMBER OF POLES AND "D" REPRESENTS MISCELLANEOUS FUSE / SWITCH FEATURES.

- SHUNT= PROVIDE SHUNT TRIP MECHANISM
- GFP= GROUND FAULT PROTECTION
- CLF= CURRENT LIMITING FUSE

GROUND CONNECTION, SIZE AS INDICATED OR AS REQUIRED.

a,b — SINGLE POLE SWITCHES, WALL MOUNTED. SUBSCRIPTS AT SYMBOL INDICATE THE FOLLOWING:

- 2 - DOUBLE POLE
- 3 - THREE WAY
- 4 - FOUR WAY
- K - KEY OPERATED
- LV - LOW VOLTAGE
- P - PILOT LIGHT
- R - REMOTE CONTROL
- M - MOTOR STARTING
- RL - ROTARY LOCK KEY TYPE
- PB - PUSHBUTTON
- S - PROJECTION SCREEN

a, b, c, ETC. - DESIGNATES QUANTITY OF SWITCHES AT EACH LOCATION.

NOTE: ALL WALL SWITCHES CONTROLLING EMERGENCY CIRCUITS SHALL BE ENGRAVED WITH "EMERGENCY".

EMERGENCY POWER OFF STATION, WALL MOUNTED PER EPO SYSTEM DETAIL.

PB OR P — PULLBOX, SIZED PER N.E.C. OR AS NOTED.

WALL MOUNTED DEVICE MOUNTING HEIGHT NOTE:

ALL WALL-MOUNTED EQUIPMENT MOUNTING HEIGHTS SHALL BE VERIFIED PRIOR TO ROUGH-IN PER REQUIREMENTS OF THE DEVICE ALIGNMENT AND MOUNTING HEIGHT DETAILS AND SPECIFICATIONS.

NOTE: ALL LIGHT SWITCHES SHALL BE MOUNTED NOT HIGHER THAN 48 INCHES AFF TO TOP OF BOX AND RECEPTACLE OUTLETS SHALL BE MOUNTED NOT LOWER THAN 15 INCHES AFF TO BOTTOM OF BOX.

ABBREVIATIONS

4S/DP	4" SQUARE BY 2-1/8" DEEP BOX
ADA	AMERICAN WITH DISABILITIES ACT
A.F.F.	ABOVE FINISH FLOOR
A.F.G.	ABOVE FINISH GRADE
AWG	AMERICAN WIRE GAUGE
AMP, A	AMPERE
A.I.C. or AIC	AMPERES INTERRUPTING CAPACITY (SYMMETRICAL)
A.F.C. or AFC	AVAILABLE FAULT CURRENT
AF/AT	AMP FRAME, AMP TRIP
AHJ	AUTHORITY HAVING JURISDICTION
AS/AF	AMP SWITCH, AMP FUSE
ATS	AUTOMATIC TRANSFER SWITCH
AVG	AVERAGE
BJ	BONDING JUMPER
BDF	BUILDING DISTRIBUTION FRAME
BR	BRANCH
BLDG	BUILDING
CBC	CALIFORNIA BUILDING CODE
CEC	CALIFORNIA ELECTRICAL CODE
CIRC., CKT.	CIRCUIT
CB	CIRCUIT BREAKER
CSFD	COMBINATION SMOKE FIRE DAMPER
C	CONDUIT
C.O.	CONDUIT ONLY, COMPLETE WITH PULLSTRING
CONN	CONNECTED
CPT	CONTROL POWER TRANSFORMER
CLCB	CURRENT LIMITING CIRCUIT BREAKER
CLF	CURRENT LIMITING FUSE
CT	CURRENT TRANSFORMER
(D)	EXISTING DEVICE TO BE DEMOLISHED
DAS	DISTRIBUTED ANTENNA SYSTEM
DIA	DIAMETER
DISC	DISCONNECT
DIST	DISTRIBUTION
D.P.C.S.	DIMMING PANEL CONTROL STATION
E.C.	ELECTRICAL CONTRACTOR
EMS	ENERGY MANAGEMENT CONTROL SYSTEM
EMT	ELECTRICAL METALLIC TUBING
ENT	ELECTRICAL NON-METALLIC TUBING
EWC	ELECTRIC WATER COOLER
E.P.O.	EMERGENCY POWER OFF
E-O-L	END-OF-LINE CIRCUIT TERMINATOR
EF	EXHAUST FAN
EGC or EG or E/G	EQUIPMENT GROUND (GREEN)
(E)	EXISTING DEVICE TO REMAIN
EP	EXPLOSION PROOF
(ER)	EXISTING DEVICE TO BE RELOCATED
FT or '	FEET
FA or F.A.	FIRE ALARM
FLA	FULL LOAD AMPS
GRD	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTION
GE or GEC	GROUNDING ELECTRODE CONDUCTOR
HACR	HEATING AIR CONDITIONING REFRIGERATION
HOA	HAND-OFF-AUTO
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
H.,W.,D.,L.	HEIGHT, WIDTH, DEPTH, LENGTH
HID	HIGH INTENSITY DISCHARGE
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
IN. or "	INCHES
I/G	ISOLATED GROUND
IBC	INTERNATIONAL BUILDING CODE
I.D.C.S.	INTEGRATED DIMMING CONTROL PANEL
IDF	INTERMEDIATE DISTRIBUTION FRAME
JBOX	JUNCTION BOX
K	DEGREE KELVIN
KCMIL	THOUSAND CIRCULAR MILS
KVA	KILOVOLT AMPERES
KW	KILOWATT
KWH	KILOWATT HOUR
LCL	LONG CONTINUOUS LOAD
LF, L.F.	LINEAR FEET
LTG, LTS	LIGHTING
LPS	LOW PRESSURE SODIUM
MAX.	MAXIMUM
MBJ	MAIN BONDING JUMPER
MDF	MAIN DISTRIBUTION FRAME
MOCP	MAXIMUM OVERCURRENT PROTECTION
MCB	MAIN CIRCUIT BREAKER
MLO	MAIN LUGS ONLY
M.C.	MECHANICAL CONTRACTOR
M	METER
M/M	METER MAIN
MV	MERCURY VAPOR
MH	METAL HALIDE
MIN.	MINIMUM
MCA	MINIMUM CIRCUIT AMPS
MCC	MOTOR CONTROL CENTER
MCM	THOUSAND CIRCULAR MILS
MCP	MOTOR CIRCUIT PROTECTOR
MFR.	MANUFACTURER
MTD	MOUNTED
MW	MICROWAVE
NATS	NON AUTOMATIC DISCONNECT
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NC	NORMALLY CLOSED
NO	NORMALLY OPENED
NF	NON-FUSED
NIC	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
NL	NIGHT LIGHT
NO. or #	NUMBER
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
%Z	PERCENT IMPEDANCE
PH. or ø	PHASE
PC	PHOTOCELL
P.C.	PLUMBING CONTRACTOR
P	POLE
PVC	POLY VINYL CHLORIDE
PDU	POWER DISTRIBUTION UNIT
PRIMARY	OVER 600 VOLTS
PROVIDE	FURNISH, INSTALL AND CONNECT
PT	POTENTIAL TRANSFORMER
PA	PUBLIC ADDRESS
(R)	DENOTES RELOCATED DEVICE LOCATION.
REC, RECEPT	RECEPTACLE
REF	REFRIGERATOR
RGS	RIGID GALVANIZED STEEL
RMS	ROOT MEAN SQUARE
SCC	SHORT CIRCUIT CURRENT
SCCR	SHORT CIRCUIT CURRENT RATING
SCS	STRUCTURED CABLING SYSTEM
SFD	SMOKE FIRE DAMPER
SECONDARY	600 VOLTS AND LESS
SMACNA	SHEET METAL AND AIR COND. CONTRACTOR'S NAT'L ASSOC.
SQ.	SQUARE
SSBJ	SUPPLY SIDE BONDING JUMPER
SBJ	SYSTEM BONDING JUMPER
TC	TIMECLOCK
TEL/DATA	TELEPHONE AND DATA
TV	TELEVISION
T.V.S.S.	TRANSIENT VOLTAGE SURGE SUPPRESSION
TYP	TYPICAL
U.G.P.S.	UNDERGROUND PULL SECTION
U.O.N.	UNLESS OTHERWISE NOTED
U.P.S. or UPS	UNINTERRUPTABLE POWER SYSTEM
VAV	VARIABLE AIR VOLUME
V	VOLTS
VA	VOLT AMPERES
VD	VOLTAGE DROP
WP	WEATHERPROOF
W	WIRE
XFMR	TRANSFORMER

ANNOTATIONS

A — PANEL CALLOUT, "A" INDICATES PANELBOARD OR EQUIPMENT DESIGNATION.

AC / 2 — MECHANICAL EQUIPMENT CALLOUT, "AC" INDICATES UNIT TYPE AND "2" INDICATES UNIT NUMBER. REFER TO MECHANICAL DRAWINGS FOR EXACT LOCATION AND ELECTRICAL REQUIREMENTS.

3 / E-1 — DETAIL CALLOUT, "3" INDICATES DETAIL NUMBER "E-1" INDICATES SHEET NUMBER.

1.100 / 2 — PLAN NOTE REFERENCE, REFER TO NOTES ON SHEET, OR AS DIRECTED.

4 — REVISION REFERENCE.

WYE CONFIGURATION — DELTA CONFIGURATION — GROUND

SHEET INDEX

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E0.11	SITE NORMAL PHOTOMETRIC PLAN
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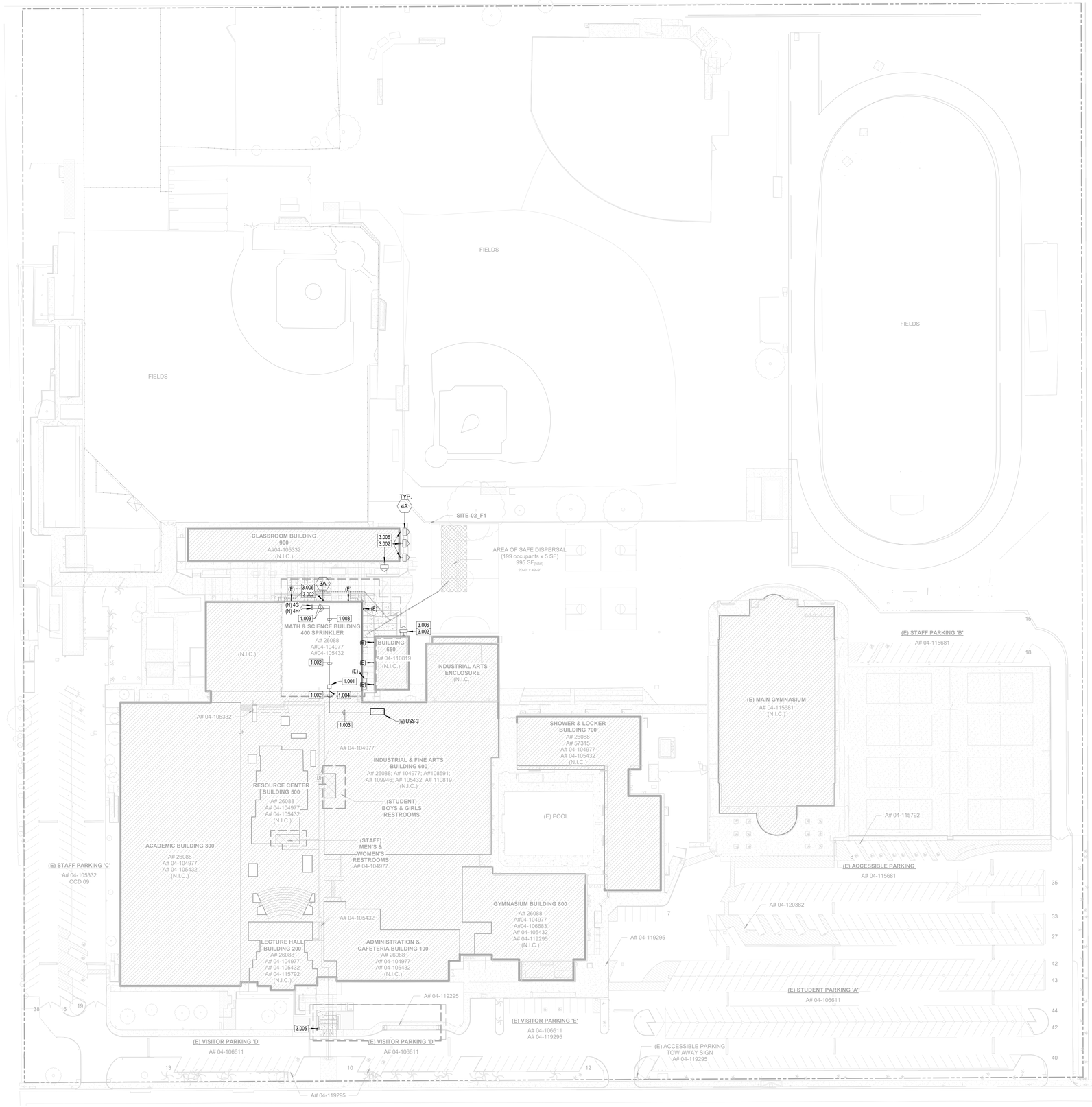
E4.06	SEQUENCE OF OPERATIONS
E5.01	LIGHTING FIXTURE SCHEDULES
E5.02	T



ELECTRICAL SITE PLAN | 1" = 50'-0" | E0.10 | 1

PLAN NOTES:

1.001	PROVIDE (N) PULL BOX, SIZED PER CEC, INSTALLED ABOVE CEILING FOR POWER.
1.002	ROUTE CONDUIT OVERHEAD ABOVE EXISTING LOWER CEILING VESTIBULE TO NEW ELECTRICAL PANELS.
1.003	PROVIDE 2-1/2"C. (4)#40, (1)#2 GND. TO BOTH NEW PANELS '4G' AND '4H'.
1.004	PROVIDE SEISMIC EXPANSION FITTING ON EACH CONDUIT CROSSING SEISMIC JOINT.
3.002	NEW EXTERIOR LIGHTING TO BE TIED-IN TO EXISTING ENERGY MANAGEMENT SYSTEM (PELICAN) FOR SCHEDULED ON/OFF OPERATION.
3.005	(E) LIGHT POLE TO BE RELOCATED AWAY FROM NEW STANDING WALL. COORDINATE NEW LOCATION WITH ARCHITECT. EXTEND WIRING AS REQUIRED.
3.006	EXTEND CIRCUIT FROM EXISTING EXTERIOR LIGHTS WITH 2#12, 12G, 3/4"C FOR NEW EXTERIOR LIGHT FIXTURE. CONNECT AS REQUIRED.

SITE UTILITY PLAN CONSTRUCTION NOTES:

THESE NOTES ESTABLISH MINIMUM QUALITY LEVELS AND COORDINATION REQUIREMENTS. RESPECTIVE UTILITY COMPANY PLANS AND REQUIREMENTS TAKE PRECEDENCE OVER THESE NOTES WITH REGARD TO RESPECTIVE UTILITY COMPANY CONDUIT AND UNDERGROUND STRUCTURE SYSTEMS.

1. CALL UNDERGROUND SERVICE ALERT (USA) AT (800) 422-4133 OR APPLICABLE STATE AND LOCAL DIG SAFE OR UNDERGROUND ALERT HOTLINES PRIOR TO CONSTRUCTION START.
2. COORDINATE ALL UNDERGROUND STRUCTURES AND CONDUIT ROUTING WITH LANDSCAPE ARCHITECT PRIOR TO ROUGH-IN TO ENSURE THAT SUCH ITEMS ARE NOT PLACED IN CRITICAL LANDSCAPE PLANTING/HARDSCAPE AREAS.
3. VAULTS, MAINTENANCE HOLES (MH's), FORMERLY KNOWN AS MANHOLES, AND CONDUITS SHALL MAINTAIN A MINIMUM COVER OF 24" BELOW FINAL SURFACE AT ALL CONDITIONS. INCLUDE ALL COSTS IN BASE BID TO MEET UTILITY COMPANY REQUIREMENTS WHICH MAY REQUIRE GREATER MINIMUM CONDUIT DEPTHS.
4. VAULTS, MH's AND PULLBOXES (PB's) SHALL BE EQUIPPED WITH KNOCKOUT PANELS OR PRE-CAST INDIVIDUAL CONDUIT OPENINGS. CONDUITS SHALL ONLY ENTER AND EXIT ON END/SHORT WALLS. CONDUITS MAY NOT ENTER AND EXIT ON SIDE/LONG WALLS, CEILINGS OR FLOORS UNLESS OTHERWISE NOTED.
5. CUT DUCTS FLUSH WITH INTERIOR VAULT/MH/PB WALL.
6. GROUT AROUND DUCT ENTRANCES ON VAULT/MH/PB WALLS.
7. SLURRY BACKFILL AROUND DUCTS WITHIN 5 FEET OF VAULT/MH/PB TO PREVENT SHEARING.
8. CONDUITS PASSING UNDER THE BUILDING PERIMETER SHALL BE ENCASED IN LIGHTWEIGHT CONCRETE OR WATER-IMPERVIOUS CLAY TO PREVENT WATER INFILTRATION. SEE ELECTRICAL SPECIFICATIONS FOR ADDITIONAL INFORMATION.
9. CONDUIT BEND RADIUS FOR BUILDING ENTRANCES AND AT POLES SHALL BE A MINIMUM OF 24" FOR CONDUITS WITH LESS THAN 2" INTERNAL DIAMETER AND A MINIMUM OF 48" FOR CONDUITS WITH MORE THAN 2" INTERNAL DIAMETER.
10. PREFERRED CONDUIT SWEEP RADIUS BETWEEN VAULTS IS 25 FEET. UNDER NO CIRCUMSTANCES SHALL THE CONDUIT SWEEP RADIUS BE LESS THAN 12.5 FEET. MAXIMUM OF 90 DEGREES PER SWEEP AND LIMITED TO NO MORE THAN (2) 90 DEGREE SWEEPS BETWEEN VAULTS.
11. VAULTS/MH's/PB's ARE TO BE EQUIPPED WITH RACKING, GROUNDING LUGS, AND BOLT-DOWN LIDS UNLESS OTHERWISE NOTED.
12. VAULTS AND MH's TO BE EQUIPPED WITH ROUND COVERS, EXTENSION RINGS AS REQUIRED, LADDERS AND (3) SEGMENTS OF 6 FOOT HIGH CABLE RACKING PER EACH LONG WALL.
13. LABEL ALL NON-UTILITY COMMUNICATION VAULT/MH/PB COVERS WITH "COMMUNICATIONS" UNLESS OTHERWISE NOTED ON PLANS.
14. COORDINATE FINAL VAULT/MH/PB OPENING HEIGHT WITH G.C. PRIOR TO ROUGH-IN TO ENSURE FINAL GRADE DOES NOT SLOPE INTO VAULT/MH/PB OPENING.
15. CONTRACTOR TO PROVIDE A MINIMUM OF 8" DEEP COMPACTED 1/2" DIAMETER GRAVEL, UNDER ALL VAULTS, MH's OR PB's TO ENSURE UNIFORM DISTRIBUTION OF SOIL PRESSURE ON THE FLOOR AND BE ABLE TO DISSIPATE WATER OUT OF THE VAULT, MH OR PB.
16. ALL VAULTS/MH's/PB's WITHOUT GROUNDING LUGS SHALL HAVE AN 8' x 3/4" COPPER GROUND ROD DRIVEN THRU THE FLOOR TO ALLOW GROUNDING OF ITEMS WITHIN.
17. ALL VAULTS/MH's/PB's SHALL BE PROVIDED WITH TRAFFIC RATED COVERS WHEN LOCATED IN PAVED AREAS UTILIZED FOR VEHICLE TRAFFIC.
18. IF THE WATER OR MOISTURE BARRIER ON OR NEAR THE FOUNDATION OF A BUILDING IS DISTURBED IN ANY MANNER BY EXCAVATION OR OTHER CONSTRUCTION WORK, THE MOISTURE BARRIER MUST BE REPAIRED FOLLOWING THE RECOMMENDATIONS OF THE MANUFACTURER OF THE ORIGINAL BARRIER PRODUCT.
19. THE CONTRACTOR SHALL INCLUDE IN BASE BID ALL COSTS TO COMPLY WITH ALL REQUIREMENTS FOR CONFINED SPACE ENTRY PER THE OSHA REQUIREMENTS 29 CFR-1910.146, 29 CFR-1910.268, ETC. DURING ANY CONFINED SPACE ENTRY.
20. ANY DUCTS LEAVING A VAULT, MH OR PB ROUTED INTO A FACILITY SHALL BE PLUGGED AT EACH END USING REMOVABLE MECHANICAL PLUGS DESIGNED TO PREVENT WATER AND GAS FROM ENTERING THE FACILITY.
21. SEE ELECTRICAL SPECIFICATIONS AND PLAN DETAILS FOR ADDITIONAL REQUIREMENTS REGARDING UNDERGROUND CONDUITS AND IN-GRADE VAULT/MH/PB/JUNCTION BOXES.

SITE UTILITY PLAN NOTES:

1. UTILITY POINTS OF SERVICE AND WORK/MATERIAL SHOWN ARE BASED UPON PRELIMINARY INFORMATION ONLY BY THE UTILITY COMPANIES AND ARE FOR BID PURPOSES ONLY.
2. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR FINAL AND EXACT WORK/MATERIAL REQUIREMENTS AND CONSTRUCT TO UTILITY COMPANY ENGINEERING PLANS AND SPECIFICATIONS ONLY. CONTRACTOR SHALL FURNISH AND INSTALL ALL CONDUIT, PULL WIRES, CABLES, PULLBOXES, CONCRETE ENCASEMENT OF CONDUITS, TRANSFORMER PAD, BARRIERS, POLE RISERS, TRENCHING AND BACKFILL, AND PAY ALL UTILITY CO. FEES AND INCLUDE ALL REQUIREMENTS IN SCOPE OF WORK.
3. LOCATIONS OF UTILITIES SHOWN ARE APPROXIMATE AND CONTRACTOR SHALL EXERCISE EXTREME CAUTION IN EXCAVATING AND TRENCHING ON THIS SITE TO AVOID EXISTING DUCTS, PIPING, OR CONDUITS, ETC., AND TO PREVENT HAZARD TO PERSONNEL AND/OR DAMAGE TO EXISTING UNDERGROUND UTILITIES OR STRUCTURES WHETHER OR NOT SHOWN AND INSTALLED BY ANY OTHER CONTRACTS. THE ENGINEER IS NOT RESPONSIBLE FOR THE LOCATION OF UNDERGROUND UTILITIES OR STRUCTURES WHETHER OR NOT SHOWN OR DETAILED AND INSTALLED BY ANY OTHER CONTRACTS. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER SHOULD SUCH UNIDENTIFIED CONDITIONS BE DISCOVERED. THESE DRAWINGS AND SPECIFICATIONS DO NOT INCLUDE THE NECESSARY ELEMENTS FOR CONSTRUCTION SAFETY.
4. UNLESS SPECIFICALLY SHOWN AS (E), (R), (ER), (D), OR EXISTING, ALL ELECTRICAL DEVICES SHOWN ARE NEW.

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SONORA HIGH SCHOOL
SCIENCE CLASSROOMS MODERNIZATION

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Developed for
FULLERTON JOINT UNION HIGH SCHOOL DISTRICT

Revision	Date

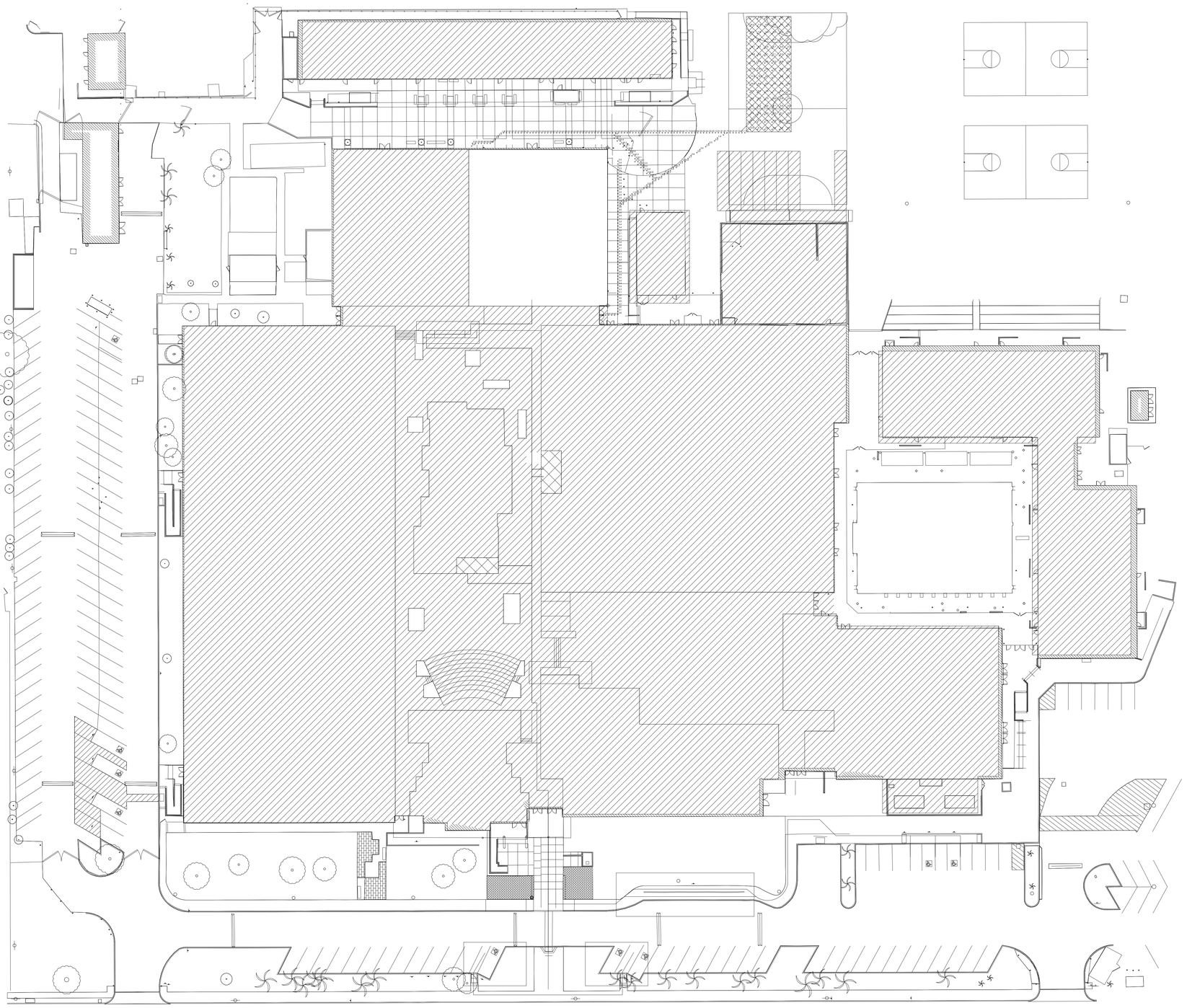
Submittal	Date
SCHEMATIC DESIGN	03/13/2025
50% DESIGN DEVELOPMENT	06/16/2025
90% DESIGN DEVELOPMENT	09/30/2025
50% CD	10/30/2025
DSA SUBMITTAL	11/21/2025
DSA BACK CHECK	01/27/2026

Job Number	32433
Checked By	Checker
Scale	1" = 50'-0"

SITE ELECTRICAL PLAN

E0.10

Statistics						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Path of Travel	+	2.6 fc	2.9 fc	2.2 fc	1.3:1	1.2:1
Path of Travel	+	3.5 fc	5.5 fc	2.3 fc	2.4:1	1.5:1
Path of Travel	+	2.7 fc	3.6 fc	2.0 fc	1.8:1	1.4:1
Path of Travel	+	2.4 fc	3.4 fc	1.0 fc	3.4:1	2.4:1
Path of Travel	+	2.0 fc	2.7 fc	1.1 fc	2.5:1	1.8:1
Path of Travel	+	4.2 fc	5.1 fc	2.8 fc	1.8:1	1.5:1
Path of Travel	+	2.5 fc	3.5 fc	1.9 fc	1.8:1	1.3:1
Path of Travel	+	2.7 fc	5.5 fc	1.0 fc	5.5:1	2.7:1
Path of Travel	+	2.0 fc	2.0 fc	2.0 fc	1.0:1	1.0:1
Path of Travel	+	2.4 fc	2.9 fc	1.9 fc	1.5:1	1.3:1
SDA	+	7.0 fc	11.8 fc	4.0 fc	3.0:1	1.8:1



SITE NORMAL PHOTOMETRIC PLAN | 1" = 30'-0" | E0.11 | 1

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DSA BACK CHECK	01/27/2026

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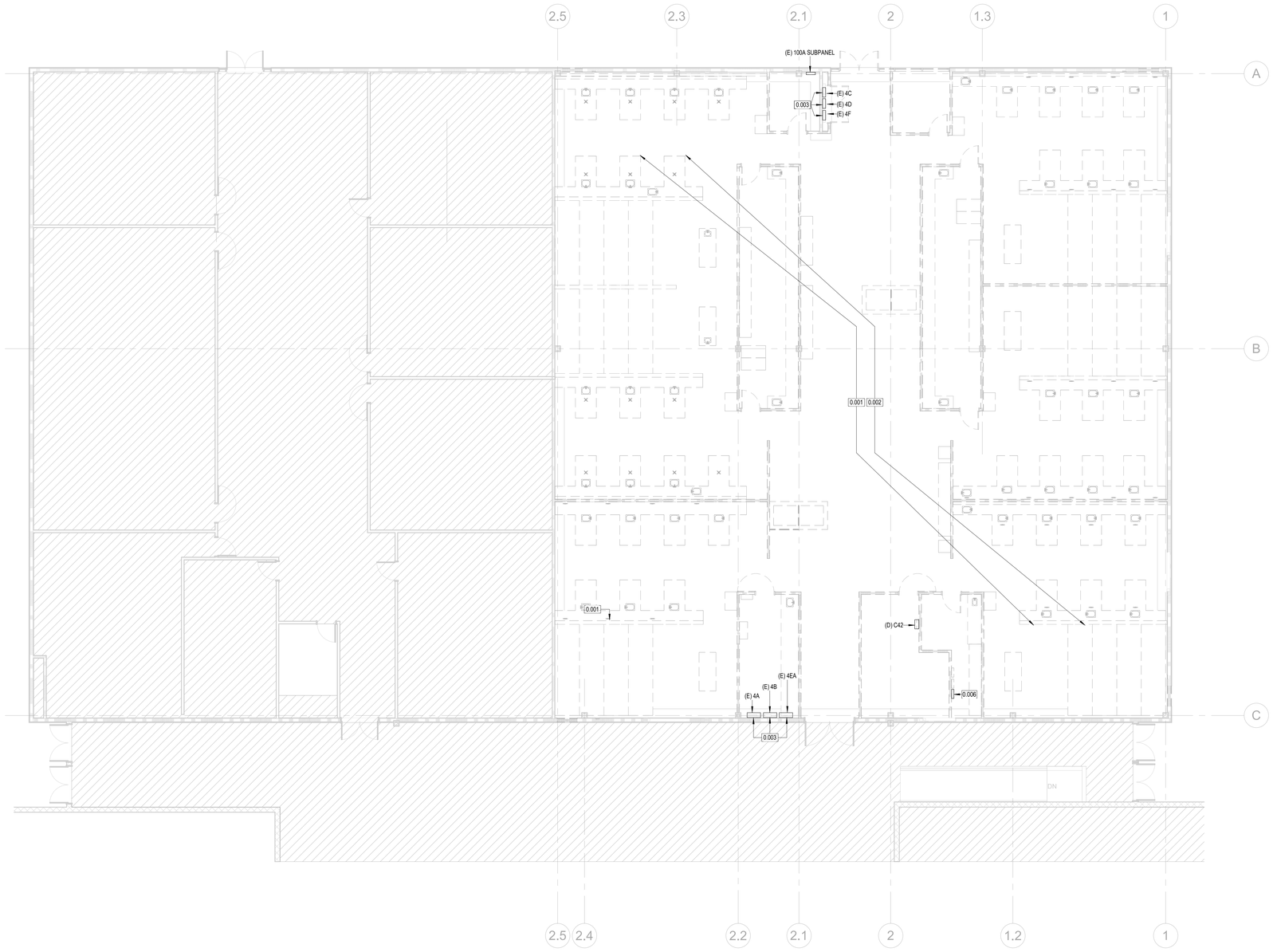
Scale	

SITE NORMAL PHOTOMETRIC PLAN

E0.11



PLAN NOTES:

0.001 CONTRACTOR TO DISCONNECT AND REMOVE ALL EXISTING ELECTRICAL DEVICES INCLUDING ASSOCIATED CIRCUIT WIRING AND CONDUITS BACK TO SERVING PANEL.

0.002 CONTRACTOR TO DISCONNECT AND REMOVE EXISTING LIGHTING FIXTURES INCLUDING ASSOCIATED CIRCUIT WIRING AND CONTROLLING SWITCHES/SENSORS.

0.003 NETEXISTING PANELS TO BE REMOVED AND RE-INSTALLED. EXISTING CIRCUITS USED ARE TO BE PROTECTED.

0.006 DEMOLISH EXISTING FA CABINET. MAINTAIN CONTINUITY OF EXISTING DEVICES TO REMAIN AS REQUIRED.

GENERAL DEMOLITION NOTES:

1. THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC ONLY. DO NOT SCALE THE ELECTRICAL DRAWINGS TO DETERMINE THE LOCATION OF EQUIPMENT OR OUTLETS. SEE ARCHITECTURAL PLANS, WHERE PROVIDED ON PROJECT, FOR EXTENT OF DEMOLITION.
2. THE EXISTING CONDITIONS SHOWN ARE FROM AVAILABLE RECORD DRAWINGS AND SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL VERIFY ACTUAL EXISTING CONDITIONS AT SITE PRIOR TO SUBMITTING BID. ALL DEMOLITION, ALTERATION, EXTENSION, RELOCATION, REHABILITATION WORK SHALL BE INCLUDED IN CONTRACT. NO ADDITIONAL ALLOWANCE OR CHANGE ORDERS WILL BE ACCEPTED.
3. CONTRACTOR IS RESPONSIBLE FOR RELOCATING OR REMOVING FROM WALLS, CEILINGS, FLOOR SPACES, ETC., ANY EXISTING CONDUITS, WIRES, BOXES, FITTINGS, FIXTURES OR OTHER ELECTRICAL EQUIPMENT WHICH INTERFERES WITH PLANNED REMODEL WORK. PROVIDE CIRCUIT CONTINUATION REQUIRED FOR ALL EXISTING OUTLETS, FIXTURES, EQUIPMENT, ETC. SCHEDULED TO REMAIN.
4. NOTIFY THE ENGINEER IMMEDIATELY WHEREVER EXISTING EQUIPMENT IS ENCOUNTERED WHICH MUST BE RELOCATED DUE TO THE NEW CONSTRUCTION, OR NOT INDICATED ON "AS-BUILT" DRAWINGS OR WAS BURIED UNDERGROUND OR EMBEDDED IN STRUCTURE WALLS.
5. CAREFULLY PROTECT ALL WALLS, TRIM, FLOORS, EQUIPMENT, UTILITY LINES AND MATERIALS. WHEN WORKING ON FINISHED SURFACES, LIMIT DAMAGE TO THE SMALLER AREA IF POSSIBLE AND RESTORE TO THE ORIGINAL CONDITION ALL SURFACES WHICH ARE DAMAGED BECAUSE OF THE INSTALLATION OF THIS WORK.
6. EQUIPMENT, MATERIALS AND SUPPLIES TEMPORARILY REMOVED FOR PROTECTION SHALL BE REPLACED IN ORIGINAL LOCATIONS. ANY MATERIALS DAMAGED SHALL BE REPLACED WITH NEW MATERIALS OF LIKE KIND AND QUALITY.
7. DEMOLITION WORK SHALL BE DONE IN A MANNER WHICH WILL NOT CAUSE UNNECESSARY INCONVENIENCE OR DANGER TO USERS OF THE PREMISES AND ADJACENT SITE, AND NOT INTERFERE WITH ITS OPERATION. ANY DEMOLITION WORK TO BE PERFORMED MUST BE PLANNED IN ADVANCE.
8. DO ALL DRILLING, CUTTING, ETC. REQUIRED TO DEMOLISH ELECTRICAL WORK AS INDICATED OR PROVIDE BLANK COVER PLATE ON ALL OUTLETS EXPOSED BY REMOVAL OF FIXTURE OF DEVICES.
9. RESEAL ALL PENETRATIONS OR OPENING THROUGH WALLS, CEILING, FLOORS, ETC., TO MAINTAIN THE RATING OF STRUCTURE.
10. ALL REMOVED MATERIALS AND EQUIPMENT WHICH ARE SALVAGED MATERIALS SHALL REMAIN THE PROPERTY OF THE OWNER. DELIVER SUCH SALVAGED MATERIALS AND EQUIPMENT ON THE PREMISES AS DIRECTED BY OWNER AND NEATLY PILE OR STORE AND PROTECT FROM DAMAGE. DISPOSE OF ALL HAZARDOUS MATERIAL PER FEDERAL, STATE AND LOCAL REGULATIONS AND OTHER AGENCIES HAVING JURISDICTION.
11. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDUIT/WIRING RUNS, REUSE AS REQUIRED, AND REMOVE ALL UNUSED CONDUIT/WIRING. UNUSED CONDUIT IN INACCESSIBLE LOCATIONS (WALLS TO REMAIN) MAY BE ABANDONED IN PLACE. REMOVE UNUSED WIRING, INCLUDING ABANDONED TELEPHONE, DATA AND OTHER LOW VOLTAGE SYSTEMS CABLING AFTER CONFIRMING WITH THE OWNER'S PROJECT MANAGER THAT CABLING IS ABANDONED AND WILL NOT BE RE-USED.
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ELECTRICAL DEMOLITION FLOOR PLAN | 1/8" = 1'-0" E1.02 | 1

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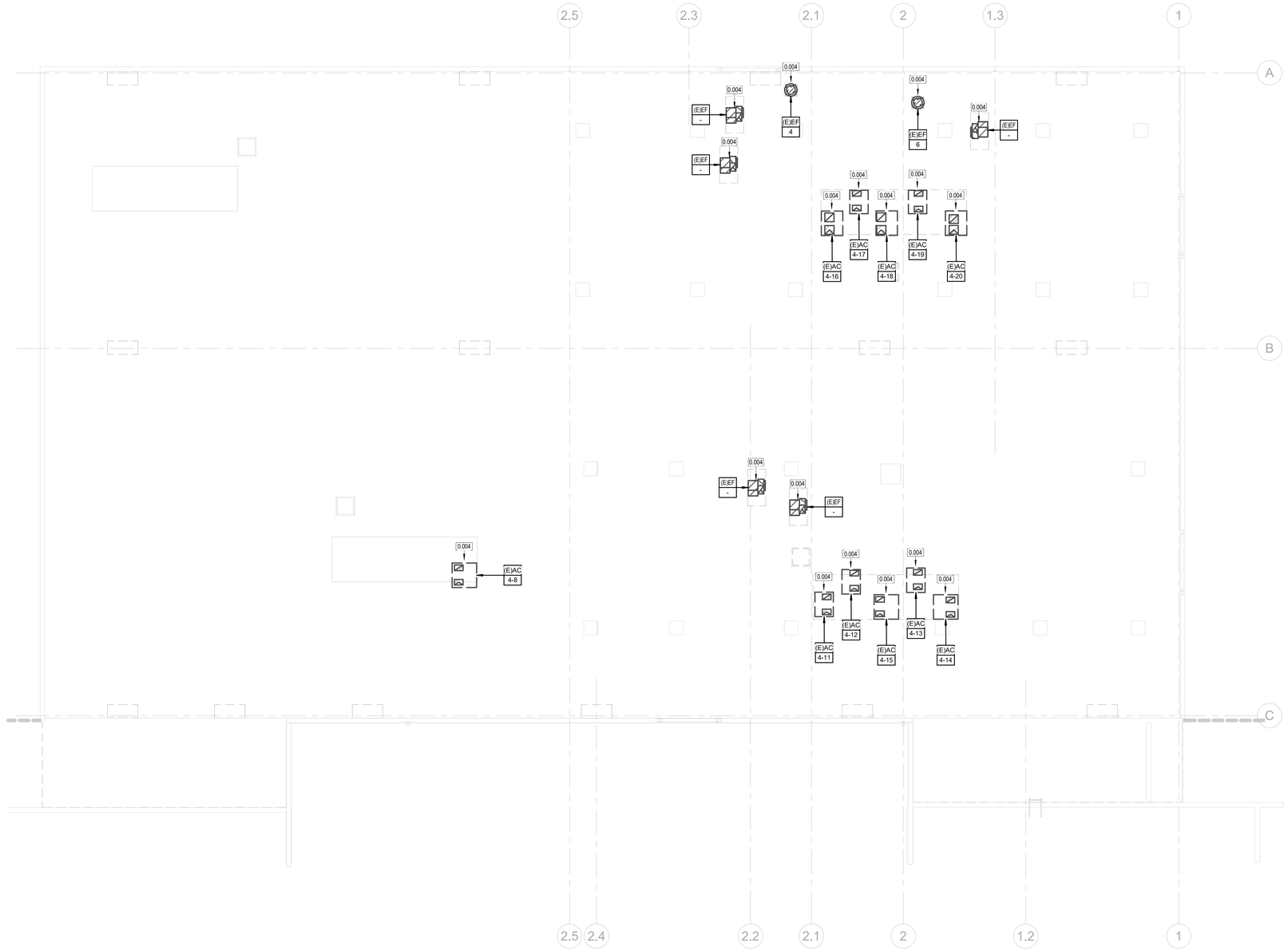
ELECTRICAL DEMOLITION FLOOR PLAN

E1.02



PLAN NOTES:

0.004 DISCONNECT POWER TO HVAC EQUIPMENT BACK TO SOURCE. REMOVE CONDUITS AND CONDUCTORS BACK TO SOURCE AND LABEL DEMOLISHED CIRCUITS AS 'SPARE' AT THE PANEL SCHEDULE.

GENERAL DEMOLITION NOTES:

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ELECTRICAL DEMOLITION ROOF PLAN | 1/8" = 1'-0" | E1.03 | 1

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ELECTRICAL DEMOLITION ROOF PLAN

E1.03

PLAN NOTES:

2.002	ROUTE CONDUIT TO NEAREST FULL HEIGHT WALL UP TO ACCESSIBLE CEILING SPACE FOR RECEPTACLE AT TEACHER'S DESK.
2.003	DEDICATED RECEPTACLE FOR COPIER/PRINTER. VERIFY EXACT LOCATION AND REQUIREMENTS WITH ARCHITECT PRIOR TO ROUGH
2.008	RECEPTACLE FOR IDF. REFER TO TECH DETAIL 1/T5.02.
2.009	RECEPTACLE FOR INTRUSION ALARM SYSTEM. REFER TO TECH DETAIL 1/T5.02 FOR MOUNTING HEIGHTS.
2.012	ROUTE CONDUIT TO THE NEAREST FULL HEIGHT WALL TO ACCESSIBLE CEILING. TYP.
2.014	SEE SHEET EFA2.01 FOR FIRE ALARM CIRCUITING.
5.108	PROVIDE 3/4"C, WITH 2#12, 1#12 GRD. TO 120V DEDICATED CIRCUIT FOR POWER. PROVIDE 20AMP, 1-POLE CIRCUIT BREAKER WITH APPROVED LOCK-ON DEVICE. RED INDICATOR AND IDENTIFIED AS "FIRE ALARM CONTROL CIRCUIT" (NFPA 72, 10.6). CONNECT AS REQUIRED. PROVIDE ALL REQUIRED MOUNTING HARDWARE. MATCH A.I.C. RATING OF DEVICES USED.

POWER PLAN GENERAL NOTES:

1. ALL RECEPTACLES ON COMMON WALLS SHALL BE SEPARATE BOXES AND OFFSET 24-INCHES MINIMUM.
2. ALL PENETRATIONS THROUGH FIRE RATED WALLS SHALL BE PROTECTED FROM THE SPREAD OF FIRE WITH AN APPROVED FIRESTOP SYSTEM EQUAL OR GREATER THAN THE FIRE RATING OF THE WALL.
3. ALL WALL-MOUNTED DEVICE HEIGHTS SHALL BE VERIFIED WITH THE ARCHITECT PRIOR TO ROUGH-IN.
4. ALL WALL-MOUNTED DEVICE HEIGHTS SHALL BE VERIFIED WITH THE ARCHITECT PRIOR TO ROUGH-IN.
5. ALL FURNITURE WHIPS SHALL BE TRIMMED TO REDUCE EXCESS WHIP LENGTH.
6. WHEN EXPOSED CEILINGS OR OPEN GRID CONDITIONS OCCUR, THE CONTRACTOR WILL NEED TO PROVIDE THE FOLLOWING ITEMS:
   a. ALL BRANCH CIRCUITS SHALL BE EMT.
   b. ALL BRANCH CIRCUITS SHALL BE ROUTED ORTHOGONALLY, NEATLY TRAINED, IN PARALLEL TO STRUCTURES OR DUCTWORK. THE TERM "TRAINED" MEANS ALL PARALLEL CONDUITS SHALL MAINTAIN THE SAME SPATIAL RELATIONSHIP WITH EACH OTHER FOR ENTIRE RUN TO INCLUDE RADIUS BENDS AND SWEEPS.
   c. VISUALLY OBJECTIONABLE BRANCH CIRCUITS WILL BE REROUTED AT THE REQUEST OF THE ARCHITECT AT NO ADDITIONAL COST.
7. EXPOSED CABLE/CONDUCTORS INSTALLED IN A PLENUM SPACE SHALL CONFORM TO NEC, OR CEC WHERE ADOPTED. **ARTICLE 300.22(C).**
8. PROVIDE G.F.C.I. TYPE RECEPTACLE(S) OR RECEPTACLE(S) PROTECTED BY AGFCI CIRCUIT BREAKER(S) WHEN RECEPTACLES ARE 50A OR LESS, 150V TO GROUND OR LESS AND ARE LOCATED WITHIN 6-FEET OF ANY SINK OR THERAPEUTIC TUB, LAUNDRY AREA, SERVING ANY DRINKING FOUNTAIN OR VENDING MACHINE, WITHIN ANY KITCHEN SPACE, LOCKER ROOM AREA, GARAGE AND BATHROOM SPACE AND/OR LOCATED OUTDOORS. WHERE RECEPTACLES ARE NOT READILY ACCESSIBLE, PROVIDE GFCI CIRCUIT BREAKER(S) TO PROTECT THE RESPECTIVE BRANCH CIRCUIT AND PROVIDE ADDITIONAL NEUTRAL CONDUCTORS IN THE BRANCH CIRCUITING AS REQUIRED TO ENSURE PROPER GFCI FUNCTION.
9. PROVIDE OCCUPANCY SENSOR/LIGHTING CONTROL SYSTEM CONTROLLED RECEPTACLE RELAY(S) AS REQUIRED TO SWITCH CONTROLLED RECEPTACLES. CONNECT BRANCH CIRCUITRY AND CONTROL WIRING AS REQUIRED TO ALLOW OCCUPANCY SENSOR/LIGHTING CONTROL SYSTEM RELAY TO SWITCH STANDALONE AND/OR SYSTEMS FURNITURE CONTROLLED RECEPTACLES AS INDICATED ON PLANS. PROVIDE ADDITIONAL CONDUIT, WIRING AND PATHWAYS NECESSARY TO CONNECT BRANCH CIRCUITRY AND CONTROL WIRING TO REMOTE RELAYS TO INCLUDE RELAY(S) LOCATED ON ALTERNATE FLOORS, IN ELECTRICAL ROOMS, ETC.
10. PROVIDE ADDITIONAL J-BOX NEAR PANEL FOR MULTIPLE HOMERUN CIRCUITRY.
11. UNLESS SPECIFICALLY SHOWN AS (E), (R), (ER), (D), EXISTING OR NON-BOLD, ALL ELECTRICAL DEVICES SHOWN ARE NEW.

POWER PLAN | 1/8" = 1'-0" | E2.01 | 1

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POWER PLAN

E2.01

PLAN NOTES:

2.004 REFER TO MOTORIZED EQUIPMENT SCHEDULE ON SHEET E3.02 FOR CIRCUITING AND ADDITIONAL INFORMATION.

2.005 PROVIDE 3/4"C.O.(S) TO RESPECTIVE CONTROL DEVICE(S) FOR CONTROL WIRING. REFER TO THE EQUIPMENT SCHEDULE CONTROL WIRING DIAGRAMS FOR ADDITIONAL INFORMATION.

2.007 PROVIDE 60A MANUAL MOTOR RATED SWITCH.

2.011 SEE ROOF PLAN E3.01 FOR CIRCUITRY FOR MECHANICAL EQUIPMENT.

2.013 PROVIDE 3/4"C, 3#10, #10G.

FLOOR PLAN GENERAL NOTES:

1. ELECTRICAL CONTRACTOR SHALL REFER TO MECHANICAL/PLUMBING AND ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS AND CHARACTERISTICS OF ALL EQUIPMENT LISTED IN SCHEDULE. ANY MODIFICATIONS AND/OR ADDITIONAL WORK NECESSARY SHALL BE INCLUDED IN THE BASE BID.
2. ALL TEMPERATURE CONTROL AND INTERLOCK CONDUIT AND WIRING SHALL BE BY ELECTRICAL CONTRACTOR UNLESS OTHERWISE NOTED . SEE MECHANICAL/PLUMBING DRAWINGS FOR ALL INFORMATION.
3. ELECTRICAL CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL CONNECTION POINTS WITH THE EQUIPMENT INSTALLER PRIOR TO ROUGH-IN.
4. ELECTRICAL CONTRACTOR SHALL PROVIDE LOCAL REMOTE DISCONNECTING MEANS FOR ALL ELECTRIC HEATING EQUIPMENT IF REQUIRED BY THE LOCAL ELECTRICAL CODE.
5. ELECTRICAL CONTRACTOR SHALL COORDINATE THE ROUTING OF CONDUIT/WIRING TO ROOF-MOUNTED EQUIPMENT WITH EQUIPMENT INSTALLER PRIOR TO ROUGH-IN. WHERE ROOF-MOUNTED EQUIPMENT IS MANUFACTURED TO BE FED FROM WITHIN MECHANICAL CURB ASSEMBLY - SEPARATE ROOF PENETRATIONS FOR WIRING CONNECTIONS SHALL NOT BE PERMITTED. ALL WIRING SHALL BE BELOW THE ROOF IN AN ACCESSIBLE CEILING SPACE LOCATION.
6. ALL ROOF MOUNTED EQUIPMENT SHALL BE NEMA 3R RATED.
7. UNLESS SPECIFICALLY SHOWN AS (E), (R), (ER), (D), EXISTING OR NON-BOLD, ALL ELECTRICAL DEVICES SHOWN ARE NEW.

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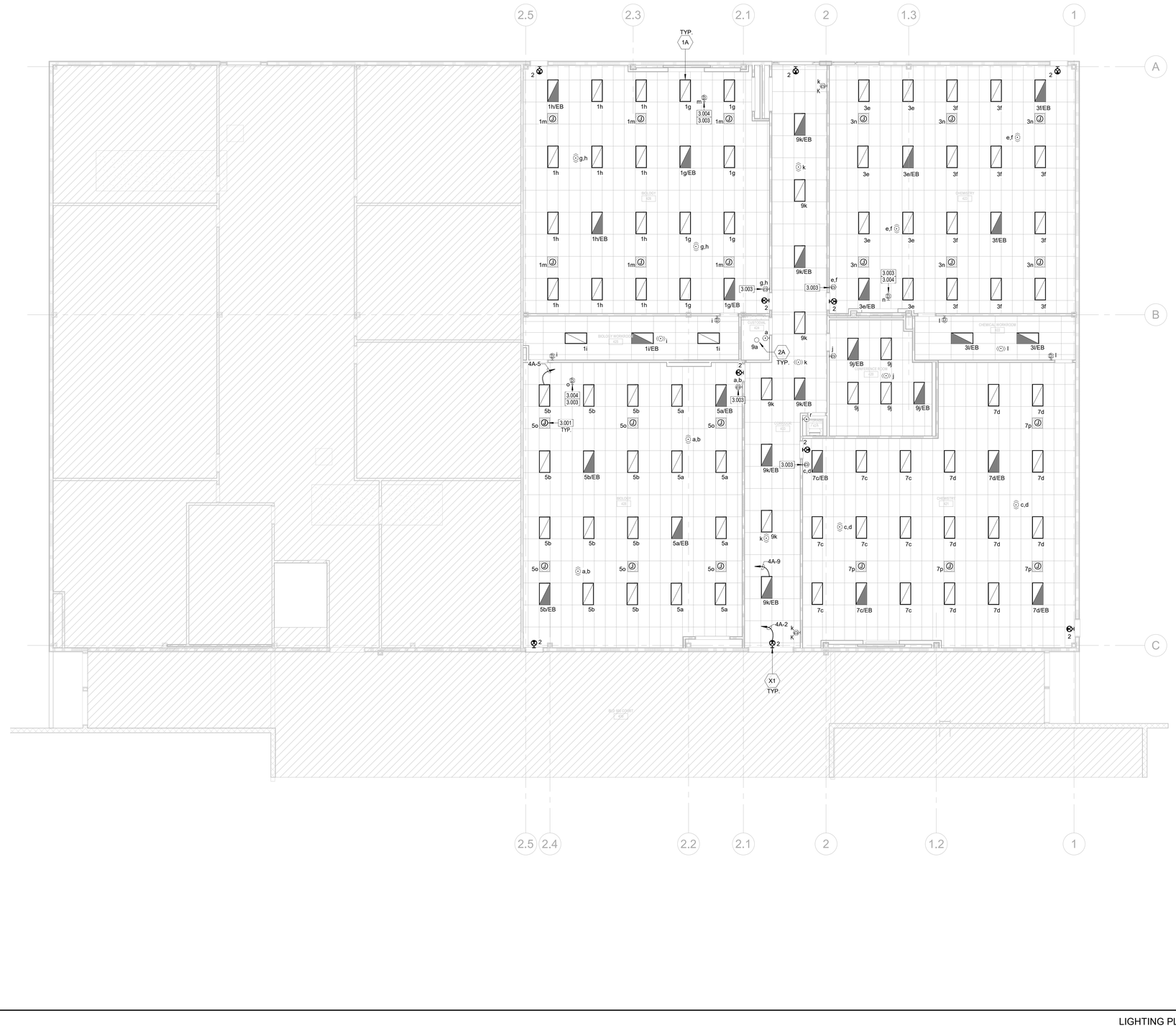
ELECTRICAL-MECHANICAL COORDINATION PLAN

E2.02



PLAN NOTES:

3.001 PROVIDE 120V POWER FOR SOLATUBE SKYLIGHT. COORDINATE EXACT LOCATION WITH ARCHITECT. CONNECT TO 0-10V DRIVER AS REQUIRED.

3.003 CONTRACTOR TO PROVIDE NLIGHT WALL SWITCH, MODEL#: NPODMS-2P-DX, FOR DIMMING LIGHTING CONTROL.

3.004 LOCATE WALL SWITCH FOR SOLATUBE DIMMING CONTROL NEAR TEACHER'S DESK. COORDINATE EXACT LOCATION WITH ARCHITECT.

LIGHTING PLAN GENERAL NOTES:

1. REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION AND ELEVATION OF ALL LIGHTING FIXTURES AND ALL DEVICES. ALL WALL-MOUNTED DEVICE HEIGHTS SHALL BE VERIFIED WITH THE ARCHITECT PRIOR TO ROUGH-IN.
2. VERIFY EXACT CEILING CONSTRUCTION WITH ARCHITECTURAL REFLECTED CEILING PLAN AND SPECS. PROVIDE LIGHTING FIXTURES WITH ALL NECESSARY MOUNTING HARDWARE.
3. ALL RECESSED FIXTURES SHALL BE PROVIDED WITH ALL STRUCTURAL SUPPORTS AS REQUIRED BY THE CBC WHERE ADOPTED, IN ADDITION TO ANY LOCAL CODES.
4. ALL LINE VOLTAGE DIMMING BRANCH CIRCUITS SHALL BE PROVIDED WITH A DEDICATED NEUTRAL CONDUCTOR FOR EACH ZONE/CHANNEL.
5. ALL LINE VOLTAGE DIMMING BRANCH CIRCUITS SHALL BE PROVIDED WITH A DEDICATED NEUTRAL CONDUCTOR FOR EACH ZONE/CHANNEL.
6. RECESSED FIXTURES LOCATED IN A FIRE-RATED CEILING OR WALL SHALL BE PROVIDED WITH A 5-SIDED, RATED ENCLOSURE SO CONSTRUCTED AS TO ALLOW CODE AND MANUFACTURER-REQUIRED CLEARANCES BETWEEN THE FIXTURE AND THE ENCLOSURE.
7. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXIT SIGN CHEVRONS AND NUMBER OF FACES PER EXIT SIGN. ANY DISCREPANCIES BETWEEN EXIT SIGNS SHOWN ON THE ELECTRICAL AND ARCHITECTURAL PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO ORDERING EXIT SIGNS.
8. WHEN EXPOSED CEILINGS OR OPEN GRID CONDITIONS OCCUR, THE CONTRACTOR WILL NEED TO PROVIDE THE FOLLOWING ITEMS:
   a. ALL BRANCH CIRCUITS SHALL BE EMT.
   b. ALL BRANCH CIRCUITS SHALL BE ROUTED ORTHOGONALLY, NEATLY TRAINED, IN PARALLEL TO STRUCTURES OR DUCTWORK. THE TERM "TRAINED" MEANS ALL PARALLEL CONDUITS SHALL MAINTAIN THE SAME SPATIAL RELATIONSHIP WITH EACH OTHER FOR ENTIRE RUN TO INCLUDE RADIUS BENDS AND SWEEPS.
   c. VISUALLY OBJECTIONABLE BRANCH CIRCUITS WILL BE REROUTED AT THE REQUEST OF THE ARCHITECT AT NO ADDITIONAL COST.
9. ALL LED REMOTE INDICATORS FOR DUCT DETECTORS AND FIRE/SMOKE DAMPERS REQUIRED BY THE LOCAL AHJ SHALL BE LOCATED IN CEILINGS IN COORDINATION WITH ARCHITECT PRIOR TO ANY ROUGH-IN.
10. PROVIDE ADDITIONAL J-BOX NEAR PANEL FOR MULTIPLE HOMERUN CIRCUITRY.
11. UNLESS SPECIFICALLY SHOWN AS (E), (R), (ER), (D), EXISTING OR NON-BOLD, ALL ELECTRICAL DEVICES SHOWN ARE NEW.
12. REFER TO GENERAL POWER PLAN NOTES AND COMMUNICATIONS PATHWAYS GENERAL NOTE FOR ADDITIONAL REQUIREMENTS WHEN POWER AND/OR DATA DEVICES ARE SHOWN ON THIS PLAN.
13. ALL PENETRATIONS THROUGH FIRE RATED WALLS SHALL BE PROTECTED FROM THE SPREAD OF FIRE WITH AN APPROVED FIRESTOP SYSTEM EQUAL OR GREATER THAN THE FIRE RATING OF THE WALL.

EMERGENCY LIGHTING GENERAL NOTES:

1. EMERGENCY LIGHTING SYSTEMS SHALL BE DESIGNED AND INSTALLED SO THAT THE FAILURE OF ANY INDIVIDUAL LIGHTING ELEMENT, SUCH AS THE BURNING OUT OF A LIGHT BULB, CANNOT LEAVE IN TOTAL DARKNESS ANY SPACE THAT REQUIRES EMERGENCY ILLUMINATION. MEANS OF EGRESS ILLUMINATION (INCLUDING EXIST DISCHARGE AREAS) SHALL CONFORM TO THE CBC SECTION 1008 AND CEC 700.16.
2. IN ADDITION TO THE CODE REQUIRED MEANS OF EGRESS ILLUMINATION EACH ROOM EXCEPT SMALL STORAGE ROOMS AND JANITOR CLOSETS SHALL BE PROVIDED WITH AT LEAST ONE EMERGENCY ILLUMINATED FIXTURE.
3. CORRIDOR EGRESS ILLUMINATION SHALL BE UN-SWITCHED 24/7. A TIMER WILL AUTOMATICALLY TURN OFF ALL CORRIDOR LIGHTS EXCEPT EGRESS LIGHTING DURING THE NIGHT SHIFT. THE STATE REQUIRES CBC 1008.3 BE PROVIDED IN ALL OCCUPIED SPACES REGARDLESS IF IT IS NOT CONSIDERED THE MEANS OF EGRESS.
4. EXIST SIGNS SHALL CONFORM TO CBC SECTION 1013. EXIT SIGNS SHALL BE ILLUMINATED AT ALL TIMES AND SHALL NOT USE POLE SWITCHES FOR POWER SOURCES.
5. A COMPLETELY INDEPENDENT RACEWAY AND WIRING SYSTEM SHALL BE ISNTALLED FOR EMERGENCY CIRCUITS PER CEC 700.9.
6. ALL OTHER ELECTRICAL LOADS INCLUDING LIGHTING, NOT INCLUDED IN EMERGENCY EGRESS ILLUMINATION, LOADS LISTED FOR EMERGENCY BRANCH PER CEC 700.2 SHALL BE CONNECTED TO TWO SOURCES OF POWER, GENERATOR POWER AND NORMAL POWER VIA A NON-EMERGENCY TRANSFER SWITCH.

LIGHTING PLAN | 1/8" = 1'-0" | E2.31 | 1

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SCIENCE CLASSROOMS MODERNIZATION

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Revision	Date

Submittal	Date
SCHEMATIC DESIGN	03/13/2025
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100% DESIGN DEVELOPMENT	09/08/2025
50% CD	10/30/2025
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DSA BACK CHECK	01/27/2026

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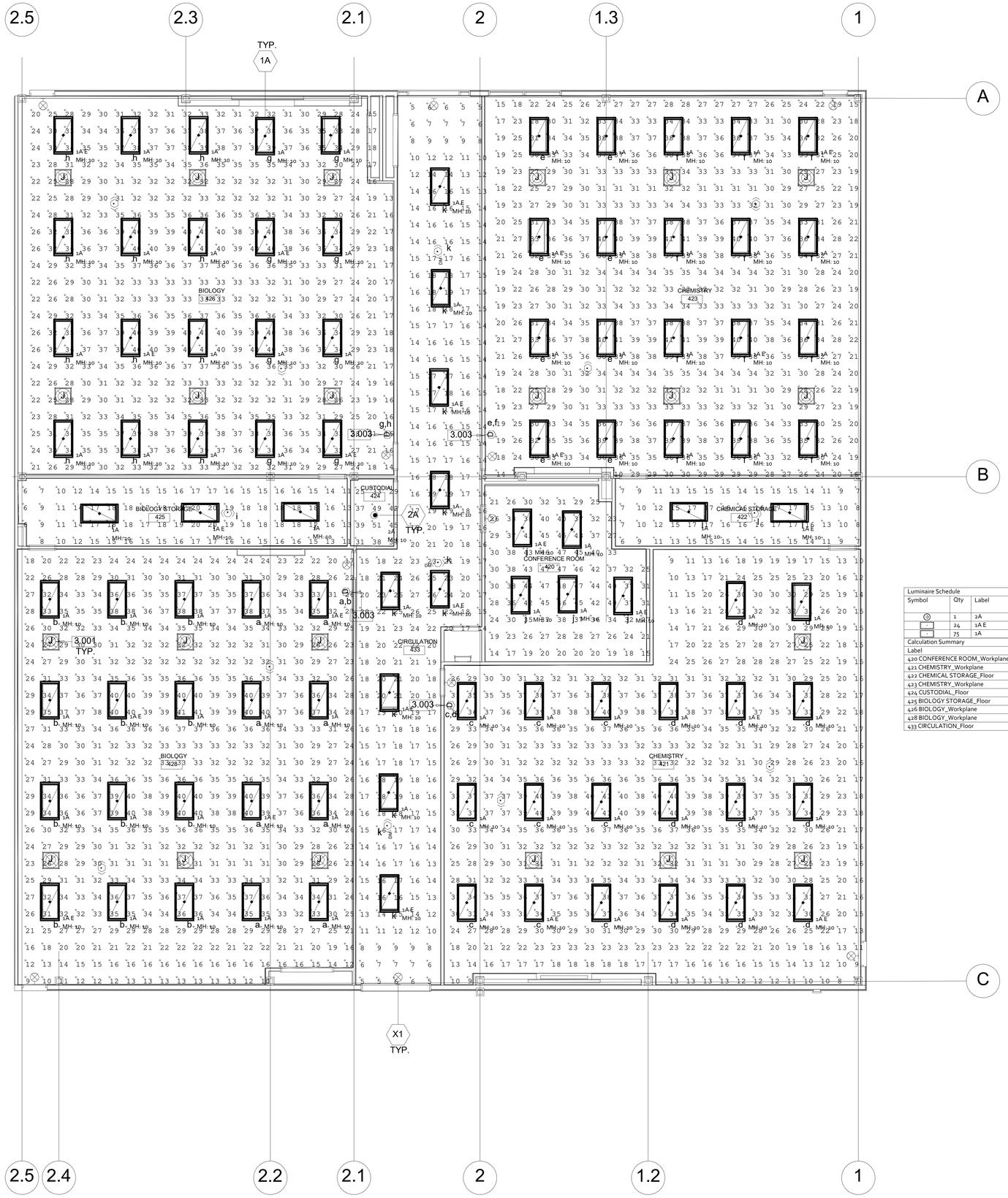
LIGHTING PLAN

E2.31



Luminaire Schedule

Symbol	Qty	Label	Arrangement	Description	LLF	Luminaire Lumens	Luminaire Watts	Total Watts
⊙	1	2A	Single	NU4-RD-SW-30LM-30K-80-50D-NL-WH-WH	0.900	3075	26	26
·	24	1A E	Single	2BLT4 40L ADP LP935	0.900	3709	30.46	731.04
·	75	1A	Single	2BLT4 40L ADP LP935	0.900	3709	30.46	2284.5

Calculation Summary

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
420 CONFERENCE ROOM_Workplane	Illuminance	Fc	33.37	48	24	2.38	3.43
421 CHEMISTRY_Workplane	Illuminance	Fc	28.64	41	7	4.09	5.86
422 CHEMICAL STORAGE_Floor	Illuminance	Fc	13.03	17	6	2.17	2.83
423 CHEMISTRY_Workplane	Illuminance	Fc	31.05	41	4	7.76	10.25
424 CUSTODIAL_Floor	Illuminance	Fc	37.75	51	25	1.51	2.04
425 BIOLOGY STORAGE_Floor	Illuminance	Fc	15.19	20	6	2.53	3.33
426 BIOLOGY_Workplane	Illuminance	Fc	31.73	41	13	2.44	3.15
428 BIOLOGY_Workplane	Illuminance	Fc	30.40	41	9	3.38	4.56
433 CIRCULATION_Floor	Illuminance	Fc	15.90	27	5	3.18	5.40

PLAN NOTES:

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NORMAL PHOTOMETRIC PLAN | 3/16" = 1'-0" E2.32 | 1

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NORMAL PHOTOMETRIC PLAN

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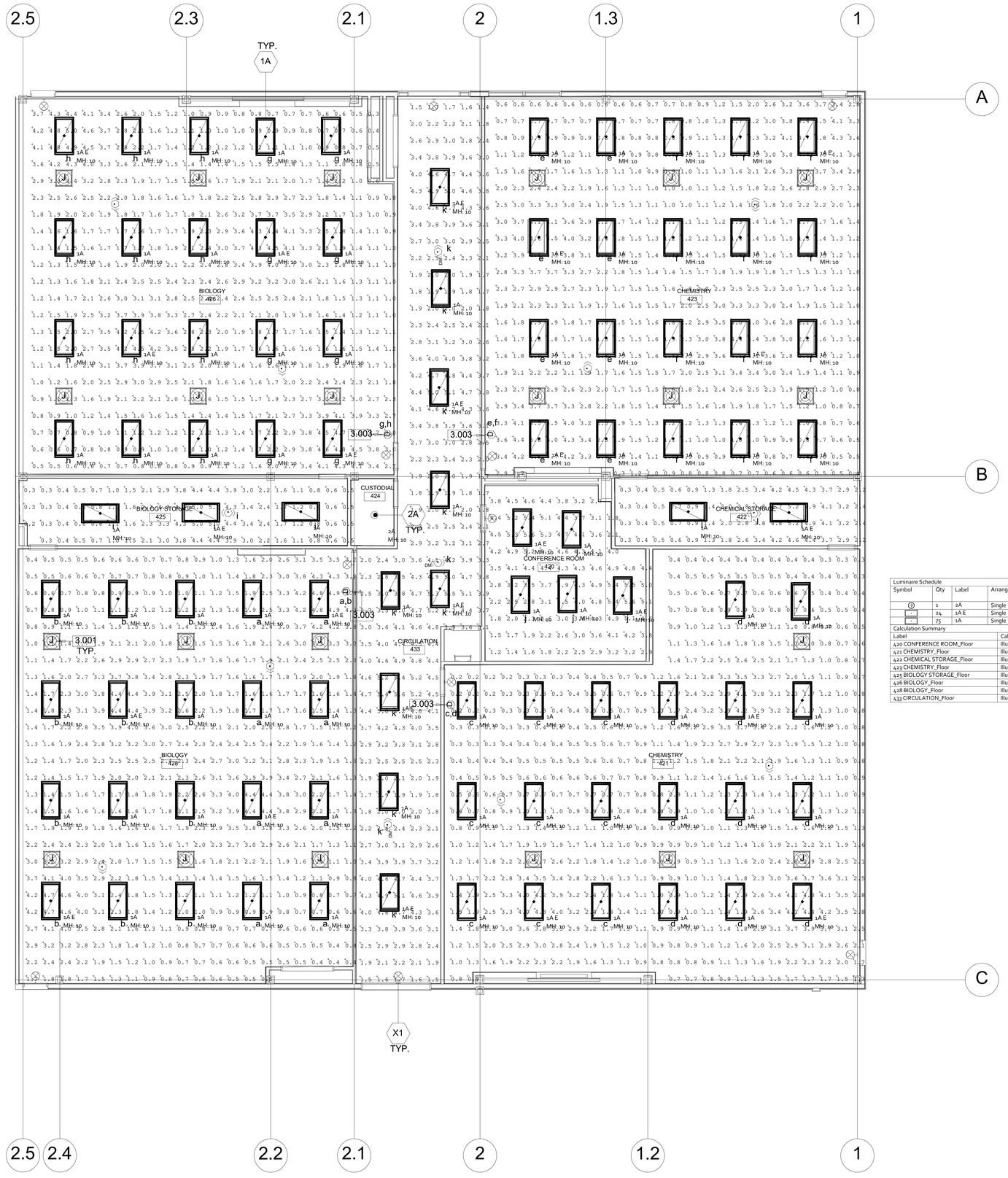

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421 CHEMISTRY_Floor	Illuminance	Fc	1.45	4.4	0.2	7.25	22.00
422 CHEMICAL STORAGE_Floor	Illuminance	Fc	2.37	5.2	0.3	7.90	17.33
423 CHEMISTRY_Floor	Illuminance	Fc	1.94	5.0	0.3	6.47	16.67
425 BIOLOGY STORAGE_Floor	Illuminance	Fc	1.92	5.0	0.2	9.60	25.00
426 BIOLOGY_Floor	Illuminance	Fc	2.07	5.0	0.3	6.90	16.67
428 BIOLOGY_Floor	Illuminance	Fc	1.97	4.9	0.4	4.93	12.25
433 CIRCULATION_Floor	Illuminance	Fc	3.22	5.6	1.4	2.30	4.00

PLAN NOTES:

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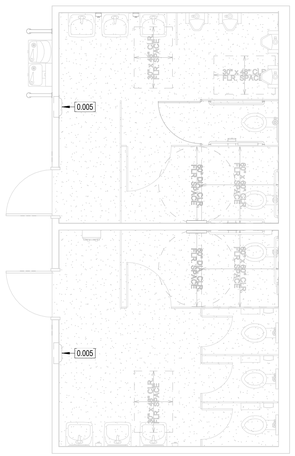
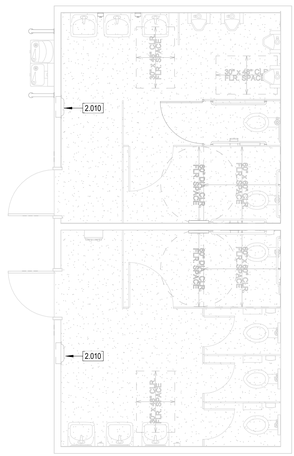
EMERGENCY PHOTOMETRIC PLAN

E2.33



2 BLDG 600 -RESTROOMS FLOOR PLAN (DEMO)

SCALE: 1/4" = 1'-0"



1 BLDG 600 - RESTROOMS FLOOR PLAN

SCALE: 1/4" = 1'-0"

PLAN NOTES:

0.005 CONTRACTOR TO DISCONNECT AND REMOVE EXISTING HAND-DRYER.

2.010 PROVIDE 120V POWER TO (N) HAND DRYER. CONTRACTOR TO USE (E) CIRCUIT FROM DEMOLISHED HAND DRYER IN SAME LOCATION. COORDINATE EXACT LOCATION WITH ARCHITECT. UPDATE PANEL DIRECTORY AS REQUIRED.

POWER PLAN GENERAL NOTES:

1. ALL RECEPTACLES ON COMMON WALLS SHALL BE SEPARATE BOXES AND OFFSET 24-INCHES MINIMUM.
2. ALL PENETRATIONS THROUGH FIRE RATED WALLS SHALL BE PROTECTED FROM THE SPREAD OF FIRE WITH AN APPROVED FIRESTOP SYSTEM EQUAL OR GREATER THAN THE FIRE RATING OF THE WALL.
3. ALL WALL-MOUNTED DEVICE HEIGHTS SHALL BE VERIFIED WITH THE ARCHITECT PRIOR TO ROUGH-IN.
4. ALL WALL-MOUNTED DEVICE HEIGHTS SHALL BE VERIFIED WITH THE ARCHITECT PRIOR TO ROUGH-IN.
5. ALL FURNITURE WHIPS SHALL BE TRIMMED TO REDUCE EXCESS WHIP LENGTH.
6. WHEN EXPOSED CEILINGS OR OPEN GRID CONDITIONS OCCUR, THE CONTRACTOR WILL NEED TO PROVIDE THE FOLLOWING ITEMS:
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   b. ALL BRANCH CIRCUITS SHALL BE ROUTED ORTHOGONALLY, NEATLY TRAINED, IN PARALLEL TO STRUCTURES OR DUCTWORK. THE TERM "TRAINED" MEANS ALL PARALLEL CONDUITS SHALL MAINTAIN THE SAME SPATIAL RELATIONSHIP WITH EACH OTHER FOR ENTIRE RUN TO INCLUDE RADIUS BENDS AND SWEEPS.
   c. VISUALLY OBJECTIONABLE BRANCH CIRCUITS WILL BE REROUTED AT THE REQUEST OF THE ARCHITECT AT NO ADDITIONAL COST.
7. EXPOSED CABLE/CONDUCTORS INSTALLED IN A PLENUM SPACE SHALL CONFORM TO NEC, OR CEC WHERE ADOPTED. **ARTICLE 300.22(C)**.
8. PROVIDE G.F.C.I. TYPE RECEPTACLE(S) OR RECEPTACLE(S) PROTECTED BY AGFCI CIRCUIT BREAKER(S) WHEN RECEPTACLES ARE 50A OR LESS, 150V TO GROUND OR LESS AND ARE LOCATED WITHIN 6-FEET OF ANY SINK OR THERAPEUTIC TUB, LAUNDRY AREA, SERVING ANY DRINKING FOUNTAIN OR VENDING MACHINE, WITHIN ANY KITCHEN SPACE, LOCKER ROOM AREA, GARAGE AND BATHROOM SPACE AND/OR LOCATED OUTDOORS. WHERE RECEPTACLES ARE NOT READILY ACCESSIBLE, PROVIDE GFCI CIRCUIT BREAKER(S) TO PROTECT THE RESPECTIVE BRANCH CIRCUIT AND PROVIDE ADDITIONAL NEUTRAL CONDUCTORS IN THE BRANCH CIRCUITING AS REQUIRED TO ENSURE PROPER GFCI FUNCTION.
9. PROVIDE OCCUPANCY SENSOR/LIGHTING CONTROL SYSTEM CONTROLLED RECEPTACLE RELAY(S) AS REQUIRED TO SWITCH CONTROLLED RECEPTACLES. CONNECT BRANCH CIRCUITRY AND CONTROL WIRING AS REQUIRED TO ALLOW OCCUPANCY SENSOR/LIGHTING CONTROL SYSTEM RELAY TO SWITCH STANDALONE AND/OR SYSTEMS FURNITURE CONTROLLED RECEPTACLES AS INDICATED ON PLANS. PROVIDE ADDITIONAL CONDUIT, WIRING AND PATHWAYS NECESSARY TO CONNECT BRANCH CIRCUITRY AND CONTROL WIRING TO REMOTE RELAYS TO INCLUDE RELAY(S) LOCATED ON ALTERNATE FLOORS, IN ELECTRICAL ROOMS, ETC.
10. PROVIDE ADDITIONAL J-BOX NEAR PANEL FOR MULTIPLE HOMERUN CIRCUITRY.
11. UNLESS SPECIFICALLY SHOWN AS (E), (R), (ER), (D), EXISTING OR NON-BOLD, ALL ELECTRICAL DEVICES SHOWN ARE NEW.

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SCIENCE CLASSROOMS MODERNIZATION

401 S PALM STREET
LA HABRA, CA 90631

Developed for
FULLERTON JOINT UNION HIGH SCHOOL DISTRICT

Revision	Date

Submittal	Date
SCHEMATIC DESIGN	03/13/2025
50% DESIGN DEVELOPMENT	06/16/2025
90% DESIGN DEVELOPMENT	07/01/2025
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DSA BACK CHECK	01/27/2026

Job Number	32433
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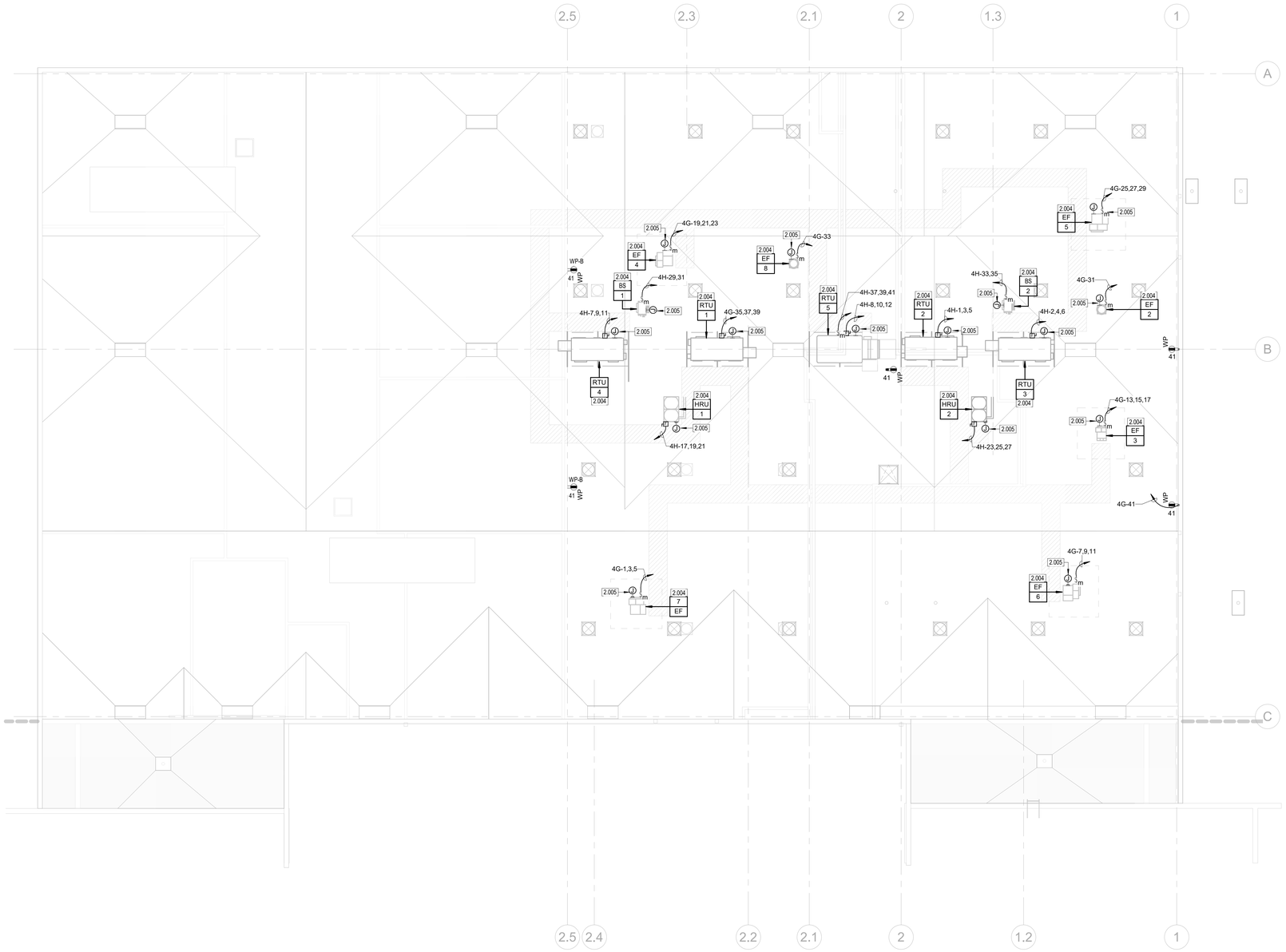
Scale	As indicated

BLDG 600 RESTROOMS FLOOR PLAN

E2.34



PLAN NOTES:

2.004 REFER TO MOTORIZED EQUIPMENT SCHEDULE ON SHEET E3.02 FOR CIRCUITING AND ADDITIONAL INFORMATION.

2.005 PROVIDE 3/4"C.O.(S) TO RESPECTIVE CONTROL DEVICE(S) FOR CONTROL WIRING. REFER TO THE EQUIPMENT SCHEDULE CONTROL WIRING DIAGRAMS FOR ADDITIONAL INFORMATION.

ROOF PLAN GENERAL NOTES:

1. ELECTRICAL CONTRACTOR SHALL REFER TO MECHANICAL/PLUMBING AND ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS AND CHARACTERISTICS OF ALL EQUIPMENT LISTED IN SCHEDULE. ANY MODIFICATIONS AND/OR ADDITIONAL WORK NECESSARY SHALL BE INCLUDED IN THE BASE BID.
2. ALL TEMPERATURE CONTROL AND INTERLOCK CONDUIT AND WIRING SHALL BE BY ELECTRICAL CONTRACTOR UNLESS OTHERWISE NOTED . SEE MECHANICAL/PLUMBING DRAWINGS FOR ALL INFORMATION.
3. ELECTRICAL CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL CONNECTION POINTS WITH THE EQUIPMENT INSTALLER PRIOR TO ROUGH-IN.
4. ELECTRICAL CONTRACTOR SHALL PROVIDE LOCAL REMOTE DISCONNECTING MEANS FOR ALL ELECTRIC HEATING EQUIPMENT IF REQUIRED BY THE LOCAL ELECTRICAL CODE.
5. ELECTRICAL CONTRACTOR SHALL COORDINATE THE ROUTING OF CONDUIT/WIRING TO ROOF-MOUNTED EQUIPMENT WITH EQUIPMENT INSTALLER PRIOR TO ROUGH-IN. WHERE ROOF-MOUNTED EQUIPMENT IS MANUFACTURED TO BE FED FROM WITHIN MECHANICAL CURB ASSEMBLY - SEPARATE ROOF PENETRATIONS FOR WIRING CONNECTIONS SHALL NOT BE PERMITTED. ALL WIRING SHALL BE BELOW THE ROOF IN AN ACCESSIBLE CEILING SPACE LOCATION.
6. ALL ROOF MOUNTED EQUIPMENT SHALL BE NEMA 3R RATED.
7. UNLESS SPECIFICALLY SHOWN AS (E), (R), (ER), (D), EXISTING OR NON-BOLD, ALL ELECTRICAL DEVICES SHOWN ARE NEW.

ELECTRICAL ROOF PLAN | 1/8" = 1'-0" | E3.01 | 1

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ELECTRICAL ROOF PLAN

E3.01

MOTORIZED EQUIPMENT SCHEDULE

TAG	ITEM	DESCRIPTION	EQUIPMENT RATING VOLTS	PH.	MOTOR HP	MOTOR FLA	VFD FLA	MCA	MOCP	SCCR	DISC. SW. SIZE STARTER SIZE	TK, Conduit & Wire	SPECIFIC NOTES
BS	1	BS CONTROLLERS	208	1	-	0.2	-	1	20A	-	MOTOR RATED SWITCH	3/4" C - 2#12, #12EG	A, C
BS	2	BS CONTROLLERS	208	3	-	0.2	-	1	20A	-	MOTOR RATED SWITCH	3/4" C - 2#12, #12EG	A, C
EF	1	EXHAUST FAN	120	1	-	0.9	-	-	20A	- -	MOTOR RATED SWITCH	3/4" C - 2#12, #12EG	A, C
EF	2	EXHAUST FAN	115	1	0.1	0.84	-	1	15A	-	MOTOR RATED SWITCH	3/4" C - 2#12, #12EG	A, C
EF	3	EXHAUST FAN	208	3	0.5	1.0	-	3	20A	-	MOTOR RATED SWITCH	3/4" C - 2#12, #12EG	A, C
EF	4	EXHAUST FAN	208	3	3	4.8	-	24.33	30A	-	MOTOR RATED SWITCH	3/4" C - 3#10, #10 EG	A, C
EF	5	EXHAUST FAN	208	3	7.5	11	-	47.33	50A		30AS	1"C - 3#6, #8 EG	A, C
EF	6	EXHAUST FAN	208	3	3	4.8	-	24.33	30A	-	MOTOR RATED SWITCH	3/4" C - 3#10, #10 EG	A, C
EF	7	EXHAUST FAN	208	3	3	4.8	-	24.33	30A	-	MOTOR RATED SWITCH	3/4" C - 3#10, #10 EG	A, C
EF	8	EXHAUST FAN	115	1	0.1	0.84	-	1	15A	-	MOTOR RATED SWITCH	3/4" C - 2#12, #12EG	A, C
HRU	1	HEAT RECOVERY UNIT	208	3	-	-	-	60	100A	-	100AS	1-1/4"C - 3#3, #8EG	A ,C
HRU	2	HEAT RECOVERY UNIT	208	3	-	-	-	60	100A	-	100AS	1-1/4"C - 3#3, #8EG	A, C
RTU	2	ROOF-TOP UNIT	208	3	-	4.8	-	5.9	15A	-	30AS	3/4" C - 2#12, #12EG	A, C
RTU	3	ROOF-TOP UNIT	208	3	-	4.8	-	5.9	15A	-	30AS	3/4" C - 2#12, #12EG	A, C
RTU	4	ROOF-TOP UNIT	208	3	-	4.8	-	5.9	15A	-	30AS	3/4" C - 2#12, #12EG	A, C
RTU	5	ROOF-TOP UNIT	208	3	-	5.3	-	28	40A	-	30AS	3/4"C - 3#8, #10EG	A, C
RTU	5	RTU-5 POWER EXHAUST	208	3	-	2.2	-	2.75	4.95A	-	MOTOR RATED SWITCH	3/4" C - 2#12, #12EG	A, C

MOTORIZED EQUIPMENT SCHEDULE SPECIFIC NOTES:

A. FUSED AS RECOMMENDED BY MANUFACTURER.

B. MAGNETIC MOTOR STARTER WITH CONTROL TRANSFORMER, AUXILIARY CONTACTS, INDICATOR LIGHT AND H.O.A. SWITCH. VERIFY CONTROL TRANSFORMER VOLTAGE WITH M.C. PRIOR TO ORDERING MATERIAL.

C. ROUTE THROUGH LINE VOLTAGE CONTROL. SEE MECHANICAL AND/OR PLUMBING PLANS FOR ADDITIONAL REQUIREMENTS.

D. VERIFY LOCATION WITH PLUMBING PLANS PRIOR TO ROUGH-IN. CONNECT TO AQUASTAT AND TIME CLOCK AS REQUIRED.

E. REMOTE VFD. PROVIDE EARLY BREAK CONTACTS ON ANY DISCONNECT SWITCHES REQUIRED BY CODE OR SHOWN ON PLANS THAT ARE DOWNSTREAM OF THE REMOTE VFD. PROVIDE CONDUIT AND CONDUCTORS AS REQUIRED TO INTERCONNECT THE CONTACT WITH VFD "ENABLE" TERMINALS. REFER TO MECHANICAL AND/OR PLUMBING PLANS FOR LOCATION. PROVIDE FEEDER(S) TO CONNECT REMOTE VFD AND MOTOR(S) AS REQUIRED.

F. INTEGRAL VFD PROVIDED WITH EQUIPMENT. REFER TO MECHANICAL AND/OR PLUMBING PLANS FOR LOCATION. CONNECT TO VFD AS REQUIRED.

G. INTEGRAL DISCONNECT PROVIDED WITH EQUIPMENT. REFER TO MECHANICAL AND/OR PLUMBING PLANS FOR LOCATION. CONNECT TO INTEGRAL DISCONNECT AS REQUIRED.

H. INTEGRAL DISCONNECT PROVIDED WITH VFD. REFER TO MECHANICAL AND/OR PLUMBING PLANS FOR LOCATION. CONNECT TO INTEGRAL DISCONNECT AS REQUIRED.

J. ROUTE 1 PHASE CONDUCTOR OF EACH UPS ROOM/DATA ROOM EXHAUST FAN BRANCH CIRCUIT THROUGH/AROUND A DEDICATED, CURRENT-OPERATED LOAD MONITORING SWITCH THAT DETECTS OVERLOADS AND UNDERLOADS (INCLUDING FAN BELT BREAKAGE) WITHIN +/- 15 PERCENT OF AVERAGE CURRENT DRAW. LOCATE IN BARRIERED PULL BOX - NEMA 3R FOR WET LOCATIONS - AND CONNECT N.O. CONTACT TO FIRE ALARM MONITORING MODULE (SUPERVISORY SIGNAL). LOCATE PULL BOX WITH DEVICES INDOORS WHERE POSSIBLE AND ADJACENT TO THE SERVING ELECTRICAL DISTRIBUTION EQUIPMENT. PROVIDE LABEL "USPA BATTERY EX. FAN MONITOR" PER LABELING SPECIFICATIONS. (NK TECHNOLOGIES #ASM-NOU-OU-FT - www.nktechnologies.com).

K. ROUTE THROUGH LINE VOLTAGE CONTROL FOR KITCHEN HOOD FIRE SUPPRESSION SYSTEM. SEE MECHANICAL, FIRE ALARM AND FOOD SERVICE PLANS FOR ADDITIONAL REQUIREMENTS.

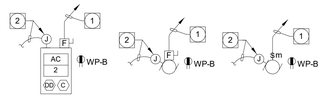
MOTORIZED EQUIPMENT SCHEDULE GENERAL NOTES:

1. ALL BRANCH CIRCUIT DATA IS BASED UPON METALLIC CONDUITS. IF THE CONTRACTOR ELECTS TO USE NONMETALLIC CONDUITS, AN EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED PER NEC, OR CEC WHERE ADOPTED, TABLE 250.122 AND THE CONDUIT SIZE SHALL BE INCREASED ACCORDINGLY.
2. ELECTRICAL CONTRACTOR SHALL REFER TO ALL DOCUMENTS RELATED TO THE EQUIPMENT (I.E. SHOP DRAWINGS, CONSTRUCTION DOCUMENTS, ETC.) IN REGARDS TO ELECTRICAL CHARACTERISTICS OF ALL EQUIPMENT LISTED IN THE SCHEDULE. ANY MODIFICATION AND/OR ADDITIONAL WORK NECESSARY SHALL BE INCLUDED IN THE BASE BID.
3. ELECTRICAL CONTRACTOR SHALL CHECK THE ROTATION OF ALL THREE PHASE MOTORS AND CORRECT THE ROTATION IF REVERSED.
4. ELECTRICAL CONTRACTOR SHALL PROVIDE FUSES SIZED PER THE EQUIPMENT NAMEPLATE INFORMATION.
5. DISCONNECT SWITCHES SHALL BE HEAVY DUTY TYPE, EXTERNALLY OPERATED, QUICK MAKE QUICK BREAK AND SHALL BE FUSIBLE OR NON FUSIBLE AS INDICATED. A MAXIMUM VOLTAGE, CURRENT AND HORSEPOWER SHALL BE CLEARLY MARKED ON SWITCH ENCLOSURE. SWITCHES HAVING DUAL RATINGS (HIGHER RATINGS WHEN USED WITH DUAL ELEMENT FUSES) SHALL HAVE RATINGS INDICATED ON METAL PLATES RIVETED OR OTHERWISE PERMANENTLY ATTACHED TO THE ENCLOSURE. WHEN INDICATED, TOGGLE SWITCHES SHALL BE MOTOR RATED FOR THE APPLICATION.
6. STARTERS SHALL BE FULL VOLTAGE, REDUCED VOLTAGE OR COMBINATION DISCONNECT AND STARTER, WITH CONTROL VOLTAGE AS REQUIRED, AS INDICATED ON THE DOCUMENTS RELATED TO THE EQUIPMENT, SUCH AS SHOP DRAWINGS, CONSTRUCTION DOCUMENTS, ETC. STARTERS SHALL INCLUDE MOTOR OVERLOAD PROTECTION, PHASE LOSS AND PHASE UNBALANCE PROTECTION AS REQUIRED.
7. ALL TERMINATIONS AND ENCLOSURES SHALL BE RATED FOR USE WITH 75 DEGREE C CONDUCTORS.
8. COMPLETE INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF NEC (OR CEC WHERE ADOPTED) ARTICLES 430 AND 440.
9. CONTRACTOR TO COORDINATE WITH ALL OTHER PROJECT TRADES AND WITH OWNER/ TENANT FOR TO OBTAIN RESPECTIVE EQUIPMENT SCCR AND PROVIDE APPROPRIATE PROTECTIVE DEVICES TO LIMIT AVAILABLE FAULT CURRENT TO LESS THAN THE EQUIPMENT NAMEPLATE SCCR PER NEC (OR CEC WHERE ADOPTED) 110.10. SEE POWER SYSTEM STUDY SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
10. UNLESS OTHERWISE NOTED, MOCP VALUES FOR VFD-EQUIPPED DEVICE ARE SIZED PER NEC (OR CEC WHERE ADOPTED) 430.130(A).1. CONTRACTOR SHALL COORDINATE WITH ALL OTHER PROJECT TRADES AND WITH OWNER/ TENANT (IF PROVIDING EQUIPMENT ON PROJECT) TO OBTAIN NAMEPLATE VFD-EQUIPPED DEVICE MOCP VALUE FROM MANUFACTURER INSTALLATION INSTRUCTIONS AND PROVIDE APPROPRIATE PROTECTIVE DEVICES TO COMPLY WITH NEC (OR CEC WHERE ADOPTED) 430.130(A).2.

ROOF PLAN SPECIFIC NOTES:

1 REFER TO MOTORIZED EQUIPMENT SCHEDULE FOR MOTOR FEEDER/ BRANCH CIRCUIT INFORMATION.

2 PROVIDE 3/4" C.O.(S) TO RESPECTIVE CONTROL DEVICE(S) FOR CONTROL WIRING. REFER TO THE EQUIPMENT CONTROL WIRING DIAGRAMS FOR ADDITIONAL INFORMATION.



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6. ALL ROOF MOUNTED EQUIPMENT SHALL BE NEMA 3R RATED.
7. UNLESS SPECIFICALLY SHOWN AS (E), (R), (ER), (D), EXISTING OR NON-BOLD, ALL ELECTRICAL DEVICES SHOWN ARE NEW.

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MECHANICAL COORDINATION SCHEDULE

E3.02

POWER SYSTEMS STUDY SPECIFICATIONS:

THE CONTRACTOR SHALL PROVIDE, WITH THE ASSISTANCE OF THE SWITCHGEAR MANUFACTURER, POWER SYSTEMS STUDIES CONSISTING OF A SHORT CIRCUIT STUDY, A COORDINATION STUDY, AND AN ARC FLASH STUDY - ALL PER LATEST PUBLISHED EDITIONS OF THE FOLLOWING STANDARDS: ANSI C37, IEEE 141, IEEE 242, IEEE 399 - BROWN BOOK, NFPA 70E AND IEEE STD 1584/1584a. ADDITIONALLY:

a. CONTRACTOR SHALL PERFORM STUDY USING SKM "SYSTEMS ANALYSIS POWER TOOLS FOR WINDOWS" COMPUTER SOFTWARE PROGRAM - LATEST AVAILABLE VERSION OR EQUAL BY ETAP.

b. CONTRACTOR SHALL FURNISH/OBTAIN ALL DATA REQUIRED FOR POWER SYSTEMS STUDIES. DATA COLLECTION EFFORT SHALL BE PERFORMED IN AN EXPEDITIOUS MANNER AND AS SOON AS POSSIBLE AFTER CONTRACT AWARD TO ENSURE STUDY COMPLETION FOR SUBMISSION AS PART OF THE ELECTRICAL DISTRIBUTION EQUIPMENT SHOP DRAWINGS AND SUBMITTALS. DATA COLLECTION EFFORTS MAY INCLUDE, BUT ARE NOT LIMITED TO, CALCULATED UTILITY COMPANY FAULT VALUES, SERVICE TRANSFORMER PRIMARY PROTECTIVE DEVICE AND APPLIED VOLTAGE, ELECTRICAL CHARACTERISTICS AND FAULT CONTRIBUTION FROM EXISTING MOTORS/GENERATORS, EXISTING CONDUCTOR QUANTITIES, SIZE AND LENGTHS, EXISTING/ NEW OVERCURRENT PROTECTIVE DEVICE SPECIFICATIONS AND PART NUMBERS, TRANSFER SWITCH CHARACTERISTICS AND SHORT CIRCUIT CURRENT RATINGS IN ADDITION TO ANY OTHER DATA REQUIRED TO PERFORM COMPREHENSIVE POWER SYSTEM STUDIES. RANGES OF FAULT CURRENT VALUES OR GENERIC FAULT CURRENT VALUES PROVIDED BY THE UTILITY COMPANY ARE UNACCEPTABLE AS ARE ANY FAULT CURRENT VALUES SHOWN ON THE SINGLE LINE DIAGRAM OR FEEDER SCHEDULE.

DATA GATHERING SHALL BE CONDUCTED IN A SAFE MANNER WITH 1) EQUIPMENT COMPLETELY DE-ENGERIZED IN COORDINATION WITH THE OWNER DURING A SCHEDULED POWER SHUTDOWN OR 2) UTILIZING A LICENSED ELECTRICIAN WEARING APPROPRIATE PERSONNEL PROTECTIVE EQUIPMENT PER NFPA 70E STANDARDS.

CONTRACTOR IS SOLELY RESPONSIBLE FOR OBTAINING UTILITY DATA FROM THE UTILITY COMPANY - INCLUDE ALL COSTS IN BASE BID FOR ANY UTILITY COMPANY FEES FOR PROVIDING NECESSARY DATA. WHERE THE PROJECT IS LOCATED ON A CAMPUS WITH AN OWNER-FURNISHED ELECTRICAL DISTRIBUTION SYSTEM, CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN SUFFICIENT ELECTRICAL SYSTEM DATA TO DEMONSTRATE COORDINATION OF THE PROJECT'S ELECTRICAL SYSTEM WITH CAMPUS DISTRIBUTION SYSTEM. THIS DATA MAY BE AVAILABLE IN THE FORM OF AN OWNER-PROVIDED CAMPUS POWER SYSTEM STUDY. WHERE SUCH STUDIES ARE NOT AVAILABLE, THE CONTRACTOR SHALL INCLUDE ALL COSTS IN BASE BID TO PERFORM NECESSARY FIELD INVESTIGATION OF CAMPUS DISTRIBUTION SYSTEM INCLUDING CAMPUS SERVICE ENTRANCE AND SERVING UTILITY DATA AS REQUIRED TO DEMONSTRATE COORDINATION OF THE PROJECT'S ELECTRICAL SYSTEM WITH CAMPUS DISTRIBUTION SYSTEM. INCLUDE ALL COSTS FOR RECOMMENDING ADJUSTMENTS TO EXISTING CAMPUS DISTRIBUTION SYSTEM SETTINGS DISCOVERED TO BE INCORRECT. OWNER SHALL BE RESPONSIBLE TO UNDERTAKE ANY PHYSICAL ADJUSTMENTS TO EXISTING MEDIUM OR HIGH VOLTAGE DISTRIBUTION EQUIPMENT WITH THE EXCEPTION OF FUSES, RELAYS OR OTHER CIRCUIT PROTECTIVE DEVICES LOCATED IN EXISTING DISTRIBUTION EQUIPMENT THAT ARE DEDICATED TO SERVE ONLY THIS PROJECT'S ELECTRICAL SYSTEM.

CONTRACTOR IS SOLELY RESPONSIBLE FOR OBTAINING EQUIPMENT SCCR RATING FROM ALL OTHER PROJECT TRADES AND FOR ANY OWNER-FURNISHED OR TENANT-FURNISHED EQUIPMENT CONNECTED TO THE ELECTRICAL SYSTEM IN ORDER TO VALIDATE AVAILABLE FAULT CURRENT AT THE EQUIPMENT CONNECTIONS IS LESS THAN THE RESPECTIVE EQUIPMENT SCCR.

c. THE SHORT CIRCUIT STUDY SHALL INCLUDE CALCULATED SHORT-CIRCUIT MOMENTARY AND INTERRUPTING DUTIES FOR 3-PHASE BOLTED FAULTS AND LINE-TO-GROUND FAULTS THROUGHOUT THE SINGLE LINE TO INCLUDE UTILITY SERVICE SUPPLY, GENERATORS AND TRANSFER SWITCHES, SUBSTATIONS, SWITCHGEAR, PANEL BOARDS ETC. STUDY SHALL EVALUATE ALL ELECTRICAL DISTRIBUTION EQUIPMENT AND PROTECTIVE DEVICES AGAINST SHORT CIRCUIT CURRENT RATINGS. THIS STUDY EFFORT SHALL EXTEND TO SCCR RATINGS OF EQUIPMENT, EQUIPMENT CONTROL PANELS, VARIABLE FREQUENCY DRIVES ETC PROVIDED BY OTHER TRADES THAT ARE CONNECTED TO THE ELECTRICAL SYSTEM. NOTE ANY EXISTING CIRCUIT PROTECTIVE DEVICE(S)/ELECTRICAL DISTRIBUTION THAT IS INADEQUATELY RATED TO WITHSTAND CALCULATED FAULT VALUES OR WHERE EQUIPMENT SCCR IS EXCEEDED. WHERE THE UTILITY COMPANY PROVIDES MULTIPLE FAULT CURRENT VALUES REFLECTING INITIAL TRANSFORMER CAPACITY AND WORST CASE TRANSFORMER CAPACITY, THE CONTRACTOR SHALL PROVIDE SHORT CIRCUIT ANALYSIS PRIMARILY BASED ON WORST CASE TRANSFORMER CAPACITY. ALL SERVICE EQUIPMENT SHALL BE LABELED WITH THE MAXIMUM AVAILABLE FAULT CURRENT AND FAULT CURRENT CALCULATION DATE PER NEC (OR CEC WHERE ADOPTED) 110.24. SEE LABELING SPECIFICATION FOR ADDITIONAL REQUIREMENTS.

d. THE COORDINATION STUDY SHALL INCLUDE TIME-CURRENT CURVES (TCC) FOR OVER CURRENT PROTECTIVE DEVICES (OCPDs) ALONG WITH TRANSFORMER FULL-LOAD CURRENT, INRUSH CURRENT, AND THROUGH-FAULT PROTECTION CURVES, CONDUCTOR DAMAGE CURVES, GROUND FAULT PROTECTIVE DEVICE CURVES, MOTOR STARTING CURVE(S)/DAMAGE POINT(S), GENERATOR SHORT-CIRCUIT CURVE(S) /DAMAGE POINT(S) ETC. - CLEARLY IDENTIFIED AND PLOTTED ON LOG-LOG SCALE GRAPH(S). TCC GRAPH(S) SHALL INCLUDE A ONE-LINE DIAGRAM IDENTIFYING THE SPECIFIC PORTION COVERED BY THE GRAPH. DEMONSTRATE THAT ADEQUATE CLEARING TIME/SELECTIVE OPERATION EXISTS BETWEEN PROTECTIVE DEVICES WHILE PROVIDING PROPER SYSTEM PROTECTION & COORDINATION. STUDY SHALL INCLUDE ALL MAIN AND FEEDER OCPDs INCLUDING SECONDARY SIDE OF EACH TRANSFORMER DOWN TO BREAKERS IN PANEL BOARDS AND INDIVIDUAL BREAKERS IN DISTRIBUTION BOARDS. IN ALL CASES, SOLID STATE AND/OR ADJUSTABLE OCPDs SHALL BE ANALYZED WITH UPSTREAM AND DOWNSTREAM OCPDs AS REQUIRED TO ESTABLISH PROPER COORDINATION SETTINGS. SPECIAL EMPHASIS SHALL BE PLACED ON ANALYZING PORTIONS OF THE ELECTRICAL SYSTEM REQUIRING SELECTIVE COORDINATION WHICH INCLUDE, BUT ARE NOT LIMITED TO, NEC (OR CEC WHERE ADOPTED) ARTICLES 517, 620, 700, 701 & 708; ALONG WITH ANY ARTICLE 702 OPTIONAL STANDBY SYSTEMS SERVING SERVER ROOMS/DATA CENTERS OR OTHER AREAS REQUIRING HIGH AVAILABILITY/PROPER COORDINATION SUCH AS MANUFACTURING, CLEAN ROOM OR LAB FACILITIES. CONTRACTOR SHALL BE RESPONSIBLE TO RECOMMEND SETTINGS OF ALL DEVICES, TO INCLUDE GROUND FAULT SETTINGS, TO ACHIEVE SYSTEM COORDINATION. THE CONTRACTOR SHALL FIELD ADJUST NEW AND EXISTING DEVICES ACCORDINGLY UTILIZING A QUALIFIED MANUFACTURER'S REPRESENTATIVE OR A THIRD-PARTY ELECTRICAL TESTING AGENCY.

e. THE ARC FLASH ANALYSIS SHALL BE BASED ON THE INCIDENT ENERGY ANALYSIS METHOD (NFPA 70E 130.5). THE ARC FLASH ANALYSIS SHALL DETERMINE THE FLASH BOUNDARY, THE WORKING DISTANCE, THE INCIDENT ENERGY AND MINIMUM ARC RATING OF CLOTHING(CAL/CM²) AT LOCATIONS IN THE ELECTRICAL SYSTEM WHERE WORK CAN OR MIGHT BE PERFORMED ON ENERGIZED COMPONENTS WHERE MULTIPLE SYSTEM CONFIGURATION SCENARIOS ARE POSSIBLE, THE CONFIGURATION WITH GREATEST INCIDENT ENERGY MUST BE SHOWN. DECREMENT FAULT CONTRIBUTIONS FROM MOTOR(S) AND GENERATOR(S) BASED ON INDUSTRY STANDARDS. THE CONTRACTOR SHALL MAKE RECOMMENDATIONS WITH REGARD TO SYSTEM ADJUSTMENTS OR OTHER MITIGATION MEASURES TO OPTIMIZE THE RESULTS OF THE STUDY AS IT RELATES TO SAFE AND RELIABLE ELECTRICAL SYSTEM OPERATION (E.G. OVERCURRENT DEVICE SETTINGS, WORKING DISTANCES, CURRENT LIMITING DEVICES). THIS INCLUDES MITIGATION, WHERE POSSIBLE, OF INCIDENT ENERGY LEVELS THAT EXCEED 40 CAL/CM². PERFORM ITERATIVE CALCULATIONS TO DEMONSTRATE EFFECTS OF OPENING PROTECTIVE DEVICES UTILIZING A VARIETY OF DIFFERENT SETTINGS TO BEST MITIGATE ARC FLASH ENERGY WHILE MAINTAINING AN ACCEPTABLE LEVEL OF SYSTEM COORDINATION. WHERE SUCH RECOMMENDATIONS COMPROMISE SELECTIVE COORDINATION SETTINGS, SO STATE IN THE ANALYSIS.

INCLUDE INCIDENT ENERGY/FLASH PROTECTION BOUNDARY CALCULATIONS FOR BOTH LINE/LOAD SIDE OF ALL SEPARATELY ENCLOSED MAIN CIRCUIT BREAKERS. ALL CALCULATIONS SHALL BE BASED ON ACTUAL OVERCURRENT DEVICE CLEARING TIMES.

f. BASED ON THE RESULTS OF THE ARC FLASH ANALYSIS, THE CONTRACTOR SHALL PRODUCE AND INSTALL A WARNING LABEL (ORANGE <40 CAL/CM2) OR DANGER LABEL (RED > 40 CAL/CM2) FOR EACH PIECE OF EQUIPMENT PER NEC (OR CEC WHERE ADOPTED) 110.16 AND IN ACCORDANCE WITH ANSI Z535.4-2007 OR LATEST PUBLISHED EDITION. THE LABEL MUST BE READABLE IN BOTH INDOOR AND OUTDOOR ENVIRONMENTS FOR AT LEAST 3 YEARS AND CONTAIN THE FOLLOWING INFORMATION: NOMINAL SYSTEM VOLTAGE, ARC HAZARD BOUNDARY (INCHES), WORKING DISTANCE (INCHES), AVAILABLE ARC FLASH INCIDENT ENERGY AT THE WORKING DISTANCE (CAL/CM²), MINIMUM ARC RATING OF CLOTHING, EQUIPMENT/BUS NAME, DATE PREPARED, SUPPLIER'S NAME AND ADDRESS. PROVIDE LABEL AS MANUFACTURED BY BRADY OR EQUAL. PRIOR TO PLACING ARC FLASH LABELS, CONTRACTOR SHALL SET ALL PROTECTIVE DEVICE SETTINGS PER THE APPROVED COORDINATION STUDY.

g. DURING THE CONSTRUCTION PHASE OF THE PROJECT, ALL GROUND FAULT RELAYS SHALL BE SET AT THE LOWEST AVAILABLE TIME DELAY AND PICK-UP SETTINGS.

h. POWER SYSTEMS STUDIES SHALL BE SUBMITTED AS PART OF THE OVERALL SWITCHGEAR SUBMITTAL. THE RESULTS OF THE POWER SYSTEMS STUDY SHALL BE PRESENTED IN A COMPREHENSIVE REPORT THAT INCLUDES:

- REPORT SUMMARY WITH ANALYSIS METHODOLOGY, FINDINGS AND RECOMMENDATIONS
- SUMMARY OF INPUT DATA FOR UTILITY SOURCE, EQUIPMENT AND CABLES
- AVAILABLE FAULT CURRENT AT EACH EQUIPMENT LOCATION WITH COMPARISON TO EQUIPMENT RATING
- OVERCURRENT DEVICE SETTINGS (E.G. PICK-UP, TIME DELAY, CURVE), "AS FOUND" AND "AS RECOMMENDED"
- OVERCURRENT DEVICE COORDINATION CURVES INCLUDING RELATED SECTION OF THE SINGLE-LINE DIAGRAM
- COMPLETE SYSTEM SINGLE-LINE DIAGRAM FOR THE SYSTEM ANALYZED
- INCIDENT ENERGY LEVEL (CAL/CM²) FOR EACH EQUIPMENT LOCATION, RECOMMENDED PPE AND SAMPLE ARC FLASH WARNING LABELS
- A DVD OR CD CONTAINING ELECTRONIC PROJECT FILES USED TO DEVELOP THE STUDY TO INCLUDE SKM OR ETAP PROJECT AND REFERENCE LIBRARY FILES. ALL FILES SHALL BE AVAILABLE FOR REVIEW AND/OR FUTURE MODIFICATION WITHOUT LIMITATION. LOCKING OR SECURING FILES BY OTHER MEANS IS NOT ACCEPTABLE. FAILURE TO SUBMIT COMPLETE STUDIES AND FULLY ACCESSIBLE FILES SHALL RESULT IN THE REJECTION OF THE ENTIRE SWITCHGEAR SUBMITTAL.

i. AS A PART OF A CLOSEOUT SUBMITTAL TO BE SUBMITTED TO THE ENGINEER PRIOR TO FINAL PROJECT CONSTRUCTION OBSERVATIONS, CONTRACTOR SHALL PROVIDE PHOTOS OF ALL ADJUSTABLE CIRCUIT BREAKERS DEPICTING THEIR FINAL SETTINGS BASED ON THE POWER SYSTEMS STUDY. SUBMITTAL SHALL BE ORGANIZED WITH OCPD IDENTIFICATION, OCPD PHOTO IMAGE AND RESPECTIVE POWER SYSTEM STUDY OCPD SETTING REQUIREMENTS TO ALLOW EFFICIENT CONFIRMATION OF RECORD SETTINGS. PLEASE NOTE THAT IMAGES MAY NEED TO BE TAKEN PRIOR TO INSTALLATION OF EQUIPMENT COVERS/EQUIPMENT ENERGIZATION SINCE OCPD SETTINGS MAY BE OBSTRUCTED BY EQUIPMENT COVERS.

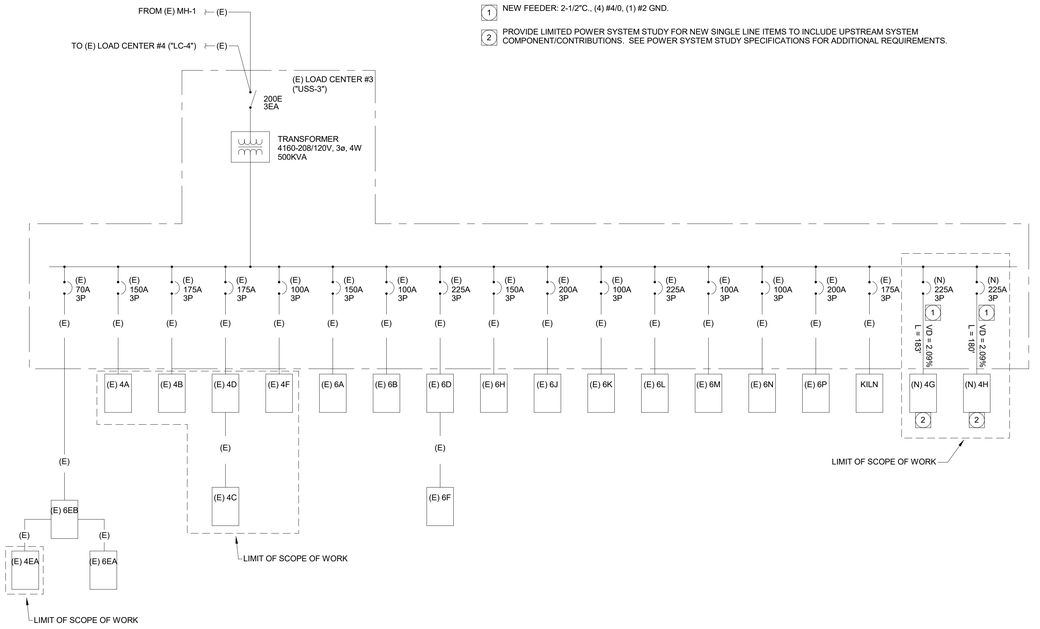
j. THE STUDY SHALL BE LIMITED IN SCOPE TO INCLUDE JUST NEW PORTIONS OF ELECTRICAL SINGLE LINE DIAGRAM TO INCLUDE UPSTREAM OR DOWNSTREAM ELEMENTS THAT MAY INFLUENCE STUDY RESULTS INCLUDING, BUT NOT LIMITED TO, UTILITY SOURCE CONTRIBUTION, RELEVANT PORTIONS OF THE EXISTING ELECTRICAL DISTRIBUTION SYSTEM WITHIN A BUILDING AND/OR CAMPUS ELECTRICAL DISTRIBUTION SYSTEMS AS DESCRIBED ABOVE. IN THIS CASE APPLICATION OF ARC FLASH LABELING SHALL BE LIMITED TO THE NEW PORTIONS OF THE SINGLE LINE AND ANY CONNECTED UPSTREAM ELECTRICAL SYSTEM COMPONENTS UP TO AND INCLUDING THE MAIN ELECTRICAL SERVICE, ANY LIFE-SAFETY, EMERGENCY, LEGALLY REQUIRED OR OPTIONAL STANDBY SYSTEMS, ELEVATORS, AND FIRE PUMPS.

GENERAL SINGLE LINE DIAGRAM NOTES:

1. ALL ELECTRICAL EQUIPMENT SHALL BE SQUARE D (BASIS OF DESIGN, DISTRICT PREFERRED) OR EQUAL BY CUTLER-HAMMER, G.E., SIEMENS, IEM, OR Z-POWER AND DISTRIBUTION.
2. ALL ITEMS DEPICTED ON THE SINGLE LINE DRAWINGS SHALL BE ASSUMED AS NEW U.O.N.
3. ALL OVERCURRENT DEVICES IN AN INDIVIDUAL PIECE OF EQUIPMENT SHALL HAVE AN AIC RATING EQUAL TO THE OVERALL RATING OF THE EQUIPMENT. SERIES-RATING OF DEVICES WITHIN A PIECE OF EQUIPMENT IS NOT ALLOWED. SEE SPECIFICATIONS FOR MORE INFORMATION.
4. ALL SWITCHBOARDS, SWITCHGEAR, AND PANELBOARDS SHALL HAVE A SHORT-CIRCUIT CURRENT RATING NOT LESS THAN THE AVAILABLE FAULT CURRENT. THE AVAILABLE FAULT CURRENT AND THE DATE THE CALCULATION WAS PERFORMED SHALL BE FIELD MARKED ON THE ENCLOSURE AT THE POINT OF SUPPLY.
5. NOT USED.
6. ALL TERMINATIONS AND ENCLOSURES SHALL BE RATED FOR USE WITH 75 DEGREE CELSIUS CONDUCTORS.
7. ALL SERVICE ENTRANCE EQUIPMENT RATED AT 400A OR GREATER SHALL BE PROVIDED WITH A BACKFEED-RATED, SOLID STATE MAIN OVERCURRENT DEVICE AND BUSSING RATED AT 100% OPERATION (1000A/sq.in. FOR CU, 750A/sq.in. FOR AL). NO HEAT RISE RATED BUSSING ALLOWED. NON-SERVICE ENTRANCE SWITCHBOARDS AND DISTRIBUTION BOARDS LARGER THAN 600A SHALL BE PROVIDED WITH BUSSING RATED FOR 100% OPERATION - SEE SPECIFICATION FOR CIRCUIT BREAKER REQUIREMENTS. ALL NON-SERVICE ENTRANCE SWITCHBOARDS AND DISTRIBUTION BOARD MAIN OVERCURRENT DEVICES SHALL BE BACKFEED-RATED. BACKFEED RATINGS SHALL COMPLY WITH NEC, OR CEC WHERE ADOPTED, 710.15 (E) AND 705.12(B)(4). SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS REGARDING CIRCUIT BREAKERS.
8. PROVIDE CIRCUIT BREAKER ARC ENERGY REDUCTION MAINTENANCE SWITCHING PER NEC, OR CEC WHERE ADPOPTED, 240.87(B)(3) FOR ANY CIRCUIT BREAKER, 1200A FRAME AND LARGER. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
9. ALL SWITCHBOARDS AND DISTRIBUTION BOARDS SHALL HAVE:
   a. TIN-PLATED ALUMINUM BUSSING WITH RECTANGULAR CROSS SECTION. HORIZONTAL AND VERTICAL BUSSING SHALL BE FULL LENGTH AND SHALL HAVE PROVISIONS FOR FUTURE EXTENSIONS. ALL BUSSING SHALL HAVE MINIMUM WITHSTAND RATING EQUAL TO THE AVAILABLE FAULT CURRENT INDICATED. ALL VERTICAL AND HORIZONTAL BUSSING SHALL BE RATED AT FULL CAPACITY IN ALL SWITCHBOARD AND DISTRIBUTION BOARD SECTIONS. PROVIDE 100% NEUTRAL BUSSING MINIMUM UNLESS OTHERWISE NOTED. PROVIDE FULL LENGTH GROUND BUS AND, WHERE INDICATED ON PLANS, ISOLATED GROUND BUSSING. PROVIDE REAR WIRE WAY IN ALL SWITCHBOARD SECTIONS.
   b. LUGS SUITABLE FOR USE WITH COPPER OR ALUMINUM CONDUCTORS LISTED FOR USE WITH 75 DEGREE CELSIUS AMPACITY CONDUCTORS.
   c. PERMANENT PLACARD(S) MARKED PER THE SPECIFICATIONS AND PER NEC (OR CEC-WHERE ADOPTED) SECTIONS 225.37, 230.2(E), 690.56, 692.56, 700.7, 701.7, 702.7, AND 705.10 AND IFC (OR CFC - WHERE ADOPTED) SECTION 608.2.6.1. DENOTING THE PRESENCE OF ADDITIONAL SERVICES, PHOTOVOLTAIC SYSTEMS, FUEL CELLS, EMERGENCY, STATIONARY BATTERY STORAGE SYSTEMS, OR STAND-BY POWER SOURCES AS APPLICABLE.
10. CONTRACTOR SHALL SUBMIT SWITCHBOARD SHOP DRAWINGS TO THE SERVING UTILITY FOR APPROVAL PRIOR TO FABRICATION. CONTRACTOR SHALL SECURE CONFIRMATION THAT THE PROPOSED SWITCHBOARD COMPLIES WITH ELECTRIC UTILITY COMPANY REGULATIONS.
11. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS PER THE SPECIFICATIONS FOR SWITCHBOARDS, DISTRIBUTION BOARDS, TRANSFORMERS, PANEL BOARDS, AND ALL OTHER DEVICES SHOWN ON THE SINGLE LINE, PRIOR TO FABRICATION.
12. ALLOWABLE DIMENSIONS IN MAIN ELECTRICAL ROOM ARE A CRITICAL COORDINATION ITEM. CONTRACTOR SHALL PROVIDE 1/4"= 1'-0" SCALE DRAWINGS WITH SWITCHGEAR SUBMITTALS SHOWING THAT ALL PROPOSED EQUIPMENT WILL FIT IN THE SPACE PROVIDED. SUBMITTALS WITHOUT THIS DRAWING SHALL BE REJECTED AS INCOMPLETE.
13. UNLESS SPECIFICALLY SHOWN AS (E), (R), (ER), (D), OR EXISTING, ALL ELECTRICAL DEVICES SHOWN ARE NEW.
14. WHERE REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION OR WHERE A NEW GROUND FAULT PROTECTIVE DEVICE IS BEING INSTALLED, A GROUND FAULT SYSTEM TEST SHALL BE CONDUCTED BY AN INDEPENDENT TESTING AGENCY PER NEC (OR CEC-WHERE ADOPTED) 230.95(C). THE GROUND FAULT SYSTEM TEST SHALL BE PERFORMED IN THE PRESENCE OF THE LOCAL AUTHORITY HAVING JURISDICTION. VERIFICATION OF DEVICE SETTINGS PER THE POWER SYSTEMS STUDY SPECIFICATION SHALL BE PERFORMED BY THE SAME INDEPENDENT TESTING AGENCY. THE GROUND FAULT TEST RESULTS SHALL BE DELIVERED TO THE ENGINEER OF RECORD. DURING THE CONSTRUCTION PHASE OF THE PROJECT, ALL NEW GROUND FAULT RELAYS SHALL BE SET AT THE LOWEST AVAILABLE TIME DELAY AND PICK-UP SETTINGS.
15. SEE POWER SYSTEMS STUDY SPECIFICATION FOR ADDITIONAL REQUIREMENTS. ALL REQUIRED POWER SYSTEMS STUDIES MUST BE COMPLETED AND SUBMITTED WITH ELECTRICAL POWER DISTRIBUTION EQUIPMENT SUBMITTAL. FAILURE TO DO SO WILL PREVENT THE ENGINEER FROM EFFECTIVELY EVALUATING THE SUBMITTAL AND SHALL RESULT IN REJECTION OF THE ELECTRICAL POWER DISTRIBUTION EQUIPMENT SUBMITTAL AS INCOMPLETE.
16. ALL EQUIPMENT SHOWN IS EXISTING UNLESS OTHERWISE NOTED.

SPECIFIC SINGLE LINE NOTES:

1. NEW FEEDER: 2-1/2"C., (4) #4/0, (1) #2 GND.
2. PROVIDE LIMITED POWER SYSTEM STUDY FOR NEW SINGLE LINE ITEMS TO INCLUDE UPSTREAM SYSTEM COMPONENT/CONTRIBUTIONS. SEE POWER SYSTEM STUDY SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.



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SONORA HIGH SCHOOL
SCIENCE CLASSROOMS MODERNIZATION

401 S PALM STREET
LA HABRA, CA 90631

Developed for
FULLERTON JOINT UNION HIGH SCHOOL DISTRICT

Revision	Date

Submittal	Date
SCHEMATIC DESIGN	03/13/2025
50% DESIGN DEVELOPMENT	06/16/2025
90% DESIGN DEVELOPMENT	07/07/2025
50% CD	10/30/2025
DSA SUBMITTAL	11/21/2025
DSA BACK CHECK	01/27/2026

Job Number	32433
Checked By	Checker
Scale	

SINGLE LINE DIAGRAM

E4.00

PANEL: 4C

MOUNTING: **DOUBLE-LUGS:** No **VOLTS:** 120/208 Wye **SUPPLY FROM:**
NEMA 3R: No **200% NEUTRAL:** No **PHASE:** 3 **LOCATION:**
FEED THRU: No **I/G BUS:** No **WIRE:** 4 **MCB:** 100 A
M.L.O.: No **AIC:** 10000 **BUS:** 225 A

NOTE	DESCRIPTION	BKR	POLE	TYPE	CIRC	A (VA)	B (VA)	C (VA)	CIRC	TYPE	POLE	BKR	DESCRIPTION	NOTE
	CHEM LAB TABLE RECEPTS RM 421	20 A	1	R	1	720 180			2	R	1	20 A	CONFERENCE ROOM RECEPT RM 420	
	CHEM LAB TABLE RECEPTS RM 421	20 A	1	R	3		720 900		4	R	1	20 A	COPIER RECEPT RM 420	
	CHEM LAB TABLE RECEPTS RM 421	20 A	1	R	5			720 180	6	P	1	20 A	FUME HOOD	
	CHEM LAB TABLE RECEPTS RM 421	20 A	1	R	7	720			8					
	CHEM LAB TABLE RECEPTS RM 421	20 A	1	R	9		720		10					
	CHEM CONVENIENCE RECEPTS RM 421	20 A	1	R	11			900	12					
	CHEM CONVENIENCE RECEPTS RM 421	20 A	1	R	13	720			14					
	TEACHER'S DESK RECEPT RM 421	20 A	1	R	15		180		16					
	CHEM LAB TABLE RECEPTS RM 423	20 A	1	P	17			720	18					
	CHEM LAB TABLE RECEPTS RM 423	20 A	1	P	19	720			20					
	CHEM LAB TABLE RECEPTS RM 423	20 A	1	P	21		720		22					
	CHEM LAB TABLE RECEPTS RM 423	20 A	1	P	23			720 --	24	--	1	--	SPACE	
	CHEM LAB TABLE RECEPTS RM 423	20 A	1	P	25	720 --			26	--	1	--	SPACE	
	CHEM CONVENIENCE RECEPTS RM 423	20 A	1	P	27		900 --		28	--	1	--	SPACE	
	CHEM CONVENIENCE RECEPTS RM 423	20 A	1	P	29			1080 --	30	--	1	--	SPACE	
	TEACHER'S DESK RECEPT RM 423	20 A	1	P	31	180			32					
	CHEM STORAGE RECEPTS RM 422	20 A	1	R	33		360		34					
	CHEM STORAGE RECEPTS RM 422	20 A	1	R	35			360	36					
	CONFERENCE RM RECEPTS RM 420	20 A	1	R	37	720 0			38	--	1	20 A	SPARE	
	(E) EXISTING CKT	20 A	1	--	39		500 1000		40	--	1	20 A	EXISTING CKT	
	(E) EXISTING CKT	20 A	1	--	41			1000 800	42	--	1	20 A	EXISTING CKT	
						PHASE TOTALS:	4680.00 VA	6000.00 VA	6480.00 VA					
COMMENTS:							39.0 A	51.7 A	55.7 A					

LOAD TYPE KEY	LOAD CLASSIFICATION	CONNECTED LOAD	AVG. DEMAND...	ESTIMATED DEMAND	PANEL TOTALS	AMPS	KVA
H = HVAC EQUIP	P	5940 VA	100.00%	5940 VA			
K = KITCHEN	R	7920 VA	100.00%	7920 VA	TOTAL CONNECTED LOAD:	47.6 A	17160 VA
L = LIGHTING					TOTAL DEMAND LOAD:	47.6 A	17160 VA
M = MOTOR					HIGH PHASE:	56 A	6480 VA
P = POWER							
R = RECEPTACLE							
W = WATER HEATER							

PANEL: 4B

MOUNTING: **DOUBLE-LUGS:** No **VOLTS:** 120/208 Wye **SUPPLY FROM:**
NEMA 3R: No **200% NEUTRAL:** No **PHASE:** 3 **LOCATION:** ELEC 428A
FEED THRU: No **I/G BUS:** No **WIRE:** 4 **MCB:** 150 A
M.L.O.: No **AIC:** 10000 **BUS:** 225 A

NOTE	DESCRIPTION	BKR	POLE	TYPE	CIRC	A (VA)	B (VA)	C (VA)	CIRC	TYPE	POLE	BKR	DESCRIPTION	NOTE
	(E) EXISTING CKT	20 A	1	--	1	720 540			2	--	1	20 A	(E) EXISTING CKT	
	(E) EXISTING CKT	20 A	1	--	3		900 180		4	--	1	20 A	(E) EXISTING CKT	
	(E) EXISTING CKT	20 A	1	--	5			540 720	6	--	1	20 A	(E) EXISTING CKT	
	(E) EXISTING CKT	20 A	1	--	7	720 540			8	--	1	20 A	(E) EXISTING CKT	
	(E) EXISTING CKT	20 A	1	--	9		180 180		10	--	1	20 A	(E) EXISTING CKT	
	(E) EXISTING CKT	20 A	1	--	11			720 720	12	--	1	20 A	(E) EXISTING CKT	
	(E) EXISTING CKT	20 A	1	--	13	180 1100			14	--	1	20 A	(E) EXISTING CKT	
	(E) EXISTING CKT	20 A	1	--	15		600 1100		16	--	1	20 A	(E) EXISTING CKT	
	(E) EXISTING CKT	20 A	1	--	17			180 1100	18	--	1	20 A	(E) EXISTING CKT	
	(E) EXISTING CKT	20 A	1	--	19	180 1100			20	--	1	20 A	(E) EXISTING CKT	
	(E) EXISTING CKT	20 A	1	--	21		1100 1300		22	--	1	20 A	(E) EXISTING CKT	
	(E) EXISTING CKT	20 A	1	--	23			1000 1100	24	--	1	20 A	(E) EXISTING CKT	
	(E) EXISTING CKT	20 A	1	--	25	1200 1100			26	--	1	20 A	(E) EXISTING CKT	
	(E) EXISTING CKT	20 A	1	--	27		1300 1100		28	--	1	20 A	(E) EXISTING CKT	
	(E) EXISTING CKT	20 A	1	--	29			1090 1100	30	--	1	20 A	(E) EXISTING CKT	
	(E) EXISTING CKT	20 A	1	--	31	1100 1100			32	--	1	20 A	(E) EXISTING CKT	
	(E) EXISTING CKT	20 A	1	--	33		1100 1100		34	--	1	20 A	(E) EXISTING CKT	
	(E) EXISTING CKT	20 A	1	--	35			1100 1000	36	--	1	20 A	(E) EXISTING CKT	
	(E) EXISTING CKT	20 A	1	--	37	1000 0			38	--	1	20 A	(E) EXISTING CKT	
	SPACE	--	1	--	39		-- 0		40	--	1	20 A	(E) EXISTING CKT	
	SPACE	--	1	--	41			-- --	42					
						PHASE TOTALS:	10580.00 VA	10140.00 VA	10370.00 VA					
COMMENTS:							88.5 A	84.5 A	86.7 A					

LOAD TYPE KEY	LOAD CLASSIFICATION	CONNECTED LOAD	AVG. DEMAND...	ESTIMATED DEMAND	PANEL TOTALS	AMPS	KVA
H = HVAC EQUIP							
K = KITCHEN					TOTAL CONNECTED LOAD:	86.3 A	31090 VA
L = LIGHTING					TOTAL DEMAND LOAD:	86.3 A	31090 VA
M = MOTOR					HIGH PHASE:	88 A	10580 VA
P = POWER							
R = RECEPTACLE							
W = WATER HEATER							

PANEL: 4A

MOUNTING: **DOUBLE-LUGS:** No **VOLTS:** 120/208 Wye **SUPPLY FROM:**
NEMA 3R: No **200% NEUTRAL:** No **PHASE:** 3 **LOCATION:** ELEC 428A
FEED THRU: No **I/G BUS:** No **WIRE:** 4 **MCB:** 150 A
M.L.O.: No **AIC:** 10000 **BUS:** 225 A

NOTE	DESCRIPTION	BKR	POLE	TYPE	CIRC	A (VA)	B (VA)	C (VA)	CIRC	TYPE	POLE	BKR	DESCRIPTION	NOTE
	CLASSROOM 426 LTG	20 A	1	L	1	822 30			2	L	1	20 A	EXIT SIGNS	
	CLASSROOM 423 LTG	20 A	1	L	3		791 95		4	L	P 1	20 A	EXTERIOR LTG	
	CLASSROOM 425 LTG	20 A	1	L	5			730 0	6	--	1	20 A	SPARE	
	CLASSROOM 421 LTG	20 A	1	L	7	690 0			8	--	1	20 A	SPARE	
	CORRIDOR CONFERENCE ROOM LTG	20 A	1	L	9		453 0		10	--	1	20 A	SPARE	
	SPARE	20 A	1	--	11			0 0	12	--	1	20 A	SPARE	
	SPARE	20 A	1	--	13	0 0			14	--	1	20 A	SPARE	
	SPARE	20 A	1	--	15		0 0		16	--	1	20 A	SPARE	
	SPACE	20 A	1	--	17			0 0	18	--	1	20 A	SPARE	
	SPACE	--	1	--	19	-- 0			20	--	1	20 A	SPARE	
	SPARE	20 A	1	--	21		0 0		22	--	1	20 A	SPARE	
	SPARE	20 A	1	--	23			0 0	24	--	1	20 A	SPARE	
	SPARE	20 A	1	--	25	0 0			26	--	1	20 A	SPARE	
	SPARE	20 A	1	--	27		0 0		28	--	1	20 A	SPARE	
	SPARE	20 A	1	--	29			0 500	30	--	1	20 A	SPARE	
	SPARE	20 A	1	--	31	0 --			32	--	1	--	SPACE	
	SPARE	20 A	1	--	33		0 0		34	--	1	20 A	SPARE	
	SPARE	20 A	1	--	35			0 0	36	--	1	20 A	SPARE	
	SPARE	20 A	1	--	37	0 1500			38	--	1	20 A	(E) EXTERIOR LTG	
	SPARE	20 A	1	--	39		0 1300		40	--	1	20 A	(E) EXTERIOR LTG	
	SPARE	20 A	1	--	41			0 0	42	--	1	20 A	SPARE	
						PHASE TOTALS:	3041.50 VA	2639.00 VA	1230.00 VA					
COMMENTS:							27.2 A	23.8 A	10.3 A					

LOAD TYPE KEY	LOAD CLASSIFICATION	CONNECTED LOAD	AVG. DEMAND...	ESTIMATED DEMAND	PANEL TOTALS	AMPS	KVA
H = HVAC EQUIP	P	95 VA	100.00%	95 VA			
K = KITCHEN	L	3516 VA	125.00%	4394 VA	TOTAL CONNECTED LOAD:	19.2 A	6911 VA
L = LIGHTING					TOTAL DEMAND LOAD:	21.6 A	7789 VA
M = MOTOR					HIGH PHASE:	27 A	3042 VA
P = POWER							
R = RECEPTACLE							
W = WATER HEATER							

PANEL: 4F

MOUNTING: **DOUBLE-LUGS:** No **VOLTS:** 120/208 Wye **SUPPLY FROM:**
NEMA 3R: No **200% NEUTRAL:** No **PHASE:** 3 **LOCATION:**
FEED THRU: No **I/G BUS:** No **WIRE:** 4 **MCB:** 100 A
M.L.O.: No **AIC:** 10000 **BUS:** 225 A

NOTE	DESCRIPTION	BKR	POLE	TYPE	CIRC	A (VA)	B (VA)	C (VA)	CIRC	TYPE	POLE	BKR	DESCRIPTION	NOTE
	BIO LAB TABLE RECEPTS RM 428	20 A	1	R	1	720			2					
	BIO LAB TABLE RECEPTS RM 428	20 A	1	R	3		720		4					
	BIO LAB TABLE RECEPTS RM 428	20 A	1	R	5			720	6					
	BIO LAB TABLE RECEPTS RM 428	20 A	1	R	7	720			8					
	BIO LAB TABLE RECEPTS RM 428	20 A	1	R	9		720		10					
	BIO CONVENIENCE RECEPTS RM 428	20 A	1	R	11			1080	12					
	BIO CONVENIENCE RECEPTS RM 428	20 A	1	R	13	900			14					
	TEACHER'S DESK RECEPT RM 428	20 A	1	R	15		180		16					
	BIO LAB TABLE RECEPTS RM 426	20 A	1	P	17			720	18					
	BIO LAB TABLE RECEPTS RM 426	20 A	1	P	19	720			20					
	BIO LAB TABLE RECEPTS RM 426	20 A	1	P	21		720		22					
	BIO LAB TABLE RECEPTS RM 426	20 A	1	P	23			720	24					
	BIO LAB TABLE RECEPTS RM 426	20 A	1	P	25	720			26					
	BIO CONVENIENCE RECEPTS RM 426	20 A	1	P	27		900	360	28	--	1	20 A	EXISTING CIRCUIT	
	BIO CONVENIENCE RECEPTS RM 426	20 A	1	P	29			1080 540	30	--	1	20 A	EXISTING CIRCUIT	
	BIO TEACHER'S DESK RECEPT RM 426	20 A	1	P	31	180 500			32	--	1	20 A	EXISTING CIRCUIT	
	BIO STORAGE RECEPTS RM 425	20 A	1	R	33		540 500		34	--	1	20 A	EXISTING CIRCUIT	
	BIO STORAGE RECEPTS RM 425	20 A	1	R	35			360	36					
	CIRCULATION RECEPTS RM 433	20 A	1	R	37	900			38					
	PA SYSTEM POWER	20 A	1	R	39		360 180		40	P	1	20 A	FAPS-D	A,E
	IDF POWER	20 A	1	R	41			360 180	42	P	1	20 A	AMP-D	A,E
						PHASE TOTALS:	5360.00 VA	5180.00 VA	5760.00 VA					
COMMENTS:							44.9 A	43.2 A	48.2 A					

LOAD TYPE KEY	LOAD CLASSIFICATION	CONNECTED LOAD	AVG. DEMAND...	ESTIMATED DEMAND	PANEL TOTALS	AMPS	KVA
H = HVAC EQUIP	P	6120 VA	100.00%	6120 VA			
K = KITCHEN	R	8280 VA	100.00%	8280 VA	TOTAL CONNECTED LOAD:	45.2 A	16300 VA
L = LIGHTING					TOTAL DEMAND LOAD:	45.2 A	16300 VA
M = MOTOR					HIGH PHASE:	48 A	5760 VA
P = POWER							
R = RECEPTACLE							
W = WATER HEATER							

PANEL: 4EA

MOUNTING: **DOUBLE-LUGS:** No **VOLTS:** 120/208 Wye **SUPPLY FROM:**
NEMA 3R: No **200% NEUTRAL:** No **PHASE:** 3 **LOCATION:** ELEC 428A
FEED THRU: No **I/G BUS:** No **WIRE:** 4 **MCB:** 40 A
M.L.O.: No **AIC:** 10000 **BUS:** 100 A

NOTE	DESCRIPTION	BKR	POLE	TYPE	CIRC	A (VA)	B (VA)	C (VA)	CIRC	TYPE	POLE	BKR	DESCRIPTION	NOTE
	EXISTING CKT	20 A	1	--	1	40 0			2	--	1	20 A	SPARE	
	EXISTING CKT	20 A	1	--	3		600 0		4	--	1	20 A	SPARE	
	EXISTING CKT	20 A	1	--	5			400 0	6	--	1	20 A	SPARE	
	EXISTING CKT	20 A	1	--	7	300 0			8	--	1	20 A	SPARE	
	SPACE	--	1	--	9		-- 0		10	--	1	20 A	SPARE	
	SPACE	--	1	--	11			-- 0	12	--	1	20 A	SPARE	
	SPACE	--	1	--	13	-- --			14	--	1	--	SPACE	
	SPACE	--	1	--	15		-- --		16	--	1	--	SPACE	
	SPACE	--	1	--	17			-- --	18	--	1	--	SPACE	
	SPACE	--	1	--	19	-- --			20	--	1	--	SPACE	
	SPACE	--	1	--	21		-- --		22	--	1	--	SPACE	
	SPACE	--	1	--	23			-- --	24	--	1	--	SPACE	
	SPACE	--	1	--	25	-- --			26	--	1	--	SPACE	
	SPACE	--	1	--	27		-- --		28	--	1	--	SPACE	
	SPACE	--	1	--	29			-- --	30	--	1	--	SPACE	
	SPACE	--	1	--	31	-- --			32	--	1	--	SPACE	
	SPACE	--	1	--	33		-- --		34	--	1	--	SPACE	
	SPACE	--	1	--	35			-- --	36	--	1	--	SPACE	
	SPACE	--	1	--	37	-- --			38	--	1	--	SPACE	
	SPACE	--	1	--	39		-- --		40	--	1	--	SPACE	
	SPACE	--	1	--	41			-- --	42	--	1	--	SPACE	
						PHASE TOTALS:	340.00 VA	600.00 VA	400.00 VA					
COMMENTS:							2.8 A	5.1 A	3.4 A					

LOAD TYPE KEY	LOAD CLASSIFICATION	CONNECTED LOAD	AVG. DEMAND...	ESTIMATED DEMAND	PANEL TOTALS	AMPS	KVA
H = HVAC EQUIP							
K = KITCHEN					TOTAL CONNECTED LOAD:	3.7 A	1340 VA
L = LIGHTING					TOTAL DEMAND LOAD:	3.7 A	1340 VA
M = MOTOR					HIGH PHASE:	5 A	600 VA
P = POWER							
R = RECEPTACLE							
W = WATER HEATER							

PANEL: 4D

MOUNTING: **DOUBLE-LUGS:** No **VOLTS:** 120/208 Wye **SUPPLY FROM:**
NEMA 3R: No **200% NEUTRAL:** No **PHASE:** 3 **LOCATION:**
FEED THRU: No **I/G BUS:** No **WIRE:** 4 **MCB:** 175 A
M.L.O.: No **AIC:** 10000 **BUS:** 175 A

NOTE	DESCRIPTION	BKR	POLE	TYPE	CIRC	A (VA)	B (VA)	C (VA)	CIRC	TYPE	POLE	BKR	DESCRIPTION	NOTE
					1				2					
					3				4					
					5				6					
					7				8					
					9				10					
					11				12					
					13				14					
					15				16					
					17				18					
					19				20					
					21				22					
					23				24	--	1	20 A	EXISTING CKT	
					25	0			26	--	1	20 A	EXISTING CKT	
					27		0		28	--	1	20 A	EXISTING CKT	
					29			0	30	--	1	20 A	EXISTING CKT	
					31	0			32	--	1	20 A	EXISTING CKT	
					33		0		34	--	1	20 A	EXISTING CKT	
					35			--	36	--	1	--	SPACE	
					37	0			38	--	1	20 A	SPARE	
	EXISTING CKT	20 A	1	--	39		0 0		40	--	1	20 A	EXISTING CKT	
	EXISTING CKT	20 A	1	--	41			0 0	42	--	1	20 A	EXISTING CKT	
						PHASE TOTALS:	0.00 VA	0.00 VA	0.00 VA					
COMMENTS:							0.0 A	0.0 A	0.0 A					

LOAD TYPE KEY	LOAD CLASSIFICATION	CONNECTED LOAD	AVG. DEMAND...	ESTIMATED DEMAND	PANEL TOTALS	AMPS	KVA
H = HVAC EQUIP							
K = KITCHEN					TOTAL CONNECTED LOAD:	0.0 A	0 VA
L = LIGHTING					TOTAL DEMAND LOAD:	0.0 A	0 VA
M = MOTOR					HIGH PHASE:	0 A	0 VA
P = POWER							
R = RECEPTACLE							
W = WATER HEATER							

PANEL: 4H

MOUNTING: **DOUBLE-LUGS:** No **VOLTS:** 120/208 Wye **SUPPLY FROM:**
NEMA 3R: No **200% NEUTRAL:** No **PHASE:** 3 **LOCATION:**
FEED THRU: No **I/G BUS:** No **WIRE:** 4 **MCB:** 225 A
M.L.O.: No **AIC:** 10000 **BUS:** 225 A

NOTE	DESCRIPTION	BKR	POLE	TYPE	CIRC	A (VA)	B (VA)	C (VA)	CIRC	TYPE	POLE	BKR	DESCRIPTION	NOTE
	RTU-2	20 A	3	H	1	576 576			2	H	3	20 A	RTU-3	
--	--	--	--	--	3		576 576		4	--	--	--	--	--
--	--	--	--	--	5			576 576	6	--	--	--	--	--
	RTU-4	20 A	3	H	7	576 636			8	H	3	20 A	RTU-5	
--	--	--	--	--	9		576 636		10	--	--	--	--	--
--	--	--	--	--	11			576 636	12	--	--	--	--	--
					13				14					
					15				16					
	HRU-1	100 A	3	H	17			4160	18					
--	--				19	4160			20					
--	--	--	--	--	21		4160		22					
	HRU-2	100 A	3	H	23			4160	24					
--	--	--	--	--	25	4160			26					
--	--	--	--	--	27		4160		28					
	BS-1	20 A	2	H	29			90	30					
--	--	--	--	--	31	90			32					
	BS-2	20 A	2	H	33		90		34					
--	--	--	--	--	35			90	36					
	RTU-5 PWR EXHAUST	15 A	3	H	37	0			38					
--	--	--	--	--	39		0		40					
--	--	--	--	--	41			0	42					
						PHASE TOTALS:	10774.00 VA	10774.00 VA	10864.00 VA					
COMMENTS:							89.8 A	89.8 A	90.5 A					

LOAD TYPE KEY	LOAD CLASSIFICATION	CONNECTED LOAD	AVG. DEMAND...	ESTIMATED DEMAND	PANEL TOTALS	AMPS	KVA
H = HVAC EQUIP	H	32412 VA	100.00%	32412 VA			
K = KITCHEN					TOTAL CONNECTED LOAD:	90.0 A	32412 VA
L = LIGHTING					TOTAL DEMAND LOAD:	90.0 A	32412 VA
M = MOTOR					HIGH PHASE:	91 A	10864 VA
P = POWER							
R = RECEPTACLE							
W = WATER HEATER							

PANEL: 4G

MOUNTING: **DOUBLE-LUGS:** No **VOLTS:** 120/208 Wye **SUPPLY FROM:**
NEMA 3R: No **200% NEUTRAL:** No **PHASE:** 3 **LOCATION:**
FEED THRU: No **I/G BUS:** No **WIRE:** 4 **MCB:** 225 A
M.L.O.: No **AIC:** 10000 **BUS:** 225 A

NOTE	DESCRIPTION	BKR	POLE	TYPE	CIRC	A (VA)	B (VA)	C (VA)	CIRC	TYPE	POLE	BKR	DESCRIPTION	NOTE
	EF-7	20 A	3	H	1	1272 360			2	H	1	20 A	EF-1	
--	--	--	--	--	3		1272		4					
--	--	--	--	--	5			1272 1333	6	W	3	30 A	EWH-1 RM 424	
	EF-6	20 A	3	H	7	1272 1333			8	--	--	--	--	--
--	--	--	--	--	9		1272 1333		10	--	--	--	--	--
--	--	--	--	--	11			1272 4000	12	W	2	50 A	EWH-2 RM 425	
	EF-3	20 A	3	H	13	267 4000			14	--	--	--	--	--
--	--	--	--	--	15		267 4000		16	W	2	50 A	EWH-2 RM 420	
--	--	--	--	--	17			267 4000	18	--	--	--	--	--
	EF-4	20 A	3	H	19	1272 4000			20	W	2	50 A	EWH-2 RM 422	
--	--	--	--	--	21		1272 4000		22	--	--	--	--	--
--	--	--	--	--	23			1272	24					
	EF-5	20 A	3	H	25	2923			26					
--	--	--	--	--	27		2923		28					
--	--	--	--	--	29			2923	30					
	EF-2	20 A	1	H	31	360			32					
	EF-8	20 A	1	H	33		360		34					
	RTU-1	20 A	3	H	35			576	36					
--	--	--	--	--	37	576			38					
--	--	--	--	--	39		576		40					
	ROOF RECEPTACLES	20 A	1	R	41			900	42					
						PHASE TOTALS:	17635.33 VA	17275.33 VA	17815.33 VA					
COMMENTS:							147.4 A	144.0 A	148.9 A					

LOAD TYPE KEY	LOAD CLASSIFICATION	CONNECTED LOAD	AVG. DEMAND...	ESTIMATED DEMAND	PANEL TOTALS	AMPS	KVA
H = HVAC EQUIP	R	900 VA	100.00%	900 VA			
K = KITCHEN	H	23826 VA	100.00%	23826 VA	TOTAL CONNECTED LOAD:	146.4 A	52726 VA
L = LIGHTING	W	28000 VA	125.00%	35000 VA	TOTAL DEMAND LOAD:	165.8 A	59726 VA
M = MOTOR					HIGH PHASE:	149 A	17815 VA
P = POWER							
R = RECEPTACLE							
W = WATER HEATER							

AS-BUILT PANEL DIRECTORY NOTE:

BRANCH CIRCUIT LOCATIONS NOTED WITH "(E)" INDICATE EXISTING CIRCUIT(S). THE IDENTITIES OF THESE CIRCUITS ARE BASED ON EXISTING PANEL DIRECTORIES AND/OR LIMITED AS-BUILT INFORMATION. CONTRACTOR SHALL FIELD VERIFY EACH BRANCH CIRCUIT AND PROVIDE COMPLETE, TYPED AS-BUILT PANEL DIRECTORIES AS REQUIRED THAT DISTINGUISH EACH CIRCUIT PER NEC, OR CEC WHERE ADOPTED, ART 408.1 AND 408.4. COMPLETED DIRECTORIES SHALL BE SUBMITTED TO THE ELECTRICAL INSPECTOR PRIOR TO FINAL ELECTRICAL INSPECTION. INCLUDE ALL COSTS IN BID.

EXISTING CIRCUIT BREAKER NOTE:

PROVIDE BREAKER INTERLOCK WITH ADJACENT BREAKER(S) FOR ANY MULTI-WIRE BRANCH CIRCUIT. BREAKER INTERLOCK GROUPING SHALL BE BY BRANCH CIRCUIT GROUP (i.e. MULTIPLE CIRCUITS SHARING A COMMON NEUTRAL (NEC, OR CEC WHERE ADOPTED, 210.4(B),) COMMON YOKE (NEC, OR CEC WHERE ADOPTED, 210.7.) OR FURNITURE SYSTEM NEC OR CEC WHERE ADOPTED, 605.6 AND 605.5.). WHERE AN EXISTING PANEL IS BEING ALTERED OR MODIFIED IN ANY WAY, CONTRACTOR SHALL INCLUDE ALL COSTS IN BASE BID TO ADD BREAKER INTERLOCKS TO EXISTING MULTI-WIRE BRANCH CIRCUITS BASED ON CONTRACTOR'S INVESTIGATION OF EXISTING CONDITIONS.

GENERAL PANEL SCHEDULE NOTES:

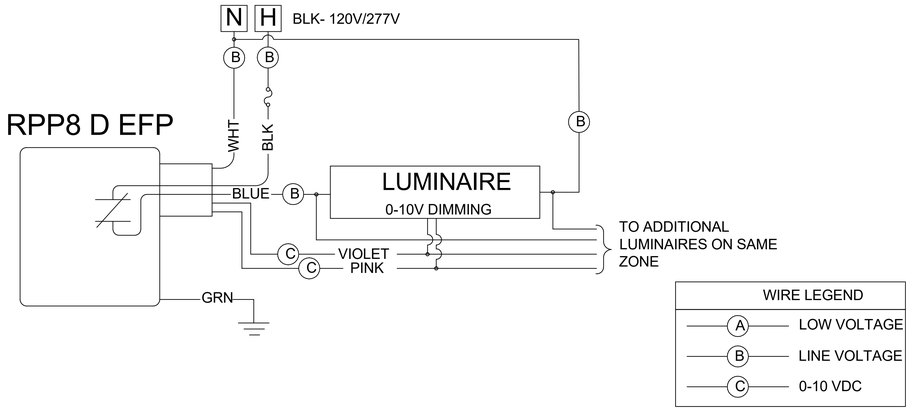
1. WHERE PANEL IS INDICATED TO INCLUDE FEED THRU LUGS, PROVIDE FEED THROUGH LUGS AT THE OPPOSITE END OF THE PANELBOARD FROM THE PANELBOARD MAIN LUGS.

2. WHERE PANEL IS INDICATED TO INCLUDE DOUBLE LUGS, PROVIDE A DOUBLE LUG KIT AT THE SAME END OF THE PANELBOARD AS THE PANELBOARD MAIN LUGS.

3. WHERE PANEL IS INDICATED TO INCLUDE 200% NEUTRAL, PROVIDE PANELBOARDS UL LISTED AS HAVING NEUTRAL BUSSES RATED TO CARRY 200 PERCENT OF THE CURRENT CARRYING CAPACITY OF THE PHASE BUSSING. OTHERWISE, NEUTRAL BUSSING TO BE FULL SIZE AND RECTANGULAR.

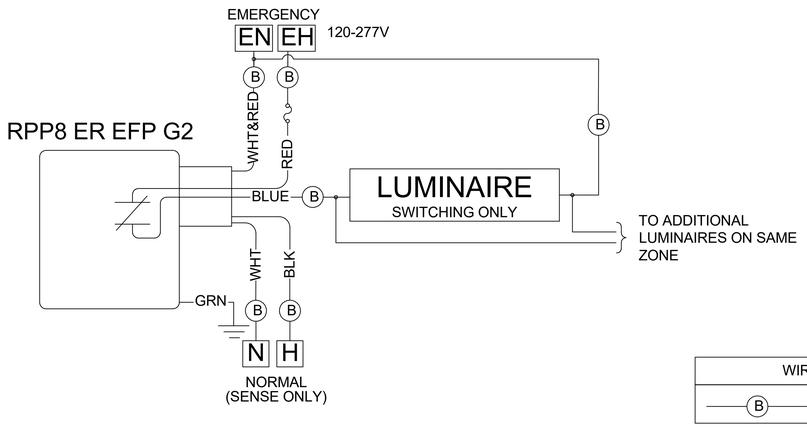
4. WHERE PANEL IS INDICATED TO INCLUDE AN I/G BUS, PROVIDE PANELBOARDS WITH AN ISOLATED GROUND BUS, DRILLED AND TAPPED FOR NUMBER OF ISOLATED GROUND CONDUCTORS SHOWN, AS WELL AS FOR ALL SPARES AND SPACES SHOWN ON THE PANELBOARD.

5. WHERE PANEL CIRCUIT BREAKER RATING IS SHOWN AS SERIES RATED, PROVIDE CIRCUIT BREAKERS IN PANELBOARD WHICH ARE SERIES RATED WITH THE UPSTREAM SYSTEM FOR THE AVAILABLE FAULT C



TYPICAL WIRING DIAGRAM: RPP8 D EFP

N.T.S.

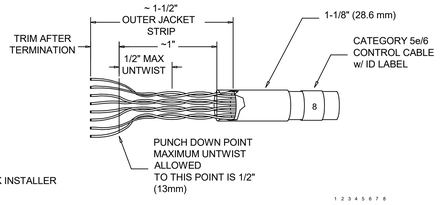


TYPICAL WIRING DIAGRAM: RPP8 ER EFP G2

N.T.S.

TIA / EIA-568-B CABLING STANDARD TERMINATION

Function	PAIR #	PIN OUT (T568B)	Wire Color
(T1)	1	5	WHITE w/ BLUE
(R1)		4	BLUE
Tx + (T2)	2	1	WHITE w/ ORANGE
Tx - (R2)		2	ORANGE
Rx + (T3)	3	3	WHITE w/ GREEN
Rx - (R3)		6	GREEN
(T4)	4	7	WHITE w/ BROWN
(R4)		8	BROWN

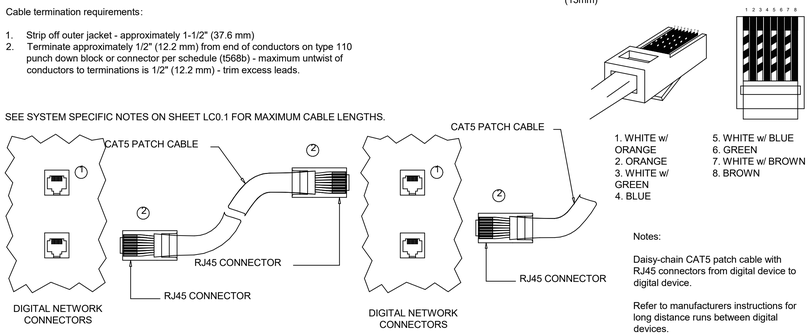


TERMINATION & TESTING OF CAT5 CABLES MUST BE DONE BY A QUALIFIED NETWORK INSTALLER

Cable termination requirements:

1. Strip off outer jacket - approximately 1-1/2" (37.6 mm)
2. Terminate approximately 1/2" (12.2 mm) from end of conductors on type 110 punch down block or connector per schedule (t568b) - maximum untwist of conductors to terminations is 1/2" (12.2 mm) - trim excess leads.

SEE SYSTEM SPECIFIC NOTES ON SHEET LC0.1 FOR MAXIMUM CABLE LENGTHS.



1. WHITE w/ ORANGE
2. ORANGE
3. WHITE w/ GREEN
4. BLUE
5. WHITE w/ BLUE
6. GREEN
7. WHITE w/ BROWN
8. BROWN

Notes:

Daisy-chain CAT5 patch cable with RJ45 connectors from digital device to digital device.

Refer to manufacturers instructions for long distance runs between digital devices.

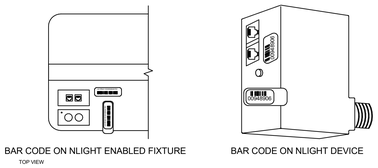
Crimp and test each cable with a LAN circuit tester prior to installation.

RJ45 FEMALE CONNECTOR

RJ45 MALE CONNECTORS. ALL CABLES SUPPLIED BY CONTRACTOR.

CAT5E/6 CABLE TERMINATION

N.T.S.



BAR CODE ON NLIGHT ENABLED FIXTURE

BAR CODE ON NLIGHT DEVICE

NOTES:

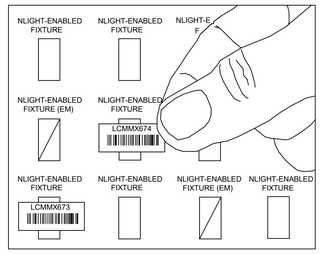
EVERY NLIGHT ENABLED DEVICE (INCLUDING NLIGHT EANABLED FIXTURES) IS FURNISHED WITH (1) PERMANENTLY ADHERED ID TAG AND (1) MATCHING, PARTIALLY ADHERED ID TAG TO BE PLACED ON THE RISER DIAGRAM SHEET PROVIDED AS PART OF AN NLIGHT SUBMITTAL DURING INSTALLATION AND PRIOR TO FACTORY STARTUP. CONTRACTOR SHALL PLACE EACH ID TAG BELOW EACH CORRESPONDING DEVICE SHOWN ON RISER DIAGRAM TO FACILITATE FACTORY STARTUP. FAILURE TO COMPLY MAY RESULT IN STARTUP DELAYS AND ADDITIONAL COSTS AT THE CONTRACTOR'S EXPENSE. DO NOT PLACE DEVICE ID STICKERS ON FLOOR PLAN UNLESS REQUIRED TO EXECUTE NFLOORPLAN SERVICES. REFERENCE NFLOORPLAN SERVICE NOTES ON THIS SHEET FOR SPECIFIC REQUIREMENTS.

THE SMALL BARCODE LABELS INCLUDED WITH ALL NLIGHT DEVICES AND NLIGHT ENABLED FIXTURES MUST BE PLACED ON A PRINTED PLAN BY THE INSTALLER PRIOR TO ONSITE SYSTEM STARTUP.

THE BARCODE INDICATES THE UNIQUE ID OF EACH NLIGHT DEVICE. THIS ID IS USED DURING SYSTEM STARTUP TO PROGRAM DEVICES WITH THE CORRECT GROUPINGS AND SETTINGS. WITHOUT THIS, SYSTEM STARTUP WILL REQUIRE ADDITIONAL DAYS ON THE JOB TO LOCATE DEVICE IDS.

BARCODE INSTRUCTIONS:

1. PRINT A PLAN OF THE INSTALLATION AREA TO A MINIMUM D SIZE (24X36). THE PLAN MAY BE A REFLECTED CEILING PLAN, LIGHTING PLAN, OR ELECTRICAL PLAN, SO LONG AS ALL DEVICES CAN BE LOCATED BY THE FIELD SUPPORT ENGINEER.
2. PLACE THE SMALL BARCODE LABEL (0.875 LONG) FROM EACH LUMINAIRE AND DEVICE ON THE FLOORPLAN. THE LARGE BARCODE LABEL (1.25 LONG) CAN BE USED ON THE OUTSIDE OF ANY HOUSING OR JUNCTION BOX THAT OBSCURES THE ID NUMBER SHOWN ON THE DEVICE ITSELF.
3. SAVE THE PLAN AT THE JOB SITE, AND HAND OVER TO ACUITY FIELD SUPPORT ENGINEER OR OTHER PERSONNEL RESPONSIBLE FOR ONSITE SYSTEM STARTUP. IT IS ALSO ACCEPTABLE TO PROVIDE THE BARCODE PLAN AS SCANNED PDF FILES, EMAILED TO YOUR LOCAL LIGHTING AGENCY. IF YOU DO NOT KNOW YOUR LOCAL LIGHTING AGENCY, PLEASE REACH OUT TO TECH SUPPORT AT 1 (800) 535-2465, OPTION 1 FOR NLIGHT. THEY WILL BE ABLE TO IDENTIFY YOUR LOCAL REP.
4. DRAW ON PLAN ANY LOCATION CHANGES FOR A FIXTURE OR DEVICES, IF DIFFERENT THAN SHOWN ON PLAN.



NLIGHT BARCODE INSTRUCTIONS

N.T.S.

OVERALL BILL OF MATERIAL

PRODUCT LEGEND
BACKBONE, LC1.0(E2.13

- rCP 9 — RCMS PDT 9 G2 — Networked nLight AIR occupancy and daylight sensor, Passive Dual Technology, Small Motion / Standard Range 360° Lens, Generation Two
- rCP B 7 — RCMSB PDT 7 G2 — Ceiling Mount Battery Powered Sensor, Passive Dual Technology, Mini-Low Bay 360° Lens, Generation Two
- r$ 2PD — RPODBA 2P DX XX G2 — nLight Preset Wall control, 2-Pole, Raise/Lower Dimming, Generation Two
- r$ D — RPODBA DX XX G2 — nLight Preset Wall control, Raise/Lower Dimming, Generation Two
- rPD8 — RPP8 D EFP G2 SKP — RPP8, Dimming, External Fault Protection, Generation Two, Stocking Program-CA
- rPD8 EM — RPP8 D EM EFP G2 SKP — RPP8, Dimming, Emergency Operation, External Fault Protection, Generation Two, Stocking Program-CA
- $XP — WSXA PDT XX — Wall Switch, Passive Dual Technology

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WSP Job #:US0043159.0992

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SONORA HIGH SCHOOL
SCIENCE CLASSROOMS MODERNIZATION

401 S PALM STREET
LA HABRA, CA 90631

Developed for
FULLERTON JOINT UNION HIGH SCHOOL DISTRICT

Revision	Date

Submittal	Date
SCHEMATIC DESIGN	03/13/2025
50% DESIGN DEVELOPMENT	09/16/2025
100% DESIGN DEVELOPMENT	09/30/2025
50% CD	10/30/2025
DSA SUBMITTAL	11/21/2025
DSA BACK CHECK	01/27/2026

Job Number	32433
Checked By	Checker
Scale	1" = 1'-0"

DISTRIBUTED LIGHTING CONTROLS

E4.04

DISTRIBUTED LIGHTING CONTROLS SYSTEM SPECIFICATIONS (OCCUPANCY / VACANCY SENSORS AND DAYLIGHTING CONTROLS):

1. SEE LIGHTING PLAN DRAWINGS FOR DISTRIBUTED LIGHTING CONTROL SYSTEM (DLCS) SPECIFICS, SPACE SPECIFIC CONFIGURATIONS/REQUIREMENTS, AS WELL AS FIXTURE BALLAST/DRIVER CONFIGURATIONS.

2. ALL PRODUCTS SHALL BE BACKED BY A FIVE YEAR MANUFACTURER'S WARRANTY.

3. ALL PRODUCTS LISTED IN THIS SPECIFICATION ARE BASED UPON PRODUCTS LISTED ON THIS SHEET. THE FEATURES AND CHARACTERISTICS OF THE PRODUCT LITERATURE AND SPECIFICATION SHEETS AVAILABLE ON THE VARIOUS MANUFACTURER'S WEB-SITES ARE INCLUDED IN THE REQUIREMENT OF THESE SPECIFICATIONS. ALL DLCS NETWORKED/NON-NETWORKED SYSTEM-BASED AND STANDALONE COMPONENTS SHALL BE PROVIDED BY A SINGLE MANUFACTURER.

4. DLCS COMPONENTS SHALL BE COMPLIANT WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL ENERGY CODES.

5. ALL NETWORKED AND NON-NETWORKED SYSTEM-BASED DLCS SYSTEMS SHALL BE COMPLIANT WITH AND CERTIFIED TO THE FOLLOWING SECURITY STANDARDS SET FORTH IN THE LATEST PUBLISHED VERSION OF THE DESIGNLIGHTS CONSORTIUM'S "NETWORKED LIGHTING CONTROL SYSTEM TECHNICAL REQUIREMENTS" DOCUMENT (VERSION 4.0 OR LATEST PUBLISHED VERSION):

   - DLCS COMPONENTS: UL2900-1 UL STANDARD FOR SOFTWARE CYBER SECURITY FOR NETWORK-CONNECTABLE PRODUCTS.
   - DLCS DESIGN PROCESS: UL 2900-1 UL STANDARD FOR SOFTWARE CYBER SECURITY FOR NETWORK-CONNECTABLE PRODUCTS AND/OR ISO/IEC 27001 STANDARD FOR INFORMATION SECURITY MANAGEMENT SYSTEMS.
   - DLCS CLOUD SERVICES: ANY ASSOCIATED DLCS CLOUD SERVICES SHALL MEET THE REQUIREMENTS OF ISO/IEC 27017 (WITH 27001) STANDARD FOR CODE OF PRACTICE FOR INFORMATION SECURITY CONTROLS FOR CLOUD SERVICES.

   WHERE THE MANUFACTURER CANNOT DEMONSTRATE COMPLIANCE WITH THE ABOVE REQUIREMENTS, THE DLCS MANUFACTURER SHALL PROVIDE A COMPREHENSIVE PRODUCT-SPECIFIC IT SECURITY STATEMENT FOR REVIEW BY THE OWNER. THE DLCS SHALL NOT BE CONNECTED TO AN OWNER-FURNISHED NETWORK WITHOUT PRIOR WRITTEN PERMISSION BY THE OWNER,

   ADDITIONALLY, WHERE INSTALLED IN THE STATE OF CALIFORNIA, SYSTEM-BASED DLCS SYSTEMS SHALL BE COMPLIANT WITH CA STATE ASSEMBLY BILL NO. 375 CALIFORNIA PRIVACY ACT OF 2018 AND CA STATE SENATE BILL NO 327 INFORMATION PRIVACY FOR CONNECTED DEVICES.

6. WHERE THE DLCS SCHEDULE INDICATES A SPECIFIC "SYSTEM TOPOLOGY" OPTION, PROVIDE ONE OF THE FOLLOWING:

   "NETWORKED" - PROVIDE A SYSTEM-BASED DLCS THAT COMMUNICATES USING A MANUFACTURER-SPECIFIC DLCS NETWORK ALLOWING BI-DIRECTIONAL FLOW OF INFORMATION BETWEEN DEVICES SUCH AS ROOM CONTROLLERS, SENSORS, RELAY PANELS AND NETWORK CONTROLLERS. PROVIDE A DLCS GUI AND RELATED SOFTWARE TO FACILITATE REMOTE DLCS DEVICE PARAMETERS CHANGES, REMOTE CONTROL ANY DLCS ELEMENT OR DEVICE, REMOTE SCHEDULE CHANGES/IMPLEMENTATIONS, AND REMOTE DLCS COMMISSIONING AND TROUBLESHOOTING. A NETWORKED SYSTEM TOPOLOGY SHALL BE CONFIGURED TO RESPOND TO LOCAL UTILITY DEMAND RESPONSE SIGNALS.

   "NON-NETWORKED" - PROVIDE A SYSTEM-BASED DLCS THAT COULD BE MADE TO COMMUNICATE USING A MANUFACTURER-SPECIFIC DLCS NETWORK, BUT FOR THIS PROJECT IS CONFIGURED WITHOUT ANY NETWORK CONNECTIVITY OR NETWORK COMPONENTS, EXCEPT FOR ANY NETWORK COMPONENTS REQUIRED FOR DUAL MODE CONTROL FOR CORRIDORS, WAREHOUSE AISLES ETC. OR WHERE REQUIRED FOR BAS INTEGRATION REQUIRED IN THE DLCS SCHEDULE OR ELSEWHERE IN THE DRAWINGS AND SPECIFICATIONS. IN A "NON-NETWORKED" DLCS, DEMAND RESPONSE CAPABILITY IS NOT REQUIRED.

   "STAND ALONE" - PROVIDE INDIVIDUAL WALL SENSORS/CONTROLS - OPERATING AT 120V OR 277V. GENERALLY, STANDALONE COMPONENT INSTALLATIONS ARE TO BE AVOIDED AND ARE LIMITED TO USE IN SMALL ROOMS WHERE ADVANCED CONTROLS, DIMMING CAPABILITY, DEMAND RESPONSE, DUAL MODE CONTROL AND/OR NETWORK CONNECTIVITY ARE NOT REQUIRED BY APPLICABLE ENERGY CODE AND WHERE ACCEPTABLE TO AN END-USER.

7. WHERE THE DLCS SCHEDULE INDICATES A SPECIFIC "COMMUNICATIONS TOPOLOGY" OPTION, PROVIDE ONE OF THE FOLLOWING:

   PROVIDE WIRING, AS REQUIRED, TO INTERCONNECT DLCS DEVICES. WIRING MAY BE A COMBINATION OF LOW AND LINE VOLTAGE CONDUCTORS BASED ON SPECIFIC MANUFACTURER REQUIREMENTS.

   "WIRELESS" - PROVIDE WIRELESS CONNECTIVITY BETWEEN WALL CONTROLS, WALL, CEILING OR FIXTURE-INTEGRATED SENSORS, ROOM CONTROLLERS, WIRELESS ROUTER(S), AND WIRELESS NETWORK BRIDGES. CONTRACTOR SHALL PROVIDE WIRELESS ROUTERS, QTY AS REQUIRED, TO MAINTAIN ROBUST COMMUNICATIONS WITH ALL WIRELESS DEVICES. ROBUST MEANS THAT A CHANGE OF VALUE FROM OR TO ANY DLCS SYSTEM COMPONENT FROM OR TO AN APPLICABLE WIRELESS ROUTER/BRIDGE OCCURS IN LESS THAN 3 SECONDS.

   "HYBRID" - WHERE A SOLELY WIRELESS DLCS TOPOLOGY IS DEEMED INADEQUATE BASED ON OPERATIONAL OR AESTHETIC REASONS, A WIRELESS TOPOLOGY SHALL BE AUGMENTED WITH WIRED SYSTEM TO FORM A HYBRID COMMUNICATIONS TOPOLOGY. AREAS REQUIRING WIRED CONNECTIVITY SHALL BE OUTLINED ON THE LIGHTING PLANS AND UNLESS OTHERWISE INDICATED, ALL RESTROOMS SHALL BE PROVIDED WITH DUAL TECHNOLOGY OCCUPANCY SENSORS WHICH REQUIRE WIRED CONNECTIVITY AND WIRED POWER SUPPLY. A NETWORKED, SYSTEM-BASED DLCS INSTALLED WITH A HYBRID COMMUNICATIONS TOPOLOGY SHALL APPEAR IN THE USER GUI/SOFTWARE AS A SINGLE UNIFIED SYSTEM. SEPARATE GUI SOFTWARE INTERFACES FOR THE WIRED AND WIRELESS PORTIONS OF THE DLCS ARE UNACCEPTABLE.

9. WHERE THE DLCS SCHEDULE REQUIRES FIXTURE-INTEGRATED SENSORS, PROVIDE OCCUPANCY AND/OR DAYLIGHT SENSORS INTEGRATED WITHIN SPECIFIED FIXTURE TYPE THAT ALSO INTEGRATE INTO THE DLCS. SEE THE LIGHTING FIXTURE SCHEDULE FOR AFFECTED FIXTURE TYPE(S). WHERE INTEGRATED SENSORS DO NOT MEET OCCUPANCY/DAYLIGHT SENSOR COVERAGE REQUIREMENTS, CONTRACTOR SHALL AUGMENT COVERAGE WITH ADDITIONAL CEILING MOUNTED SENSORS AS REQUIRED AND AS A PART OF THE BASE BID.

10. WHERE THE DLCS SCHEDULE REQUIRES THE DLCS TO INTEGRATE WITH THE PROJECT'S BUILDING AUTOMATION SYSTEM (BAS) - SEE THE DLCS START-UP, BUILDING AUTOMATION SYSTEM (BAS) INTEGRATION, COMMISSIONING, & TRAINING PORTION OF THIS SPECIFICATION FOR ADDITIONAL REQUIREMENTS.

11. WHERE THE DLCS SCHEDULE INDICATES "WIRELESS" OR "HYBRID" COMMUNICATIONS TOPOLOGIES AND ALOS ALLOWS WIRELESS DLCS COMPONENT BATTERY USAGE, PROVIDE BATTERIES WITHIN THE WIRELESS DLCS COMPONENTS INDICATED IN LIEU OF LINE OR LOW VOLTAGE POWER SOURCES.

12. DLCS COMPONENTS SHALL BE BE PROVIDED AS FOLLOWS:

    a. STANDALONE: WALL MOUNTED OCCUPANCY SENSORS SHALL BE UL LISTED AND HAVE A MINIMUM LOAD CAPACITY OF 800 WATTS AT 120 VOLTS AND 1200 WATTS AT 277 VOLTS. WALL SENSORS SHALL ALSO BE DECORA STYLE, WITH A LOW-PROFILE APPEARANCE AND A HARD LENS FOR DURABILITY. SENSOR SHALL UTILIZE PASSIVE INFRARED TECHNOLOGY (PIR) AND ULTRASONIC/MICROPHONIC TECHNOLOGY. UNIT SHALL BE RATED FOR 120/277 VOLT WITH NO MINIMUM LOAD, COMPATIBLE WITH ALL THE SPECIFIED BALLASTS, PROVIDED WITH A NEUTRAL CONNECTION (NO LEAKAGE TO GROUND) AND NO LEAKAGE TO LOAD IN THE "OFF" MODE. SENSOR SHALL BE UTILIZED IN SPACES NOT EXCEEDING 150 SQ.FT. SINGLE RELAY SENSORS SHALL BE CONFIGURED WITH THE RELAY IN A "MANUAL ON/ AUTO OFF" SETTING. DUAL RELAY SENSORS SHALL BE CONFIGURED WITH THE FIRST RELAY IN A "AUTOMATIC ON/ AUTOMATIC OFF" SETTING AND THE SECOND RELAY IN A "MANUAL ON/ AUTOMATIC OFF" SETTING. FACTORY STANDARD COLOR TO BE APPROVED BY ARCHITECT.

    b. SYSTEM-BASED (NETWORK OR NON-NETWORK): THE OCCUPANCY SENSOR SYMBOL SHALL REPRESENT A LOW VOLTAGE, WALL MOUNTED OCCUPANCY SENSOR CONNECTED TO A CONTROL UNIT(S) AS REQUIRED. SENSOR SHALL BE DECORA STYLE WITH A LOW-PROFILE APPEARANCE, HAVE ON/OFF/RAISE/LOWER BUTTONS, AND A HARD LENS FOR DURABILITY. FACTORY STANDARD COLOR TO BE APPROVED BY ARCHITECT.

       SYSTEM-BASED (NETWORK OR NON-NETWORK) OR STANDALONE CEILING MOUNTED OCCUPANCY SENSORS SHALL SHALL REPRESENT A LOW VOLTAGE, CEILING-MOUNTED OCCUPANCY SENSOR WITH A LOW-PROFILE APPEARANCE AND SHALL BE CONFIGURED IN ONE OF THE FOLLOWING WAYS AS INDICATED ON THE DRAWINGS:

       - AUTO ON: a/b
       - SWITCHED: AUTO ON a / MANUAL ON b
       - CONTINUOUS DIMMED: AUTO ON 50% a / MANUAL ON 100% a

    c. SENSOR(S) SHALL UTILIZE DUAL TECHNOLOGY (PIR AND ULTRASONIC/MICROPHONIC TECHNOLOGY) WITH 360 DEGREE COVERAGE. IN SPACES WITH DESKTOP ACTIVITIES, THE COVERAGE SHALL BE "HAND MOTION" AND SHALL NOT EXCEED 500 SQ. FT. AT A MAXIMUM CEILING HEIGHT OF 10 FT. IN CORRIDORS, STORAGE ROOMS AND OTHER SPACES WITH NON-DESKTOP ACTIVITIES, COVERAGE SHALL BE "HALF-STEP, WALKING MOTION" AND SHALL NOT EXCEED 1200 SQ. FT. AT A MAXIMUM CEILING HEIGHT OF 10 FT. PIR-ONLY WIRELESS OCCUPANCY SENSORS SHALL NOT BE UTILIZED IN RESTROOMS OR LOCKER ROOMS.

    d. "H" AT THE OCCUPANCY SENSOR INDICATES CONNECTION TO AUXILIARY OUTPUT CONTROL DEVICE FOR CONTROL OF A THIRD PARTY DEVICE VIA LOW-VOLTAGE CONTACT CLOSURES - 1 AMP @ 24V AC/DC. NC/NO RELAYS SHALL BE CONNECTED TO A CONTROLLER TO PERFORM THE AUXILIARY CONTROL REQUIREMENTS INDICATED BY THE DRAWINGS.

    e. OCCUPANCY SENSORS LOCATED WITHIN CORRIDORS, HALLWAYS, STAIRWAYS/WELLS, AISLEWAYS WITHIN WAREHOUSE SPACES, AND IN OTHER AREAS PER PLANS AND/OR SOO SHALL BE CONFIGURED TO CREATE DUAL MODE CONTROL FUNCTIONALITY PER THE SOO/ZONE SCHEDULE. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL DEVICES AND WIRING REQUIRED FOR DUAL MODE OPERATIONS AND ANY PROGRAMMING/CONFIGURATION OF TIME-BASED OPERATING PARAMETERS. COORDINATE WITH OWNER TO DETERMINE BUSINESS HOUR/AFTER BUSINESS HOUR MODES. IF THE PLANS IDENTIFY A NEW OR EXISTING LIGHTING CONTROL PANEL AS THE SOURCE OF DUAL MODE TIMING, E.C. SHALL INCLUDE ALL COSTS TO INSTALL ANY NECESSARY I/O TERMINALS, CARDS, ETC. TO MAKE THE SYSTEM FULLY FUNCTIONAL.

    f. NETWORK SYSTEM-BASED DLCS SYSTEMS SHALL PROVIDE/RESULT IN "LADDERLESS COMMISSIONING" OF DAYLIGHT CONTROLS. AT A MINIMUM, NETWORK ACQUIRED DATA SHALL PROVIDE CT-BASED LIGHTING POWER (WATTS) MEASUREMENTS PER THE COMMISSIONING PORTION OF THESE REQUIREMENTS. PROVIDE NETWORKED CONTROL UNITS/POWER PACKS/INTERFACES AND MISCELLANEOUS EQUIPMENT AS FOLLOWS:

       1) NETWORK SEGMENT MANAGER OR BORDER ROUTER WITH NATIVE BACnet IP - QUANTITY AS REQUIRED BASED UPON A MAXIMUM OF 100 LOCAL ROOM NETWORKS PER SEGMENT AND A MINIMUM OF ONE SEGMENT MANAGER PER FLOOR. THIS EQUIPMENT SHALL BE LOCATED IN THE TYPICAL FLOOR ELECTRICAL ROOM.

       2) NETWORK BRIDGE CONNECTING THE SEGMENT MANAGER TO THE CONTROLLER SUB/LOCAL NETWORK.

       3) ALL CORRIDORS, WAREHOUSE AISLE WAYS, AND STAIRWELLS SHALL BE PROVIDED WITH DUAL MODE CORRIDOR/STAIRWAY CONTROLS TO INCLUDE CEC-LISTED TIME CLOCK(S), ROUTERS, OR SYSTEM GATEWAYS, INTERPOSING RELAYS (WHEN INTERFACING WITH EXISTING CEC-LISTED RELAY PANELS), WIRING, 120V POWER, PROGRAMMING, ETC. NECESSARY FOR A COMPLETE AND FUNCTIONING CONTROL SYSTEM.

       4) INCLUDE ALL COSTS IN BASE BID TO PROVIDE 120V CIRCUIT(S) AND RECEPTACLE(S) NECESSARY TO POWER ALL DEMAND RESPONSE EQUIPMENT.

       5) PROVIDE DATA OUTLET/PATHWAY, DATA CABLING (IF REQUIRED ELSEWHERE BY PROJECT DOCUMENTS), AND CONNECTION TO THE PROJECT'S LOCAL AREA NETWORK.

       6) INCLUDE ALL COSTS IN BASE BID TO PROVIDE 120V CIRCUIT(S) AND RECEPTACLE(S) NECESSARY TO POWER ALL NETWORK SEGMENT MANAGERS, SWITCHES AND ROUTERS.

       7) DEMONSTRATE DLCS RESPONSE TO A SIMULATED DEMAND RESPONSE REQUEST AS PART OF THE LIGHTING COMMISSIONING PROCESS. WHERE MORE THAN ONE WIRING TOPOLOGY AND/OR ZONE IS REQUIRED TO ACCOMPLISH DEMAND RESPONSE - ALL WIRING TOPOLOGIES AND ZONES SHALL BE TESTED ACCORDINGLY. SEE DLCS SOO FOR POWER REDUCTION PERCENTAGES BY ROOM TYPE THAT SHALL BE UTILIZED IN THE SIMULATED DEMAND RESPONSE TESTING.

    g. WHERE INDICATED ON DRAWINGS, PROVIDE DLCS DAYLIGHTING CONTROLS AS FOLLOWS:

       1) AUTOMATIC SWITCHING DAYLIGHTING CONTROLS SHALL BE PROVIDED TO SWITCH SELECTED FIXTURES AND/OR LAMPS OFF AND ON BASED UPON LIGHTING LEVELS PRESENT IN THE CONTROLLED SPACE. THE DAYLIGHTING CONTROLS SHALL BE CONNECTED TO THE CONTROL UNIT. THE SENSOR SHALL UTILIZE AN INTEGRAL PHOTO DIODE TO MEASURE AMBIENT LIGHT LEVELS. CONTROLS SHALL BE FULLY ADJUSTABLE FROM 1 TO 6,500 FOOTCANDLES AND SHALL BE PROVIDED WITH AN ADJUSTABLE TIME DELAY AND ADJUSTABLE DEAD BAND SETTINGS.

       2) AUTOMATIC DIMMING DAYLIGHTING CONTROLS SHALL BE PROVIDED TO CONTINUOUSLY DIM SELECTED FIXTURES/LAMPS UP AND DOWN BASED UPON LIGHTING LEVELS PRESENT IN THE CONTROLLED SPACE. THE SENSOR SHALL UTILIZE AN INTERNAL PHOTO DIODE TO MEASURE AMBIENT LIGHT LEVELS. 0-10 VOLT DIMMING CONTROLS SHALL RANGE FROM 0.2 VOLTS TO 10 VOLTS, WITH AMBIENT LIGHTING SET POINTS FROM 1-6,500 FOOTCANDLES.

       3) AUTOMATIC DAYLIGHTING CONTROLS SHALL BE CONNECTED TO CONTROL UNITS TO PERFORM THE FIXTURE SWITCHING/DIMMING REQUIREMENTS INDICATED BY THE DRAWINGS - CONNECTIONS DIRECTLY TO A BALLAST ARE NOT ALLOWED.

       4) DAYLIGHT SENSOR SHALL PROVIDE CONTROLS FOR UP TO THREE DISTINCT LIGHTING ZONES TO ALLOW SEPARATE CONTROL OF PRIMARY DAYLIT, SECONDARY DAYLIT, AND SKYLIT ZONES.

    h. PROVIDE CONTROL UNITS AND SYSTEM FUNCTIONALITY AS FOLLOWS:

       1) CONTINUOUS DIMMING CONTROLS: SYSTEM-BASED WALL OR CEILING MOUNTED OCCUPANCY SENSORS (CONTINUOUS DIMMED - AUTO ON 50%/MANUAL ON 100%) SHALL BE PROVIDED WITH CONTROL UNITS TO PERFORM THE FUNCTIONALITY AND DIMMING REQUIREMENTS INDICATED BY THE BALLAST AND FIXTURE TYPE. SWITCH LEG INDICATED OUTSIDE THE PARENTHESIS TO BE CONFIGURED AS "AUTO ON 50%/MANUAL ON 100%" FOR CONTINUOUS DIMMED. SWITCH LEGS INSIDE PARENTHESIS INDICATES A MANUAL ACTION REQUIRED TO INCREASE LIGHTING LEVELS ABOVE 50%. CONTROL UNITS WITH INTEGRAL TRANSFORMERS SHALL BE UTILIZED TO PROVIDE POWER TO OCCUPANCY SENSORS AND OTHER CONTROL DEVICES. CONTROL UNITS SHALL BE LOCATED WITHIN JUNCTION BOXES AND NOT EXPOSED IN THE CEILING SPACE. CONTROL UNIT SHALL BE 120/277 VOLT RATED WITH NO MINIMUM LOAD, COMPATIBLE WITH ALL THE SPECIFIED BALLASTS PROVIDED WITH A NEUTRAL CONNECTION (NO LEAKAGE TO GROUND) AND NO LEAKAGE TO LOAD IN THE "OFF" MODE. ADDITIONAL RELAY ZONES MAY BE REQUIRED FOR THE ADDITION OF PRIMARY DAYLIT, SECONDARY DAYLIT, AND PRIMARY SKYLIT UTILIZING THE SAME CONTROL CHANNEL. (I.E. EVEN THOUGH A SINGLE LETTER "a" IS INDICATED AT THE PRIMARY SENSOR), ADDITIONAL RELAYS WOULD BE REQUIRED FOR THE "a+" (PRIMARY SIDELIT DAYLIT ZONE), "a++" (SECONDARY SIDELIT DAYLIT ZONE), AND "a*" (SKYLIT DAYLIT ZONE). WHERE MORE THAN ONE CIRCUIT/THREE SWITCH LEGS/THREE RELAY ZONES ARE REQUIRED, PROVIDE ADDITIONAL FULL FEATURE CONTROL UNITS AS REQUIRED.

       2) WHERE ADDITIONAL 120/ 277 VOLT DEVICES, RECEPTACLES, OR BRANCH CIRCUITS ARE BEING CONTROLLED BY THE ROOM CONTROLLER, AN ADDITIONAL CONTROL UNIT SHALL BE PROVIDED AS REQUIRED.

       3) THE OCCUPANCY SENSOR CONTROLLED RECEPTACLE BRANCH CIRCUIT RELAY, CONNECTED TO THE SPACE'S DISTRIBUTED LIGHTING CONTROL SYSTEM, SHALL CONTROL OCCUPANCY SENSOR RELAY. SHALL TURN ON WHEN THE ROOM IS OCCUPIED, REGARDLESS OF THE CONFIGURATION OF THE LIGHTING CONTROL STATE - I.E. AUTO ON/MANUAL ON. SEE THE DISTRIBUTED LIGHTING CONTROL SPECIFICATION FOR MORE INFORMATION. EVEN THOUGH A SINGLE SYMBOL IS INDICATED, MULTIPLE RELAYS MAY BE REQUIRED TO CONTROL THE REQUIRED NUMBER OF SWITCHLEGS/CIRCUITS.

       4) LOW VOLTAGE WALL CONTROLS SHALL BE DECORA STYLE, LOW-VOLTAGE, MOMENTARY SWITCHES WITH COLOR TO MATCH OTHER WALL DEVICES/SWITCHES. LOWER CASE LETTERS INDICATE SWITCHING CONFIGURATION. PROVIDE SWITCHING OR DIMMING CONTROL DEVICES AS REQUIRED BY DRAWINGS.

          DIMMING - NUMBER OF SWITCHES AS REQUIRED - 4 ZONES/YOKE MAX. EACH CONTROL ZONE TO HAVE A DEDICATED RAISE AND LOWER BUTTONS. FACTORY STANDARD COLOR BY ARCHITECT. EACH MULTI-ZONE DIMMING CONTROL STATION SHALL BE PROVIDED WITH MASTER ON AND MASTER OFF BUTTON IN ADDITION TO THE INDIVIDUAL CONTROL ZONE BUTTONS.

          WHERE INDICATED, PROVIDE VANDAL RESISTANT, HIGH ABUSE SWITCH CONNECTED TO THE DLCS INPUT/OUTPUT INTERFACE DEVICE FOR ON/ OFF AND DIMMING CONTROLS. SWITCHES LOCATED IN HIGH ABUSE AREAS (EXTERIOR AREAS OR AREAS SUBJECT TO WASH-DOWN ETC.) OR IDENTIFIED ON PLANS AS HIGH-ABUSE SWITCHES SHALL BE VANDAL RESISTANT, STAINLESS STEEL, TOUCH SENSITIVE AND AVAILABLE WITH UP TO TWO BUTTONS IN A SINGLE GANG. EACH HIGH ABUSE SWITCH SHALL BE ABLE TO BE PROGRAMMED FOR ON, OFF, TOGGLE OR MAINTAIN OPERATION. SWITCHES MUST BE CAPABLE OF HANDLING ELECTROSTATIC DISCHARGES OF AT LEAST 30,000 VOLTS (1CMSPARK) WITHOUT ANY INTERRUPTION OR FAILURE IN OPERATION.

          WHERE INDICATED, PROVIDE A LOCKING SINGLE POLE SWITCH CONNECTED TO THE ROOM CONTROLLER VIA A INPUT/OUTPUT INTERFACE DEVICE FOR ON/OFF CONTROLS. DIRECT CONNECTION OF THE KEYED SWITCH ON THE LOAD SIDE OF THE CONTROLLER IS PROHIBITED. PROVIDE AT LEAST THREE (3) KEYS TO OWNER AT CONCLUSION OF PROJECT. ADJACENT SWITCH SHALL ONLY BRING LIGHTS FULL ON. KEYED SWITCH ALLOWS MANUAL OFF FUNCTIONALITY. DIMMER SWITCH ALLOWS AUTO-ON 50% OVERRIDE TO 100% ALL-ON AND SHALL NOT ALLOW LIGHTING LEVELS TO DECREASE IN ANY WAY.

    i. WHEN LIGHTING SYSTEM IS INDICATED WITH A CONNECTION TO A REMOTE EMERGENCY POWER SOURCE (I.E. AN INVERTER OR GENERATOR) PROVIDE UL924 LISTED INTERFACE EQUIPMENT TO ALLOW THE OVERRIDE OF THE LOCAL SWITCHING AND/OR DIMMING CONTROLS DURING A POWER OUTAGE.

    j. WHEN LIGHTING FIXTURES/CONTROLS ARE PROVIDED WITH LUTRON 3-WIRE DIMMING BALLASTS, AN INTERFACE DEVICE SHALL BE PROVIDED TO ALLOW 0-10V CONTROL OF LUTRON 3-WIRE DIMMING BALLASTS. MOUNT INTERFACE IN A NEMA1 ENCLOSURE IN ACCESSIBLE CEILING SPACE ADJACENT TO ITS ASSOCIATED CONTROL UNIT.

    k. WHEN LIGHTING FIXTURES/CONTROLS ARE LINE VOLTAGE DIMMED OR PROVIDED ELECTRONIC LOW-VOLTAGE, MAGNETIC LOW-VOLTAGE, NEON/COLD CATHODE, LUTRON "TU-WIRE" DIMMING BALLASTS, AN INTERFACE DEVICE SHALL BE PROVIDED TO ALLOW LINE VOLTAGE CONTROL. MOUNT INTERFACE IN A NEMA1 ENCLOSURE IN ACCESSIBLE CEILING SPACE ADJACENT TO ITS ASSOCIATED CONTROL UNIT.

    l. WHEN AV SYSTEM INTERFACE IS INDICATED, PROVIDE TWO-WAY CAPABLE RS-232 COMMUNICATIONS INTERFACE TO ALLOW AV CONTROL SYSTEM TO CALL ADDRESSABLE LIGHTING/ROOM SCENES. COMMUNICATIONS INTERFACE SHALL PROVIDE FEEDBACK TO THE AV CONTROL SYSTEM FOR LIGHT LEVEL STATUS.

    m. WHEN MOVEABLE PARTITION INTERFACE IS INDICATED, PROVIDE ALL COMPONENTS, SENSORS, WIRING, POWER SUPPLIES AND PROGRAMMING NECESSARY TO MONITOR AND REPORT MOVEABLE PARTITION(S) OPEN/CLOSED STATUS. DLCS SYSTEM SHALL AUTOMATICALLY ADOPT SINGLE ROOM OR MULTI-ROOM CONTROL PROFILES AS REQUIRED BY PARTITION STATUS.

    n. WHEN NETWORKED LIGHTING CONTROL RELAY PANEL(S) ARE INDICATED, PROVIDE ALL COMPONENTS, WIRING, AND PROGRAMMING NECESSARY TO INTEGRATE RELAY PANELS WITHIN THE DLCS SYSTEM.

13. GENERAL SYSTEM REQUIREMENTS:

    a. ALL EQUIPMENT SHALL FEATURE A PRE-SET DEFAULT OPERATION. UPON INITIAL POWER UP, THE SYSTEM SHALL AUTOMATICALLY IDENTIFY THE DEVICES ON THE LOCAL NETWORK, THEN ENTERS THE PRE-SET CONFIGURATION TO ALLOW BASIC OPERATION OF ALL DEVICES. IN MOST APPLICATIONS THE RELATIONSHIP BETWEEN QUANTITY OF LOADS, SWITCHES AND OCCUPANCY SENSORS WILL NOT REQUIRE ANY ADJUSTMENTS - ALTHOUGH AN ADJUSTMENT TO THE AUTOMATIC SETTINGS SHALL BE INCLUDED IN THE BASE BID.

    b. ALL EQUIPMENT SHALL FEATURE A CONFIGURATION (CONFIG) BUTTON ON MOST DEVICES THAT ALLOWS EASY ACCESS TO THE INTEGRATED AUTO-CONFIGURATION TECHNOLOGY TO MODIFY SYSTEM OPERATION. FUNCTIONALITY OF THE CONFIG BUTTON SHALL BE STANDARDIZED THROUGHOUT THE PRODUCT LINE, AS IS THE OPERATION OF THE CONFIG LED INDICATORS.

    c. NETWORK DLCS SYSTEM CONTROL/CONFIGURATION SOFTWARE SHALL BE PRE-CONFIGURED TO THE MAXIMUM EXTENT POSSIBLE OFF-SITE AT THE DLCS FACTORY OR ENGINEERING FACILITY. THE CONTRACTOR SHALL DOCUMENT EVERY NETWORK COMPONENT'S LOCATION (ROOM AND / OR NUMBER) AND ITS' RESPECTIVE SERIAL NUMBER OR OTHER DEVICE IDENTIFIER ON A FULL SIZE FLOOR PLAN IN PDF FORMAT. HANDWRITTEN DOCUMENTATION IS UNACCEPTABLE. THE PREFERRED ACCEPTABLE METHOD OF NETWORK COMPONENT DOCUMENTATION IS COLLECTION OF FACTORY-PROVIDED, SELF-ADHESIVE, BAR-CODE IDENTIFIERS DESIGNED TO BE REMOVED FROM NETWORK COMPONENTS AS THEY ARE INSTALLED IN THE FIELD. BAR CODES IDENTIFIERS SHALL BE APPLIED TO A PAPER COPY OF A FLOOR PLAN WHICH SHALL BE PROVIDED TO THE FACTORY FOR USE IN OFF-SITE DLCS NETWORK PROGRAMMING AND CONFIGURATION. THE RESULTS OF EITHER METHOD SHALL BE SCANNED AND SUBMITTED AS A PART OF THE PROJECT CLOSEOUT DOCUMENTATION.

    d. NETWORK SYSTEMS SHALL BE INSTALLED BY VENDOR-CERTIFIED CONTRACTOR FIELD PERSONNEL TO PERFORM NETWORK INSTALLATIONS INCLUDING ACCURATE, REPEATABLE COMMUNICATIONS CABLING TERMINATIONS (BOTH LAN AND MS/TP TYPE). INCLUDE CERTIFICATES FOR EACH CERTIFIED INSTALLER TO BE UTILIZED ON THE PROJECT AS A PART OF THE PROJECT SUBMITTALS. A CERTIFIED FIELD INSTALLER SHALL BE ON-SITE SUPERVISING COMMUNICATIONS CABLING AND CABLING TERMINATIONS AT ALL TIMES WHEN THIS WORK IS OCCURRING ON THE PROJECT.

    e. ANY BATTERY-POWERED DLCS COMPONENTS SHALL BE PROVIDED WITH A 10 YEAR EXPECTED BATTERY LIFE. EACH COMPONENT SHALL BE PROVIDED WITH BOTH A LOCAL LOW BATTERY INDICATION ON EACH DEVICE AND A SOFTWARE-BASED LOW BATTERY ALARM. WHERE A WIRELESS DLCS SYSTEM COMPONENT IS AVAILABLE EITHER AS A BATTERY POWERED DEVICE OR A LINE/LOW VOLTAGE POWERED DEVICE, PROVIDE THE LINE/LOW VOLTAGE VERSION ALONG WITH ANY LINE OR LOW VOLTAGE WIRING, CONDUIT AND BACK BOXES TO LIMIT THE NUMBER OF BATTERIES WITHIN THE DLCS INSTALLATION TO A MINIMUM.

14. INSTALLATION OF CONTROL UNITS, OCCUPANCY/VACANCY SENSORS AND DAYLIGHTING CONTROLS:

    a. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND AIM SENSORS IN THE CORRECT LOCATION REQUIRED FOR COMPLETE AND PROPER VOLUMETRIC COVERAGE PER THE MANUFACTURER'S RECOMMENDATIONS. ROOMS SHALL HAVE NINETY (90) TO ONE HUNDRED (100) PERCENT COVERAGE AND SHALL ACCOMMODATE ALL HABITS OF SINGLE OR MULTIPLE OCCUPANTS PRESENT IN THE CONTROLLED SPACE. THE LOCATIONS AND QUANTITIES OF SENSORS SHOWN ON THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE ONLY THE ROOMS THAT ARE TO BE PROVIDED WITH SENSORS. THE CONTRACTOR SHALL PROVIDE ADDITIONAL SENSORS AS REQUIRED TO PROPERLY AND COMPLETELY COVER THE SPACES. WHERE PIR-ONLY WIRELESS CEILING OR FIXTURE-INTEGRAL OCCUPANCY SENSORS ARE UTILIZED, PROVIDE QUANTITY AS REQUIRED TO MAINTAIN THE SAME COVERAGE AND SAME MOVEMENT DETECTION SENSITIVITY AS PROVIDED BY WIRED DUAL TECHNOLOGY SENSORS. ADDITIONALLY, IT MAY BE NECESSARY FOR THE CONTRACTOR TO MAKE ADJUSTMENTS, CHANGE THE LOCATION OR TYPE OF SENSOR TO OBTAIN PROPER OPERATION IN A SPECIFIC ROOM. THE USE OF FACTORY-SUPPLIED INTERNAL MASKING (PIR) SHALL BE PROVIDED/INSTALLED AS REQUIRED TO LIMIT DETECTION TO WITHIN THE CONTROLLED SPACE ONLY. IN THE EVENT MASKING IS NOT AVAILABLE AS A FACTORY-SUPPLIED ITEM, ALTERNATE FACTORY-SUPPLIED MEANS OF COMPLIANCE OR METHODS MAY BE ACCEPTABLE. THE CONTRACTOR SHALL HAVE FINAL RESPONSIBILITY FOR PROPER OPERATION OF THE SYSTEM IN EACH ROOM AND SHOULD THEREFORE MAKE LABOR ALLOWANCES FOR CHANGES AND ADJUSTMENTS.

    b. CEILING MOUNTED SENSORS SHOULD BE LOCATED IN THE SPACE TO BE COVERED, A MINIMUM OF 4', PREFERABLY 5', AWAY FROM THE LATCH SIDE OF THE DOOR, 2' TO 3' AWAY FROM THE WALL AND 3' TO 4' FROM AN AIR SUPPLY REGISTER. DO NOT MOUNT SENSORS OVER A DOORWAY OR BEHIND A FULL HEIGHT DOOR. SENSORS SHALL BE AIMED IN THE DIRECTION OF THE SPACE TO BE COVERED. DO NOT AIM SENSORS TOWARD A DOORWAY. THE USE OF FACTORY SUPPLIED INTERNAL MASKING (PIR) SHALL BE PROVIDED/INSTALLED AS REQUIRED TO LIMIT DETECTION TO WITHIN THE CONTROLLED SPACE ONLY.

    c. ALL SENSORS SHALL BE ADJUSTED PER THE DLCS SOO/ZONE SCHEDULE. WHERE A ROOM TYPE IS NOT INDICATED ON THE DLCS SOO, ADJUST FOR FOR A TIME DELAY OF TWENTY (20) MINUTES.

    d. EACH DAYLIGHTING CONTROL SYSTEM/ZONE SHALL BE INSTALLED/ADJUSTED AS FOLLOWS:

       1) AUTOMATIC SWITCHING/DIMMING CONTROL PLACEMENT: IT IS IMPORTANT TO SELECT A LOCATION IN THE DAYLIGHTING

AREA TYPE	OCC SENSOR					INTERIOR DAYLIGHT SENSOR			EXTERIOR PHOTOCELL		ASTRONOMICAL TIME CLOCK CONTROLS			LOCAL CONTROL			SYSTEM		NOTES	REMARKS
ALL VALUES ARE BASED ON CALIFORNIA TITLE 24 2022 LIGHTING CONTROLFOR NON-RESIDENTIAL BUILDINGS	AUTO ON WHEN OCCUPANCY IS DETECTED (PERCENTAGE OF NOMINAL FC)	MANUAL ON (WHEN SWITCH / BITTON IS PRESSED)	PRIMARY OCCUPANCY SENSOR ZONE REDUCED OUTPUT OR OFF	REDUCED OUTPUT OR OFF DURING NORMAL HOURS	REDUCED OUTPUT OR OFF AFTER NORMAL HOURS	AUTO OFF AT TARGET FC FIXTURES DIM TO OFF	AUTO DIM AT TARGET FC FIXTURES REMAIN AT LOWEST LEVEL	TARGET ILLUMINATION LEVEL NOMINAL FOOTCANDLE & METER HEIGHT	EXTERIOR PHOTOCELL ON	EXTERIOR PHOTOCELL OFF	BEGIN NORMAL OPERATING HOURS (ASTRONOMICAL TIME CLOCK TURN ON)	END NORMAL OPERATING HOURS (ASTRONOMICAL TIME CLOCK TURN OFF)	AFTER NORMAL HOURS OVERRIDE CANNOT EXCEED 2 HOURS PER §130.1(b)3.B	ON / OFF	ON / OFF / TARGET / LOWER / DIMMING	SCENE SELECTOR (1) SCENE ESTN. LTG ONLY*, NO DECON*IVE (1) SCENE ALL OFF OR "CLOSED"	PLUG LOAD CONTROL MUST BE CAPABLE OF TURNING OFF IN RESPONSE TO DEMAND RESPONSE SIGNAL	LIGHTING REDUCTION FOR SYSTEMS WITH DEMAND RESPONSE REFER TO TITLE 24 DOCUMENTATION TO CONFIRM IF REQ'D	PROGRAMMING NOTES PLEASE SEE BELOW	PLEASE REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION. O = INDICATES OPTIONAL COMPLIANCE, NOT REQ'D. ● = INDICATES REQUIRED COMPLIANCE ALL LIGHTING WITHIN DAYLIGHTING ZONES SHALL BE COMMISSIONED AT NIGHT, WITH NO DAYLIGHT CONTRIBUTION, IN ORDER TO ESTABLISH BASELINE ILLUMINATION LEVELS. "NORMAL HOURS" REFERS TO OWNER-DETERMINED OPERATING HOURS. "AFTER HOURS" REFERS TO ANY TIME PERIOD BEFORE OR AFTER OWNER-DETERMINED OPERATING HOURS. WHERE EXTERIOR PHOTOCELL CONTROL IS INDICATED, PLEASE PROVIDE EXTERIOR NORTH FACING DAYLIGHT SENSOR.
CLASSROOM	ON AT 70%	ON AT 100%	OFF AFTER 5 MIN.	-	-	-	●	40-50 FC +30" AFF	-	-	-	-	-	-	●	○	-	●	A,B,D	CONFIRM SWITCH TYPE PREFERENCE WITH OWNER. PROVIDE SCENE SELECTOR SWITCH IF MORE THAN ONE LIGHTING PRESET IS REQUIRED (E.G. "AV MODE").
CLASSROOM > 0.7 W PER SQ FT	ON AT 70%	ON AT 100%	OFF AFTER 5 MIN.	-	-	-	●	35 FC +30" AFF	-	-	-	-	-	-	●	○	-	●	A,B,D	CONFIRM SWITCH TYPE PREFERENCE WITH OWNER PRIOR TO RELEASE OF ORDER. MULTI-ZONE LIGHTING SCENARIO WILL REQUIRE SCENE SELECTOR. PROVIDE SCENE SELECTOR SWITCH IF MORE THAN ONE LIGHTING PRESET IS REQUIRED (E.G. "AV MODE"). PROVIDE SEPARATE CONTROL ZONE FOR LIGHTING ADJACENT TO PROJECTION SCREENS OR TV MONITORS.
CLASSROOM LABORATORY	ON AT 70%	ON AT 100%	OFF AFTER 5 MIN.	-	-	-	●	50 FC +36" AFF	-	-	-	-	-	-	●	-	●	●	A,B,D	
CLOSET	ON AT 100%	ON AT 100%	OFF AFTER 5 MIN.	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	§130.1(b) EXCEPTION 1 - AN AREA ENCLOSED BY CEILING HEIGHT PARTITIONS THAT HAS ONLY ONE LUMINAIRE WITH NO MORE THAN TWO LAMP DOES NOT REQUIRE MULTI-LEVEL CONTROLS.
CONFERENCE ROOM / MEETING / HUDDLE ROOM	ON AT 70%	ON AT 100%	OFF AFTER 5 MIN.	-	-	-	●	40-50 FC +0" AFF	-	-	-	-	-	-	●	○	●	●	A,C,D,F	
CORRIDOR	ON AT 100%	-	-	DIM 50% AFTER 5 MIN.	OFF AFTER 5 MIN.	-	●	5-10 FC +0" AFF	-	-	06:00	18:00	●	-	●	-	-	●	A,B,C,J,M	§130.1(a)1 EXCEPTION 1 - MANUAL CONTROL MAY BE LOCATED IN A SEPARATE, SECURED LOCATION. PROVIDE DUAL MODE CONTROL PER DLCS SPECIFICATIONS.
EXTERIOR LIGHTING, TIMECLOCK / PHOTOCELL CONTROL																				
EXTERIOR LIGHTING >24 FT TALLER THAN 24 FT	-	-	-	-	-	-	-	-	●	-	PERIOD 1: ON 100% AT DUSK - PERIOD 2: DIM 80% AT 24:00	OFF AT DAWN	●	-	-	-	-	-	J, L, M	§130.2(c) LIGHTS SHALL BE OFF DURING DAYTIME; LIGHTS SHALL BE AUTOMATICALL CONTROLLED BY TIME-BASED SCHEDULING CONTROLS. §130.2(c)2B - AUTOMATIC SCHEDULING CONTROLS SHALL ALLOW SCHEDULING OF MIN. OF TWO NIGHTTIME PERIODS WITH INDEPENDENT LIGHTING LEVELS.... OCCUPANCY SENSOR NOT REQUIRED
EXTERIOR LIGHTING ≤24 FT & >40W 24 FT OR SHORTER 40W OR MORE	ON AT 100%	ON AT 100%	PERIOD 1: 50% 10 MIN. PERIOD 2: 40% 10 MIN.	-	-	-	-	-	●	-	PERIOD 1: ON 100% AT DUSK - PERIOD 2: DIM 40% AT 24:00	OFF AT DAWN	●	-	-	-	-	-	BJ, M	§130.2(c) LIGHTS SHALL BE OFF DURING DAYTIME; LIGHTS SHALL BE AUTOMATICALL CONTROLLED BY TIME-BASED SCHEDULING CONTROLS. §130.2(c)2B - AUTOMATIC SCHEDULING CONTROLS SHALL ALLOW SCHEDULING OF MIN. OF TWO NIGHTTIME PERIODS WITH INDEPENDENT LIGHTING LEVELS.... §130.2(c)3DI - FACADE, ORNAMENTAL HARDSCAPE, OUTDOOR DINING AND SALES FRONTAGE LIGHTING ARE EXEMPT FROM MOTION SENSOR REQUIREMENT. OCCUPANCY SENSOR REQUIRED; LIGHTING SHALL REMAIN ON FROM DUSK UNTIL DAWN, REDUCED OUTPUT BETWEEN 40% AND 80% WHEN VACANT OR AFTER LOCAL CURFEW, IF REQUIRED. NO MORE THAN 1,500W OF LIGHTING CONTROLLED TOGETHER.
EXTERIOR LIGHTING ≥24 FT & <40W 24 FT OR SHORTER 40W OR LESS	-	-	-	-	-	-	-	-	●	●	PERIOD 1: ON 100% AT DUSK - PERIOD 2: DIM 50% AT 24:00	OFF AT DAWN	●	-	-	-	-	-	J,L,M	§130.2(c) LIGHTS SHALL BE OFF DURING DAYTIME; LIGHTS SHALL BE AUTOMATICALL CONTROLLED BY TIME-BASED SCHEDULING CONTROLS. §130.2(c)2B - AUTOMATIC SCHEDULING CONTROLS SHALL ALLOW SCHEDULING OF MIN. OF TWO NIGHTTIME PERIODS WITH INDEPENDENT LIGHTING LEVELS.... §130.2(c)3 - LUMINAIRES WITH A MAXIMUM RATED WATTAGE OF 40W EACH ARE NOT REQUIRED TO HAVE MOTION SENSING CONTROLS.

PROGRAMMING NOTES

NOTES:	A. PROVIDE DAYLIGHTING CONTROL FOR PRIMARY AND SECONDARY DAYLIT OR SKYLIT ZONES WERE REQUIRED. DAYLIGHTING IS NOT NECESSARY WHEN AREAS DO NOT INCLUDE SKYLIGHTS OR GLAZING < 24 SQ FT OR SKYLIT+PRIMARY SIDELIT ZONE IS LESS THAN 120W. LUMINAIRES IN OR AT LEAST 50% WITHIN DAYLIGHTING ZONES MUST BE CONTROLLED.
	B. CONTROLLED BY OCCUPANCY SENSOR: AUTO AND / OR MANUAL ON UNLESS OVERRIDDEN BY DAYLIGHTING SENSORS.
	C. MANUAL CONTROL WALL STATIONS FOR THESE AREAS SHALL BE LOCATED IN THE NEAREST BACK OF HOUSE CLOSET, CONTROL BOOTH, ELECTRICAL ROOM, ETC. TO PREVENT UNAUTHORIZED USERS FROM ADJUSTING LIGHTING LEVELS.
	D. CONFIGURE LIGHTING CONTROL TO PROVIDE PROPORTIONATE RAISE / LOWER OF ALL ROOM LIGHTING TOGETHER, REGARDLESS OF LOCATION IN DAYLIGHTING AND NON-DAYLIGHTING ZONES WHERE THEY OCCUR.
	E. PROVIDE RS-232 OR ETHERNET CONNECTION TO AV SYSTEM TO ALLOW RECALL OF LIGHTING PRESETS BY AV SYSTEM WITHIN THIS ROOM, IF REQUESTED BY OWNER.
	F. PROVIDE CONTROLLED RECEPTACLES IN THIS ROOM AS REQUIRED. CONTROLLED RECEPTACLE MUST BE WITHIN 6'-0" OF UNCONTROLLED RECEPTACLE.
	G. PROVIDE AUTOMATIC TRANSFER RELAY, BRANCH CIRCUIT ELTS OR OTHER APPROVED METHOD WITH FACP INPUT TO FORCE LIGHTS ON TO FULL DURING LOSS OF NORMAL POWER OR DURING A FIRE ALARM EVENT. UNLESS SPECIFIED WITH A MANUAL EMERGENCY CONDITION RELEASE, LIGHTING SHALL RESTORE TO NORMAL OPERATION WHEN POWER IS RESTORED OR ALARM CONDITION IS CLEARED.
	H. LIGHTING IN THIS SPACE MAY BE CONTROLLED FROM A STAGE LIGHTING SYSTEM. THE STAGE LIGHTING SYSTEM SHALL BE PROVIDED WITH A TITLE 24 COMPLIANT LIGHTING CONTROL PROCESSOR AND COMPATIBLE OCCUPANCY AND DAYLIGHT SENSORS AS REQUIRED FOR COMPLIANCE.
	I. NOT USED
	J. CONFIRM OPERATING HOURS WITH OWNER PRIOR TO FINAL PROGRAMMING.
	K. REQUIRES CONNECTION TO BUILDING AUTOMATION SYSTEM (BAS) WHEN SUCH SYSTEM IS PRESENT.
	L. FIXTURES WITHOUT OCCUPANCY SENSORS SHALL HAVE LOW END TRIM ADJUSTED TO MAINTAIN MINIMUM ILLUMINATION LEVELS.
	M. LIGHTING CONTROL SYSTEM SHALL HAVE ASTRONOMICAL TIME CLOCK AND DUAL MODE CAPABILITY FOR "AFTER HOURS" CONTROL OF LIGHTING.
	N. PERFORMANCE SPACE, NO DAYLIGHTING REQUIRED. TARGET ILLUMINATION LISTED ONLY FOR REFERENCE IN THIS COLUMN.

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Revision	Date

Submittal	Date
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Scale	

SEQUENCE OF OPERATIONS

E4.06

LIGHTING FIXTURE SCHEDULE NOTES:

A. GENERAL NOTES:

1. THE LIGHTING FIXTURES, LAMPS, BALLASTS, POWER SUPPLIES, DRIVERS AND TRANSFORMERS FOR THIS PROJECT HAVE BEEN SPECIFIED TO ENSURE THAT SPECIFIC AESTHETIC AND PERFORMANCE REQUIREMENTS WILL BE SATISFIED. THESE PRODUCTS HAVE BEEN CAREFULLY RESEARCHED AND EACH SPECIFIED ITEM HAS UNIQUE QUALITIES WHICH WERE DETERMINED TO BE ESSENTIAL IN SATISFYING THE OWNER'S, ARCHITECT'S, ENGINEER'S AND LIGHTING CONSULTANT'S DESIGN CRITERIA.

2. CONTRACTOR SHALL PROVIDE ALL MATERIALS AS DETAILED ON DRAWINGS AND/OR SCHEDULES, AND LABOR AS REQUIRED TO ACHIEVE A COMPLETE AND OPERATING LIGHTING SYSTEM.

3. CONTRACTOR SHALL NOTIFY THE ELECTRICAL ENGINEER AND/OR LIGHTING CONSULTANT OF ANY PROVISIONS OF THE SPECIFICATION THAT IS IN CONFLICT WITH LOCALLY ENFORCED CODES.

4. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT OF ANY REQUIRED MODIFICATIONS THAT ARE NOT SHOWN ON THE DRAWINGS.

5. ALL ELECTRICAL MATERIAL SHALL BE IN NEW & UNDAMAGED CONDITION WHEN INSTALLED. ALL EQUIPMENT SHALL BE LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY.

6. ALL DIMENSIONS & MEASUREMENTS FOUND ON PLANS ARE APPROXIMATE. CONTRACTOR SHALL VALIDATE ALL DIMENSIONS PRIOR TO ORDERING MATERIAL TO INCLUDE MAKING FIELD MEASUREMENTS BASED ON ACTUAL SITE CONDITIONS TO DEVELOP COMPLETE ORDERS AND INSTALL SYSTEMS PER DRAWINGS AND SPECIFICATIONS.

7. REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION AND ELEVATION OF ALL LIGHTING FIXTURES AND ASSOCIATED DEVICES AND EQUIPMENT.

8. PRIOR TO AIMING/ADJUSTING ACTIVITIES, COMMISSIONING OR PUNCHWALK COMMENCEMENT, CONTRACTOR SHALL PROPERLY TEST AND VERIFY ALL CIRCUITRY AND CONTROL WIRING AND IMPLEMENT ALL CONTROLS PROGRAMMING.

B. INSTALLATION:

1. LOCATIONS OF THE FIXTURES SHALL BE PER THE ARCHITECTURAL REFLECTED CEILING PLAN(S) AND SHALL BE COORDINATED AT TIME OF ROUGH IN. CONFLICTS BETWEEN THE ARCHITECTURAL REFLECTED CEILING PLAN(S) AND THE ELECTRICAL/LIGHTING DESIGN PLAN(S) SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT IN WRITING PRIOR TO ORDERING FIXTURES.

2. LIGHTING DRAWINGS REPRESENT THE DESIGN INTENT OF THE EQUIPMENT, DEVICES, ETC. TO BE CONNECTED AND THE CIRCUITS TO WHICH THEY ARE TO BE CONNECTED. CONTRACTOR SHALL INSTALL ALL CONDUIT, J-BOXES AND ADDITIONAL HARDWARE AND DEVICES AS REQUIRED FOR A COMPLETE AND OPERATING SYSTEM.

3. ALL LIGHTING FIXTURES SHALL BE MOUNTED AND INDIVIDUALLY SUPPORTED IN ACCORDANCE WITH APPLICABLE CODES. FIXTURES SHALL BE FURNISHED AND INSTALLED WITH ALL REQUIRED MOUNTING DEVICES, HARDWARE AND ACCESSORIES.

4. CONTRACTOR TO VERIFY LIGHTING FIXTURE MOUNTING HARDWARE IS COMPATIBLE WITH APPROVED MOUNTING CONDITIONS. MOUNTING CONDITIONS MUST ALLOW FOR AIMING AND ADJUSTING OF LIGHTING FIXTURES ON SITE.

5. CONTRACTOR TO INCLUDE AIMING/ADJUSTING LABOR AFTER DARK AS REQUIRED FOR ANY ADJUSTABLE LIGHTING FIXTURE AND FOR EACH INDIVIDUAL LIGHTING FIXTURE HEAD OR LAMP HOLDER IN A MULTI-FIXTURE/MULTI-LAMP ASSEMBLY. LIGHTING FIXTURES TO BE AIMED/ADJUSTED PER THE DIRECTION OF OWNER, ARCHITECT AND/OR LIGHTING CONSULTANT.

6. CONTRACTOR TO SUPPLY ADEQUATE SUPPORT INCLUDING LADDERS, LIFTS OR OTHER EQUIPMENT REQUIRED TO ACCESS LIGHTING FIXTURES AT THE TIME OF FOCUS, INCLUDING EVENING OR NIGHT WORK AS MAY BE REQUIRED DUE TO SCHEDULE CONFLICT OR DAYLIGHT IMPACT. AIMING/ADJUSTING LABOR SHALL BE PREPARED FOR WORK WITH COMMON HAND TOOLS TO MAKE ADJUSTMENTS AND MINOR REPAIRS DURING AIMING.

7. ALL COVE MOUNTED LIGHTING FIXTURES SHALL EXTEND THE FULL LENGTH OF THE COVE. CONTRACTOR TO FIELD MEASURE COVE LENGTH AND ORDER QUANTITY OF LIGHTING FIXTURES AS REQUIRED. PROVIDE COMPLETE MANUFACTURER SHOP DRAWINGS OF BUILT-IN COVE OR LINEAR LIGHTING SYSTEMS.

8. CONTRACTOR TO REPLACE ALL INOPERATIVE LAMPS, LED ARRAYS OR SYSTEMS AT THE END OF THE CONSTRUCTION PHASE PRIOR TO THE FOCUS AND PROGRAMMING PHASE AND AGAIN PRIOR TO OWNER OCCUPANCY OR PROJECT OPENING.

9. ALL POLE MOUNTED FIXTURES, POST MOUNTED FIXTURES AND BOLLARDS SHALL BE PROVIDED WITH A STRUCTURAL FOOTING AS DETAILED ELSEWHERE IN THE DRAWINGS. FOOTING SIZE TO BE PROVIDED BY STRUCTURAL ENGINEER. REFERENCE FIXTURE SCHEDULE AND DETAILS FOR MORE INFORMATION.

10. ALL EXIT SIGNS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE LOCAL FIRE PREVENTION CODE AUTHORITY. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY HARDWARE SUCH THAT ALL EXIT SIGNS ARE INSTALLED IN AN APPROVED VISIBLE LOCATION. THE CONTRACTOR SHALL VERIFY CHEVRONS AND NUMBER OF FACES PER EXIT SIGN WITH ARCHITECTURAL REFLECTED CEILING PLAN(S). ANY DISCREPANCIES BETWEEN EXIT SIGNS DEPICTED ON ARCHITECTURAL AND ELECTRICAL PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO ORDERING EXIT SIGNS.

C. SUBMITTALS AND SUBSTITUTIONS:

1. CONTRACTOR TO SUBMIT FOR APPROVAL ON THE PRODUCTS THEY INTEND TO FURNISH WITHIN TEN (10) DAYS OF AWARD OF CONTRACT. FAILURE TO SUBMIT WITHIN DEADLINE CONSTITUTES A GUARANTEE THAT ONLY THE BASE SPECIFIED PRODUCTS WILL BE SUPPLIED AND THAT NO OTHER PRODUCTS, WHETHER LISTED AS ALTERNATES OR NOT, WILL BE CONSIDERED.

2. CONTRACTOR TO PROVIDE A SUBMITTAL/SHOP DRAWING SUBMITTAL FOR EACH LIGHTING FIXTURE TYPE INCLUDING ACCESSORIES, BALLAST(S), POWER SUPPLIES, DRIVER(S) TRANSFORMER(S), AND INTEGRAL EMERGENCY BATTERIES AND TEST SWITCHES. ANY LIGHTING FIXTURE SUBMITTAL PROVIDED WITHOUT SPECIFIC LIGHTING FIXTURE'S ACCESSORIES, BALLAST, POWER SUPPLY, DRIVER, TRANSFORMER OR BATTERY INFORMATION SHALL BE REJECTED AS INCOMPLETE.

3. SUBSTITUTIONS OF THE SPECIFIED PRODUCTS ARE STRICTLY PROHIBITED - UNLESS APPROVED AS STATED HEREIN. LIGHTING FIXTURE SUBSTITUTIONS SHALL BE FORMALLY PRESENTED TO THE ELECTRICAL ENGINEER AND/OR LIGHTING CONSULTANT, BY APPOINTMENT ONLY, AT LEAST TEN (10) WORKING DAYS PRIOR TO BID TIME. THE SUBMITTAL MATERIAL SHALL INCLUDE THE FOLLOWING ITEMS.

   a. A COMPLETE AND OPERATING SAMPLE, WIRED FOR 120V OPERATION, WITH LAMP, CORD AND PLUG .

   b. A COMPLETE PHOTOMETRIC REPORT, FOR THE PROPOSED SUBSTITUTE PRODUCT, USING THE SPECIFIED LAMP OR LED TYPE AND WATTAGE, INCLUDING TABULATED CANDLEPOWER VALUES, COEFFICIENT OF UTILIZATION, AND AN ISO-FOOT-CANDLE DIAGRAM. PRORATED DATA WILL NOT BE ACCEPTABLE. THE PHOTOMETRIC REPORT MUST BE DONE IN ACCORDANCE WITH PUBLISHED I.E.S. TESTING PROCEDURES AND CERTIFIED BY A REGISTERED ELECTRICAL ENGINEER.

   c. A CURRENT ORIGINAL CATALOG DATA SHEET WITH LIGHTING FIXTURE CATALOG NUMBERS. MODIFIED DATA SHEETS WILL NOT BE ACCEPTABLE.

   d. A SIGNED COPY OF THE "SUBSTITUTION COMPLIANCE FORM", LOCATED IN THE DIVISION 1 SPECIFICATION, STATING THAT IF THE PROPOSED SUBSTITUTION IS ACCEPTED, THE PROJECT SCHEDULE WILL NOT BE NEGATIVELY AFFECTED. IF THE COMPLETION OF THE PROJECT IS DELAYED BECAUSE OF THE APPROVED SUBSTITUTION, THE CONTRACTOR WILL BE RESPONSIBLE FOR PAYMENT OF ANY ESTABLISHED LIQUIDATED DAMAGES.

   e. FOR SPECIFIC INTERIOR FIXTURE SUBSTITUTIONS, WHEN DIRECTED BY THE ELECTRICAL ENGINEER AND/OR LIGHTING CONSULTANT, A POINT-BY-POINT SCALED COMPUTER PRINTOUT SHALL BE PROVIDED VERIFYING THE ILLUMINATION LEVELS FOR THE SPECIFIC INTERIOR AREA. IF THE SUBSTITUTED FIXTURE IS AN EMERGENCY FIXTURE, THE REPORT SHALL BE RUN IN BOTH NORMAL AND EMERGENCY MODES. THIS REPORT SHALL BE CONFIGURED WITH SPECIFIC CONSTRAINTS, AS DIRECTED BY THE ENGINEER OF RECORD. THE REPORT MUST SHOW THAT THE SUBSTITUTED FIXTURE PROVIDES PERFORMANCE EQUAL TO OR BETTER THAN THE LIGHTING LEVELS OF THE SPECIFIED PRODUCT.

   f. FOR ALL EXTERIOR FIXTURE SUBSTITUTIONS, A POINT-BY-POINT SCALED COMPUTER PRINTOUT SHALL BE PROVIDED VERIFYING THE ILLUMINATION LEVELS FOR THE ENTIRE SITE PLAN BASED ON USING THE PROPOSED ALTERNATIVE FIXTURES. THE REPORT MUST SHOW THAT THE SUBSTITUTED FIXTURE PROVIDES PERFORMANCE EQUAL TO, OR BETTER THAN THE LIGHTING LEVELS AND UNIFORMITY RATIOS (MAX:MIN AND AVG:MIN) OF THE SPECIFIED PRODUCT. THIS REPORT SHALL BE CONFIGURED WITH THE FOLLOWING CONSTRAINTS.

      i. THE SPACING INCREMENT OR POINTS ON THE VERIFICATION REPORT SHALL NOT EXCEED TEN (10) FEET IN EITHER DIRECTION.

      ii. THE PHOTOMETRIC CALCULATION SHALL BE BASED ON PROVIDING MAINTAINED FOOT-CANDLE LEVELS USING MEAN LAMP LUMENS AND A LIGHT LOSS FACTOR, AS DIRECTED BY THE ENGINEER OF RECORD.

      iii. THE PHOTOMETRIC CALCULATION SHALL SHOW ANY ADDITIONAL ENERGY AND/OR ENERGY COSTS, FOR A TEN YEAR PERIOD, AS COMPARED TO THE ORIGINALLY SPECIFIED ITEM. THE TOTAL COSTS FOR THESE EXPENSES WILL BE DEDUCTED FROM THE CONTRACT COST.

4. DURING THE BIDDING PROCESS, THE CONTRACTOR SHALL REFER TO THE LIGHTING FIXTURE SCHEDULES ON THE ARCHITECTURAL PLANS (IF PROVIDED ON PROJECT), LIGHTING DESIGN PLANS/SPECIFICATIONS (IF PROVIDED ON PROJECT), AND THE ELECTRICAL PLANS. ANY DISCREPANCIES BETWEEN THEM INCLUDING, BUT NOT LIMITED TO, PART NUMBERS AND FIXTURE DESCRIPTIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT, ELECTRICAL ENGINEER, AND LIGHTING DESIGNER WITH PRE-BID RFI(S). WHERE DISCREPANCIES ARE DISCOVERED WHEN THERE IS INSUFFICIENT TIME TO ISSUE PRE-BID RFI(S), THE BASE BID SHALL INCORPORATE THE MOST COSTLY VERSION OF THE DISCREPANCY AND SHALL BE MEMORIALIZED IN AN RFI OR AS A BID CLARIFICATION. PROVIDING A VOLUNTARY DEDUCTIVE ALTERNATE BID CLARIFYING FIXTURE SCHEDULE DISCREPANCIES IS ALSO AN ACCEPTABLE FORM OF DISCREPANCY DOCUMENTATION.

5. FIXTURE FINISHES:

   a. ALL FIXTURE FINISHES AND COLORS, UNLESS NOTED AS PREMIUM OR CUSTOM, SHALL BE SELECTED FROM THE MANUFACTURERS STANDARD COLOR OPTIONS AS LISTED ON THE FIXTURE SPECIFICATION SHEET. STANDARD FINISH SHALL BE SELECTED BY THE ARCHITECT, INTERIOR DESIGNER OR OWNER. THIS DIRECTION WILL BE PROVIDED IN THE SHOP DRAWING REVIEW PROCESS.

   b. ALL FIXTURES INDICATED WITH A PREMIUM OR CUSTOM COLOR SHALL BE ASSIGNED A CUSTOM COLOR REFERENCE NUMBER (SUCH AS RAL#) OR PROVIDE FIVE (5) PAINT CHIPS FOR MANUFACTURER TO USE TO MATCH COLOR. PREMIUM OR CUSTOM FINISH SHALL BE SELECTED BY THE ARCHITECT, INTERIOR DESIGNER OR OWNER. THIS DIRECTION WILL BE PROVIDED IN THE SHOP DRAWING REVIEW PROCESS.

6. THE LIGHTING FIXTURE MODEL NUMBER MAY INDICATE A FIXTURE OPTION THAT THE CONTRACTOR MUST IDENTIFY PRIOR TO ORDERING/PROVIDING SUBMITTALS, INCLUDING, BUT NOT LIMITED TO: VOLTAGE, MOUNTING CONDITION/HARDWARE, FINISH, DIMMING REQUIREMENTS/BALLAST INFORMATION. GENERALLY, CONTRACTOR-SELECTED OPTIONS ARE DENOTED IN THE PART NUMBER WITH BRACKETS EX: [VOLTS?]

   a. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND PROVIDING ALL HANGERS, CLIPS AND NECESSARY HARDWARE TO INSTALL THE FIXTURE IN THE ENVIRONMENT AS SHOWN ON THE ARCHITECTURAL PLANS. ALL FIXTURES SHALL BE PROVIDED WITH ALL REQUIRED STRUCTURAL SUPPORTS AS REQUIRED BY THE CURRENTLY ADOPTED CODES.

   b. VOLTAGES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO ORDERING - SEE ELECTRICAL DRAWINGS FOR BRANCH CIRCUIT INFORMATION. IT IS POSSIBLE THAT FIXTURES WILL BE REQUIRED IN VARIOUS VOLTAGES.

7. "NO KNOWN EQUAL" LIGHTING FIXTURE PRICING/BIDDING NOTES:

   a. EACH FIXTURE IDENTIFIED AS "NO KNOWN EQUAL" ON THIS PROJECT SHALL BE BID IN A "LINE ITEM" FORMAT. A PER UNIT MATERIAL COST SHALL BE PROVIDED FOR EACH "NO KNOWN EQUAL" FIXTURE. THIS PRICE SHALL INCLUDE LAMPS AS WELL AS ALL OTHER REQUIRED MATERIALS REQUIRED FOR INSTALLATION. THE FIXTURE PRICE QUOTED WILL BE UTILIZED, PRIOR TO SHOP DRAWING APPROVAL, FOR "ADDING" AND/OR "DELETING" ANY QUANTITY OF THE FIXTURE.

   b. A UNIT COST SHALL BE SUBMITTED FOR EACH "NO KNOWN EQUAL" FIXTURE. SUBMIT THE PRICING AS PART OF THE BID FORM ON A SEPARATE 8 1/2" X 11" SHEET.

   c. FAILURE TO SUBMIT A LINE ITEM FOR EACH "NO KNOWN EQUAL" FIXTURE MAY RESULT IN THE REJECTION, REFUSAL, OR NON-ACCEPTANCE OF THE CONTRACTOR'S BID.

8. FIXTURES IDENTIFIED AS "NO KNOWN EQUAL - OWNER STANDARD" OR "CAMPUS STANDARD" ARE TO BE PROVIDED AS SPECIFIED, WITH SUBSTITUTIONS STRICTLY PROHIBITED. SEE ADDITIONAL NOTES FOR "NO KNOW EQUAL" BIDDING REQUIREMENTS.

D. LIGHTING FIXTURE SPECIFICATIONS:

1. ALL EXTERIOR LIGHTING EQUIPMENT SHALL BE RATED FOR WET LOCATION AND THE IP RATING OF ALL EQUIPMENT, INCLUDING BALLAST, POWER SUPPLY AND TRANSFORMER ENCLOSURES SHALL CONFORM TO THE CONDITIONS IN WHICH THE LIGHTING FIXTURE IS MOUNTED.

2. ALL BALLASTS, POWER SUPPLIES, DRIVERS AND/OR TRANSFORMERS THAT ARE REMOTELY LOCATED SHALL BE INSTALLED AS NEAR TO THE LIGHTING FIXTURE(S) AS POSSIBLE, HIDDEN FROM PUBLIC VIEW IN AN ACCESSIBLE COMPARTMENT THAT IS WELL VENTILATED. CONTRACTOR TO COORDINATE LOCATION(S) WITH ARCHITECT PRIOR TO ROUGH-IN.

3. ALL TRANSFORMERS SHALL BE FUSED ON THE SECONDARY SIDE.

4. COLOR FILTERS SHALL BE GLASS OR DICHROIC UNLESS OTHERWISE INDICATED ON DRAWINGS.

5. CONTRACTOR TO PROVIDE 20% ADDITIONAL COLOR FILTERS FOR EACH COLOR AND SIZE.

6. CONTRACTOR TO VERIFY THAT ALL LIGHTING FIXTURES SPECIFIED WITH A COLOR FILTER ARE SUPPLIED WITH ANY AND ALL ATTACHMENT DEVICES FOR THE FILTER.

7. ALL TRACK LIGHTING FIXTURES SHALL BE PROVIDED WITH THE APPROPRIATE TRACK SYSTEM WHICH SHALL INCLUDE ALL MISCELLANEOUS COMPONENTS REQUIRED, AS WELL A ANY REQUIRED CIRCUIT LIMITERS FOR A COMPLETE INSTALLATION. TRACK LENGTH(S) SHALL BE PER DRAWINGS.

E. DRIVERS / TRANSFORMERS:

1. [OPTION?] IN FIXTURE MODEL NUMBER INDICATE THAT THE FIXTURE DRIVER TYPE AND QUANTITY MUST BE VERIFIED BY THE CONTRACTOR USING FIXTURE CALLOUT INFORMATION AND FIXTURE SWITCHING CONFIGURATION INFORMATION.

2. CONTINUOUS DIMMING AND CONTROLLABLE LED:

   a. PROVIDE CONTROLLABLE LED DIMMING DRIVERS (INTEGRAL OR REMOTE) WITH POWER FACTOR GREATER THAN 0.85 AND MAXIMUM THD OF 20% AT FULL LOAD.

   b. PRIOR TO BID CONTRACTOR TO VERIFY DRIVER COMPATIBILITY WITH DIMMERS, DIMMING CONTROL SYSTEM(S) AND DISTRIBUTED LIGHTING CONTROL SYSTEM(S) WITH RESPECTIVE LIGHTING MANUFACTURER(S) AND LIGHTING/DIMMING CONTROL SYSTEM MANUFACTURERS. IF COMPATIBILITY DOCUMENTATION IS UNAVAILABLE FOR A GIVEN LED FIXTURE/LIGHTING CONTROL SYSTEM COMBINATION, CONTRACTOR SHALL INCLUDE COSTS IN THE BASE BID FOR RESPECTIVE LIGHTING MANUFACTURER AND LIGHTING CONTROLS MANUFACTURER TO TEST/WARRANT COMPATIBILITY OF SAID COMBINATIONS.

   c. CONTINUOUS LED DIMMING DRIVERS SHALL BE AT MINIMUM 4-WIRE 0-10V 10% DIMMING (HOT, NEUTRAL, DIM+, DIM-).

F. EMERGENCY FIXTURES / BATTERY PACKS:

1. LIGHT FIXTURES INDICATED AS EMERGENCY SHALL BE IDENTIFIED / PROVIDED AS FOLLOWS:
   a. INTEGRAL BATTERY PACK (EB):
      - 3a/3EB - FIXTURE CONNECTED TO CIRCUIT "3", CONTROL SWITCHLEG "a" - WITH THE BATTERY CHARGING LEAD CONNECTED TO A CONSTANT HOT CIRCUIT "3".
      - 3NL/3EB - FIXTURE CONNECTED TO A CONSTANT HOT CIRCUIT "#3". BATTERY CHARGING LEAD CONNECTED TO A CONSTANT HOT CIRCUIT "3".
   b. REMOTE BACK-UP SOURCE (EM):
      - 3a/3EM - ROUTED THROUGH A U.L. LISTED TRANSFER RELAY (LC & D #GR-2001E/S) FOR SWITCHED CONTROLS OR A U.L. LISTED TRANSFER SWITCH (BODINE #GTD SERIES DEVICE) FOR DIMMING CONTROLS. CONNECTED TO A CONSTANT HOT EMERGENCY CIRCUIT "3". SEE DISTRIBUTED LIGHTING CONTROL SPECIFICATIONS FOR DEVICE REQUIREMENTS WHEN CONTROLLED BY OCCUPANCY SENSORS.
      - 3NL/3EM - FIXTURE CONNECTED TO A CONSTANT HOT EMERGENCY CIRCUIT "3".
   c. REMOTE BACK-UP SOURCE (EM)
      NOTES:
      - ALL REMOTE BACK UP SOURCE (EM) FIXTURES SHALL BE PROVIDED WITH AN IN LINE FUSE. PROVIDE ADDITIONAL LABELING TO INDICATE FIXTURE IS PROTECTED BY A FUSE.

EMERGENCY BATTERY PACK
2. NOTES:

   a. PROVIDE INTEGRAL TEST SWITCH / CHARGE LIGHT OPTION FOR ALL EMERGENCY BATTERY PACKS INSTALLED IN LIGHT FIXTURES.

   b. ALL RECESSED DOWNLIGHTS SUPPLIED WITH A BATTERY PACK SHALL BE PROVIDED WITH AN INTEGRAL COMBINATION TEST SWITCH / CHARGING INDICATOR LIGHT- MOUNTED INSIDE THE REFLECTOR. REMOTE TEST SWITCH / CHARGING LIGHTS ARE NOT ALLOWED. THE TEST SWITCH / CHARGING INDICATOR LIGHT SHALL BE SECURELY ATTACHED TO THE REFLECTOR WITH 18" OF SLACK LEADS, FOR EASY REMOVAL OF THE REFLECTOR ASSEMBLY.

   c. ALL BATTERY PACKS AND ALL COMBINATION LED BATTERY PACK/EMERGENCY DRIVERS SHALL BE UL924 LISTED.

   d. PRIOR TO BID, CONTRACTOR SHALL VERIFY WITH FIXTURE MANUFACTURER(S) THAT EMERGENCY BATTERY PACKS ARE MANUFACTURED TO BE INTEGRAL TO FIXTURE HOUSINGS.

   e. SHOULD THE SPECIFIED LED EMERGENCY BATTERY PACK(S) NOT FIT WITHIN A GIVEN FIXTURE(S) OR SHOULD THE FIXTURE NOT BE MANUFACTURED TO ACCOMMODATE A BATTERY PACK, CONTRACTOR SHALL INCLUDE ALL COSTS IN BASE BID TO LOCATE/CONNECT SELF-TESTING MINI INVERTER(S) (IOTA #ILS SERIES OF BODINE#ELI-S-[WATT?]) REMOTELY FROM THE FIXTURE(S) IN THE NEAREST ELECTRICAL ROOM OR TO LOCATE EMERGENCY BATTERY PACK(S) REMOTELY FROM THE FIXTURE ABOVE THE NEAREST ACCESSIBLE CEILING.

   f. LED BATTERY PACKS SHALL PROVIDE A MINIMUM OF 90 MINUTES OF EMERGENCY ILLUMINATION, AND SHALL BE RATED AT A MINIMUM OF 10 WATTS, OR AS SPECIFIED. WHERE A FIXTURE TYPE IS UNAVAILABLE WITH A 10W BATTERY PACK OR WHERE THE WATTAGE IS NOT SPECIFIED ON THE PLANS, INCLUDE ALL COST IN BASE BID TO PROVIDE THE HIGHEST WATTAGE AVAILABLE ON THE FIXTURE CUTSHEET. ANY LISTED EQUAL FIXTURE OR ANY SUBSTITUTION OFFERED BY THE CONTRACTOR MUST ALSO HAVE BATTERY PACKS CAPABLE OF PRODUCING THE SAME OR MORE LUMENS WHEN ON BATTERY AS OUTLINED ABOVE. ACCEPTABLE MANUFACTURES: BODINE OR IOTA.

   g. TO MAINTAIN UL LISTING OF LED FIXTURE, FIXTURE MANUFACTURER(S) SHALL INSTALL LED EMERGENCY BATTERY PACKS AT THE FACTORY AND OBTAIN A UL LISTING FOR THE FIXTURE WITH EMERGENCY BATTERY PACK. FIELD-INSTALLATION OF LED EMERGENCY BATTERY PACK(S) IS PROHIBITED.

   h. PROVIDE DAMP LOCATION VERSION IN ALL DAMP LABEL INSTALLATIONS.

LIGHTING FIXTURE SCHEDULE

SYMBOL	TYPE	MANUFACTURER AND MODEL NUMBER	FIXTURE VA/ WATTS	LAMP/ LAMP OPTION	GENERAL DESCRIPTION
	1A	LITHONIA LIGHTING 2BLT4-40L-ADP-GZ10-LP935 - EM BATTERY PACK: EL7L OR APPROVED EQUAL	30.5	LED/3500	RECESSED 2' X 4' LED LUMINAIRE WITH 4200 LUMEN OUTPUT. UNIVERSAL VOLTAGE, 120-277V. 0-10V DIMMING DRIVER. CONTRACTOR SHALL VERIFY FINISH WITH ARCHITECT PRIOR TO ORDERING. CONTRACTOR SHALL VERIFY EXACT DIMMING REQUIREMENTS AND PROVIDE ALL COMPONENTS TO MAKE A COMPLETE AND OPERATIONAL TITLE 24 CODE COMPLIANT LIGHTING CONTROLS SYSTEM. LOCATED IN MDF/IDF ROOM.
	2A	ALPHABET LIGHTING NU4-RD-30LM-35K-8D-NL-TRIM COLOR-UNV-DIM10 - EM BATTERY PACK W/ INT TEST SWITCH: EM7-ITS - OR APPROVED EQUAL	26W	LED/3500K	RECESSED 4" DIAMETER LED ROUND DOWNLIGHT. 120/277V INPUT VOLTAGE. 0-10V DIMMING DRIVER. CONTRACTOR SHALL VERIFY FINISH WITH ARCHITECT PRIOR TO ORDERING. CONTRACTOR SHALL VERIFY EXACT DIMMING REQUIREMENTS AND PROVIDE ALL COMPONENTS TO MAKE A COMPLETE AND OPERATIONAL TITLE 24 COMPLIANT LIGHTING CONTROLS SYSTEM.
	3A	LITHONIA LIGHTING WDGE2-P2-40K-80CRI-T3M-MVOLT - EM BATTERY PACK: E10WH OR APPROVED EQUAL	19W	LED	EXTERIOR WALL PACK.
	4A	LITHONIA LIGHTING DSXF3 LED 6 P4 40K 70CRI WFL MVOLT YKC62 PE WG FINISH OR APPROVED EQUAL	189W	LED	WALL SPOTLIGHT WITH PRECISION OPTIC. 70CRI, 4000K. OUTDOOR RATED.
	X1	LITHONIA LIGHTING EDG-W-1/2-LETTER COLOR-EL OR APPROVED EQUAL	3W	LED	EMERGENCY EXIT SIGN WITH 90MIN BATTERY PACK. - - -

SEE GENERAL LIGHTING FIXTURE SCHEDULE NOTES FOR CRITICAL FIXTURE SPECIFICATION AND ORDERING INFORMATION.

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Project documents describe the design intent of the work and are not a representation of as-built or existing conditions. LPA is not responsible for any discrepancies between the project documents and the existing conditions.

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SONORA HIGH SCHOOL
SCIENCE CLASSROOMS MODERNIZATION

401 S PALM STREET
LA HABRA, CA 90631

Developed for
FULLERTON JOINT UNION HIGH SCHOOL DISTRICT

Revision	Date

Submittal	Date
SCHEMATIC DESIGN	03/13/2025
50% DESIGN DEVELOPMENT	06/16/2025
90% DESIGN DEVELOPMENT	07/07/2025
95% CD	10/30/2025
DSA SUBMITTAL	11/21/2025
DSA BACK CHECK	01/27/2026

Job Number	32433
Checked By	Checker
Scale	NTS

LIGHTING FIXTURE SCHEDULES

E5.01

F. INDOOR LIGHTING FIXTURE SCHEDULE

This table includes all planned permanent and portable lighting other than dwelling unit/ hotel/ motel room lighting. Multifamily dwelling unit and hotel/motel room lighting is documented in Table T. If using Table T to document lighting in multifamily common use areas providing shared provisions for living, eating, cooking or sanitation, those luminaires are not included here.

Designed Wattage: Conditioned Spaces

01	02	03	04	05	06	07	08	09	10	
Name or Item Tag	Complete Luminaire Description	Modular (Track) Fixture	Small Aperture & Color Change[1]	Watts per luminaire[2]	How is Wattage determined	Total Number of Luminaires	Excluded per 140.6(a)3 / 170.2(e)2C	Design Watts	Field Inspector	
									Pass	Fail
1A	1A 2X4 RECESSED	No	NA	30.5	Mfr. Spec	99	No	3,019.5	☐	☐
2A	2A RECESSED DOWNLIGHT	No	NA	26	Mfr. Spec	1	No	26	☐	☐
Total Designed Watts: CONDITIONED SPACES								3,046		

[1]*FOOTNOTE: Design Watts for small aperture and color changing luminaires which qualify per 140.6(a)4B / 170.2(e)2D is adjusted to be 75% /80% of their rated wattage. Table F automatically makes this adjustment, the permit applicant should enter full rated wattage in column 05.*

[2]*Authority Having Jurisdiction may ask for Luminaire cut sheets to confirm wattage used for compliance per 130.0(c) / 160.5(b). Wattage used must be the maximum rated for the luminaire, not the lamp.*

G. MODULAR LIGHTING SYSTEMS

This section does not apply to this project.

H. INDOOR LIGHTING CONTROLS (Not including PAFs)

This table includes lighting controls for conditioned and unconditioned spaces.

Building Level Controls

01	02	03	
		Field Inspector	
Mandatory Demand Response 110.12(c)	Shut-off controls 130.1(c) / 160.5(b)4C	Pass	Fail
Required >= 4,000W subject to multilevel	Whole Building Auto Time Switch	☐	☐

Q. RATED POWER REDUCTION COMPLIANCE FOR ONE-FOR-ONE ALTERATIONS

This section does not apply to this project.

R. 80% LIGHTING POWER FOR ALL ALTERATIONS - CONTROLS EXCEPTIONS

This section does not apply to this project.

S. DAYLIGHT DESIGN POWER ADJUSTMENT FACTOR (PAF)

This section does not apply to this project.

T. DWELLING UNIT LIGHTING

This section does not apply to this project.

U. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selections have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online

Form/Title
NRCI-LTI-E - Must be submitted for all buildings

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Company: WSP USA	Signature Date: 2025-11-13
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: Ray Swartz	Responsible Designer Signature:
Company: WSP Global Inc	Date Signed: 2025-11-13
Address: 15231 Laguna Canyon Road, Suite 100	License: E15610
City/State/Zip: Irvine CA 92618	Phone: 949-751-5800

C. COMPLIANCE RESULTS

If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D. for guidance.

Lighting in conditioned and unconditioned spaces must not be combined for compliance per 140.6(b)1 / 170.2(e)	Allowed Lighting Power per 140.6(b) / 170.2(e) (Watts)						Adjusted Lighting Power per 140.6(a) / 170.2(e) (Watts)				Compliance Results
	01	02	03	04		05		06	07		08	09
	Complete Building 140.6(c)1	Area Category 140.6(c)2 / 170.2(e)4	Area Category Additional 140.6(c)2G / 170.2(e)4Av (+)	Tailored 140.6(c)3 / 170.2(e)4B (+)		**Total Allowed** (Watts)		Total Designed (Watts)	Adjustments PAF Lighting Control Credits 140.6(a)2 / 170.2(e)1B (-)		**Total Adjusted** (Watts) *Includes Adjustments	**05 must be >= 08 140.6 / 170.2(e)**
	(See Table I)	(See Table I)	(See Table J)	(See Table K)				(See Table F)	(See Table P)			
Conditioned		8,068.7	0		=	8,069	≥	3,046	0	=	3046	COMPLIES
Unconditioned					=		≥			=		
Controls Compliance (See Table H for Details)												COMPLIES
Rated Power Reduction Compliance (See Table Q for Details)												

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

I. LIGHTING POWER ALLOWANCE: COMPLETE BUILDING OR AREA CATEGORY METHODS

STORAGE	All Other Space Types	0.4	585	234	No	No
		TOTALS:	9,965	8,068.7	See Tables J, or P for detail	

J. ADDITIONAL ALLOWANCE: AREA CATEGORY METHOD QUALIFYING LIGHTING SYSTEM

This section does not apply to this project.

K. TAILORED METHOD GENERAL LIGHTING POWER ALLOWANCE

This section does not apply to this project.

L. ADDITIONAL LIGHTING ALLOWANCE: TAILORED WALL DISPLAY

This section does not apply to this project.

M. ADDITIONAL LIGHTING ALLOWANCE: TAILORED FLOOR AND TASK LIGHTING

This section does not apply to this project.

N. ADDITIONAL LIGHTING ALLOWANCE: TAILORED DECORATIVE /SPECIAL EFFECTS

This section does not apply to this project.

O. ADDITIONAL LIGHTING ALLOWANCE: TAILORED VERY VALUABLE MERCHANDISE

This section does not apply to this project.

P. POWER ADJUSTMENT: LIGHTING CONTROL CREDIT (POWER ADJUSTMENT FACTOR (PAF))

This section does not apply to this project.

V. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Selections have been made based on information provided in this document. If any selections have been changed by the permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and any with "-A" in the form name must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit: http://www.energy.ca.gov/title24/attcp/providers.html

Form/Title	Systems/Spaces To Be Field Verified
NRCA-LTI-02-A - Must be submitted for occupancy sensors and automatic time switch controls.	Whole Building Time Switch; Conference; Corridors; All Other Rooms;
NRCA-LTI-04-A - Must be submitted for demand responsive lighting controls.	Whole Building Demand Response;

A. GENERAL INFORMATION

01 Project Location (city)	LA HABRA	04 Total Conditioned Floor Area (ft²)	9,965
02 Climate Zone	13	05 Total Unconditioned Floor Area (ft²)	0
03 Occupancy Types Within Project (select all that apply):		06 # of Stories (Habitable Above Grade)	1

● Support Areas ● All Other Occupancies

B. PROJECT SCOPE

This table includes any lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.6 / 170.2(e) or 141.0(b)2 / 180.2(b)4 for alterations.

Scope of Work	Conditioned Spaces		Unconditioned Spaces	
01	02	03	04	05
My Project Consists of (check all that apply):	Calculation Method	Area (ft²)	Calculation Method	Area (ft²)
☐ New Lighting System				
☐ New Lighting System - Parking Garage				
☒ Altered Lighting System	Area Category Method	9965	Area Category Method	0
Total Area of Work (ft²)	9965		0	

H. INDOOR LIGHTING CONTROLS (Not including PAFs)

Area Level Controls

04	05	06	07	08	09	10	11	12	
Area Description	Complete Building or Area Category Primary Function Area	Manual Area Controls 130.1(a) / 160.5(b)4A	Multi-Level Controls 130.1(b) / 160.5(b)4B	Shut-Off Controls 130.1(c) // 160.5(b)4C	Primary/Sky lit Daylighting 130.1(d) / 160.5(b)4D	Secondary Daylighting 130.1(d) / 160.5(b)4D	Interlocked Systems 140.6(a)1/ 170.2(e)2A	Field Inspector	
								Pass	Fail
Conference	All Other Space Types	Readily Accessible	Dimmer	Occupancy Sensor	NA: General Ltg < 120W	NA: General Ltg < 120W	No	☐	☐
Corridors	All Other Space Types	Readily Accessible	Dimmer	Occupancy Sensor	NA: General Ltg < 120W	NA: General Ltg < 120W	No	☐	☐
All Other Rooms	All Other Space Types	Readily Accessible	Dimmer	Occupancy Sensor	NA: General Ltg < 120W	NA: General Ltg < 120W	No	☐	☐
							13		
							Plan Sheet Showing Daylit Zones:		

I. LIGHTING POWER ALLOWANCE: COMPLETE BUILDING OR AREA CATEGORY METHODS

Each area complying using the Complete Building or Area Category Methods per 140.6(b) are included in this table. Column 06 indicates if additional lighting power allowances per 140.6(c) or adjustments per 140.6(a) are being used .

Conditioned Spaces

01	02	03	04	05	06	
Area Description	Complete Building or Area Category Primary Function Area	Allowed Density (W/ft²)	Area (ft²)	Allowed Wattage (Watts)	Additional Allowance / Adjustment	
					Area Category	PAF
CORRIDORS	Corridor	0.4	1,106	442.4	No	No
SCIENTIFIC LABORATORIES	Laboratory Area, Scientific	0.9	7,912	7,120.8	No	No
CONFERENCE	Convention, Conference, Multipurpose and Meeting Center	0.75	362	271.5	No	No

TITLE 24 PROCEDURES FOR TESTING AND ADJUSTING

CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK ASSOCIATED WITH FINAL INSPECTION AND APPLICABLE ACCEPTANCE REQUIREMENT PROCEDURES. INCLUDE ALL COSTS IN THE BASE BID. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, CONSTRUCTION INSPECTION, MEASUREMENTS, MONITORING, FUNCTIONAL TESTING, CALIBRATING, ETC. CONTRACTOR SHALL ASSUME THE ROLE OF "FIELD TECHNICIAN" AND "RESPONSIBLE PERSON" AS DEFINED IN STATE OF CALIFORNIA 2022 BUILDING ENERGY EFFICIENCY STANDARDS NONRESIDENTIAL COMPLIANCE MANUAL SECTIONS 13.1.2.2 AND 13.1.2.3.

LIGHTING CONTROL ACCEPTANCE TESTING AND ADJUSTING PROCEDURES - REFER TO NRCA-LTI-02-A DOCUMENTS.

AUTOMATIC DAYLIGHT CONTROL ACCEPTANCE TESTING AND ADJUSTING PROCEDURES - REFER TO NRCA-LTI-03-A DOCUMENTS.

DEMAND RESPONSE LIGHTING CONTROL ACCEPTANCE TESTING AND ADJUSTING PROCEDURES - REFER TO NRCA-LTI-04-A DOCUMENTS.

INSTITUTIONAL TUNING PAF ACCEPTANCE TESTING AND ADJUSTING PROCEDURES - REFER TO NRCA-LTI-05-A DOCUMENTS.

OUTDOOR LIGHTING CONTROL ACCEPTANCE TESTING AND ADJUSTING PROCEDURES - REFER TO NRCA-LTO-02-A DOCUMENTS.

ALL LIGHTING CONTROLS TESTING AND ADJUSTING DOCUMENTS NOTED ABOVE ARE AVAILABLE FROM THE CALIFORNIA ENERGY COMMISSION WEB SITE AT:
https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency-5

TITLE 24 GENERAL NOTE

CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK ASSOCIATED WITH FINAL INSPECTION AND APPLICABLE ACCEPTANCE REQUIREMENT PROCEDURES. INCLUDE ALL COSTS IN THE BASE BID. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, CONSTRUCTION INSPECTION, MEASUREMENTS, MONITORING, FUNCTIONAL TESTING, CALIBRATING, ETC. CONTRACTOR SHALL ASSUME THE ROLE OF "FIELD TECHNICIAN" AND "RESPONSIBLE PERSON" AS DEFINED IN STATE OF CALIFORNIA 2022 BUILDING ENERGY EFFICIENCY STANDARDS NONRESIDENTIAL COMPLIANCE MANUAL SECTION 14.1.2.

SEE STATE OF CALIFORNIA 2022 BUILDING ENERGY EFFICIENCY STANDARDS SECTIONS 10-103(a)3A AND 10-103(a)3B AND SECTION 130.4 FOR MORE INFORMATION.

SEE STATE OF CALIFORNIA 2022 BUILDING ENERGY EFFICIENCY STANDARDS NONRESIDENTIAL COMPLIANCE MANUAL CHAPTER 14 FOR MORE DETAILED REQUIREMENTS / INFORMATION.

SEE STATE OF CALIFORNIA 2022 BUILDING ENERGY EFFICIENCY STANDARDS RESIDENTIAL COMPLIANCE MANUAL CHAPTER 2 FOR MORE DETAILED REQUIREMENTS / INFORMATION.

PROVIDE COMPLETED INSTALLATION CERTIFICATE(S) AND CERTIFICATE(S) OF ACCEPTANCE AS REQUIRED TO THE SATISFACTION OF THE ENFORCEMENT AGENCY.

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Project Leader - Bill Voller
Electrical Lead - Ronald Dela Cruz
WSP Job #:US0043159.0992

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SONORA HIGH SCHOOL
SCIENCE CLASSROOMS MODERNIZATION

401 S PALM STREET
LA HABRA, CA 90631

Developed for
FULLERTON JOINT UNION HIGH SCHOOL DISTRICT

Revision	Date

Submittal	Date
SCHEMATIC DESIGN	08/15/2025
50% DESIGN DEVELOPMENT	09/12/2025
100% DESIGN DEVELOPMENT	07/01/2025
50% CD	10/30/2025
DSA SUBMITTAL	11/21/2025
DSA BACK CHECK	01/27/2026

Job Number	32433
Checked By	Checker
Scale	

TITLE 24 (INTERIOR)

E5.02

MEP COMPONENT ANCHORAGE NOTE:

ALL MECHANICAL, ELECTRICAL AND PLUMBING COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON THE DSA APPROVED CONSTRUCTION DOCUMENTS. THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 2022 CBC, SECTIONS 1617A.1.18 THROUGH 1617A.1.26 AND ASCE 7-16, CHAPTERS 13, 26 AND 30.

1. ALL PERMANENT EQUIPMENT AND COMPONENTS.
2. TEMPORARY, MOVABLE OR MOBILE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS OR WATER. "PERMANENTLY ATTACHED" SHALL INCLUDE ALL ELECTRICAL CONNECTIONS EXCEPT PLUGS FOR 110/220 VOLT RECEPTACLES HAVING A FLEXIBLE CABLE.
3. TEMPORARY, MOVABLE OR MOBILE EQUIPMENT WHICH IS HEAVIER THAN 400 POUNDS OR HAS A CENTER OF MASS LOCATED 4 FEET OR MORE ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT IS REQUIRED TO BE RESTRAINED IN A MANNER APPROVED BY DSA.

THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE BUT NEED NOT DEMONSTRATE DESIGN COMPLIANCE WITH THE REFERENCES NOTED ABOVE. THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT. FLEXIBLE CONNECTIONS MUST ALLOW MOVEMENT IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTIONS:

A. COMPONENTS WEIGHING LESS THAN 400 POUNDS AND HAVING A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT.

B. COMPONENTS WEIGHING LESS THAN 20 POUNDS, OR IN THE CASE OF DISTRIBUTED SYSTEMS, LESS THAN 5 POUNDS PER FOOT, WHICH ARE SUSPENDED FROM A ROOF OR FLOOR OR HUNG FROM A WALL.

THE ANCHORAGE OF ALL MECHANICAL, ELECTRICAL AND PLUMBING COMPONENTS SHALL BE SUBJECT TO THE APPROVAL OF THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE OR STRUCTURAL ENGINEER DELEGATED RESPONSIBILITY AND ACCEPTANCE BY DSA. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH THE ABOVE REQUIREMENTS.

MEP DISTRIBUTION SYSTEM BRACING NOTE FOR PIPING, DUCTWORK, AND ELECTRICAL CONDUIT:

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7 SECTION 13.3 AS DEFINED IN ASCE 7 SECTIONS 13.6.5, 13.6.6, 13.6.7, AND 13.6.8; AND 2022 CBC, SECTIONS 1617A.1.24, 1617A.1.25 AND 1617A.1.26.

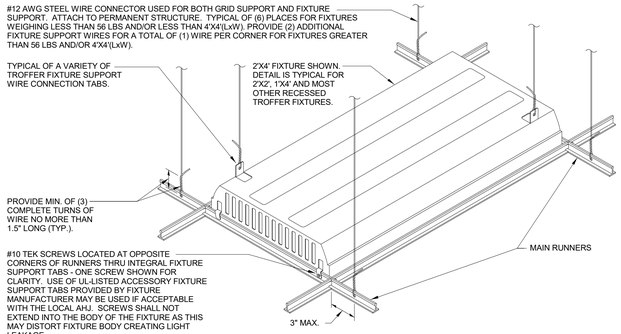
THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEM ARE AS NOTED BELOW AND SHALL BE IN ACCORDANCE WITH DSA IR 16-13. WHEN BRACING AND ATTACHMENTS ARE BASED ON A PREAPPROVED INSTALLATION GUIDE COPIES OF THE BRACING SYSTEM INSTALLATION GUIDE OR MANUAL SHALL BE AVAILABLE ON THE JOBSITE PRIOR TO THE START OF AND DURING THE HANGING AND BRACING OF THE DISTRIBUTION SYSTEMS. THE STRUCTURAL ENGINEER OF RECORD SHALL VERIFY THE ADEQUACY OF THE STRUCTURE TO SUPPORT THE HANGER AND BRACE LOADS.

MECHANICAL PIPING (MP), MECHANICAL DUCTS (MD), PLUMBING PIPING (PP), ELECTRICAL DISTRIBUTION SYSTEMS (E):

MP☐ MD☐ PP☐ E☒ IR 16-13 SECTION 2.1: PROJECT SPECIFIC DESIGN.

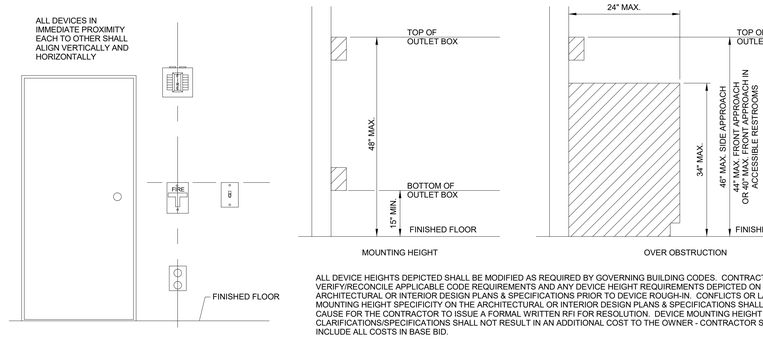
MP☐ MD☐ PP☐ E☐ IR 16-13 SECTION 2.2: DESIGN BASED ON OSHPD OPM, PART OF PROJECT SUBMITTAL.
OPM NUMBERS: _____
SHEET NUMBERS: _____

MP☐ MD☐ PP☐ E☐ IR 16-13 SECTION 2.2.3: DESIGN BASED ON OSHPD OPM, DEFERRED APPROVAL.



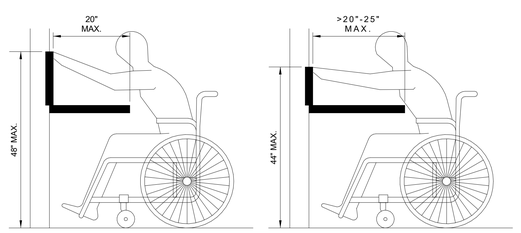
NOTE: SEE 12/A9.21 FOR ADDITIONAL INFORMATION ON FIXTURE SUPPORT.

FIXTURE SUPPORT DETAIL 4
SCALE: NTS

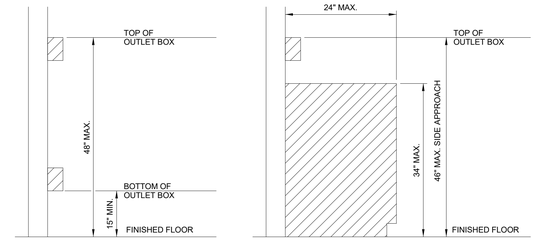


ALL DEVICE HEIGHTS DEPICTED SHALL BE MODIFIED AS REQUIRED BY GOVERNING BUILDING CODES. CONTRACTOR TO VERIFY/RECONCILE APPLICABLE CODE REQUIREMENTS AND ANY DEVICE HEIGHT REQUIREMENTS DEPICTED ON ARCHITECTURAL OR INTERIOR DESIGN PLANS & SPECIFICATIONS PRIOR TO DEVICE ROUGH-IN. CONFLICTS OR LACK OF MOUNTING HEIGHT SPECIFICITY ON THE ARCHITECTURAL OR INTERIOR DESIGN PLANS & SPECIFICATIONS SHALL BE CAUSE FOR THE CONTRACTOR TO ISSUE A FORMAL WRITTEN RFI FOR RESOLUTION. DEVICE MOUNTING HEIGHT CLARIFICATIONS/SPECIFICATIONS SHALL NOT RESULT IN AN ADDITIONAL COST TO THE OWNER - CONTRACTOR SHALL INCLUDE ALL COSTS IN BASE BID.

DEVICE ALIGNMENT & MOUNTING HEIGHT DETAILS 1
SCALE: N.T.S.

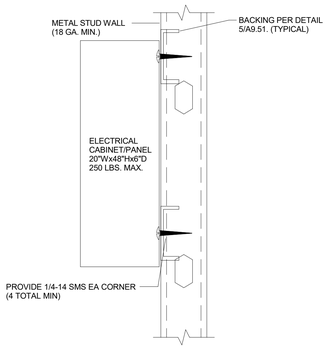


OBSTRUCTED HIGH FORWARD REACH DIAGRAM



ALL DEVICE HEIGHTS DEPICTED SHALL BE MODIFIED AS REQUIRED BY GOVERNING BUILDING CODES. CONTRACTOR TO VERIFY/RECONCILE APPLICABLE CODE REQUIREMENTS AND ANY DEVICE HEIGHT REQUIREMENTS DEPICTED ON ARCHITECTURAL OR INTERIOR DESIGN PLANS & SPECIFICATIONS PRIOR TO DEVICE ROUGH-IN. CONFLICTS OR LACK OF MOUNTING HEIGHT SPECIFICITY ON THE ARCHITECTURAL OR INTERIOR DESIGN PLANS & SPECIFICATIONS SHALL BE CAUSE FOR THE CONTRACTOR TO ISSUE A FORMAL WRITTEN RFI FOR RESOLUTION. DEVICE MOUNTING HEIGHT CLARIFICATIONS/SPECIFICATIONS SHALL NOT RESULT IN AN ADDITIONAL COST TO THE OWNER - CONTRACTOR SHALL INCLUDE ALL COSTS IN BASE BID.

MOUNTING HEIGHT OVER OBSTRUCTION DETAIL 2
SCALE: N.T.S.



SURFACE PANEL MOUNTING 3
SCALE: N.T.S.

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Developed for
FULLERTON JOINT UNION HIGH SCHOOL DISTRICT

Revision	Date

Submittal	Date
SCHEMATIC DESIGN	03/13/2025
50% DESIGN DEVELOPMENT	06/16/2025
90% DESIGN DEVELOPMENT	07/01/2025
95% CD	10/30/2025
DSA SUBMITTAL	11/21/2025
DSA BACK CHECK	01/27/2026

Job Number	32433
Checked By	Checker
Scale	

ELECTRICAL DETAILS

E5.05

FIRE ALARM NOTES

1. WALL MOUNTED, AUDIBLE NOTIFICATION DEVICES SHALL HAVE THEIR TOPS MOUNTED AT 90" MINIMUM AND 100" MAXIMUM ABOVE THE FINISHED FLOOR, AND NO CLOSER THAN 6" TO A HORIZONTAL STRUCTURE. (NFPA 72, SECTION 18.4.8.1). ALL WALL MOUNTED VISUAL APPLIANCES AND COMBINATION AUDIBLE/VISUAL APPLIANCES SHALL HAVE THEIR BOTTOMS MOUNTED AT 80" MINIMUM AND 96" MAXIMUM ABOVE FINISHED FLOOR AS MEASURED TO THE LENS. (NFPA 72, SECTION 18.5.5.1)
2. ALL EQUIPMENT SHALL BE U.L. AND C.S.F.M. LISTED.
3. ALL FIRE ALARM WIRING SHALL BE FLP (FIRE POWER LIMITED) AS REQUIRED FOR APPLICATION. WIRING IN CONDUIT ABOVE GROUND MAY BE THHN OR THWN.
4. PER THE CEC, ALL WIRING IS TO BE PULLED THROUGH EACH JUNCTION BOX AND CONNECTED DIRECTLY TO EACH FIRE DEVICE. DO NOT SPLICE THE WIRE. THERE MUST BE AT LEAST 6" OF LEAD WIRE FROM THE BOX TO THE DEVICE. ALL BOXES TO BE SIZED PER CEC AND SHALL HAVE THEIR COVERS PAINTED RED WHERE APPLICABLE.
5. DO NOT DEVIATE FROM CONDUIT RUNS AS SHOWN ON FLOOR PLANS WITHOUT PRIOR APPROVAL FROM ELECTRICAL ENGINEER. FACTORS SUCH AS EXCESSIVE VOLTAGE DROP, ADDITIONAL PARTS, ENGINEERING, ETC., THAT ARE A RESULT OF CONDUIT RUN DEVIATIONS SHALL BE THE SOLE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
6. ALL FAN SHUTDOWN FUNCTIONS, DAMPER CLOSURES AND ASSOCIATED MECHANICAL SYSTEM FIRE ALARM INTERFACE SHALL BE BY MECHANICAL CONTRACTOR, AND SHALL BE COORDINATED WITH FIRE ALARM SYSTEM.
7. ALL DUCT SMOKE DETECTORS SHALL BE MOUNTED BY THE MECHANICAL CONTRACTOR. DUCT SMOKE DETECTORS EXPOSED TO THE WEATHER SHALL BE C.S.F.M. LISTED FOR OUTDOOR INSTALLATION, AND WEATHER PROTECTED BY THE MECHANICAL CONTRACTOR. ALL AIR VELOCITY TESTING SHALL BE PERFORMED BY THE MECHANICAL CONTRACTOR.
8. ALL FIRE ALARM DEVICE BACKBOXES, FIRE ALARM TERMINAL CABINETS, GUTTERS, JUNCTION BOXES AND ASSOCIATED CONDUITS SHALL BE FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR UNLESS OTHERWISE NOTED. REFER TO FIRE ALARM SYMBOL LIST AND/OR MOUNTING DETAILS FOR ADDITIONAL INFORMATION. SYSTEM SUPPLIER PROVIDED BACKBOXES SHALL BE INSTALLED BY ELECTRICAL CONTRACTOR UNLESS OTHERWISE NOTED.
9. SMOKE DETECTOR TESTING SHALL BE PERFORMED TO ENSURE THAT EACH DETECTOR IS WITHIN ITS LISTED AND MARKED SENSITIVITY RANGE USING THE METHODS RECOMMENDED PER CFC, SECTION 907.8.4 AND NFPA 72, SECTION 14.4.4.3.4.
10. ALL WIRING, INITIATING DEVICES AND ANNUNCIATOR PANEL SHALL BE SUPERVISED TO THE PRINCIPAL POINT OF ANNUNCIATION. THE FIRE ALARM CONTROL PANEL TO SUPERVISE THE ANNUNCIATOR PANEL, ALL INITIATING AND INDICATING DEVICE CIRCUITS.
    A. INITIATING DEVICE CIRCUITS (IDC): CLASS B
    B. SIGNALING LINE CIRCUITS (SLC): CLASS B
    C. NOTIFICATION APPLIANCE CIRCUITS (NAC): CLASS B
11. ALL WIRING SHALL BE CUT FOR IN AND OUT. WIRING SHALL NOT BE LOOPED THROUGH DEVICES.
12. POINT AND COMMON ANNUNCIATION AND T-TAPPING ARE PROHIBITED. (T-TAPPING IS ALLOWABLE ON SLC LOOPS).
13. PROVIDE 3/4" CONDUIT FROM FIRE ALARM CONTROL PANEL TO TELEPHONE BACKBOARD FOR OWNER PROVIDED CENTRAL STATION MONITORING, WHEN APPLICABLE.
14. CONTRACTOR TO FIELD VERIFY AND PROVIDE DECIBEL METER FOR TESTING OF AMBIENT NOISE LEVELS AUDIBLE DEVICES TO BE AT LEAST 15 DBA ABOVE THE AVERAGE AMBIENT SOUND LEVEL BUT NOT LESS THAN 75 DBA AT 10 FEET OR 5 DBA ABOVE THE MAXIMUM SOUND LEVEL BUT NOT MORE THAN 110 DBA AT THE MINIMUM HEARING DISTANCE. SOUND LEVEL SHALL BE MAINTAINED FOR DURATION OF AT LEAST 60 SECONDS. (CFC, SECTION 907.5.2.1.1) THE CONTRACTOR SHALL ADJUST/INSTALL ALL DEVICES TO MAXIMIZE PERFORMANCE AND TO MINIMIZE FALSE ALARMS. PROVIDE UPDATED PLANS AND CALCULATIONS THROUGH THE "CHANGE ORDER" PROCESS WHEN INSTALLING ADDITIONAL DEVICES.
15. VISUAL DEVICES SHOULD NOT EXCEED 2 FLASHES PER SECOND AND SHOULD NOT BE SLOWER THAN 1 FLASH EVERY SECOND. THE DEVICE SHALL HAVE A PULSING LIGHT SOURCE NOT LESS THAN 15-CANDELA. VISUAL DEVICES WITHIN 55' FROM EACH OTHER SHALL BE SYNCHRONIZED.
16. ALL FIRE ALARM CIRCUITS SHALL BE IN CONDUIT OR APPROVED SURFACE RACEWAY IN A NEAT AND PROTECTED MANNER AS INDICATED ON THE DESIGN DOCUMENTS. EXPOSED CIRCUITS ARE ONLY PERMITTED WHEN NOTED AS EXPOSED ON DESIGN DOCUMENTS. ALL CONDUITS SHALL BE 3/4" MINIMUM. CONTRACTOR TO VERIFY CONDUIT FILL PRIOR TO INSTALLATION.
17. ALL FLOW SWITCHES SHALL BE 2 WIRE WITH NON-ELECTRONIC RETARD TYPE SIMILAR TO THE SYSTEM SENSOR MODEL "WFD SERIES" ONLY.
18. ALL DEVICES IN THE ALARM SYSTEM SHALL BE COMPATIBLE AND INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
19. SYSTEM SHALL BE FURNISHED AND INSTALLED BY AN AUTHORIZED DISTRIBUTOR.
20. FIRE ALARM SYSTEM INSTALLATION COMPANY SHALL BE UL LISTED (UUJS).
21. FIRE ALARM PANEL, REMOTES, AND COMPONENTS SHALL BE SECURED TO MOUNTING SURFACES PER MANUFACTURER'S SPECIFICATIONS. NO SINGLE DEVICE SHALL EXCEED THE WEIGHT OF 20 LBS. WITHOUT SPECIAL MOUNTING DETAILS.
22. SMOKE DETECTOR SHALL NOT BE ANY CLOSER THAN 1 FOOT FROM FIRE SPRINKLERS OR 3 FEET FROM ANY SUPPLY DIFFUSER. IN THE AREA OF CONSTRUCTION OR WHERE POSSIBLE DAMAGE/CONTAMINATION COULD OCCUR ON NEWLY INSTALLED FIRE ALARM DEVICES, DEVICES SHALL BE COVERED UNTIL THAT AREA IS READY TO BE TURNED OVER TO THE OWNER. DETECTORS THAT HAVE BEEN INSTALLED PRIOR TO FINAL CLEAN-UP BY ALL TRADES SHALL BE CLEANED OR REPLACED IN ACCORDANCE WITH CFC, SECTION 907. CLEANING OR REPLACEMENT OF DEVICES THAT WERE MOUNTED AT THE REQUEST OF THE CONTRACTOR WILL NOT BE PERFORMED WITHOUT WRITTEN AUTHORIZATION THAT ASSUMES FINANCIAL RESPONSIBILITY FOR COSTS INCURRED. TESTING OF DETECTORS SHALL BE PERFORMED PER NFPA 72, SECTION 14.4.5.3 AND CFC, SECTION 907.8.4.
23. PER CBC, SECTION 11B-309 ACTIVATION OF INITIATING DEVICE SHALL NOT REQUIRE MORE THAN 5 LBS. (22.2N) OF FORCE OR REQUIRE TIGHT GRASPING PINCHING, OR TWISTING OF WRIST.
24. THE SYSTEM SHALL CONFORM TO CALIFORNIA CODE OF REGULATIONS (CCR) TITLES 19 AND 24 AS APPLICABLE TO THIS PROJECT.
25. THE VOICE/ALARM COMMUNICATION SYSTEM VOICE MESSAGE SHALL COMPLY WITH NFPA 72, SECTIONS 18.4 AND 24.4 FOR GENERAL REQUIREMENTS, INTELLIGIBILITY, AUDIBILITY, MESSAGE PRIORITY, TONES, ETC.
26. A DEDICATED 120V BRANCH CIRCUIT SHALL BE PROVIDED FOR FIRE ALARM EQUIPMENT. THIS CIRCUIT SHALL BE ENERGIZED FROM THE COMMON USE AREA PANEL AND SHALL HAVE NO OTHER OUTLETS. THE BREAKER SHALL HAVE A RED LOCKING DEVICE TO BLOCK THE HANDLE IN THE "ON" POSITION AND BE LABELED AS FOLLOWS:
    A. "FIRE ALARM" FOR FIRE ALARM SYSTEMS
    B. "EMERGENCY COMMUNICATIONS" FOR EMERGENCY COMMUNICATION SYSTEMS, OR
    C. "FIRE ALARM/ECS" FOR COMBINATION FIRE ALARM AND COMMUNICATIONS SYSTEMS.
27. WHERE A DETECTOR IS INSTALLED ABOVE THE CEILING, THE DETECTOR SHALL BE EASILY ACCESSIBLE AND THE LOCATION OF THE DETECTOR SHALL BE CLEARLY MARKED. FOR DUCT SMOKE DETECTORS A REMOTE TEST STATION SHALL BE PROVIDED. ELECTRICAL CONTRACTOR SHALL FURNISH ACCESS PANELS TO AREAS THAT REQUIRE SERVICING, TROUBLE SHOOTING, ETC.
28. THE "END OF LINE RESISTANCE" OF EACH CIRCUIT SHALL BE TESTED IN THE PRESENCE OF THE I.O.R. AND SHALL NOT EXCEED THE LISTED MANUFACTURER'S MINIMUM OPERATING VOLTAGE.
29. UNDERGROUND AND EXTERIOR CONDUITS TO HAVE WATERTIGHT FITTINGS AND WIRE LISTED FOR WET LOCATIONS, IN ACCORDANCE WITH CEC, SECTIONS 110.11, 300.5(B), 300.6, 300.9, 310.10, AND 760.3(D).
30. FIRE ALARM SYSTEM IS A FULLY AUTOMATIC SYSTEM. CONTRACTOR TO UTILIZE AREA COVERAGE SMOKE DETECTORS AND ADDRESSABLE CONTROL RELAYS FOR THE SHUTDOWN AND/OR CLOSURE OF HVAC UNITS AND COMBINATION SMOKE/FIRE DAMPERS. CONTROL RELAYS TO BE LOCATED WITHIN 3FT OF THE CONTROLLED CIRCUIT OR APPLIANCE PER NFPA 72, SECTION 21.2.4.
31. PROVIDE (VIA CHANGE ORDER PROCESS) APPROPRIATE MANUFACTURER PRODUCT DATA SHEETS AND APPLICABLE CSFM LISTINGS FOR ALL SUBSTITUTED MANUFACTURER'S MATERIAL, EQUIPMENT OR APPLIANCES, TO DSA PRIOR TO START OF INSTALLATION.
32. CONTRACTOR SHALL PROVIDE FIRE WATCH FOR ALL OCCUPIED AREAS OF WORK WHERE THE REQUIRED FIRE ALARM SYSTEM IS OUT OF SERVICE FOR THE DURATION OF THE SYSTEM OUTAGE. FIRE WATCH AND SYSTEM/EQUIPMENT SHALL BE PER CFC, SECTION 901.7.
33. EMERGENCY VOICE/ALARM COMMUNICATION SYSTEMS SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH NFPA 72. THE OPERATION OF ANY AUTOMATIC FIRE DETECTOR, SPRINKLER WATERFLOW DEVICE OR MANUAL FIRE ALARM BOX SHALL AUTOMATICALLY SOUND AN ALERT TONE FOLLOWED BY VOICE INSTRUCTIONS GIVING APPROVED INFORMATION AND DIRECTIONS FOR A GENERAL OR STAGED EVACUATION IN ACCORDANCE WITH THE FIRE SAFETY EVACUATION PLANS REQUIRED BY CFC, SECTION 404 PER CBC/CFC, SECTION 907.5.2.2
34. EMERGENCY VOICE/ALARM COMMUNICATION SYSTEMS SHALL HAVE THE CAPABILITY TO BROADCAST LIVE VOICE MESSAGES BY PAGING ZONES ON A SELECTIVE AND ALL-CALL BASIS PER CBC/CFC, SECTION 907.5.2.2.2.
35. EMERGENCY VOICE/ALARM COMMUNICATION SYSTEMS SHALL BE PROVIDED WITH AN APPROVED EMERGENCY POWER SOURCE PER CBC/CFC, SECTION 907.5.2.2.5.
36. UPON DETECTION OF CARBON MONOXIDE THE FIRE ALARM SYSTEM SHALL PRODUCE A FOUR-PULSE TEMPORAL PATTERN SIGNAL WITHIN THE BUILDING AND COMPLY WITH NFPA 720, SECTION 5.8.6.5.
37. ALL MEMBRANE AND THROUGH-PENETRATIONS OF RATED ASSEMBLIES SHALL BE PROTECTED BY AN APPROVED FIRE STOP SYSTEM AS IDENTIFIED IN CBC, CHAPTER 7, UL OR OTHER LAB TESTING CRITERIA. APPROVED TYPES OF MATERIALS SHALL BE IDENTIFIED WITHIN THE FIRE ALARM SECTION OF THE PROJECT SPECIFICATIONS.
38. CONTROL PANELS AND REMOTE ANNUNCIATORS SHALL BE INSTALLED WITH THEIR BOTTOMS MOUNTED AT 48" ABOVE THE FINISHED FLOOR.

FIRE ALARM SYSTEM TESTING NOTES:

1. INSTALLATION OF THE SYSTEMS SHALL NOT BE STARTED UNTIL DETAILED DESIGN DOCUMENTS AND SPECIFICATIONS, INCLUDING STATE FIRE MARSHAL LISTING NUMBERS FOR EACH COMPONENT OF THE SYSTEM HAS BEEN APPROVED BY DSA.
2. A STAMPED SET OF APPROVED FIRE ALARM DESIGN DOCUMENTS SHALL BE ON THE JOB SITE AND USED FOR INSTALLATION.
3. DISTRICT SHALL PROVIDE A CERTIFIED IMPARTIAL FIRE ALARM INSPECTOR, DSA, ARCHITECT/ENGINEER AND OWNER SHALL BE NOTIFIED A MINIMUM OF 48 HOURS PRIOR TO THE FINAL INSPECTION AND/OR TESTING.
4. 100% OF THE SYSTEM IN CONTRACT WILL BE TESTED AND INSPECTED WITH THE CONTRACTOR OR CONTRACTOR'S SUB AND DISTRICT'S ETS STAFF MEMBER PRESENT. INSPECTION WILL INCLUDE, BUT NOT BE LIMITED TO, REMOVING STROBES/HORNS TO CHECK FOR "T-TAPS", REMOVING J-BOX COVERS TO CHECK WIRE GAGE AND SPLICES.
5. FOLLOW ALL REQUIREMENTS AND INSTRUCTIONS PROVIDED BY MANUFACTURER UPON INSTALLATION OF MANUFACTURER'S PRODUCTS AND DEVICES.
6. PRIOR TO REQUESTING FINAL APPROVAL OF THE INSTALLATION, THE INSTALLING CONTRACTOR SHALL FURNISH A WRITTEN STATEMENT TO THE FIRE CODE OFFICIAL THAT THE SUBJECT FIRE PROTECTION SYSTEM HAS BEEN INSTALLED IN ACCORDANCE WITH APPROVED PLANS AND HAS BEEN TESTED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND THE APPROPRIATE INSTALLATION STANDARD. ANY DISCREPANCIES BETWEEN THE DRAWINGS AND THE CODE OR RECOGNIZED STANDARDS SHALL BE BROUGHT TO THE ATTENTION OF DSA AND THE ARCHITECT/ENGINEER OF THE PROJECT. ANY DEVIATIONS FROM THE DESIGN STANDARDS SHALL BE NOTED AND COPIES OF THE APPROVALS FOR SUCH DEVIATIONS SHALL BE ATTACHED TO THE WRITTEN STATEMENT. (CFC, SECTION 901.2.1)
7. UPON COMPLETION OF SYSTEM INSTALLATION, THE SYSTEM SHALL BE TESTED IN THE PRESENCE OF AND IN A MANNER ACCEPTABLE TO DSA/I.O.R. CONTRACTOR SHALL SUPPLY NECESSARY TESTING EQUIPMENT, INCLUDING A "SOUND LEVEL METER" TO CHECK ACCEPTABLE NOISE LEVELS OF AUDIBLE DEVICES. PROVIDE TEST RESULTS PER NFPA 72 TO ARCHITECT, D.S.A., I.O.R. AND TO LOCAL FIRE AUTHORITY, PER CFC, SECTION 907.8.2.
8. INSPECTION, TESTING AND MAINTENANCE SHALL BE IN COMPLIANCE WITH NFPA 72, CHAPTER 14, REACCEPTANCE TESTING SHALL BE IN COMPLIANCE WITH NFPA 72, SECTION 14.4.2.
9. THE LOCAL FIRE AUTHORITY SHALL BE NOTIFIED FOR TESTING. THE FIRE AUTHORITY SHALL BE PRESENT AND SHALL BEAR WITNESS FOR TESTING PROCEDURES. DOCUMENTATION FOR WHETHER THE FIRE AUTHORITY WAS PRESENT AND WITNESSED TESTING SHALL BE DOCUMENTED AS PART OF TESTING PROCEDURES DOCUMENTATION.
10. PRIOR TO COMPLETION OF FIRE ALARM SYSTEM THE TWO WAY COMMUNICATION SYSTEM SHALL BE TESTED AND CERTIFIED VIA NFPA 72 EMERGENCY COMMUNICATION SYSTEM SUPPLEMENTARY RECORD OF INSPECTION AND TESTING FORM.
11. THE INSTALLING CONTRACTOR SHALL PROVIDE A COMPLETED RECORD OF COMPLETION PER NFPA 72, FIGURE 7.8.2(A) THROUGH (I) AS APPLICABLE. A COMPLETE RECORD OF THE TESTS AND OPERATIONS OF EACH SYSTEM SHALL BE KEPT UNTIL THE NEXT TEST AND FOR ONE YEAR AFTER PER NFPA 72, SECTION 7.7.1.
12. FIRE ALARM SYSTEM DOCUMENTS SHALL BE HOUSED IN THE DOCUMENT CABINET. THE DOCUMENT CABINET SHALL BE INSTALLED AT THE SYSTEM CONTROL UNIT OR AT ANOTHER APPROVED LOCATION AT THE PROTECTED PREMISES AS REQUIRED BY NFPA 72, SECTION 7.7.2.
13. THE INSTALLING CONTRACTOR SHALL PROVIDE SYSTEM PROGRAMMING FOR SUPERVISORY MONITORING PER CFC, SECTION 907.6.6. SUPERVISORY MONITORING SHALL BE TESTED AND VERIFIED AS SENDING CORRECT SIGNALS IN CONJUNCTION WITH FINAL ACCEPTANCE TEST. OWNER SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING A FIRE ALARM SYSTEM MONITORING CONTRACT.
14. THE VOICE/ALARM COMMUNICATION SYSTEM VOICE MESSAGE SHALL COMPLY WITH NFPA 72 SECTIONS 18.4 AND 24.4 FOR GENERAL REQUIREMENTS, INTELLIGIBILITY, AUDIBILITY, MESSAGE PRIORITY, TONES, ETC. REFER TO NFPA 72 ANNEX D, D.1 THROUGH D.6 FOR DETERMINING THE FUNDAMENTALS OF TEST PROTOCOL AND METHOD OF MEASURING INTELLIGIBILITY.

SEQUENCE OF OPERATIONS

ACTION	DEVICE	120 VOLT POWER FAILURE	SYSTEM TROUBLE WIRING FAULT, SYSTEM GROUND FAULT, SYSTEM LOW BATTERY, CIRCUIT SHORT	MANUAL PULL STATION	AREA SMOKE DETECTOR	CARBON MONOXIDE DETECTOR	ABEA or ATTIC HEAT DETECTOR	SMOKE/FIRE DAMPER SMOKE DETECTOR
SOUND CONTROL PANEL TROUBLE BUZZER		YES	YES	NO	NO	YES	NO	NO
SOUND CONTROL PANEL SUPERVISORY BUZZER		NO	NO	NO	NO	YES	NO	NO
SOUND CONTROL PANEL ALARM BUZZER		NO	NO	YES	YES	YES	YES	YES
ACTIVATE RELAY FOR CENTRAL STATION MONITORING		YES	YES	YES	YES	YES	YES	YES
ANNUNCIATE AT FIRE ALARM CONTROL PANEL (ALARM)		NO	NO	YES	YES	YES	YES	YES
ANNUNCIATE AT FIRE ALARM CONTROL PANEL (TROUBLE)		YES	YES	NO	NO	NO	NO	NO
ANNUNCIATE AT REMOTE ANNUNCIATOR PANEL (ALARM)		NO	NO	YES	YES	YES	YES	YES
ANNUNCIATE AT REMOTE ANNUNCIATOR PANEL (TROUBLE)		YES	YES	NO	NO	NO	NO	NO
ACTIVATE AUDIBLE NOTIFICATION ALARM SIGNAL THROUGHOUT CAMPUS		NO	NO	YES	YES	NO	YES	YES
ACTIVATE VISUAL NOTIFICATION ALARM SIGNAL THROUGHOUT CAMPUS		NO	NO	YES	YES	NO	YES	YES
ACTIVATE AUDIBLE NOTIFICATION ALARM SIGNAL THROUGHOUT BLDG		NO	NO	YES	YES	YES	YES	YES
ACTIVATE VISUAL NOTIFICATION ALARM SIGNAL THROUGHOUT BLDG		NO	NO	YES	YES	YES	YES	YES
SOUND SPRINKLER BELL ALARM -		NO	NO	NO	NO	NO	NO	NO
SHUT DOWN ASSOCIATED AIR HANDLING (HVAC) THROUGHOUT BUILDING		NO	NO	NO	YES	NO	NO	YES
NOTIFY FIRE DEPARTMENT VIA MONITORING STATION -		NO	NO	YES	YES	YES	YES	YES
SOUND AN ALERT TONE FOLLOWED BY VOICE INSTRUCTION		NO	NO	YES	YES	YES	YES	YES

PLAN REVIEW REQUIREMENTS AND APPLICABLE CODES AND STANDARDS

1.0 FIRE ALARM PLAN REVIEW

A. FIRE ALARM PLAN REVIEW

1. AS PART OF THE FIRE ALARM PLAN REVIEW, PLANS AND SPECIFICATIONS FOR THE FIRE ALARM SYSTEM HAVE BEEN INCLUDED FOR REVIEW AND COMMENT BY THE DIVISION OF THE STATE ARCHITECT, FIRE & LIFE SAFETY.
2. THE FLOOR PLANS AND SPECIFICATIONS INCLUDE THE FOLLOWING: - LOCATIONS OF ALL ALARM-INITIATING AND SIGNALING DEVICES, CONTROL AND TROUBLE SIGNALING EQUIPMENT (FIRE ALARM CONTROL PANEL, BUILDING ANNUNCIATION (FIRE ALARM ANNUNCIATOR).

B. FIRE ALARM COMPONENTS

1. PROVIDE CALIFORNIA STATE FIRE MARSHAL LISTING SHEETS AND U.L. LISTING NUMBERS FOR EACH COMPONENT.
2. EQUIPMENT POWER CONNECTIONS.
3. RISER DIAGRAM SHOWING EACH COMPONENT.
4. VOLTAGE DROP CALCULATIONS.
5. POWER CONNECTIONS TO APPLICABLE COMPONENTS.
6. WIRE AND/OR CABLING TYPES AND SIZES.
7. PROVIDE CATALOG DATA SHEETS FOR ALL FIRE ALARM SYSTEM COMPONENTS.
8. CONTRACTOR TO FURNISH STATEMENT OF COMPLIANCE BEFORE REQUESTING FINAL APPROVAL OF INSTALLATION IN ACCORDANCE WITH CFC, SECTION 901.2.1.
9. A SATISFACTORY TEST OF THE ENTIRE SYSTEM SHALL BE MADE IN THE PRESENCE OF THE PROJECT INSPECTOR AND, IF APPLICABLE, LOCAL FIRE AUTHORITY.
10. THE INSTALLER SHALL SUPPLY THE OWNER WITH A WRITTEN OPERATING, TESTING AND MAINTENANCE INSTRUCTIONS, POINT-TO-POINT AS BUILT DRAWINGS AND EQUIPMENT SPECIFICATIONS. AS BUILT RECORDS SHALL BE MAINTAINED ON PREMISES FOR A MINIMUM OF THREE YEARS PER CFC, SECTION 901.6.3.

C. SCOPE OF WORK

1. INSTALL A FULLY AUTOMATIC, ADDRESSABLE, FIRE ALARM SYSTEM WITH AN EMERGENCY VOICE/ALARM COMMUNICATION SYSTEM WITHIN ALL BUILDINGS IN SCOPE OF PROJECT AS DEFINED PER CFC, SECTION 907.2.3 AND NFPA 72.
2. FIRE ALARM SYSTEM SHALL TRANSMIT THE ALARM, SUPERVISORY AND TROUBLE SIGNALS TO AN APPROVED SUPERVISING STATION IN ACCORDANCE WITH NFPA 72. THE SUPERVISING STATION SHALL BE U.L. LISTED AS UUFX (CENTRAL STATION) PER CFC, SECTION 907.6.6.3.
3. FIRE SPRINKLER SYSTEM UTILIZED FOR HEAT DETECTION IN ALL ABOVE CEILING, ATTIC SPACES AND CONCEALED COMBUSTIBLE AREAS. PROVIDE HEAT DETECTORS WHERE FIRE SPRINKLERS HAVE BEEN OMITTED PER NFPA 72 AND NFPA 13.

2.0 LIST OF CURRENT CALIFORNIA CODE OF REGULATIONS

APPLICABLE CODES AS OF JANUARY 1, 2023

2025 California Administrative Code (CAC), Part 1, Title 24, C.C.R.

2022 California Building Code (CBC), Volumes 1 & 2, Part 2, Title 24, C.C.R.

2022 California Electrical Code (CEC), Part 3, Title 24, C.C.R.

2022 California Mechanical Code (CMC), Part 4, Title 24, C.C.R.

2022 California Plumbing Code (CPC), Part 5, Title 24, C.C.R.

2022 California Energy Code, Part 6, Title 24, C.C.R.

2022 California Historical Building Code, Title 24, C.C.R.

2022 California Fire Code (CFC), Part 9, Title 24, C.C.R.

2022 California Existing Building Code (CEBC), Part 10, Title 24, C.C.R.

2022 California Green Building Standards Code (CALGreen), Part 11, Title 24, C.C.R.

2022 California Referenced Standards Code, Part 12, Title 24, C.C.R.

LIST OF FEDERAL CODES AND STANDARDS (if applicable)

Americans with Disabilities Act (ADA), Title II or Title III

For Title II: Uniform Federal Accessibility Standards (UFAS) or ADA Standards for Accessible Design (Appendix A of 28 CFR Part 36.)

For Title III: ADA Standards for Accessible Design (Appendix A of 28 CFR Part 36.)

Americans with Disabilities Act Accessibility Guidelines (ADAAG) (with amendments through September 2002)

PARTIAL LIST OF APPLICABLE NFPA STANDARDS:

NFPA 13	Automatic Sprinkler Systems (CA Amended)	2022 Edition
NFPA 14	Standpipes Systems (CA Amended)	2019 Edition
NFPA 17	Standard for Dry Chemical Extinguishing Systems	2021 Edition
NFPA 17a	Standard for Wet Chemical Systems	2021 Edition
NFPA 20	Installation Stationary Pumps for Fire Protection	2019 Edition
NFPA 22	Water tanks for Private Fire Protection	2019 Edition
NFPA 24	Installation of Private Fire Service Mains (CA Amended)	2022 Edition
NFPA 72	National Fire Alarm and Signaling Code (CA Amended) (Note: See UL Standard 1971 for "Visual Devices")	2022 Edition
NFPA 80	Fire Door and Other Opening Protectives	2019 Edition
NFPA 92	Standard for Smoke Control Systems	2018 Edition
NFPA 253	Critical Radiant Flux of Floor Covering Systems	2019 Edition
NFPA 2001	Clean Agent Fire Extinguishing Systems (CA Amended)	2018 Edition
ICC 300	ICC Standards on Bleachers, Folding and Telescoping Seating and Grandstands	2017 Edition
UL 38	Manual Operating Signal Boxes (with revisions through February 2, 2005 as amended)	1999 Edition
UL 268	Smoke Detectors for Fire Alarm Systems	2016 Edition
UL 268A	Smoke Detectors Duct Applications (with revisions through October 22, 2003 as amended)	2009 Edition
UL 300	Fire Testing of Fire Extinguishing Systems for Protection Of Restaurant Cooking Areas (with revisions through December 2014 as amended)	2005 Edition
UL 464	Audible Signal Appliances (with revisions through October 10, 2003 as amended)	2003 Edition
UL 521	Heat Detectors for Fire Protective Signaling Systems (with revisions through July 20, 2005 as amended)	1999 Edition
UL 864	Control Units for Fire Protective Signaling Systems (with revisions through December 2018)	2014 Edition

Refer to 2022 California Building Code (SFM) Chapter 35 and 2022 California Fire Code Chapter 80 for a complete list of applicable NFPA Standards.

FIRE ALARM SYMBOL LIST

SYMBOL	DESCRIPTION	MODEL	MANUFACTURER	BACKBOX	MOUNTING HEIGHT	C.S.F.M. NUMBER
VECP	(E) VOICE EVACUATION CONTROL PANEL (AI#04-104977)	IFP-2100ECS	FARENHYT BY SILENT KNIGHT	PROVIDED	5'-6" A.F.F. TO TOP	7165-0559:0505
FAAP / RM	REMOTE FIRE ALARM ANNUNCIATOR WITH BUILT-IN REMOTE MICROPHONE	ECS-LOC	FARENHYT BY SILENT KNIGHT	PROVIDED	5'-6" A.F.F. TO TOP	7165-0559:0505
FAPS	(E) FIRE ALARM POWER SUPPLY (AI#04-104977)	5895XL	FARENHYT BY SILENT KNIGHT	PROVIDED	5'-6" A.F.F. TO TOP	7165-0559:0135
AMP	VOICE EVACUATION AUDIO AMPLIFIER	ECS-50W	FARENHYT BY SILENT KNIGHT	PROVIDED	5'-6" A.F.F. TO TOP	7165-0559:0173
FATC	FIRE ALARM TERMINAL CABINET	N/A	BY ELECTRICIAN	18"SQ. x 6"D U.N.O. (RED)	VERIFY IN FIELD	N/A
MS	MANUAL PULL STATION (ADDRESSABLE)	IDP-PULL-DA	FARENHYT BY SILENT KNIGHT	4S DEEP BOX W/ SINGLE GANG RING	48" A.F.F. TO TOP OF ACTIVATING HANDLE	7150-0559:0140
SD	AREA SMOKE DETECTOR (ADDRESSABLE/PHOTO.)	IDP-PHOTO B210LP (BASE)	FARENHYT BY SILENT KNIGHT	4S DEEP BOX W/ 3-0 RING	CEILING	7272-0559:0149
HD	AREA HEAT DETECTOR (ADDRESS.FIXED 200'F)	IDP-HEAT-HT B210LP (BASE)	FARENHYT BY SILENT KNIGHT	4S DEEP BOX W/ 3-0 RING	ABOVE ACCESSIBLE CEILING, U.O.N.	7270-0559:0147
CO	MULTI-CRITERIA FIRE/CO DETECTOR	IDP-FIRE-CO B210LP (BASE)	FARENHYT BY SILENT KNIGHT	4S DEEP BOX W/ 3-0 RING	CEILING	7270-0559:0517
CR	FIRE ALARM RELAY CONTROL MODULE	IDP-RELAY	FARENHYT BY SILENT KNIGHT	4S DEEP BOX	VERIFY IN FIELD	7300-0559:0155
DH	FIRE ALARM DOOR HOLD	EXISTING	EXISTING	EXISTING	VERIFY IN FIELD	EXISTING
S WP	WEATHERPROOF FIRE ALARM SPEAKER	WSSPK	GENTEX	GBLP WEATHERPROOF ENCLOSURE	90" A.F.F. TO TOP	7320-0569:0141
SF cd	FIRE ALARM SPEAKER/ STROBE (WALL)	SSPK24WLP	GENTEX	4S DEEP BOX W/ 4S EXTENSION	80" A.F.F. TO BOTTOM	7320-0569:0137
SF cd	FIRE ALARM SPEAKER/ STROBE (CEILING)	SSPK24CLP	GENTEX	4S DEEP BOX W/ 4S EXTENSION	CEILING	7320-0569:0137
F cd	FIRE ALARM STROBE (WALL)	GES3-24W	GENTEX	4S DEEP BOX W/ 4S EXTENSION	80" A.F.F. TO BOTTOM	7125-0569:0123
F cd	FIRE ALARM STROBE (CEILING)	GCS24C	GENTEX	4S DEEP BOX W/ 4S EXTENSION	CEILING	7135-0569:0123
SYNC	NOTIFICATION SYNC MODULE	AVSM	GENTEX	4S DEEP BOX	VERIFY IN FIELD	7125-0569:0123
J	FIRE ALARM JUNCTION BOX	N/A	BY ELECTRICIAN	4S BOX, U.N.O.	VERIFY IN FIELD	N/A

GENERAL FIRE ALARM SYMBOL LIST NOTES:

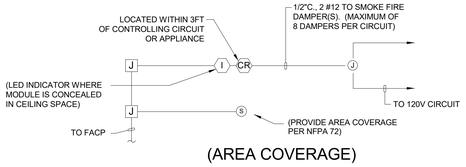
1. CONFIRM NOTIFICATION DEVICE COLOR (WHITE OR RED) WITH ARCHITECT PRIOR TO ANY ORDER OR INSTALLATION. COLOR TO BE INDICATED IN SHOP DRAWING SUBMITTAL.
2. NOTIFICATION APPLIANCES USED FOR SIGNALING OTHER THAN FIRE SHALL NOT HAVE THE WORD "FIRE", OR ANY FIRE SYMBOL, IN ANY FORM (i.e., STAMPED, IMPRINTED, ETC.) ON THE APPLIANCE VISIBLE TO THE PUBLIC. (NFPA 72 18.3.3.2.
3. NUMBER ADJACENT TO VISUAL DEVICES INDICATES MINIMUM CANDELLA RATING OF STROBE DEVICE.
4. UPON DETECTION OF CARBON MONOXIDE THE FIRE ALARM SYSTEM SHALL PRODUCE A FOUR-PULSE TEMPORAL PATTERN SIGNAL WITHIN THE BUILDING AND COMPLY WITH NFPA 720, SECTION 5.8.6.5.

GENERAL FIRE ALARM ABBREVIATIONS:

A.F.F.	ABOVE FINISHED FLOOR	N/A	NOT APPLICABLE
E.O.L.	END OF LINE RESISTOR	U.N.O.	UNLESS NOTED OTHERWISE
(E)	EXISTING DEVICE	VL	VERIFY LOCATION IN FIELD
F.B.O.	FURNISHED BY OTHERS	WP	WEATHERPROOF DEVICE
TSP	TWISTED SHIELDED PAIR	cd	INDICATED CANDELA RATING OF STROBE DEVICE

WIRING LEGEND

WIRE DESIGNATION	WIRE IN CONDUIT	WIRE IN CONDUIT UNDERGROUND/WET LOC.	UNDERGROUND/WET WIRE DESIGNATION
INITIATING CIRCUITS Z	2 CONDUCTOR #18 FPL TWISTED/ UNSHEILDED W/OVERALL JACKET	2 CONDUCTOR #18 FPL TWISTED/ UNSHEILDED W/OVERALL JACKET	INITIATING CIRCUITS ZU
POWER CKT. P	2 CONDUCTOR #12 THHN STRANDED	2 CONDUCTOR #12 STRANDED TYPE THWN	POWER CKT. PU
NETWORK CONTROL C	2 CONDUCTOR #12 THHN STR



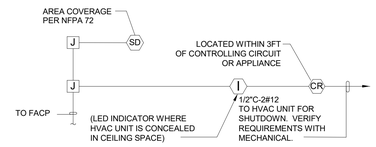
(AREA COVERAGE)

Note:
PER CMC 605.8, When the automatic activation of a smoke damper or a combination smoke-fire damper occurs, the HVAC system serving such dampers shall immediately shut down. ALL HVAC UNITS CONTAINING COMBINATION SMOKE FIRE DAMPERS AS PART OF THEIR DUCTING SYSTEM SHALL BE PROVIDED WITH SHUNT RELAYS AND DEVICES FOR IMMEDIATE SHUT DOWN UPON THE ACTIVATION / CLOSURE OF ASSOCIATED COMBINATION SMOKE FIRE DAMPERS.

SMOKE/FIRE DAMPER SCHEMATIC

SCALE: N.T.S.

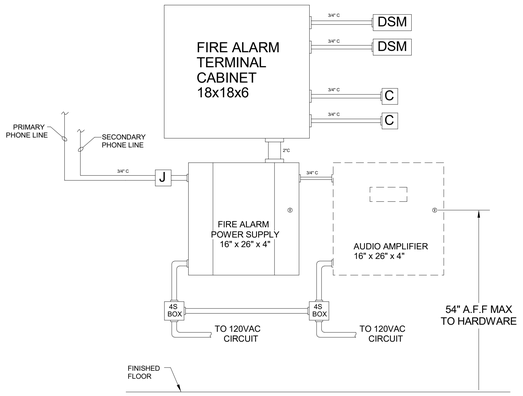
7



HVAC SHUT DOWN SCHEMATIC (AREA COVERAGE)

SCALE: N.T.S.

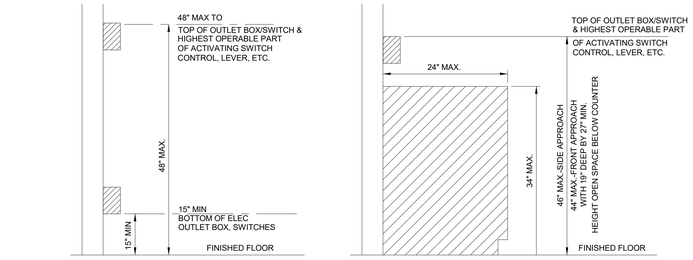
6



FIRE ALARM PANEL/POWER SUPPLY MOUNTING ELEVATION

SCALE: N.T.S.

5

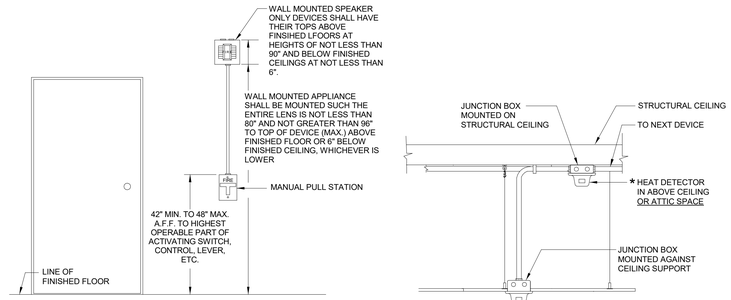


ALL DEVICE HEIGHTS DEPICTED SHALL BE MODIFIED AS REQUIRED BY GOVERNING BUILDING CODES. CONTRACTOR TO VERIFY/RECONCILE APPLICABLE CODE REQUIREMENTS AND ANY DEVICE HEIGHT REQUIREMENTS DEPICTED ON ARCHITECTURAL OR INTERIOR DESIGN PLANS & SPECIFICATIONS PRIOR TO DEVICE ROUGH-IN. CONFLICTS OR LACK OF MOUNTING HEIGHT SPECIFICITY ON THE ARCHITECTURAL OR INTERIOR DESIGN PLANS & SPECIFICATIONS SHALL BE CAUSE FOR THE CONTRACTOR TO ISSUE A FORMAL WRITTEN RFI FOR RESOLUTION. DEVICE MOUNTING HEIGHT CLARIFICATIONS/SPECIFICATIONS SHALL NOT RESULT IN AN ADDITIONAL COST TO THE OWNER - CONTRACTOR SHALL INCLUDE ALL COSTS IN BASE BID.

MOUNTING HEIGHT OVER OBSTRUCTION DETAIL

SCALE: NTS

3



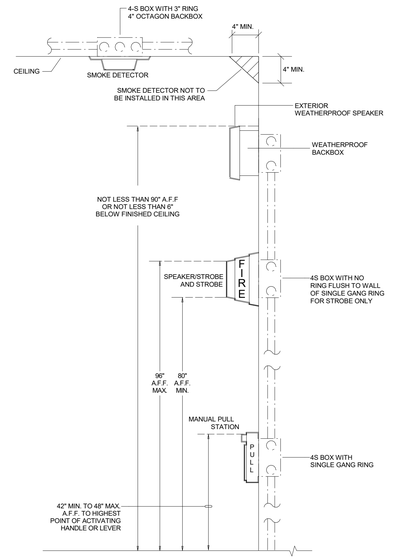
** NOTE: PER ADAAG, 4.27.4 & CBC, 11B-309
CONTROLS AND OPERATING MECHANISMS AT INITIATING DEVICE "SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING OR TWISTING OF THE WRIST. THE FORCE REQUIRED TO ACTIVATE CONTROLS SHALL BE NO GREATER THAN 5lbf (22.2N)."

* - TEMPERATURE SETTING OF HEAT DETECTOR DEVICE TO BE SET AT MINIMUM OF 20°F. ABOVE THE MAXIMUM EXPECTED TEMPERATURE OF THE SPACE INSTALLED PER NFPA 72, 17.6.2.3.

DEVICE MOUNTING DETAILS

SCALE: N.T.S.

2



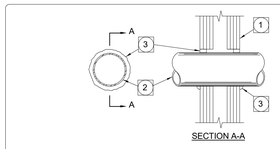
GENERAL NOTES:

1. THE ENTIRE LENS OF STROBE LIGHTS MUST BE BETWEEN 80" AND 96" ABOVE FLOOR FINISH. (NFPA 72, 18.5.5)
2. MANUAL FIRE ALARM BOXES SHALL BE INSTALLED IN ACCORDANCE WITH CFC, SECTIONS 907.4 THROUGH 907.5.
3. WHEN APPLICABLE, MANUAL FIRE ALARM BOXES SHALL BE LOCATED NOT MORE THAN 5 FEET FROM THE ENTRANCE TO EACH EXIT. ADDITIONAL MANUAL FIRE ALARM BOXES SHALL BE LOCATED SO THAT TRAVEL DISTANCE TO THE NEAREST BOX DOES NOT EXCEED 200 FEET. (CFC, 907.4.2.1)

MOUNTING HEIGHT DETAIL

SCALE: N.T.S.

1



SECTION A-A

PENETRATION THRU GYPSUM BOARD WALL
NO SCALE

System No.W-L-1252
January 22, 2019
F Ratings - 1, 2, 3 and 4 Hr (See Items 1 and 3)
T Ratings - 0 Hr
L Rating At Ambient - less than 1 CFM/sq ft
L Rating At 400 F - less than 1 CFM/sq ft

1. Wall Assembly - The 1, 2, 3 or 4 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400 or W400 Series Wall or Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs - Wall framing may consist of steel channel studs. Steel studs to be min 3-1/2 in. (89 mm) wide by 1-3/8 in. (35 mm) deep channels spaced max 24 in. (610 mm) OC.
   B. Gypsum Board * - Nom 1/2 or 5/8 in. (13 or 16 mm) thick, 4 ft. (122 cm) wide with square or tapered edges. The gypsum wallboard type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 26 in. (660 mm).

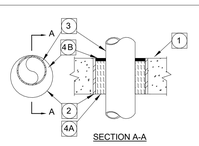
The hourly fr and FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.

2. Through Penetrant - One metallic pipe, conduit or tube to be installed either concentrically or eccentrically within the firestop system. The annular space between the pipe, conduit or tube and periphery of opening shall be min 0 in. (point contact) to max 7/8 in. (22 mm). Pipe, conduit or tube to be rigidly supported on both sides of wall assembly.
   A. Steel Pipe - Nom 4 in. (102 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. Iron Pipe - Nom 4 in. (102 mm) diam (or smaller) cast or ductile iron pipe.
   C. Conduit - Nom 4 in. (102 mm) diam (or smaller) rigid steel conduit.
   D. Conduit - Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic conduit.
   E. Copper Tubing - Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.
   F. Copper Pipe - Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.

3. Fill, Void or Cavity Material * - Sealant - 1. Fill material applied within annulus , flush with both surfaces of wall. Type and thickness of sealant is dependent on F and FH Ratings as indicated in Table below. An additional 1/2 in. (13 mm) diameter bead of sealant applied at penetrant/gypsum board interface at point contact location on both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC – FS-ONE Sealant, FS-ONE MAX Intumescent Sealant or CP 606 Sealant

F, FH RATINGS (HR)	SEALANT TYPE	SEALANT THICKNESS, IN. (MM)
1,2	FS-ONE, FS-ONE MAX OR CP 606	5/8 (16)
3	FS-ONE, FS-ONE MAX OR CP 606	1 (25)
4	FS-ONE, FS-ONE MAX	1 (25)

*Bearing the UL Classification Marking



SECTION A-A

PENETRATION THRU CONCRETE WALL OR FLOOR
NO SCALE

System No. C-AJ-1630
DECEMBER 20, 2013
F Ratings - 2, 3, and 4 Hr (See Item 4)
T Rating - 0 Hr
L Rating At Ambient - less than 1 CFM/sq ft
L Rating At 400 F - less than 1 CFM/sq ft
W Rating - Class I (See Item 4)

1. Floor or Wall Assembly - 1. See Configuration A above. Reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/cu meter) concrete as specified in the Table in item 4 below. Wall may also be constructed of any UL Classified Concrete Blocks'. Max diam of sleeved opening is 32 in. (813 mm).
See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.

1A. Floor Assembly - See Configuration B above. Min 6 in. (152 mm) thick UL Classified hollow-core Precast Concrete Units'. Max diam of opening is 7 in. (178 mm).
See Precast Concrete Units (CFTV) category in the Fire Resistance Directory for names of manufacturers.

2. Steel Sleeve (Optional) - Nom 32 in. (813 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe sleeve cast or grouted into floor or wall assembly, flush with both surfaces of floor or wall. As an option, sleeve may extend max 2 in. above top surface of floor or beyond one or both surfaces of wall. Steel sleeve may be used in 2 and 3 hr F Rated systems only.

3. Through Penetrants - One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. Pipe, conduit or tubing to be rigidly supported on both sides of floor or wall assembly. See Table in item 4 for sizes of penetrants A, B, D and E that may be used. See Item 3C below for size of conduit that may be used. The annular space shall be as specified in Table in item 4 below. The following types and sizes of metallic pipes, conduits or tubing may be used:
   A. Steel Pipe - -- Schedule 10 (or heavier) steel pipe.
   B. Iron Pipe - Cast or ductile iron pipe.
   C. Conduit - Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing or nom 6 in. (152 mm) diam (or smaller) steel conduit.
   D. Copper Tubing - Type L (or heavier) copper tubing.
   E. Copper Pipe - Regular (or heavier) copper pipe.

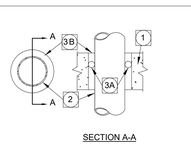
4. Firestop System - The F Rating of the system is dependent upon the type of concrete, thickness of concrete, annular space, fill and packing material thickness, packing material density and penetrant size as shown in the Table below. W Rating applies to annular spaces of min 0 in. (point contact) to max 1-7/8 in. and to Configuration A detail only.

				MIN DENSITY		PENETRANT SIZE IN. DIAM (OR SMALLER)	
F RATING HR	MIN THICK CONCRETE IN.	ANNULAR SPACE IN.	MIN THICK PACKING MTL IN.	PACKING MTL PCF (KG/CU MTR	MIN THICK FILL MTL IN.	E,E COPPER	A,B STEEL, IRON
2	5-1/2(140)	0 TO 1-7/8 (0 TO 48)	5 (127)	4 (64)	1/2 (13)	4 (102)	16 (406)
3	4-1/2(114)	0 TO 2-1/8 (0 TO 54)	4-1/4 (108)	4 (64)	1/4 (6)	6 (152)	30 (762)
4	5-1/2(140)	0 TO 1-7/8 (0 TO 48)	5 (127)	4 (64)	1/2 (13)	4 (102)	8 (203)

A. Packing Material – Min 4-1/4 or 5 in. (108 or 127 mm) thickness of min 4.0 pcf (64 kg/cu meter) mineral wool batt insulation firmly packed into opening as a permanent form as specified in the Table above. Packing material to be recessed from top surface of floor or top end of sleeve, or from both surfaces of wall or ends of sleeve, as required to accommodate the required thickness of fill material. For hollow-core floor applications as shown in Configuration B, one half of the required thickness of mineral wool packing material shall be installed flush with the bottom surface of the floor and the remaining half of the mineral wool packing material installed at the top of the opening and recessed from the top surface of the floor to accommodate the required thickness of the fill material.

B. Fill, Void or Cavity Material* – Caulk – Min 1/4 or 1/2 in. (6 or 13 mm) thickness of fill material as specified in the Table above applied within the annulus, flush with top surface of floor or top end of sleeve, or with both surfaces of wall or ends of sleeve. At the point contact location betWeen pipe and concrete or sleeve, a min 1/2 in. (13 mm) diam bead of fill material shall be applied. As an option, for hollow-core floors, the packing material (Item 4A) on the bottom surface of the floor may be recessed to accommodate a 1/4 in. (6 mm) depth of fill material installed flush with bottom surface of floor.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC – CFS-S SIL GG (floors or walls) and CFS-S SIL SL (floors only)

*Bearing the UL Classification Mark



SECTION A-A

PENETRATION THRU CONCRETE FLOOR
NO SCALE

SYSTEM NO.C-AJ-1276
April 29, 2012
F RATING-3 HR
T RATING-0 HR

Floor or Wall Assembly - 1. Floor or Wall Assembly – Min 4-1/2 in. (114 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 diam of opening is 6 in. (152 mm).

See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Through Penetrants - One metallic pipe, conduit or tubing to be centered within the firestop system. A nom annular space of 3/4 in. (19 mm) is required within the firestop system. Pipe, conduit or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
   A. Steel Pipe - Nom 4 in. (102 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe
   B. Conduit - Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing or steel conduit.

3. Firestop System - The firestop system shall consist of the following:
A. Packing or Forming Materials – Optional – One of the following packing or forming materials may be used:

A1. Foam Backer Rod – Foam backer rod tightly packed into the opening as a permanent form. Packing material to be recessed from the top surface of floor or both surfaces of wall as required to accommodate the required thickness of putty.

A2. Mineral Wool Batt Insulation – Min 4 pcf (64 kg/m3), tightly packed into the opening as a permanent form. Packing material to be recessed from the top surface of floor or both surfaces of wall as required to accommodate the required thickness of putty.

A3. Forming Material* – Forming material to be foamed into the opening as a permanent form. Forming material to be recessed from the top surface of floor or both surfaces of wall as required to accommodate the required thickness of putty.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC – CF612 or CF-AS CJP Foam Sealant

B. Fill, Void or Cavity Material* – Putty – Min 1 in. (25 mm) thickness of putty applied within the annulus, flush with top surface of floor or with both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC – CP 618 Firestop Putty Stick

*Bearing the UL Classification Mark

THROUGH RATED WALL OR FLOOR PENETRATIONS (U.L. LISTINGS)

SCALE: N.T.S.

4

COMPLETE FIRE ALARM SUBMITTAL
AUTOMATIC ADDRESSABLE FIRE ALARM SYSTEM WITH EMERGENCY VOICE/ALARM COMMUNICATION SYSTEM

LPA
ARCHITECTURE ENGINEERING INTERIORS
LANDSCAPE ARCHITECTURE PLANNING
949-261-1001 Office
LPADesignStudios.com
5301 California Avenue, Suite 100
Irvine, California 92617

wsp
11870 Pierce Street, Suite 160
Riverside, California 92505
951.299.4160 wsp.com
Project Leader - Bill Voller
Electrical Lead - Ronald Dela Cruz
WSP Job #:US0043159.0992

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SONORA HIGH SCHOOL
SCIENCE CLASSROOMS MODERNIZATION

401 S PALM STREET
LA HABRA, CA 90631

Developed for
FULLERTON JOINT UNION HIGH SCHOOL DISTRICT

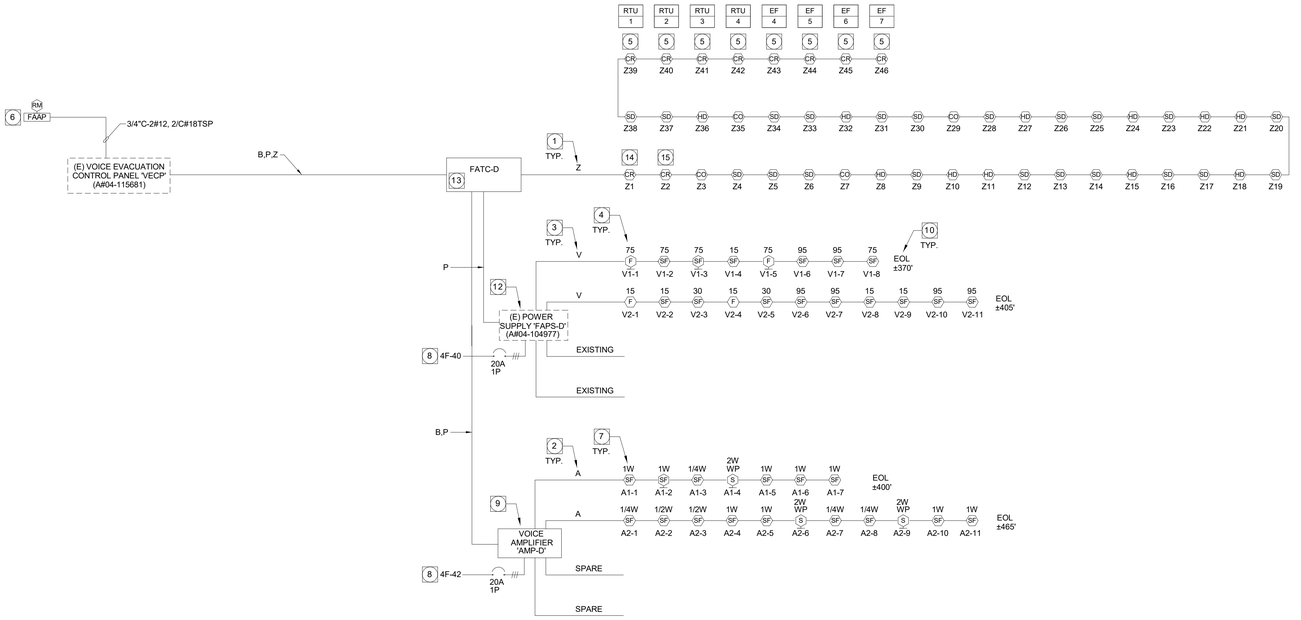
Submittal	Date
SCHEMATIC DESIGN	03/13/2025
50% DESIGN DEVELOPMENT	06/16/2025
90% DESIGN DEVELOPMENT	07/30/2025
95% CD	10/30/2025
DSA SUBMITTAL	11/21/2025
DSA BACK CHECK	01/27/2026

Revision	Date

Job Number	32433
Checked By	Checker
Scale	12" = 1'-0"

FIRE ALARM DETAILS

EFA0.02



RISER DIAGRAM SPECIFIC NOTES:

1. 'Z' INDICATES ZONABLE/ADDRESSABLE CIRCUIT, PROVIDE 2#18 TWISTED PAIR PER CIRCUIT. SEE WIRE LEGEND FOR ADDITIONAL INFORMATION.
2. 'A' INDICATES AUDIBLE SPEAKER CIRCUIT, SEE WIRE LEGEND FOR ADDITIONAL INFORMATION.
3. 'V' INDICATES VISIBLE STROBE CIRCUIT, SEE WIRE LEGEND FOR ADDITIONAL INFORMATION.
4. NUMBER INDICATES CANDELA RATING OF STROBE DEVICE.
5. CONNECT AS REQUIRED TO MECHANICAL UNIT FOR IMMEDIATE SHUTDOWN OF UNIT UPON ACTIVATION OF FIRE ALARM SYSTEM. VERIFY EXACT LOCATION OF UNIT PRIOR TO ROUGH-IN.
6. NEW FIRE ALARM ANNUNCIATOR PANEL (FAAP) TO REPLACE EXISTING. VERIFY WITH DISTRICT REPRESENTATIVE, A.H.J. AND ARCHITECT FOR EXACT LOCATION.
7. INDICATES WATTAGE FOR SPEAKER.
8. PROVIDE 3/4"C. WITH 2#12, 1#12 GRD. TO 120V DEDICATED CIRCUIT FOR POWER. PROVIDE 20AMP, 1-POLE CIRCUIT BREAKER WITH APPROVED LOCK-ON DEVICE, RED INDICATOR AND IDENTIFIED AS "FIRE ALARM CONTROL CIRCUIT" (NFPA 72, SECTION 10.6.5.2). CONNECT AS REQUIRED. PROVIDE ALL REQUIRED MOUNTING HARDWARE. MATCH A.I.C. RATING OF DEVICES USED.
9. NEW FIRE ALARM DIGITAL AUDIO AMPLIFIER (AMP-D). SEE SYMBOL LIST FOR ADDITIONAL INFORMATION.
10. INDICATES LENGTH OF WIRE IN FEET. SEE WIRING DIAGRAM FOR WIRE TYPES. SEE VOLTAGE DROP CALCULATIONS FOR PERCENT DROPPED AND ADDITIONAL INFORMATION.
12. EXISTING FIRE ALARM POWER SUPPLY (FAPS-D), PROVIDE DEDICATED 120V CIRCUIT WITH RED INDICATOR AND APPROVED LOCK-ON DEVICE PER PLANS. RECONNECT EXISTING CIRCUITS THAT ARE NOT PART OF SCOPE.
13. NEW FIRE ALARM TERMINAL CABINET (FATC). ESTABLISH RECONNECTION BETWEEN BUILDING 900 AND 400 TO THE CONTROL PANEL. PROVIDE ANY NEW OR ADDITIONAL WIRING AND CONNECTIONS AS NEEDED FOR A COMPLETE AND OPERABLE SYSTEM.
14. PROVIDE CONTROL MODULE WITHIN FIRE ALARM PANEL AND CONNECT AS REQUIRED FOR CONTROL OF COMBINATION SMOKE/FIRE DAMPERS.
15. INTERCEPT DOOR HOLDER RELAY CIRCUIT AND RECONNECT TO THE NEW FIRE ALARM TERMINAL CABINET.

FIRE ALARM GENERAL NOTES:

1. NOTIFICATION DEVICES IN ROOMS CONTAINING (2) OR MORE AUDIBLE AND/OR (2) OR MORE VISUAL DEVICES SHALL BE SYNCHRONIZED PER NFPA 72. THIS SHALL INCLUDE AUDIBLE AND VISUAL DEVICES LOCATED IN ADJACENT/ADJOINING SPACES.
2. DO NOT DEVIATE FROM CONDUIT RUNS AS SHOWN ON FLOOR PLANS WITHOUT PRIOR APPROVAL FROM SYSTEM SUPPLIER / ENGINEER. FACTORS SUCH AS EXCESSIVE VOLTAGE DROP, ADDITIONAL PARTS, ENGINEERING, ETC. THAT ARE A RESULT OF CONDUIT RUN DEVIATIONS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
3. DETECTORS SHALL NOT BE LOCATED IN A DIRECT AIR-FLOW, NOR CLOSER THAN 3 FEET (915 mm) FROM ANY AIR SUPPLY DIFFUSER.
4. THE AUDIBLE ALARM NOTIFICATION APPLIANCES SHALL PROVIDE A SOUND PRESSURE LEVEL OF 15 dBA ABOVE THE AVERAGE AMBIENT SOUND LEVEL OR 5 dBA ABOVE THE MAXIMUM SOUND LEVEL HAVING DURATION OF AT LEAST 60 SECONDS, WHICHEVER IS GREATER, IN EVERY OCCUPIED SPACE WITHIN THE BUILDING PER CFC SECTION 907.5.2.1.1. THE MINIMUM SOUND PRESSURE LEVEL SHALL BE 60 dBA PER NFPA 72, TABLE A.18.4.3.
5. THE AUDIBLE ALARM SIGNAL SHALL BE THE STANDARD FIRE ALARM EVACUATION SIGNAL, ANSI S34.1 AUDIBLE EMERGENCY EVACUATION SIGNAL, "THREE PULSE TEMPORAL PATTERN", AS DESCRIBED IN NFPA 72. EXCEPTION: THE USE OF THE EXISTING EVACUATION SIGNALING SCHEME SHALL BE PERMITTED WHERE APPROVED BY THE ENFORCING AGENT. (CFC, SECTION 907.5.2.1.3)
6. THE EXISTING CAMPUS FIRE ALARM SYSTEM SHALL BE MAINTAINED AND OPERATIONAL AT ALL TIMES DURING ALTERATIONS AND CONSTRUCTION. WHEN PORTIONS OF THE SYSTEM REQUIRE ALTERATIONS, THE REMAINDER OF THE SYSTEM SHALL BE KEPT IN SERVICE. IF NECESSARY TO SHUT DOWN ENTIRE FIRE ALARM SYSTEM, CONTRACTOR SHALL PROVIDE A FIRE WATCH FOR ALL OCCUPIED AREAS OF WORK WHERE THE REQUIRED FIRE ALARM SYSTEM IS OUT OF SERVICE FOR THE DURATION OF THE SYSTEM OUTAGE. FIRE WATCH AND SYSTEM/EQUIPMENT IDENTIFICATIONS SHALL BE PER CFC, SECTION 901.7. LOCAL FIRE AUTHORITY SHALL BE NOTIFIED 48 HOURS IN ADVANCE OF ANY SHUT DOWN.
7. PROVIDE HEAT DETECTORS WHERE FIRE SPRINKLERS HAVE BEEN OMITTED PER NFPA 72 AND NFPA 13.
8. EMERGENCY VOICE/ALARM COMMUNICATION SYSTEMS SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH NFPA 72. THE OPERATION OF ANY AUTOMATIC FIRE DETECTOR, SPRINKLER WATERFLOW DEVICE OR MANUAL FIRE ALARM BOX SHALL AUTOMATICALLY SOUND AN ALERT TONE FOLLOWED BY VOICE INSTRUCTIONS GIVING APPROVED INFORMATION AND DIRECTIONS FOR A GENERAL OR STAGED EVACUATION IN ACCORDANCE WITH THE FIRE SAFETY EVACUATION PLANS REQUIRED BY CFC SECTION 404 PER CBC/CFC SECTION 907.5.2.2.
9. EMERGENCY VOICE/ALARM COMMUNICATION SYSTEMS SHALL HAVE THE CAPABILITY TO BROADCAST LIVE VOICE MESSAGES BY PAGING ZONES ON A SELECTIVE AND ALL-CALL BASIS PER CBC/CFC, SECTION 907.5.2.2.2.
10. EMERGENCY VOICE/ALARM COMMUNICATION SYSTEMS SHALL BE PROVIDED WITH AN APPROVED EMERGENCY POWER SOURCE PER CBC/CFC, SECTION 907.5.2.2.5.

VOLTAGE DROP CALCULATIONS

SONORA HIGH SCHOOL

DEVICE	UL MAX. CURRENT AMPS	NO	AUDIBLE CIRCUIT A1	NO	AUDIBLE CIRCUIT A2	NO	AUDIBLE CIRCUIT SPARE	NO	AUDIBLE CIRCUIT SPARE	NO	VISUAL CIRCUIT V1	NO	VISUAL CIRCUIT V2	NO	VISUAL CIRCUIT EXISTING	NO	VISUAL CIRCUIT EXISTING
SPEAKER (2W) (EXTERIOR)	0.028	1	0.028	2	0.056		0.000		0.000		0.000		0.000		0.000		0.000
SPEAKER (1W) (INTERIOR)	0.014	5	0.070	4	0.056		0.000		0.000		0.000		0.000		0.000		0.000
SPEAKER (1/2W) (INTERIOR)	0.007		0.000	2	0.014		0.000		0.000		0.000		0.000		0.000		0.000
SPEAKER (1/4W) (INTERIOR)	0.004	1	0.004	3	0.011		0.000		0.000		0.000		0.000		0.000		0.000
STROBE (WALL) 30 CD	0.063		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000
STROBE (WALL) 75 CD	0.112		0.000		0.000		0.000		0.000	3	0.336		0.000		0.000		0.000
STROBE (WALL) 110 CD	0.136		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000
STROBE (CEILING) 15 CD	0.072		0.000		0.000		0.000		0.000	1	0.072	5	0.360		0.000		0.000
STROBE (CEILING) 30 CD	0.101		0.000		0.000		0.000		0.000		0.000	2	0.202		0.000		0.000
STROBE (CEILING) 75 CD	0.167		0.000		0.000		0.000		0.000	2	0.334		0.000		0.000		0.000
STROBE (CEILING) 95 CD	0.200		0.000		0.000		0.000		0.000	2	0.400	4	0.800		0.000		0.000
			0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000
			0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000
TOTAL CURRENT ON CIRCUIT			0.102 AMPS		0.137 AMPS		0.000 AMPS		0.000 AMPS		1.142 AMPS		1.362 AMPS		0.000 AMPS		0.000 AMPS
TOTAL WIRE LENGTH IN FEET			400		465						370		405				
OPERATING VOLTAGE			**20.06**		**19.87**		**20.40**		**20.40**		**19.00**		**18.58**		**20.40**		**20.40**
WIRE SIZE			#16		#16		#16		#16		#12		#12		#12		#12
CIRCUIT LOCATION			AMP-D		AMP-D		AMP-D		AMP-D		FAPS-D		FAPS-D		FAPS-D		FAPS-D
VOLTS DROPPED			**0.34**		**0.53**		**0.00**		**0.00**		**1.40**		**1.82**		**0.00**		**0.00**
% VOLTS DROPPED			**1.67**		**2.60**		**0.00**		**0.00**		**6.85**		**8.94**		**0.00**		**0.00**

VOLTAGE DROP CALCULATIONS GENERAL NOTES:

1. THE LISTED MANUFACTURER OPERATING VOLTAGE RANGE FOR EQUIPMENT AND DEVICES ARE AS FOLLOWS:

   DEVICES = 16 - 33 VDC
   EQUIPMENT = +24VDC FILTERED, REGULATED
   BATTERY = 20.4 VDC END OF USEFUL LIFE PER NFPA 72 HANDBOOK AND UL 864.

2. VOLTAGE DROP PERCENT FORMULA:

$$\frac{\text{WIRE LENGTH x TOTAL CURRENT AMPS x 21.6}}{\text{CIRCULAR MILS}} \times \frac{100}{20.4}$$

   21.6 = CONSTANT (RESISTANCE OF CONDUCTOR)

   CIRCULAR MILS:
   #12AWG = 6530 #16AWG = 2580
   #14AWG = 4110 #18AWG = 1620

BATTERY SIZING - NEW LOAD

PROJECT NAME: SONORA HS SCIENCE CLASSROOMS MOD
PANEL LOCATION: ADMIN BUILDING 100
DATE PERFORMED: January 20, 2026

(E) VECP

QTY.	DEVICE NAME	STD-BY (AMPS)		ALARM (AMPS)	
21	SMOKE DETECTOR	0.0003	0.0063	0.0065	0.1365
11	HEAT DETECTOR	0.0002	0.0022	0.0065	0.0715
4	COMBINAITON CO MODULE	0.0004	0.0016	0.0055	0.0220
10	CONTROL RELAY MODULE	0.0003	0.0030	0.0065	0.0650
1	ANNUNCIATOR	0.0200	0.0200	0.0250	0.0250
		0.0000	0.0000	0.0000	0.0000
		0.0000	0.0000	0.0000	0.0000
		0.0000	0.0000	0.0000	0.0000
	TOTALS =		0.0246		0.1120

STAND-BY LOAD = 0.0246 ALARM LOAD = 0.1120 AMPS
STAND-BY TIME = 24 ALARM TIME = 15 / 60 HRS
STAND-BY = 0.5904 ALARM = 0.0280 AMP HRS
TOTAL = STAND-BY + ALARM
= 0.59 + 0.03
= 0.62 Ah (AMP HRS)
MULTIPLY BY DERATING FACTOR OF 1.25 = 0.77 Ah (AMP HRS)

MINIMUM BATTERY SIZE = 0.77 AMPERE HOURS

PROVIDE MIN. (2) 18.00 Ah 12VDC BATTERIES AS REQUIRED FOR 24VDC OPERATION

BATTERY SIZING - NEW LOAD

PROJECT NAME: SONORA HS SCIENCE CLASSROOMS MOD
PANEL LOCATION: BLDG 400 - IDF 410
DATE PERFORMED: January 20, 2026

(E) FAPS-D

QTY.	DEVICE NAME	STD-BY (AMPS)		ALARM (AMPS)	
3	75cd STROBE (WALL)	0.0000	0.0000	0.1800	0.5400
6	15cd STROBE (CEILING)	0.0000	0.0000	0.1200	0.7200
2	30cd STROBE (CEILING)	0.0000	0.0000	0.1200	0.2400
2	75cd STROBE (CEILING)	0.0000	0.0000	0.2000	0.4000
6	95cd STROBE (CEILING)	0.0000	0.0000	0.2200	1.3200
2	SYNC MODULE	0.0000	0.0000	0.0450	0.0900
		0.0000	0.0000	0.0000	0.0000
		0.0000	0.0000	0.0000	0.0000
		0.0000	0.0000	0.0000	0.0000
	TOTALS =		0.0000		3.3100

STAND-BY LOAD = 0.0000 ALARM LOAD = 3.3100 AMPS
STAND-BY TIME = 24 ALARM TIME = 15 / 60 HRS
STAND-BY = 0.0000 ALARM = 0.8275 AMP HRS
TOTAL = STAND-BY + ALARM
= 0.00 + 0.83
= 0.83 Ah (AMP HRS)
MULTIPLY BY DERATING FACTOR OF 1.25 = 1.03 Ah (AMP HRS)

MINIMUM BATTERY SIZE = 1.03 AMPERE HOURS

PROVIDE MIN. (2) 7.00 Ah 12VDC BATTERIES AS REQUIRED FOR 24VDC OPERATION

BATTERY SIZING CALCULATION

PROJECT NAME: SONORA HS SCIENCE CLASSROOMS MOD
PANEL LOCATION: BLDG 400 - IDF 410
DATE PERFORMED: January 20, 2026

AMP-D

QTY.	DEVICE NAME	STD-BY (AMPS)		ALARM (AMPS)	
1	50 WATT AMPLIFIER	0.1000	0.1000	0.5800	0.5800
4	SPEAKER (1/4W)	0.0000	0.0000	0.0490	0.1960
2	SPEAKER (1/2W)	0.0000	0.0000	0.0490	0.0980
9	SPEAKER (1W)	0.0000	0.0000	0.0490	0.4410
3	WP SPEAKER (2W)	0.0000	0.0000	0.0490	0.1470
2	SYNC MODULE	0.0000	0.0000	0.0450	0.0900
		0.0000	0.0000	0.0000	0.0000
		0.0000	0.0000	0.0000	0.0000
		0.0000	0.0000	0.0000	0.0000
	TOTALS =		0.0000		0.6780

STAND-BY LOAD = 0.0000 ALARM LOAD = 0.6780 AMPS
STAND-BY TIME = 24 ALARM TIME = 15 / 60 HRS
STAND-BY = 0.0000 ALARM = 0.1695 AMP HRS
TOTAL = STAND-BY + ALARM
= 0.00 + 0.17
= 0.17 Ah (AMP HRS)
MULTIPLY BY DERATING FACTOR OF 1.25 = 0.21 Ah (AMP HRS)

MINIMUM BATTERY SIZE = 0.21 AMPERE HOURS

PROVIDE MIN. (2) 7.00 Ah 12VDC BATTERIES AS REQUIRED FOR 24VDC OPERATION

BATTERY CALCULATIONS GENERAL NOTES:

CONTRACTOR TO PROVIDE BATTERY MANUFACTURER DATE STAMP PER NFPA 72. TYPICAL FOR ALL CONTROL PANELS, POWER SUPPLY PANELS AND AUDIO AMPLIFIER PANELS.

COMPLETE FIRE ALARM SUBMITTAL
AUTOMATIC ADDRESSABLE FIRE ALARM SYSTEM WITH EMERGENCY VOICE/ALARM COMMUNICATION SYSTEM

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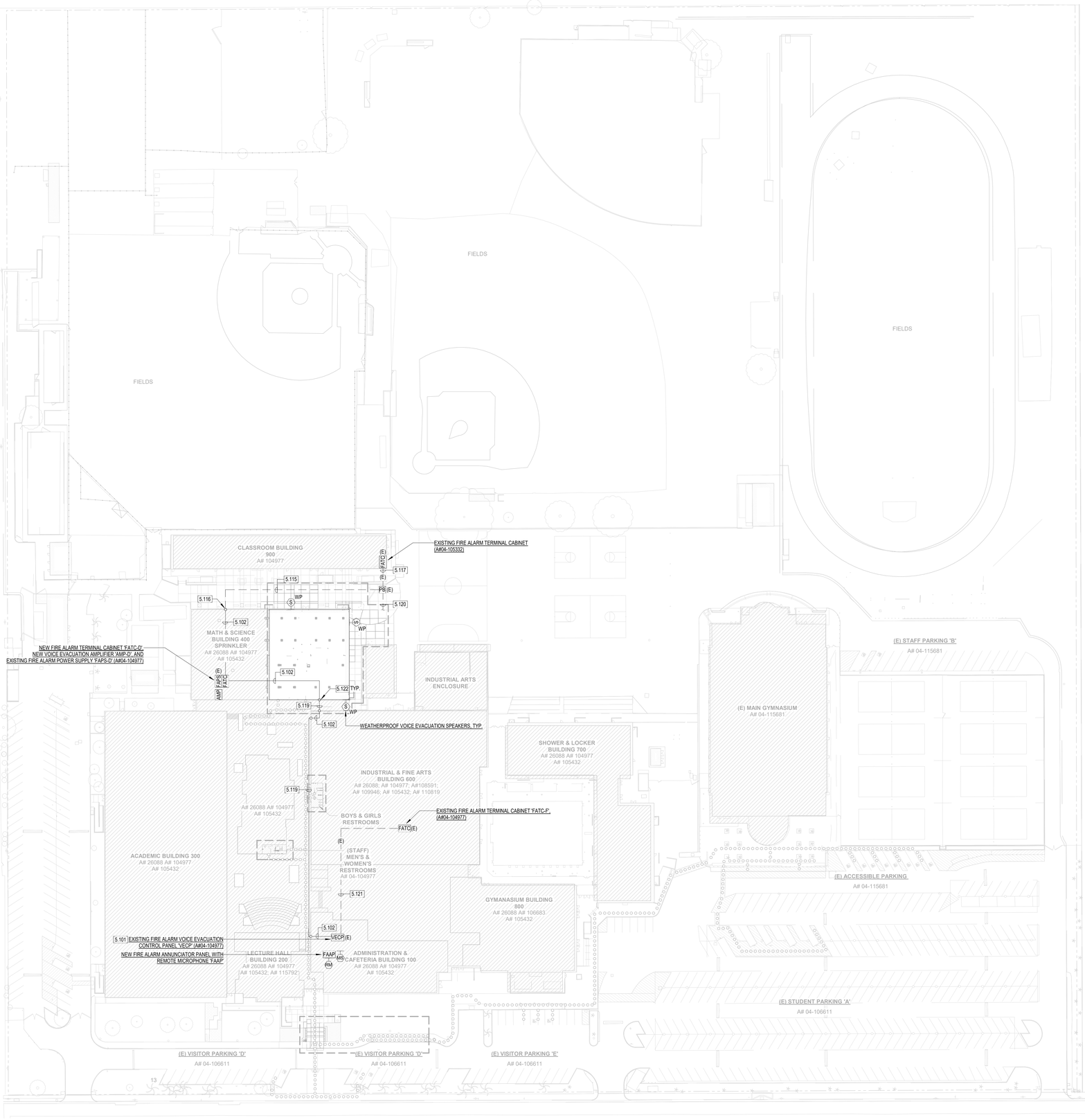
DSA BACK CHECK	01/27/2026

Job Number	32433
Checked By	Checker
Scale	12" = 1'-0"

FIRE ALARM RISER DIAGRAM & SYSTEM CALCULATIONS

EFA0.03



FIRE ALARM SITE PLAN | 1" = 50'-0" | EFA0.10 | 1

PLAN NOTES:

5.101 MODIFY EXISTING FIRE ALARM CONTROL PANEL AS REQUIRED TO SERVE THE NEW CONSTRUCTION. PROVIDE ADDITIONAL HARDWARE, MODULES, CONNECTIONS, PROGRAMMING, ETC. AS NEEDED FOR A COMPLETE AND OPERABLE SYSTEM.

5.102 ROUTE 1"C. THROUGH ACCESSIBLE CEILING SPACE.

5.115 PROVIDE NEW 2"C. ESTABLISHING RECONNECTION BETWEEN BUILDING 900 AND 400.

5.116 ROUTE CONDUIT FROM BELOW GRADE EXPOSED ON BUILDING EXTERIOR TO AN ELEVATION ABOVE THE ACCESSIBLE CEILING SPACE. PROVIDE A WEATHERPROOF "LB" FITTING AND SEALED PENETRATION THROUGH THE BUILDING EXTERIOR AS REQUIRED TO PERFORM WORK INDICATED. PAINT CONDUIT TO MATCH THE SURROUNDING SURFACE.

5.117 EXISTING CONDUIT TO BE PROTECTED IN PLACE. PROVIDE NEW WIRING FOR A COMPLETE AND OPERABLE SYSTEM OF BUILDING 900.

5.119 ROUTE CONDUIT OVERHEAD ABOVE EXISTING LOWER CEILING VESTIBULE.

5.120 ABANDON CONDUIT IN PLACE AND REMOVE EXISTING WIRING.

5.121 EXISTING CONNECTION TO REMAIN PROTECTED IN PLACE. SHOWN FOR REFERENCE ONLY.

5.122 PROVIDE SEISMIC EXPANSION FITTING ON EACH CONDUIT CROSSING SEISMIC JOINT.

SITE PLAN GENERAL NOTES:

1. CONTRACTOR SHALL EXERCISE EXTREME CAUTION IN EXCAVATING AND TRENCHING ON THIS SITE TO AVOID EXISTING DUCTS, PIPING OR CONDUITS, ETC., AND TO PREVENT HAZARDS TO PERSONNEL AND/OR DAMAGE TO EXISTING UNDERGROUND UTILITIES OR STRUCTURES WHETHER OR NOT SHOWN AND INSTALLED BY ANY OTHER CONTRACTS. THE ENGINEER IS NOT RESPONSIBLE FOR THE LOCATION OF UNDERGROUND UTILITIES OR STRUCTURES WHETHER OR NOT SHOWN OR DETAILED AND INSTALLED BY ANY OTHER CONTRACTS. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER SHOULD SUCH UNIDENTIFIED CONDITIONS BE DISCOVERED. THESE DRAWINGS AND SPECIFICATIONS DO NOT INCLUDE THE NECESSARY ELEMENTS FOR CONSTRUCTION SAFETY.
2. CALL UNDERGROUND SERVICE ALERT (USA) AT 1 (800) 422-4133 OR APPLICABLE STATE AND LOCAL DIG SAFE OR UNDERGROUND ALERT HOTLINES PRIOR TO CONSTRUCTION START.
3. MINIMUM CONDUIT SIZE SHALL BE 3/4" - U.O.N.
4. MINIMUM CONDUCTOR SIZE SHALL BE #10 AWG. - U.O.N.
5. ALL SITE BRANCH CIRCUITS SHALL INCLUDE AN EQUIPMENT GROUND CONDUCTOR THAT, AT MINIMUM, MATCHES THE SIZE OF THE ASSOCIATED BRANCH CIRCUIT CONDUCTOR. WHERE MULTIPLE BRANCH CIRCUITS ARE ROUTED/GROUPED TOGETHER, THE EQUIPMENT GROUNDING CONDUCTOR SHALL MATCH THE SIZE OF THE LARGEST BRANCH CIRCUIT CONDUCTOR IN THE GROUP.
6. ALL ELECTRICAL EQUIPMENT MOUNTED OUTDOORS SHALL BE WEATHERPROOF (NEMA #3R).
7. ALL CONDUIT ONLY SHALL BE PROVIDED WITH A NYLON PULL STRING.
8. SEE ARCHITECTURAL/LANDSCAPE ARCHITECTURAL PLANS FOR EXACT LOCATIONS OF FIXTURES, PULLBOXES, MANHOLES, OTHER ELECTRICAL DEVICES, ETC. COORDINATE ALL UNDERGROUND STRUCTURES AND CONDUIT ROUTING WITH LANDSCAPE ARCHITECT PRIOR TO ROUGH-IN TO ENSURE THAT SUCH ITEMS ARE NOT PLACED IN CRITICAL LANDSCAPE PLANTING/HARDSCAPE AREAS.
9. UNLESS SPECIFICALLY SHOWN AS (E), (R), (ER), (D), EXISTING OR NON-BOLD, ALL ELECTRICAL DEVICES SHOWN ARE NEW.

FIRE ALARM PLAN GENERAL NOTES:

1. NOTIFICATION DEVICES IN ROOMS CONTAINING (2) OR MORE AUDIBLE AND/OR (2) OR MORE VISUAL DEVICES SHALL BE SYNCHRONIZED PER NFPA 72. THIS SHALL INCLUDE AUDIBLE AND VISUAL DEVICES LOCATED IN ADJACENT/ADJOINING SPACES.
2. DO NOT DEVIATE FROM CONDUIT RUNS AS SHOWN ON FLOOR PLANS WITHOUT PRIOR APPROVAL FROM SYSTEM SUPPLIER / ENGINEER. FACTORS SUCH AS EXCESSIVE VOLTAGE DROP, ADDITIONAL PARTS, ENGINEERING, ETC. THAT ARE A RESULT OF CONDUIT RUN DEVIATIONS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
3. DETECTORS SHALL NOT BE LOCATED IN A DIRECT AIR-FLOW, NOR CLOSER THAN 3 FEET (915 mm) FROM ANY AIR SUPPLY DIFFUSER.
4. THE AUDIBLE ALARM NOTIFICATION APPLIANCES SHALL PROVIDE A SOUND PRESSURE LEVEL OF 15 dBA ABOVE THE AVERAGE AMBIENT SOUND LEVEL OR 5 dBA ABOVE THE MAXIMUM SOUND LEVEL HAVING DURATION OF AT LEAST 60 SECONDS, WHICHEVER IS GREATER, IN EVERY OCCUPIED SPACE WITHIN THE BUILDING PER CFC SECTION 907.5.2.1.1. THE MINIMUM SOUND PRESSURE LEVEL SHALL BE 60 dBA PER NFPA 72, TABLE A.18.4.4.
5. THE VOICE/ALARM COMMUNICATION SYSTEM VOICE MESSAGE SHALL COMPLY WITH NFPA 72, SECTIONS 18.4 AND 24.4 FOR GENERAL REQUIREMENTS, INTELLIGIBILITY, AUDIBILITY, MESSAGE PRIORITY, TONES, ETC.
6. REFER TO ARCHITECTURAL EXTERIOR ELEVATIONS FOR PRECISE DEVICE LOCATIONS.
7. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION OF ALL CEILING MOUNTED DEVICES.
8. IF SHIELDED WIRE IS USED, THE FOLLOWING MUST BE OBSERVED:
   A. METALLIC CONTINUITY OF THE SHIELD MUST BE MAINTAINED AND INSULATED THROUGHOUT THE ENTIRE LENGTH OF THE CABLE.
   B. THE ENTIRE LENGTH OF THE CABLE MUST HAVE A RESISTANCE GREATER THE 1 MEGOHM TO EARTH.
9. ALL PENETRATIONS THROUGH FIRE RATED WALLS SHALL BE PROTECTED FROM THE SPREAD OF FIRE WITH AN APPROVED FIRE STOP SYSTEM EQUAL TO OR GREATER THAN THE FIRE RATING OF THE STRUCTURE / SURFACE BEING PENETRATED AS IDENTIFIED IN CBC CHAPTER 7, UL OR OTHER LAB TESTING CRITERIA. APPROVED TYPES OF MATERIALS SHALL BE IDENTIFIED WITHIN THE FIRE ALARM SECTION OF THE PROJECT SPECIFICATIONS.
10. A SYSTEM GROUND MUST BE PROVIDED FOR EARTH DETECTION AND LIGHTNING PROTECTION DEVICES. THIS CONNECTION SHALL BE MADE TO AN APPROVED DEDICATED EARTH CONNECTION PER CEC, ARTICLE 250.
11. WIRING IN DUCTS, PLENUMS AND OTHER AIR HANDLING SPACES MUST BE INSTALLED IN ACCORDANCE WITH CEC.
12. UNDERGROUND WIRING MUST BE FREE OF ALL WATER.
13. ALL FIRE ALARM SYSTEM CONDUCTORS SHALL BE RUN IN A DEDICATED FIRE ALARM CONDUIT SYSTEM.
14. WHERE A DETECTOR IS INDICATED TO BE INSTALLED ABOVE THE CEILING AND NO ACCESS TO THE CEILING SPACE EXISTS, THE ELECTRICAL CONTRACTOR SHALL FURNISH ACCESS PANELS. THE DETECTOR SHALL BE EASILY ACCESSIBLE AND THE LOCATION OF THE DETECTOR SHALL BE CLEARLY MARKED.
15. FIRE ALARM SYSTEM UTILIZES A COMPLETE COVERAGE, FULLY AUTOMATIC SYSTEM. PROVIDE RELAY MODULE(S) AT FATC/FACP LOCATIONS FOR CONTROL OF HVAC SHUT DOWN, SMOKE/FIRE DAMPER CLOSURE AND DOOR HOLD RELEASES.
16. WHERE NEW DEVICES (AND ASSOCIATED CONDUIT) CANNOT PHYSICALLY BE MOUNTED CONCEALED IN WALLS, RUN IN PANDUIT SURFACE RACEWAY/RACEWAY (AND DEVICES SHALL BE MOUNTED ON SURFACE OUTLET BOXES). REFER TO SPECIFICATIONS. PROVIDE SIZE OF RACEWAY TO ACCOMMODATE THE REQUIRED CONDUCTORS. WHERE CONDUIT IS INDICATED, PROVIDE SURFACE RACEWAY WITH AN EQUAL CROSS SECTION TO THE DIAMETER OF THE CONDUIT INDICATED.
17. DETECTOR SENSITIVITY SHALL BE TESTED USING MANUFACTURER'S CALIBRATED SENSITIVITY INSTRUMENT OR OTHER CALIBRATED TESTING METHOD. (CFC, SECTIONS 907.8.3 AND 907.8.4).
18. UPON DETECTION OF CARBON MONOXIDE THE FIRE ALARM SYSTEM SHALL PRODUCE A FOUR-PULSE TEMPORAL PATTERN SIGNAL WITHIN THE BUILDING AND COMPLY WITH NFPA 72 SECTION 18.4.3.
19. THE VOICE/ALARM COMMUNICATION SYSTEM VOICE MESSAGE SHALL COMPLY WITH NFPA 72 SECTIONS 18.4 AND 24.4 FOR GENERAL REQUIREMENTS, INTELLIGIBILITY, AUDIBILITY, MESSAGE PRIORITY, TONES, ETC. REFER TO NFPA 72 ANNEX D, D.1 THROUGH D.6 FOR DETERMINING THE FUNDAMENTALS OF TEST PROTOCOL AND METHOD OF MEASURING INTELLIGIBILITY.
20. THE EXISTING CAMPUS FIRE ALARM SYSTEM SHALL BE MAINTAINED AND OPERATIONAL AT ALL TIMES DURING ALTERATIONS AND CONSTRUCTION. WHEN PORTIONS OF THE SYSTEM REQUIRE ALTERATIONS, THE REMAINDER OF THE SYSTEM SHALL BE KEPT IN SERVICE. IF NECESSARY TO SHUT DOWN ENTIRE FIRE ALARM SYSTEM, CONTRACTOR SHALL PROVIDE FIREWATCH FOR ALL OCCUPIED AREAS OF WORK UNTIL THE FIRE ALARM SYSTEM IS RETURNED TO OPERATIONAL SERVICE. FIREWATCH AND SYSTEM/EQUIPMENT IDENTIFICATION SHALL BE PER THE 2022 CFC, CHAPTER 14. LOCAL FIRE AUTHORITY AND OWNER SHALL BE NOTIFIED 48 HOURS IN ADVANCE OF ANY SHUT DOWN.

COMPLETE FIRE ALARM SUBMITTAL
AUTOMATIC ADDRESSABLE FIRE ALARM SYSTEM WITH EMERGENCY VOICE/ALARM COMMUNICATION SYSTEM

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DSA BACK CHECK	01/27/2026

Job Number	32433
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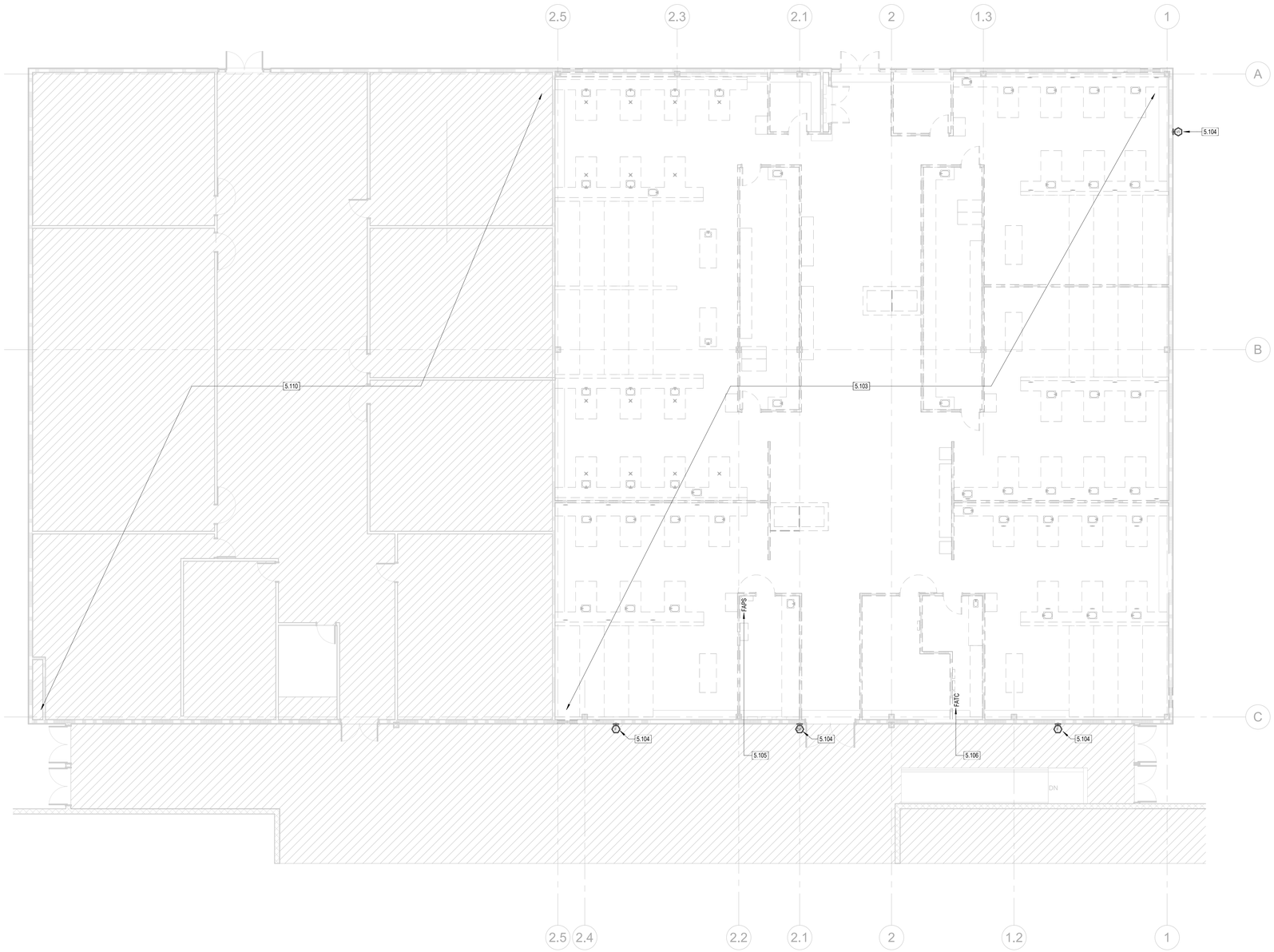
Scale	As indicated

FIRE ALARM SITE PLAN

EFA0.10



FIRE ALARM DEMOLITION PLAN | 1/8" = 1'-0" | EFA1.02 | 1

PLAN NOTES:

5.103 REMOVE ALL EXISTING INITIATION AND NOTIFICATION DEVICES AND ASSOCIATED WIRING.

5.104 EXISTING DEVICE TO BE REPLACED WITH NEW IN SAME LOCATION.

5.105 REMOVE EXISTING FIRE ALARM POWER SUPPLY AND RELOCATE TO IDF ROOM 410 - SEE EFA2.01 FOR EXACT LOCATION.

5.106 DEMOLISH EXISTING FIRE ALARM TERMINAL CABINET. DEMOLISH EXISTING CONNECTION BETWEEN BUILDING 900 FATC. REMOVE EXISTING WIRE AND ABANDON CONDUIT. PROVIDE NEW FIRE ALARM TERMINAL CABINET IN IDF ROOM 410 - SEE EFA2.01 FOR EXACT LOCATION.

5.110 INTERCEPT CONDUIT ABOVE CEILING AND CONNECT EXISTING DEVICES THAT ARE NOT IN SCOPE TO THE NEW FIRE ALARM TERMINAL CABINET AND EXISTING RELOCATED POWER SUPPLY.

GENERAL DEMOLITION NOTES:

1. THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC ONLY. DO NOT SCALE THE ELECTRICAL DRAWINGS TO DETERMINE THE LOCATION OF EQUIPMENT OR OUTLETS. SEE ARCHITECTURAL PLANS, WHERE PROVIDED ON PROJECT, FOR EXTENT OF DEMOLITION.
2. THE EXISTING CONDITIONS SHOWN ARE FROM AVAILABLE RECORD DRAWINGS AND SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL VERIFY ACTUAL EXISTING CONDITIONS AT SITE PRIOR TO SUBMITTING BID. ALL DEMOLITION, ALTERATION, EXTENSION, RELOCATION, REHABILITATION WORK SHALL BE INCLUDED IN CONTRACT. NO ADDITIONAL ALLOWANCE OR CHANGE ORDERS WILL BE ACCEPTED.
3. CONTRACTOR IS RESPONSIBLE FOR RELOCATING OR REMOVING FROM WALLS, CEILINGS, FLOOR SPACES, ETC., ANY EXISTING CONDUITS, WIRES, BOXES, FITTINGS, FIXTURES OR OTHER ELECTRICAL EQUIPMENT WHICH INTERFERES WITH PLANNED REMODEL WORK. PROVIDE CIRCUIT CONTINUATION REQUIRED FOR ALL EXISTING OUTLETS, FIXTURES, EQUIPMENT, ETC. SCHEDULED TO REMAIN.
4. NOTIFY THE ENGINEER IMMEDIATELY WHEREVER EXISTING EQUIPMENT IS ENCOUNTERED WHICH MUST BE RELOCATED DUE TO THE NEW CONSTRUCTION, OR NOT INDICATED ON "AS-BUILT" DRAWINGS OR WAS BURIED UNDERGROUND OR EMBEDDED IN STRUCTURE WALLS.
5. CAREFULLY PROTECT ALL WALLS, TRIM, FLOORS, EQUIPMENT, UTILITY LINES AND MATERIALS. WHEN WORKING FINISHED SURFACES, LIMIT DAMAGE TO THE SMALLER AREA IF POSSIBLE AND RESTORE TO THE ORIGINAL CONDITION ALL SURFACES WHICH ARE DAMAGED BECAUSE OF THE INSTALLATION OF THIS WORK.
6. EQUIPMENT, MATERIALS AND SUPPLIES TEMPORARILY REMOVED FOR PROTECTION SHALL BE REPLACED IN ORIGINAL LOCATIONS. ANY MATERIALS DAMAGED SHALL BE REPLACED WITH NEW MATERIALS OF LIKE KIND AND QUALITY.
7. DEMOLITION WORK SHALL BE DONE IN A MANNER WHICH WILL NOT CAUSE UNNECESSARY INCONVENIENCE OR DANGER TO USERS OF THE PREMISES AND ADJACENT SITE, AND NOT INTERFERE WITH ITS OPERATION. ANY DEMOLITION WORK TO BE PERFORMED MUST BE PLANNED IN ADVANCE.
8. DO ALL DRILLING, CUTTING, ETC. REQUIRED TO DEMOLISH ELECTRICAL WORK AS INDICATED OR PROVIDE BLANK COVER PLATE ON ALL OUTLETS EXPOSED BY REMOVAL OF FIXTURE OF DEVICES.
9. RESEAL ALL PENETRATIONS OR OPENING THROUGH WALLS, CEILING, FLOORS, ETC., TO MAINTAIN THE RATING OF STRUCTURE.
10. ALL REMOVED MATERIALS AND EQUIPMENT WHICH ARE SALVAGED MATERIALS SHALL REMAIN THE PROPERTY OF THE OWNER. DELIVER SUCH SALVAGED MATERIALS AND EQUIPMENT ON THE PREMISES AS DIRECTED BY OWNER AND NEATLY PILE OR STORE AND PROTECT FROM DAMAGE. DISPOSE OF ALL HAZARDOUS MATERIAL PER FEDERAL, STATE AND LOCAL REGULATIONS AND OTHER AGENCIES HAVING JURISDICTION.
11. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDUIT/WIRING RUNS, REUSE AS REQUIRED, AND REMOVE ALL UNUSED CONDUIT/WIRING. UNUSED CONDUIT IN INACCESSIBLE LOCATIONS (WALLS TO REMAIN) MAY BE ABANDONED IN PLACE. REMOVE UNUSED WIRING, INCLUDING ABANDONED TELEPHONE, DATA AND OTHER LOW VOLTAGE SYSTEMS CABLING AFTER CONFIRMING WITH THE OWNER'S PROJECT MANAGER THAT CABLING IS ABANDONED AND WILL NOT BE RE-USED.
12. CONTRACTOR TO VERIFY CIRCUIT NUMBER AND LOADS FOR ALL EXISTING EQUIPMENT PRIOR TO INSTALLATION OF NEW OR RELOCATED ELECTRICAL EQUIPMENT. REASSIGN CIRCUITS AND LOADS ACCORDINGLY. PROVIDE COMPLETE "AS BUILT" DRAWINGS AND TYPEWRITTEN DIRECTORIES FOR PANELS.
13. WHERE NECESSARY TO SHUT OFF UTILITY SERVICES OR CAUSE INTERRUPTION TO POWER OR SIGNAL SYSTEMS WHILE A BUILDING IS OCCUPIED OR THAT AFFECT ADJACENT BUILDINGS, SCHEDULE OUTAGES OR INTERRUPTIONS WITH THE OWNER, BUILDING OCCUPANTS AND/OR ADJACENT BUILDING OWNER(S) AND OCCUPANTS PRIOR TO CONDUCTING OUTAGE(S) OR INTERRUPTIONS.

FIRE ALARM PLAN GENERAL NOTES:

1. NOTIFICATION DEVICES IN ROOMS CONTAINING (2) OR MORE AUDIBLE AND/OR (2) OR MORE VISUAL DEVICES SHALL BE SYNCHRONIZED PER NFPA 72. THIS SHALL INCLUDE AUDIBLE AND VISUAL DEVICES LOCATED IN ADJACENT/ADJOINING SPACES.
2. DO NOT DEVIATE FROM CONDUIT RUNS AS SHOWN ON FLOOR PLANS WITHOUT PRIOR APPROVAL FROM SYSTEM SUPPLIER / ENGINEER. FACTORS SUCH AS EXCESSIVE VOLTAGE DROP, ADDITIONAL PARTS, ENGINEERING, ETC. THAT ARE A RESULT OF CONDUIT RUN DEVIATIONS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
3. DETECTORS SHALL NOT BE LOCATED IN A DIRECT AIR-FLOW, NOR CLOSER THAN 3 FEET (915 mm) FROM ANY AIR SUPPLY DIFFUSER.
4. THE AUDIBLE ALARM NOTIFICATION APPLIANCES SHALL PROVIDE A SOUND PRESSURE LEVEL OF 15 dBA ABOVE THE AVERAGE AMBIENT SOUND LEVEL OR 5 dBA ABOVE THE MAXIMUM SOUND LEVEL HAVING DURATION OF AT LEAST 60 SECONDS, WHICHEVER IS GREATER, IN EVERY OCCUPIED SPACE WITHIN THE BUILDING PER CFC SECTION 907.5.2.1.1. THE MINIMUM SOUND PRESSURE LEVEL SHALL BE 60 dBA PER NFPA 72, TABLE A.18.4.4.
5. THE VOICE/ALARM COMMUNICATION SYSTEM VOICE MESSAGE SHALL COMPLY WITH NFPA 72, SECTIONS 18.4 AND 24.4 FOR GENERAL REQUIREMENTS, INTELLIGIBILITY, AUDIBILITY, MESSAGE PRIORTY, TONES, ETC.
6. REFER TO ARCHITECTURAL EXTERIOR ELEVATIONS FOR PRECISE DEVICE LOCATIONS.
7. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION OF ALL CEILING MOUNTED DEVICES.
8. IF SHIELDED WIRE IS USED, THE FOLLOWING MUST BE OBSERVED:
   A. METALLIC CONTINUITY OF THE SHIELD MUST BE MAINTAINED AND INSULATED THROUGHOUT THE ENTIRE LENGTH OF THE CABLE.
   B. THE ENTIRE LENGTH OF THE CABLE MUST HAVE A RESISTANCE GREATER THE 1 MEGOHM TO EARTH.
9. ALL PENETRATIONS THROUGH FIRE RATED WALLS SHALL BE PROTECTED FROM THE SPREAD OF FIRE WITH AN APPROVED FIRE STOP SYSTEM EQUAL TO OR GREATER THAN THE FIRE RATING OF THE STRUCTURE / SURFACE BEING PENETRATED AS IDENTIFIED IN CBC CHAPTER 7. UL OR OTHER LAB TESTING CRITERIA. APPROVED TYPES OF MATERIALS SHALL BE IDENTIFIED WITHIN THE FIRE ALARM SECTION OF THE PROJECT SPECIFICATIONS.
10. A SYSTEM GROUND MUST BE PROVIDED FOR EARTH DETECTION AND LIGHTNING PROTECTION DEVICES. THIS CONNECTION SHALL BE MADE TO AN APPROVED DEDICATED EARTH CONNECTION PER CEC, ARTICLE 250.
11. WIRING IN DUCTS, PLENUMS AND OTHER AIR HANDLING SPACES MUST BE INSTALLED IN ACCORDANCE WITH CEC.
12. UNDERGROUND WIRING MUST BE FREE OF ALL WATER.
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COMPLETE FIRE ALARM SUBMITTAL
AUTOMATIC ADDRESSABLE FIRE ALARM SYSTEM WITH EMERGENCY VOICE/ALARM COMMUNICATION SYSTEM

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90% CD	10/30/2025
DSA SUBMITTAL	11/21/2025
DSA BACK CHECK	01/27/2026

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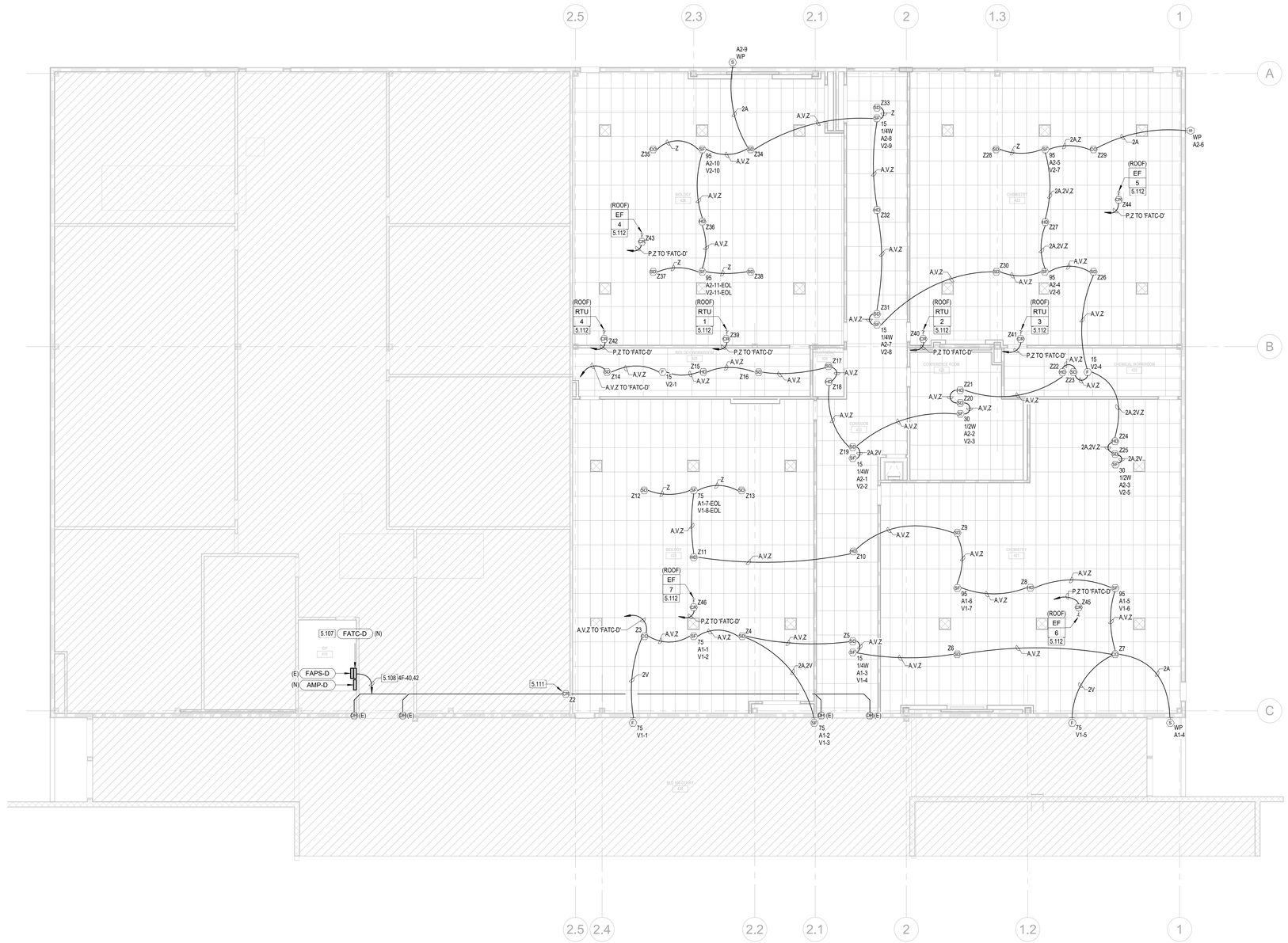
Scale	As indicated

FIRE ALARM DEMOLITION PLAN

EFA1.02



PLAN NOTES:

5.107 NEW FIRE ALARM TERMINAL CABINET. RE-CONNECT ALL EXISTING FIRE ALARM DEVICES NOT IN SCOPE OF WORK FOR A COMPLETE AND OPERATIONAL SYSTEM. RE-ROUTE IN ACCESSIBLE CEILING SPACE TO THE EXISTING CONTROL PANEL IN ADMIN BUILDING 100 - SEE EFA0.10 FOR EXACT ROUTING.

5.108 PROVIDE 3/4"C. WITH 2#12, 1#12 GRD. TO 120V DEDICATED CIRCUIT FOR POWER. PROVIDE 20AMP, 1-POLE CIRCUIT BREAKER WITH APPROVED LOCK-ON DEVICE, RED INDICATOR AND IDENTIFIED AS "FIRE ALARM CONTROL CIRCUIT" (NFPA 72, 10.6). CONNECT AS REQUIRED. PROVIDE ALL REQUIRED MOUNTING HARDWARE. MATCH A.I.C. RATING OF DEVICES USED.

5.111 INTERCEPT DOOR HOLDER RELAY CIRCUIT AND RECONNECT TO THE NEW FIRE ALARM TERMINAL CABINET.

5.112 CONNECT AS REQUIRED TO MECHANICAL UNIT FOR IMMEDIATE SHUTDOWN OF UNIT UPON ACTIVATION OF FIRE ALARM SYSTEM. VERIFY EXACT LOCATION OF UNIT PRIOR TO ROUGH-IN.

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VISUAL NOTIFICATION APPLIANCES NOTE:
VISUAL NOTIFICATION APPLIANCES UTILIZED FOR CO ALARM PURPOSES MUST NOT REFLECT THE WORD 'FIRE' OR HAVE ANY FIRE SYMBOL THEREON. REFER TO DSA IR - 9-1

VOICE EVACUATION SPEAKER NOTE:
- ALL INTERIOR SPEAKERS SHALL BE TAPPED AT 1 WATT, U.O.N.
- ALL EXTERIOR SPEAKERS SHALL BE TAPPED AT 2 WATTS, U.O.N.

COMPLETE FIRE ALARM SUBMITTAL
AUTOMATIC ADDRESSABLE FIRE ALARM SYSTEM WITH EMERGENCY VOICE/ALARM COMMUNICATION SYSTEM

FIRE ALARM PLAN | 1/8" = 1'-0" | EFA2.01 | 1

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FIRE ALARM PLAN

EFA2.01

DESIGN CRITERIA

LIGHT HAZARD OCCUPANCIES

CONFERENCE ROOM, CIRCULATION.

MAX AREA OF PROTECTION:	225 SF
MAX SPACING:	15' (STANDARD PENDENT & UPRIGHT), 14' (SIDEWALL)
DENSITY:	0.10 GPM/SF
DESIGN AREA:	1500 SF
HOSE ALLOWANCE:	100 GPM
DEFLECTOR DISTANCE: (OBSTRUCTUED AND UNOBSTRUCTED CONSTRUCTION).	1" TO 12" BELOW CEILING FOR UNOBSTRUCTED CONSTRUCTION 1" TO 6" BELOW BOTTOM OF FRAMING MEMBERS FOR OBSTRUCTED CONSTRUCTION

ORDINARY HAZARD (GROUP I) OCCUPANCIES

CUSTODIAL.

MAX AREA OF PROTECTION:	130 SF
MAX SPACING:	15' (STANDARD PENDENT & UPRIGHT), 10' (SIDEWALL)
DENSITY:	0.15 GPM/SF
DESIGN AREA:	1500 SF
HOSE ALLOWANCE:	250 GPM
DEFLECTOR DISTANCE: (OBSTRUCTUED AND UNOBSTRUCTED CONSTRUCTION).	1" TO 12" BELOW CEILING FOR UNOBSTRUCTED CONSTRUCTION 1" TO 6" BELOW BOTTOM OF FRAMING MEMBERS FOR OBSTRUCTED CONSTRUCTION

ORDINARY HAZARD (GROUP II) OCCUPANCIES

CHEMISTRY CLASSROOM, CHEMICAL STORAGE, BIOLOGY CLASSROOM.

MAX AREA OF PROTECTION:	130 SF
MAX SPACING:	15' (STANDARD PENDENT & UPRIGHT), 10' (SIDEWALL)
DENSITY:	0.20 GPM/SF
DESIGN AREA:	1500 SF
HOSE ALLOWANCE:	250 GPM
DEFLECTOR DISTANCE: (OBSTRUCTUED AND UNOBSTRUCTED CONSTRUCTION).	1" TO 12" BELOW CEILING FOR UNOBSTRUCTED CONSTRUCTION 1" TO 6" BELOW BOTTOM OF FRAMING MEMBERS FOR OBSTRUCTED CONSTRUCTION

SPRINKLER HEAD USE:

EXPOSED, UPRIGHT - GENERAL EXPOSED CEILING, MECHANICAL ROOMS WITHOUT CEILINGS, EQUIPMENT ROOMS WITHOUT CEILINGS, UTILITARIAN MECHANICAL TYPE SHOPS, ELECTRICAL ROOMS WITHOUT CEILINGS, TELECOM ROOMS WITHOUT CEILINGS

SEMI-RECESSED - ALL REMOVABLE TILE CEILINGS AND HARD LID CEILINGS. TO BE INSTALLED CENTER TILE.

CONCEALED - ONLY IN ARCHITECTURAL SENSITIVE LOCATIONS TO MATCH. TO BE INSTALLED CENTER TILE.

HIGH TEMPERATURE - UTILIZE IN ALL MECHANICAL ROOMS, ELECTRICAL ROOMS, TELECOM ROOMS OR OTHER AREAS WHERE ELEVATED TEMPERATURES MAY BE PREVALENT.

SPRINKLER HEAD GUARD - UTILIZE IN ALL MECHANICAL ROOMS, ELECTRICAL ROOMS, TELECOM ROOMS OR OTHER AREAS WHERE DAMAGE TO HEADS COULD EASILY OCCUR.

IN CORRIDORS, SPRINKLER HEADS ARE IDEALLY LOCATED ALONG CENTERLINE.

STANDPIPES (CBC 905):

NOT REQUIRED

ABBREVIATIONS

ADA	AMERICANS WITH DISABILITIES ACT
AHJ	AUTHORITY HAVING JURISDICTION
AUTO	AUTOMATIC
A/CONC	ABOVE CONCRETE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
BFP	BACKFLOW PREVENTER
BSMT	BASEMENT
BOB	BOTTOM OF BEAM
BLDG	BUILDING
BLK	BLACK
CI	CAST IRON
CL	CLASS
CLG	CEILING
CHK	CHECK
CR	CONCRETE
CON	CONCENTRIC
DN	DOWN
D	DRY
DIA	DIAMETER
DEG	DEGREE
DWG	DRAWING
DEPT	DEPARTMENT
DOD	DEPT OF DEFENSE
DI	DUCTILE IRON
DSA	DIVISION OF THE STATE ARCHITECT
EA	EACH
EL	ELBOW
EC	EXTENDED COVERAGE
ECC	ECCENTRIC
ELEC	ELECTRIC
EL	ELEVATION
EH1	EXTRA HAZARD 1
EH2	EXTRA HAZARD 2
EXIST	EXISTING
EX	EXTERIOR
EXT	EXTINGUISHER
FM	FACTORY MUTUAL GLOBAL
FA	FIRE ALARM
FDC	FIRE DEPARTMENT CONNECTION
FLG	FLANGE
FL	FLOOR
FP	FIRE PROTECTION
GAL	GALLONS
GPM	GALLONS PER MINUTE
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GR	GRADE
GND	GROUND
GVD	GROOVED
HYD	HYDRANT
HP	HORSEPOWER
HR	HOSE REEL
HV	HOSE VALVE
HC	HOSE CABINET
HVAC	HEATING VENTING AND AIR CONDITIONING
INT	INTERIOR
INSP	INSPECTOR
LTG	LIGHTING
LH	LIGHT HAZARD
MJ	MECHANICAL JOINT
MEZZ	MEZZANINE
MI	MALLEABLE IRON
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NC	NORMALLY CLOSED
NO	NORMALLY OPENED
NIC	NOT IN CONTRACT
NA	NOT APPLICABLE
NRS	NON RISING STEM
NTS	NOT TO SCALE
NPT	NATIONAL PIPE THREAD
OS&Y	OUTSIDE SCREW AND YOKE
OSHPD	OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
OTS	OPEN TO STRUCTURE
OH1	ORDINARY HAZARD I
OH2	ORDINARY HAZARD 2
PEND	PENDENT
PLB	PLUMBING
PH	PHASE
PIV	POST INDICATING VALVE
PSI	POUNDS PER SQUARE INCH
RED	REDUCER
RES	RESIDUAL
RM	ROOM
SCH	SCHEDULE
SCR	SCREWED
SW	SIDEWALL
SPEC	SPECIFICATION
SP	SPECIAL
SF	SQUARE FEET
STL	STEEL
TOC	TOP OF CONCRETE
TOS	TOP OF STEEL
THRD	THREADED
TYP	TYPICAL
TBD	TO BE DETERMINED
UL	UNDERWRITERS LABORATORY
UPR	UPRIGHT
UNO	UNLESS NOTED OTHERWISE
UG	UNDERGROUND
VA	US DEPT OF VETERANS AFFAIRS
VAL	VALVE
V	VOLTS
FS	WATER FLOW SWITCH
WLD	WELDED
WG	WIREGUARD

FIRE SPRINKLER GENERAL NOTES

1. BEFORE SUBMITTING A PROPOSAL FOR THE WORK, EACH BIDDER WILL BE HELD RESPONSIBLE TO HAVE EXAMINED THE EXISTING SITE CONDITIONS FOR THE WORK INCLUDED UNDER THIS CONTRACT. NO ALLOWANCE WILL BE MADE SUBSEQUENTLY IN THIS CONNECTION ON BEHALF OF THE CONTRACTOR FOR ANY ERROR OR NEGLIGENCE ON THEIR PART.
2. PIPE ROUTING SHOWN SHALL BE USED; ANY ADDITIONAL OFFSETS OR FITTINGS REQUIRED FOR PROPER INSTALLATION, COORDINATION WITH OTHER TRADES, AND/OR TO MAINTAIN PROPER CLEARANCE SHALL BE APPROVED BY ARCHITECT/ENGINEER AND SHALL BE PROVIDED BY THE SPRINKLER CONTRACTOR AT NO ADDITIONAL COST.
3. DESIGN AND INSTALLATION SHALL BE SUBJECT TO FINAL INSPECTION AND APPROVAL.
4. THE FIRE PROTECTION CONTRACTOR SHALL BE C-16 LICENSED BY THE STATE OF CALIFORNIA FOR THE DESIGN AND INSTALLATION OF SPRINKLER AND STANDPIPE SYSTEMS.
5. THE FIRE PROTECTION CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING, SEALING, PATCHING, AND PAINTING REQUIRED FOR INSTALLATION OF THE STANDPIPE SYSTEM. ALL PENETRATIONS OF FIRE-RATED ASSEMBLIES SHALL BE FIRE STOPPED WITH AN APPROVED/LISTED FIRE STOPPING METHOD AS PRESCRIBED IN THE CALIFORNIA BUILDING CODE.
6. THE FIRE PROTECTION CONTRACTOR SHALL COMPLETE AND SIGN CONTRACTOR'S MATERIAL AND TEST CERTIFICATE FOR THE ABOVE AND UNDERGROUND PIPING AS WELL AS ANY EQUIPMENT. THE FORMS SHALL BE GIVEN TO THE PROJECT INSPECTOR WHO WILL FORWARD TO FAU FOR FILLING IN PROJECT RECORDS. A COPY OF THIS CERTIFICATE SHALL BE PROVIDED TO THE OWNER.
7. CONTRACTOR SHALL MAINTAIN A CLEAN WORK PREMISE AT ALL TIMES AND SHALL CLEAN CONSTRUCTION SITE OF ALL THEIR DEBRIS AT THE END OF THE DAY AND BEFORE FINAL PAYMENT IS MADE.
8. THE BUILDING IS ASSUMED TO BE STRUCTURALLY SOUND AND FULLY CAPABLE OF SUPPORTING THE PROPOSED SPRINKLER PIPING AND ALL ASSOCIATED FITTINGS, HANGERS, SEISMIC BRACING AND ASSOCIATED APPURTENANCES.
9. REFER TO FIRE PROTECTION SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING THE FIRE PROTECTION SYSTEM.
10. REFER TO ARCHITECTURAL DRAWINGS FOR ACTUAL BUILDING DIMENSIONS AND DETAILS. DO NO SCALE "FP" DRAWINGS FOR CONSTRUCTION PURPOSES.
11. REFERENCE TO THE CIVIL DRAWINGS FOR ADDITIONAL FIRE SERVICE LINE INFORMATION AND ACTUAL LENGTH OF PIPE. THE LAYOUT SHOWN ON THE CIVIL DRAWINGS WILL SUPERSEDE WHAT IS SHOWN ON THE FIRE PROTECTION SITE PLAN (IF PROVIDED IN SET).
12. OWNER SHALL BE PROVIDED WITH ALL REQUIRED TEST CERTIFICATES, CARE & MAINTENANCE BOOK.
13. ALL MATERIALS, EQUIPMENT, APPURTENANCE AND RELATED DEVICES SHALL BE APPROVED FOR FIRE PROTECTION USE AND BE UL LISTED AND/OR FM APPROVED.
14. ALL WELDING SHALL BE DONE BY CERTIFIED WELDERS.
15. INSTALL ALL EQUIPMENT AND SPECIALTY DEVICES IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
16. ALL PIPE SHALL BE BLACK STEEL SCHEDULE 40 FOR PIPES 2" AND SMALLER AND/OR SCHEDULE 10 FOR PIPES 2 ½" AND LARGER UNLESS NOTED IN DESIGN DRAWINGS.
17. FLOOR/ WALL PENETRATIONS THROUGH RATED SEPARATIONS SHALL BE SEALED WITH AN APPROVED FIRE RATED MATERIAL AND/OR APPROVED ASSEMBLY.
18. WALL PENETRATIONS THROUGH NON-RATED PARTITIONS SHALL BE PROVIDED WITH A NON-SHRINKING GROUT OR CAULKING MATERIAL AND/OR APPROVED ASSEMBLY.
19. JOINING OF PIPE AND FITTINGS SHALL BE DONE WITH GROOVED COUPLINGS WHEN LIGHTWALL PIPE IS USED OR THREADED CAST IRON OR DUCTILE IRON FITTINGS WITH THREADABLE PIPE.
20. SIGNAGE SHALL BE PROVIDED IN ACCORDANCE WITH AHJ AND NFPA 13.
21. THE SPRINKLER SYSTEM SHALL BE MONITORED BY AN APPROVED SUPERVISORY STATION FURNISHED AND INSTALLED BY THE FIRE ALARM CONTRACTOR. ALL TAMPER AND WATER FLOW SWITCHES SHALL BE INSTALLED BY THE FIRE PROTECTION CONTRACTOR AND WIRED TO THE SUPERVISORY STATION BY THE FIRE ALARM CONTRACTOR.
22. THE SPRINKLER SYSTEM SHALL BE HYDRAULICALLY TESTED IN ACCORDANCE WITH NFPA 13 AND 14. PRIOR TO CONNECTION TO THE ABOVE GROUND SYSTEM, THE UNDERGROUND FIRE WATER SERVICE SHALL BE FLUSHED IN ACCORDANCE WITH NFPA 13.
23. ALL SPRINKLER LOCATIONS SHALL BE COORDINATED WITH LIGHTING FIXTURES, HVAC DIFFUSERS, FIRE ALARM DEVICES, SIGNS, AND OTHER RELATED CEILING DEVICES PRIOR TO CONSTRUCTION. THE SPRINKLER PIPE ROUTING SHALL ALSO BE COORDINATED WITH STRUCTURAL AND OTHER DISCIPLINES PRIOR TO CONSTRUCTION TO ELIMINATE OR MINIMIZE THE NUMBER OF LOW POINT DRAINS FOR THE SPRINKLER SYSTEM.
24. ALL INSPECTOR'S TEST CONNECTION AND LOW POINT DRAINS SHALL BE IN ACCORDANCE WITH NFPA 13 AND 14 (UNLESS OTHERWISE NOTED) AND SHALL BE DISPLAYED ON SHOP DRAWINGS. ALL PIPING RELATED SHALL BE LOCATED TIGHT AGAINST THE PERIMETER WALLS. COORDINATE WITH ARCHITECT FOR ACCEPTABLE LOCATIONS.
25. MOUNTING OF CONTROL VALVES SHALL BE AT MAXIMUM HEIGHT OF 7'-0" A.F.F. UNLESS OTHERWISE NOTED WHICH WILL REQUIRE APPROVED MEANS OF ACCESSIBILITY.
26. PROVIDE A SPARE SPRINKLER CABINET AND WRENCH(ES) IN ACCORDANCE WITH NFPA 13.
27. FLOW SWITCH SHALL BE CONNECTED TO A 10-INCH OUTSIDE ALARM BELL OR OTHER AUDIBLE ALARM DEVICE AT RISER. APPROVED IDENTIFICATION SIGNS SHALL BE PROVIDED ON THE OUTSIDE OF THE ALARM BELL "SPRINKLER FIRE ALARM – WHEN ALARM SOUNDS CALL 911/FIRE DEPARTMENT".
28. STORAGE AND USE OF HAZARDOUS MATERIALS SHALL NOT EXCEED THE MAXIMUM ALLOWABLE QUANTITIES LISTED IN CHAPTER 50 OF THE ADOPTED FIRE CODE.

FIRE SPRINKLER HANGING AND BRACING NOTES

1. 1NSTALL AFSS PIPING WITH 2" MINIMUM CLEARANCE FROM STRUCTURAL MEMBERS NOT PENETRATED OR USED TO SUPPORT THE PIPING.
2. HANGER LOCATIONS FOR ALL PIPING SHALL BE IN ACCORDANCE WITH NFPA 13, SECTION 17.4. SEE HANGER SCHEDULE AND/OR DETAILS FOR TYPES OF HANGERS USED. ALTERNATE UL AND FM HANGER METHODS ARE ACCEPTED AT NO ADDITIONAL COST TO THE OWNER. PROVIDE UL AND/OR FM APPROVAL TO ARCHITECT/ENGINEER PRIOR TO INSTALLATION.
3. PROVIDE SEISMIC BRACING IN ACCORDANCE WITH NFPA 13 SECTION 18.1.
4. AFSS PIPING SHALL PASS THROUGH HOLES/SLEEVES IN WALLS, FLOORS, ROOFS OR FOUNDATIONS. COMPLY WITH ALL STRUCTURAL DETAILS AND THE FOLLOWING: PROVIDE 2" NOMINAL CLEARANCE AT HOLES/SLEEVES FOR PIPES 3-1/2" AND SMALLER. PROVIDE 4" NOMINAL CLEARANCE AT HOLES/SLEEVES FOR PIPES 4" AND LARGER.
5. SAFSS PIPING SHALL NOT PENETRATE OR INTERRUPT FRAMING MEMBERS INCLUDING BUT NOT LIMITED TO STUDS, POSTS, COLUMNS, JOISTS, RAFTERS, BEAMS AND GIRDERS. DO NOT CUT OR DRILL FRAMING MEMBERS UNLESS SPECIFICALLY NOTED.
6. AFSS PIPING HANGERS, COMPONENTS, AND FASTENERS SHALL BE LISTED FERROUS, AND DESIGNED TO SUPPORT FIVE TIMES THE TRIBUTARY WEIGHT OF WATER-FILLED PIPE PLUS 250 POUNDS.
7. PIPING HANGERS SHALL NOT BE SUBJECTED TO BENDING. INSTALL WITH SWIVELS, EYE NUTS, ARTICULATING ATTACHMENTS OR OTHER DEVICES TO PREVENT BENDING.
8. PIPING HANGERS SHALL BE SUBSTANTIALLY SUPPORTED FROM THE BUILDING STRUCTURE. C-TYPE CLAMPS USED TO ATTACH HANGERS TO THE BUILDING STRUCTURE SHALL BE EQUIPPED WITH A RESTRAINING STRAP. POWER ACTUATED FASTENERS SHALL NOT BE USED TO ATTACH HANGERS TO THE BUILDING STRUCTURE.
9. THE MAXIMUM DISTANCE BETWEEN AFSS PIPING HANGERS SHALL NOT EXCEED: 12' FOR STEEL PIPE 1-1/4" AND SMALLER; 15' FOR STEEL PIPE 1-1/2" AND LARGER.
10. PROVIDE ONE HANGER MINIMUM ON EACH SECTION OF PIPE BETWEEN EACH BRANCHLINE AT MAINS, AND AT THE ENDS OF MAINS. HANGER CLEARANCE TO UPRIGHT SPRINKLERS SHALL BE 3" MINIMUM.
11. WOOD FRAMING SUPPORTING AFSS PIPING, HANGERS SHALL COMPLY WITH THE FOLLOWING: DO NOT SUPPORT PIPING FROM STRUCTURAL PANELS OR 2X OR SMALLER FRAMING/DECKING UNO. SUPPORT PIPING 2" AND SMALLER FROM 3X MINIMUM FRAMING/DECKING OR WITH THROUGH BOLTS TO THE SIDES OF 2X FRAMING. SUPPORT PIPING 2-1/2" TO 6" FROM 4X MINIMUM FRAMING. SUPPORT PIPING 8" FROM 6X MINIMUM FRAMING. DO NOT SUPPORT PIPING FROM FRAMING LESS THAN 8" DEEP. DO NOT SUPPORT MORE THAN ONE PIPING HANGER AT ANY MEMBER LESS THAN 6X MINIMUM. SCREWS OR BOLTS IN THE SIDES OF THE FRAMING SHALL NOT BE INSTALLED LESS THAN 3" OR 1/3 THE FRAMING DEPTH FROM THE BOTTOM.
12. STEEL FRAMING SUPPORTING AFSS PIPING HANGERS SHALL COMPLY WITH THE FOLLOWING: U.N.O. DO NOT SUPPORT PIPING FROM BARE STEEL DECK. U.N.O. DO NOT SUPPORT PIPING 2-1/2" AND GREATER FROM CONCRETE FILLED STEEL DECK OR CONCRETE SLABS. U.N.O. DO NOT SUPPORT PIPING FROM FRAMING LESS THAN 8" DEEP. U.N.O. DO NOT SUPPORT MORE THAN ONE PIPING HANGER AT ANY MEMBER LESS THAN 12" DEEP.
13. LATERAL BRACING SHALL BE PROVIDED ON ALL FEED AND CROSS MAIN REGARDLESS OF PIPING SIZE, ON ALL OTHER PIPING 2-1/2" AND LARGER AND SHALL BE SPACED AT A MAXIMUM OF 40' ON CENTER. PROVIDE A LATERAL BRACE WITHIN 6' OF EACH END OF EACH RUN OF MAIN PIPE.
14. LONGITUDINAL BRACING SHALL BE PROVIDED ON ALL FEES AND CROSS MAIN PIPING AND SHALL BE SPACED AT CALCULATED VALUES.
15. LONGITUDINAL BRACES SHALL BE ALLOWED TO ACT AS LATERAL BRACES IF THEY ARE WITHIN 24" OF THE CENTER LINE OF THE PIPING BRACED LATERALLY. LATERAL BRACES SHALL BE ALLOWED TO ACT AS LONGITUDINAL BRACES IF THEY ARE WITHIN 24" OF THE CENTERLINE OF THE PIPING BRACED LONGITUDINALLY AND THE LATERAL BRACE IS ON A PIPE OF EQUAL OR GREATER SIZE THAN THE PIPE BEING BRACED LONGITUDINALLY.
16. EACH RUN OF PIPE BETWEEN CHANGES IN DIRECTION SHALL BE PROVIDED WITH BOTH LATERAL AND LONGITUDINAL BRACING OTHER THAN PIPE RUNS LESS THAN 12' LONG.
17. BRACE ATTACHMENT TO PIPING SHALL BE ATTACHED DIRECTLY TO FEED AND CROSS MAINS. INSTALL SO THAT CONNECTIONS ARE TIGHT AND IN STRAIGHT LINES TO AVOID ECCENTRIC LOADINGS ON BRACES, COMPONENTS, AND FASTENERS. POWER ACTUATED FASTENERS, LAG SCREWS, OR C-TYPE CLAMPS SHALL NOT BE USED TO ATTACH BRACES TO THE BUILDING STRUCTURE.
18. THREADED PIPE USED AS PART OF A BRACE ASSEMBLY SHALL BE SCHEDULE 40 MINIMUM.
19. TOPS OF RISERS EXCEEDING 3' IN LENGTH SHALL BE PROVIDE WITH A FOUR-WAY BRACE.
20. BRANCH LINE PIPING SHALL BE VERTICALLY AND LATERALLY RESTRAINED AT INTERVALS IN ACCORDANCE WITH NFPA 13 TABLE 18.6.4(a), AND SHALL NOT EXCEEDING 36 INCHES FROM THE END OF THE LINE FOR 1 INCH PIPE; 48 INCHES FROM THE END OF THE LINE FOR 1.25 INCH PIPE; AND 60 INCHES FROM THE END OF THE LINE FOR 1.5 INCH PIPE. SPRIGS 4' OR LONGER SHALL BE LATERALLY RESTRAINED.
21. PROVIDE RIGID COUPLINGS THROUGHOUT, EXCEPT FLEXIBLE COUPLINGS SHALL BE INSTALLED WHERE REQUIRED BY NFPA 13 SECTION 18.2.

SCOPE OF WORK

MODIFY THE EXISTING FIRE SPRINKLER SYSTEM TO SERVE THE RENOVATED SCIENCE CLASSROOMS.

PARTIAL LIST OF APPLICABLE CODES & STANDARDS

TITLE 19, STATE FIRE MARSHAL - PUBLIC SAFETY

TITLE 24, CALIFORNIA BUILDING AND FIRE CODE (PARTS 1-9 INCLUSIVE) - 2022 EDITION

NFPA 13, STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS - 2022 EDITION

NFPA 24, STANDARD FOR THE INSTALLATION OF PRIVATE FIRE SERVICE MAINS AND THEIR APPURTENANCES - 2019 EDITION

NFPA 25, STANDARD FOR THE INSPECTION, TESTING, AND MAINTENANCE OF WATER-BASED FIRE PROTECTION SYSTEMS - 2013 CA EDITION

NFPA, AUTOMATIC SPRINKLER SYSTEM HANDBOOK

UNDERWRITERS LABORATORIES FIRE PROTECTION EQUIPMENT DIRECTORY

FACTORY MUTUAL APPROVAL GUIDE

LOCAL FIRE MARSHAL

SYMBOL LIST

FIRE FLOW TEST INFORMATION - INFORMATION CURRENTLY UNAVAILABLE - PRELIMINARY HYDRAULIC SYSTEM DEMAND

SPECTRUM FIRE PROTECTION
1330 E. Orangethorpe Ave.
Fullerton, CA 92831
SPECTRUM C-16 886810 PHONE: (714) 213-8451 FAX: (714) 213-8759

PRIVATE FIRE HYDRANT INSPECTION AND TESTING RECORD

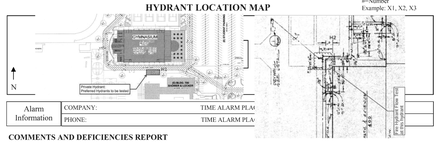
Company: Sonora High School Contact: Andy kim
Address: 401 South Palm Street Phone: 714-62-4400
City: La Habra

HYDRANT FLOW TEST Time: 3:30PM

Hydrant Location	Static Hydrant Location	Residual Hydrant Location	Nozzle Size/ Coefficient	Static Pressure	Residual Pressure	Pitot (PSI)	Flow (GPM)	Flushing (Y/N)
H1	H2	H2	2.5 /0.90	70	30	28	1002	Y
H2	H1	H1	2.5 /0.90	70	50	32	1557	Y
			/					
			/					
			/					
			/					
			/					
			/					
			/					
			/					
			/					
			/					
			/					
			/					
			/					
			/					

HYDRANT LOCATION MAP

X= Location
#=Number
Example: X1, X2, X3



Alarm Information	COMPANY:	TIME ALARM PLA
	PHONE:	TIME ALARM PLA

COMMENTS AND DEFICIENCIES REPORT

Jaime Flores — INSPECTOR NAME
Jaime Flores — INSPECTOR SIGNATURE
05/21/2025 — DATE

BUILDING INFORMATION

OCCUPANCY - BUILDING 400 (CLASSROOMS AND LAB):	A-3/B
TYPE OF CONSTRUCTION:	TYPE II-B
TOTAL BUILDING AREA (SQ. FT.):	9,454 SQ. FT.
BUILDING HEIGHT:	10'-0" (1 STORY)
AUTOMATIC SPRINKLER SYSTEM:	FULLY SPRINKLERED THROUGHOUT

PIPE DESIGN CRITERIA

ABOVEGROUND PIPE - SIZES 2" AND SMALLER
STEEL PIPE, SCH. 40 BLACK MUST HAVE MALLEABLE IRON OR FORGED STEEL WELDING TYPE FITTINGS AND THREADED FITTINGS.

ABOVEGROUND PIPE - SIZES 2-1/2" AND LARGER
STEEL PIPE, SCH. 40 OR 10 BLACK MUST HAVE WELDED FITTINGS OR GROOVED COUPLINGS.

UNDERGROUND PIPE
CORROSION RESISTANT STAINLESS STEEL PIPE, TYPE 304. C900 PVC MAY BE USED WHEN PIPE IS UNDERGROUND AND LOCATED MORE THAN 5'-0" FROM BUILDING EXTERIOR WALL.

STEEL PIPE DIMENSIONS: SCH. 10 PIPE

NOMINAL PIPE SIZES (inches)	OUTSIDE DIAMETER (inches)	INSIDE DIAMETER (inches)	WALL THICKNESS (inches)	WEIGHT OF WATER FILLED PIPE (lbs/ft)	CAPACITY OF PIPE (gal/ft)
1	1.315	1.097	0.109	1.81	0.049
1 -1/4	1.660	1.442	0.109	2.52	0.085
1 -1/2	1.900	1.682	0.109	3.04	0.115
2	2.375	2.157	0.109	4.22	0.190
2 -1/2	2.875	2.635	0.120	5.89	0.283
3	3.500	3.260	0.120	7.94	0.434
3 -1/2	4.000	3.760	0.120	9.78	0.577
4	4.500	4.260	0.120	11.78	0.740
6	6.625	6.357	0.134	23.03	1.649
8	8.625	8.249	0.188	40.08	2.776

STEEL PIPE DIMENSIONS: SCH. 40 PIPE

NOMINAL PIPE SIZES (inches)	OUTSIDE DIAMETER (inches)	INSIDE DIAMETER (inches)	WALL THICKNESS (inches)	WEIGHT OF WATER FILLED PIPE (lbs/ft)	CAPACITY OF PIPE (gal/ft)
1	1.315	1.049	0.133	2.05	0.045
1 -1/4	1.660	1.380	0.140	2.93	0.078
1 -1/2	1.900	1.610	0.145	3.61	0.106
2	2.375	2.067	0.154	5.13	0.174
2 -1/2	2.875	2.469	0.203	7.89	0.249
3	3.500	3.068	0.216	10.82	0.384
3 -1/2	4.000	3.548	0.226	13.48	0.514
4	4.500	4.026	0.237	16.40	0.661
6	6.625	6.065	0.280	31.69	1.501
8	8.625	7.981	0.322	47.70	2.599

DRAWING INDEX

SHEET INDEX

FP0.01	FIRE PROTECTION NOTES, SYMBOLS, ABBREVIATIONS
FP0.02	FIRE PROTECTION SITE PLAN (FOR HYDRAULIC REFERENCE ONLY)
FP0.03	FIRE PROTECTION BUILDING SECTIONS
FP1.01	FIRE PROTECTION FLOOR PLAN
FP1.02	FIRE PROTECTION REFLECTED CEILING PLAN

HOSE STREAM ALLOWANCE

OCCUPANCY	INSIDE HOSE gpm	INSIDE HOSE L/min	TOTAL COMBINED INSIDE AND OUTSIDE HOSE gpm	TOTAL COMBINED INSIDE AND OUTSIDE HOSE L/min	DURATION (minutes)
LIGHT HAZARD	0, 50, 100	0, 190, 380	100	380	30
ORDINARY HAZARD	0, 50, 100	0, 190, 380	250	950	60-90
EXTRA HAZARD	0, 50, 100	0, 190, 380	500	1900	90-120

NFPA 13 TABLE 11.2.3.1.2

LPA
ARCHITECTURE ENGINEERING INTERIORS
LANDSCAPE ARCHITECTURE PLANNING
949-261-1001 Office
LPADesignStudios.com
5301 California Avenue, Suite 100
Irvine, California 92617

WSP
11870 Pierce Street, Suite 160
Riverside, California 92505
951.299.4160 wsp.com
Project Leader - Bill Vollier
FECC Lead - Chris Pascual
WSP Job #:US0043159.0992

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SONORA HIGH SCHOOL
SCIENCE CLASSROOMS MODERNIZATION
401 S PALM STREET
LA HABRA, CA 90631
Developed for
FULLERTON JOINT UNION HIGH SCHOOL DISTRICT

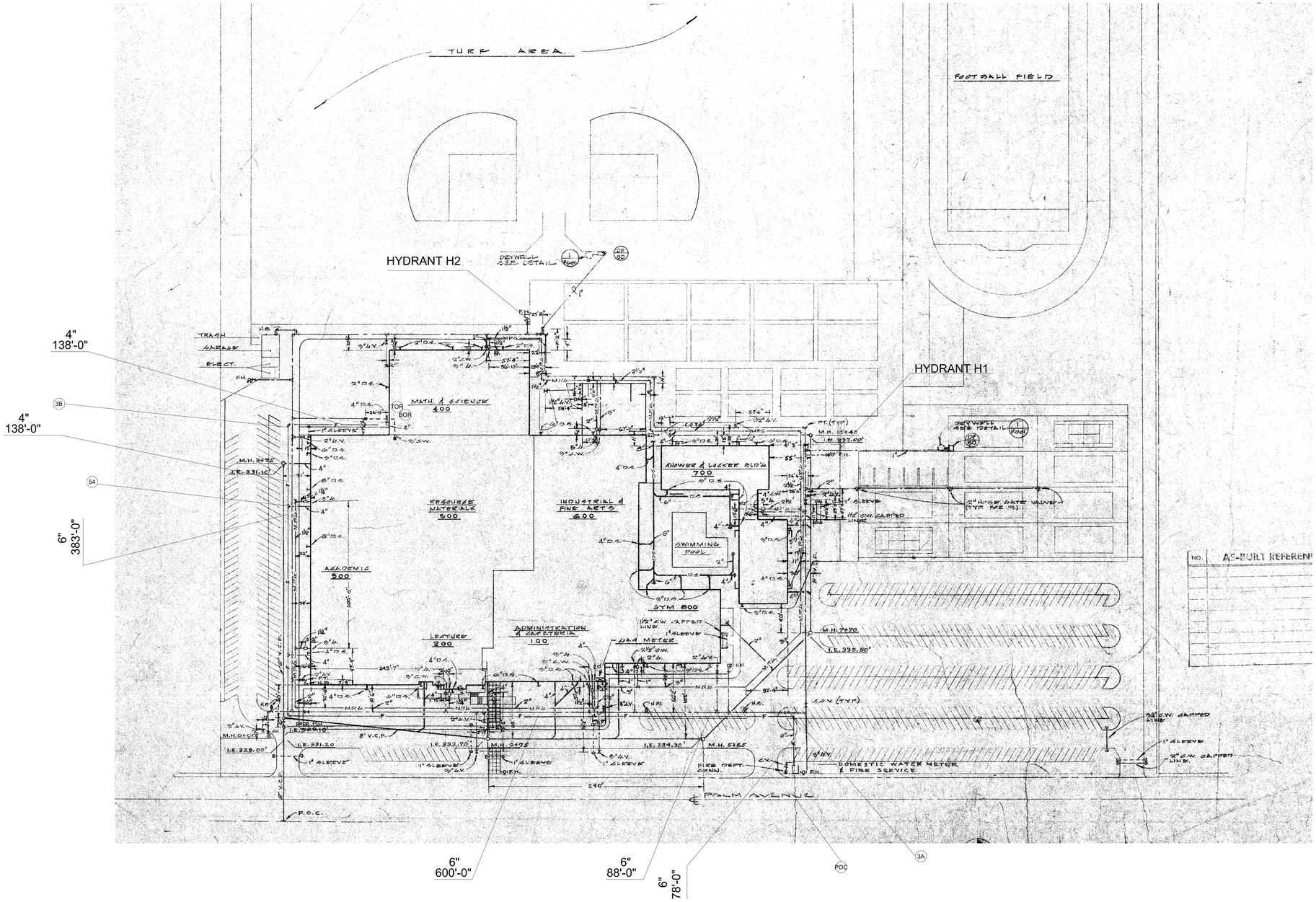
Revision	Date

Submittal	Date
SCHEMATIC DESIGN	03/13/2025
50% DESIGN DEVELOPMENT	06/16/2025
95% CD	11/20/2025
DSA SUBMITTAL	11/21/2025
DSA BACK CHECK	01/27/2026

Job Number	32433
Checked By	Checker
Scale	12" = 1'-0"

FIRE PROTECTION NOTES, SYMBOLS, ABBREVIATIONS

FP0.01



1 SITE PLAN (FOR HYDRAULIC REFERENCE ONLY)

SCALE: 1/8" = 1'-0"

KEYNOTES

LPA

ARCHITECTURE ENGINEERING INTERIORS
LANDSCAPE ARCHITECTURE PLANNING

949-261-1001 Office

LPADesignStudios.com

5301 California Avenue, Suite 100
Irvine, California 92617

wsp

11870 Pierce Street, Suite 160
Riverside, California 92505
951.299.4160 wsp.com
Project Leader - Bill Voller
FECC Lead - Chris Pascual
WSP Job #:US0043159.0992

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SONORA HIGH SCHOOL
SCIENCE CLASSROOMS MODERNIZATION

401 S PALM STREET
LA HABRA, CA 90631

Developed for
FULLERTON JOINT UNION HIGH SCHOOL DISTRICT

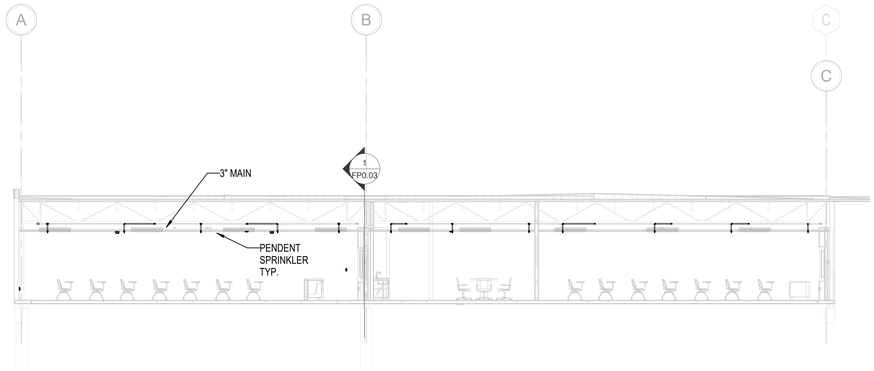
Revision	Date

Submittal	Date
SCHEMATIC DESIGN	03/13/2025
50% DESIGN DEVELOPMENT	06/16/2025
90% CD	10/30/2025
DSA SUBMITTAL	11/21/2025
DSA BACK CHECK	01/27/2026

Job Number	32433
Checked By	Checker
Scale	1/8" = 1'-0"

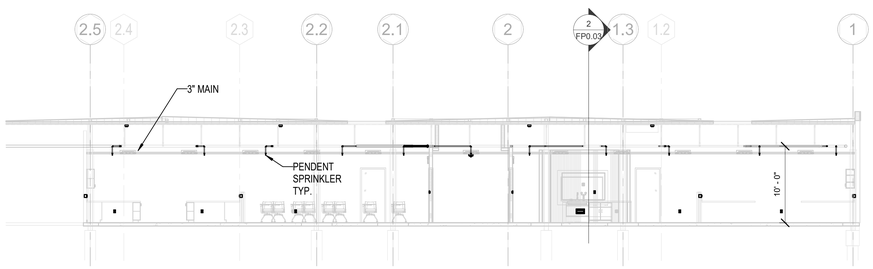
FIRE PROTECTION SITE PLAN (FOR HYDRAULIC REFERENCE ONLY)

FP0.02



2 BUILDING SECTION 2

SCALE: 1/8" = 1'-0"



1 BUILDING SECTION 1

SCALE: 1/8" = 1'-0"

LPA

ARCHITECTURE ENGINEERING INTERIORS
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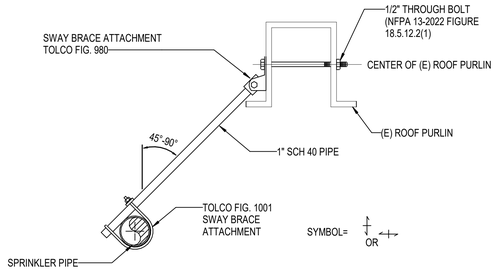
Scale	1/8" = 1'-0"

FIRE PROTECTION
BUILDING SECTIONS

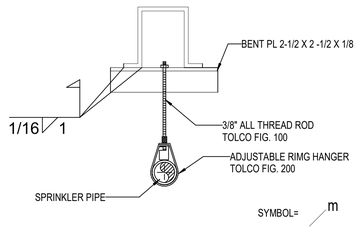
FP0.03



3 BRANCH LINE RESTRAINT AT HSS

SCALE: NTS

HANGER ROD SIZES	
PIPE SIZE	DIAMETER OF ROD
UP TO INCLUDING 4"	3/8"



2 HANGER AT HSS

SCALE: NTS

SPRINKLER SCHEDULE & LEGEND

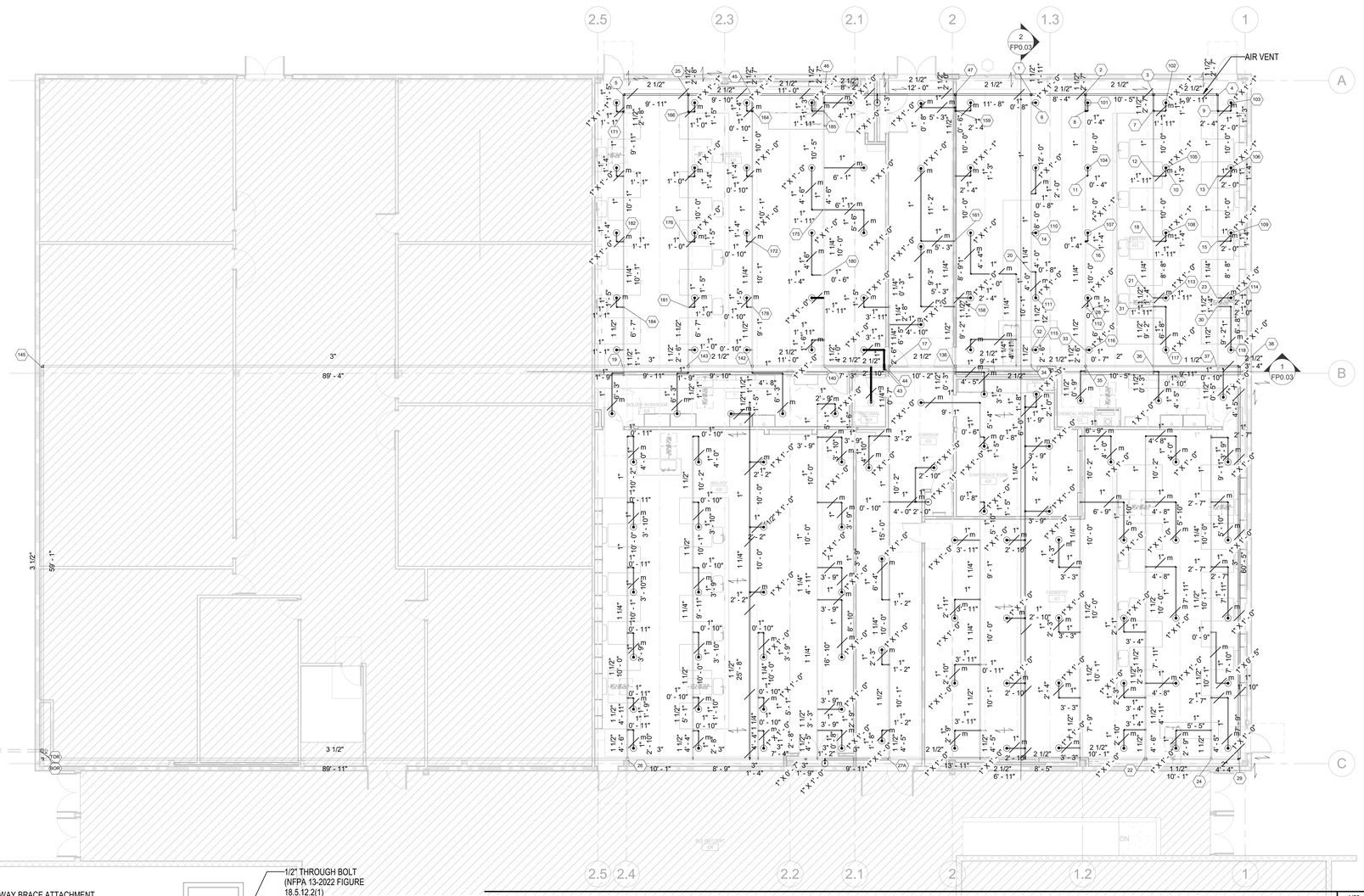
SYMBOL	SPRINKLER DESCRIPTION	MANUFACTURER	MODEL/SERIES	K-FACTOR	TEMP.	FINISH	SIN	QUANTITY
◉	RECESSED QUICK RESPONSE PENDENT SPRINKLER	TYCO	TY-FRB	5.6	155° F	WHITE	TY3231	126
○	QUICK RESPONSE UPRIGHT SPRINKLER	TYCO	TY-FRB	5.6	200° F	WHITE	TY3131	4
	HEAD CAB'T & WRENCH(ES) PROVIDED			TOTAL COUNT THIS BUILDING =				130

NOTE: WHERE SPRINKLERS ARE EXPOSED TO ATMOSPHERIC CONDITIONS PROVIDE CORROSION PROTECTION.
WHERE SURFACE MOUNTED LIGHTS OCCUR, INSTALL 401 CANOPY TYPE.

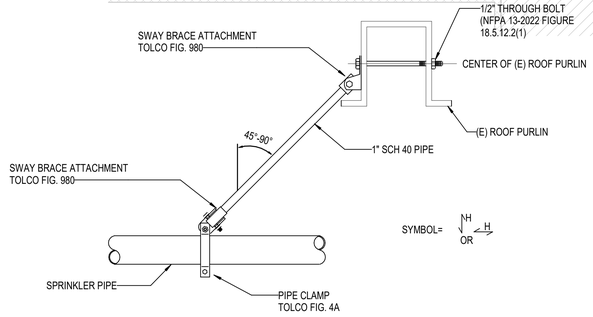
PIPE LEGEND

EXISTING SPRINKLER PIPE

NEW SPRINKLER PIPE

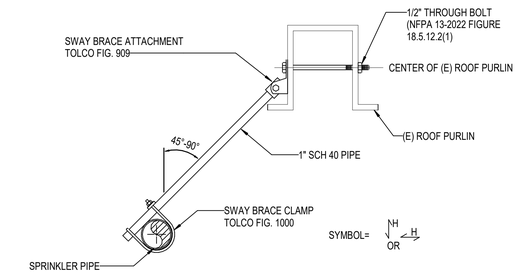


FIRE PROTECTION FLOOR PLAN | 1/8" = 1'-0" FP1.01 | 1



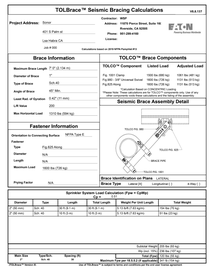
5 LONGITUDINAL BRACE AT HSS STEEL BEAM

SCALE: NTS



4 LATERAL BRACE AT HSS STEEL BEAM

SCALE: NTS



TOLBrace™ Seismic Bracing Calculations — W.A.V.V.

Project Address: Donor — Contractor: MEP, Address: 10370 Pierce Street, Suite 190, Riverside, CA 92505, Phone: 951.288.4160, License: —

Brace Information — TOLCO™ Brace Components

	TOLCO™ Component	Listed Load	Adjusted Load
Maximum Brace Length: 7'-0" (2,134 in.)			
Diameter of Brace: 1"	Fig. 160 Clamp	3500 lbs (887 kg)	1691 lbs (767 kg)
Type of Brace: SCH 40	Fig 909 Angle	3500 lbs (1,58 kg)	1691 lbs (767 kg)
Angle of Brace: 45° Min.	Fig 909 Rod	3500 lbs (1,58 kg)	1691 lbs (767 kg)

Load Rad. of Gyration: 0.421" (11 mm); Life Value: 2000; Max Horizontal Load: 1310 lbs (594 kg)

*Loads listed are allowable per IAPMO ES Report ER-305 and are based on a safety factor of 2.0. Adjusted loads are listed for use in ASD load combinations. Local building codes may govern. Refer to ER-305 for additional limitations.

Fastener Information — Seismic Brace Assembly Detail

Orientation to Connecting Surface: NPTA Type E; Fastener: Fig.925 Anchor; Diameter: N/A; Length: N/A; Maximum Load: 1000 lbs (720 kg); Prying Factor: N/A

Brace Identification on Plans: LATERAL; Brace Type: 1 at 45° (1); Longitudinal (2); 4 Way (-)

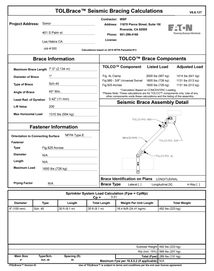
Sprinkler System Load Calculation (Fate + Cpeffic)

Diameter	Type	Length	Total Length	Weight Per Unit Length	Total Weight
4" (90 mm)	Sch. 40	0 ft (0.0 m)	0.0 ft (0.0 m)	10.79 lb (16.07 kg/m)	0.0 lbs (0.0 kg)
1" (90 mm)	Sch. 40	0 ft (0.0 m)	0.0 ft (0.0 m)	10.79 lb (16.07 kg/m)	0.0 lbs (0.0 kg)

Sprinkler Weight: 0.0 lbs (0.0 kg); Misc. Weight: 0.0 lbs (0.0 kg); Total Weight: 0.0 lbs (0.0 kg)

Main Brace: Type N/A, Spacing (ft): —; Maximum Spacing: 0.0 ft (0.0 m); Total Number of Braces: 0

TOLBrace™ Version 1.0 — Use of this software is subject to the terms and conditions of the TOLCO Engineering Software Agreement



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Fastener Information — Seismic Brace Assembly Detail

Orientation to Connecting Surface: NPTA Type E; Fastener: Fig.925 Anchor; Diameter: N/A; Length: N/A; Maximum Load: 1000 lbs (720 kg); Prying Factor: N/A

Brace Identification on Plans: LONGITUDINAL; Brace Type: 1 at 45° (1); Longitudinal (2); 4 Way (-)

Sprinkler System Load Calculation (Fate + Cpeffic)

Diameter	Type	Length	Total Length	Weight Per Unit Length	Total Weight
4" (90 mm)	Sch. 40	0 ft (0.0 m)	0.0 ft (0.0 m)	10.79 lb (16.07 kg/m)	0.0 lbs (0.0 kg)

Sprinkler Weight: 0.0 lbs (0.0 kg); Misc. Weight: 0.0 lbs (0.0 kg); Total Weight: 0.0 lbs (0.0 kg)

Main Brace: Type N/A, Spacing (ft): —; Maximum Spacing: 0.0 ft (0.0 m); Total Number of Braces: 0

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GENERAL NOTES:

1.DEMOLISH ALL EXISTING SPRINKLERS AND ARMOVERS IN AREA OF WORK, AND PROVIDE NEW ARMOVERS AND SPRINKLERS IN ACCORDANCE WITH THE FIRE PROTECTION FLOOR PLAN.

3. ALL EXISTING FIRE PROTECTION UNDERGROUND UTILITIES, SITE APPURTENANCES, RISER, SPRINKLER MAINS, BRANCH LINES, HANGERS AND SWAY BRACING SHALL REMAIN.

4. CONTRACTOR TO VERIFY AND COORDINATE BRACHLINE ARMOVERS WITH OTHER TRADES IN FIELD.

LEGEND

- LONGITUDINA SWAY BRACING AT HHS
- LATERAL SWAY BRACING AT HHS
- END OF BRANCH LINE RESTRAINT AT HHS
- m HANGER AT HHS

HYDRAULIC CALCULATIONS

THIS BUILDING IS PROTECTED BY A HYDRAULICALLY DESIGNED AUTOMATIC SPRINKLER SYSTEM. REMOTE AREA IS A TREE SYSTEM FED FROM A SMALL GRID.

LOCATION	CHEMISTRY 423
NO. OF SPRINKLERS	18

BASIS OF DESIGN

1. DENSITY	0.20 GPM/SQ. FT.
2. DESIGNED AREA OF DISCHARGE	1,516 SQ. FT.

3. HAZARD OCUPANCY: ORDINARY HAZARD GROUP I

SYSTEM DEMAND AT FLANGE ON THE RISER

1. GPM DISCHARGE	382.95 GPM
2. RESIDUAL PRESSURE	40.37 PSI

TOTAL COMBINED INSIDE AND OUTSIDE HOSE STREAM - 250 GPM

REQ'D FLOW AND PRESSURE OF THE SYSTEM AT THE WATER SUPPLY SOURCE:

1. GPM DISCHARGE	632.95 GPM
2. RESIDUAL PRESSURE	55.92 PSI

QUICK-RESPONSE, PENDENT SPRINKLERS
K-5.6 155° TY3231

20 GPM AT 12.76 PSI REQUIRED FROM HYDRAULICALLY MOST DEMANDING SPRINKLER

PROTECTION AREA PER SPRINKLER: 120 SQ. FT.
MAXIMUM SPRINKLER SPACING SHALL BE 130 SQ. FT.

NFPA 13, 2016 EDITION

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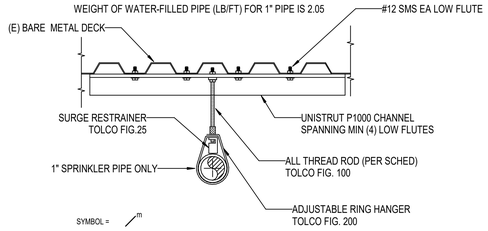
Job Number	32433
Checked By	Checker
Scale	As indicated

FIRE PROTECTION FLOOR PLAN

FP1.01

HANGER ROD SIZES	
PIPE SIZE	DIAMETER OF ROD
1"	3/8"



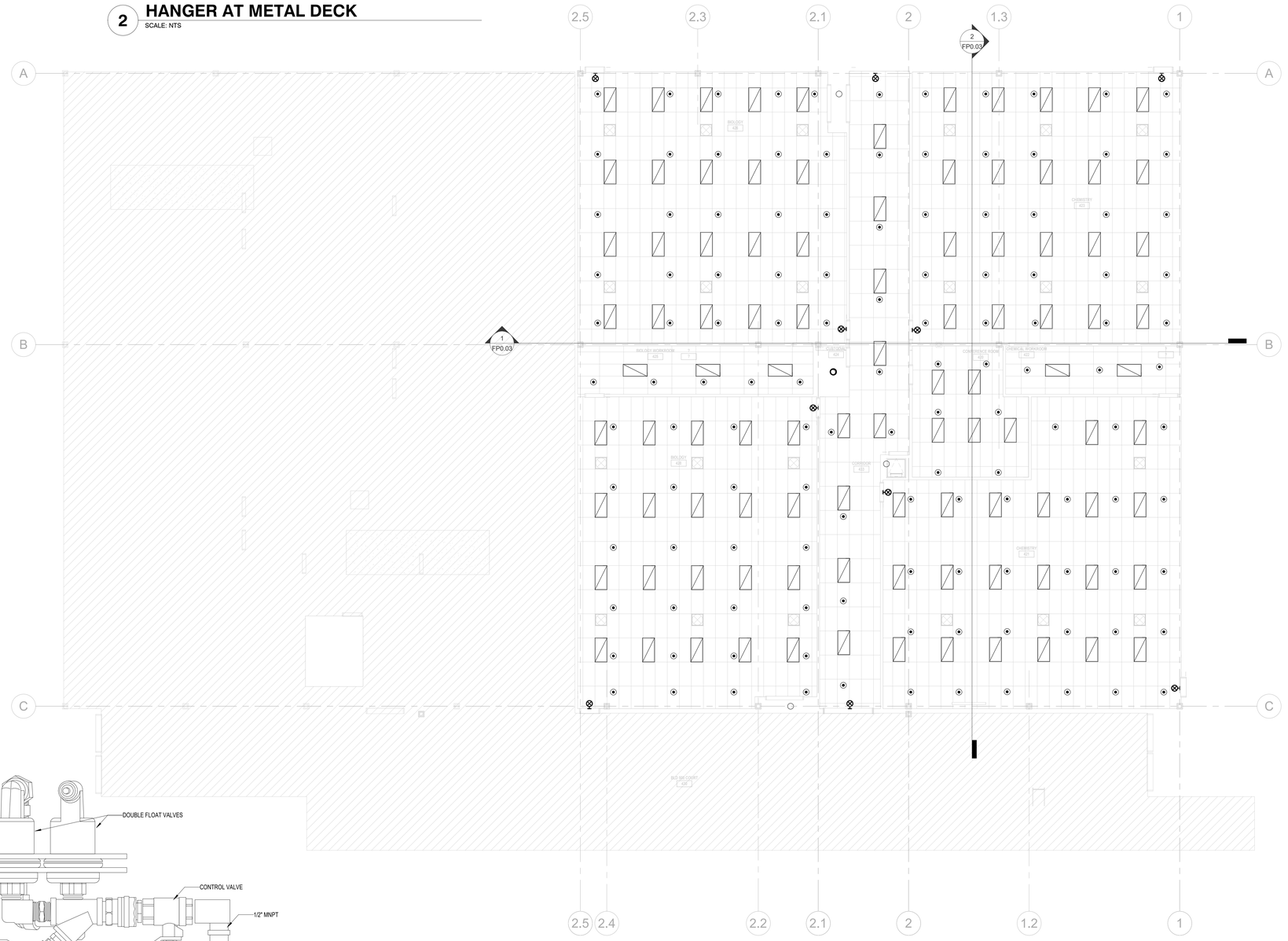
2 HANGER AT METAL DECK

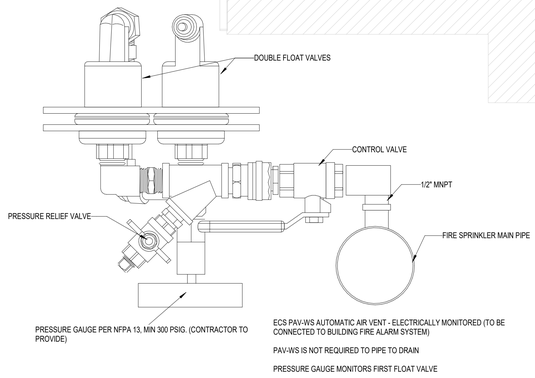
SCALE: NTS

SPRINKLER SCHEDULE & LEGEND

SYMBOL	SPRINKLER DESCRIPTION	MANUFACTURER	MODEL/SERIES	K-FACTOR	TEMP.	FINISH	SIN	QUANTITY
◉	RECESSED QUICK RESPONSE PENDENT SPRINKLER	TYCO	TY-FRB	5.6	155º F	WHITE	TY3231	126
○	QUICK RESPONSE UPRIGHT SPRINKLER	TYCO	TY-FRB	5.6	200º F	WHITE	TY3131	2
	HEAD CAB'T & WRENCH(ES) PROVIDED				TOTAL COUNT THIS BUILDING =			128

NOTE: WHERE SPRINKLERS ARE EXPOSED TO ATMOSPHERIC CONDITIONS PROVIDE CORROSION PROTECTION.
WHERE SURFACE MOUNTED LIGHTS OCCUR, INSTALL 401 CANOPY TYPE.





3 TYPICAL ECS AIR VENT

SCALE: N.T.S.

KEYNOTES

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FIRE PROTECTION REFLECTED CEILING PLAN

FP1.02

ABBREVIATIONS

NOT ALL ABBREV. MAY BE USED

4S/DP	4" SQUARE BY 2-1/8" DEEP BOX
ADA	AMERICAN WITH DISABILITIES ACT
A.F.F.	ABOVE FINISH FLOOR
A.F.G.	ABOVE FINISH GRADE
AWG	AMERICAN WIRE GAUGE
AMP, A	AMPERE
A.I.C. or AIC	AMPERES INTERRUPTING CAPACITY (SYMMETRICAL)
A.F.C. or AFC	AVAILABLE FAULT CURRENT
AF/AT	AMP FRAME, AMP TRIP
AHJ	AUTHORITY HAVING JURISDICTION
AS/AF	AMP SWITCH, AMP FUSE
ATS	AUTOMATIC TRANSFER SWITCH
AVG	AVERAGE
BJ	BONDING JUMPER
BDF	BUILDING DISTRIBUTION FRAME
BR	BRANCH
BD	BOB DYLAN
BLDG	BUILDING
CBC	CALIFORNIA BUILDING CODE
CEC	CALIFORNIA ELECTRICAL CODE
CIRC., CKT.	CIRCUIT
CB	CIRCUIT BREAKER
CSFD	COMBINATION SMOKE FIRE DAMPER
C	CONDUIT
C.O.	CONDUIT ONLY; COMPLETE WITH PULLSTRING
CFCI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
CONN	CONNECTED
CPT	CONTROL POWER TRANSFORMER
CLCB	CURRENT LIMITING CIRCUIT BREAKER
CLF	CURRENT LIMITING FUSE
CT	CURRENT TRANSFORMER
(D)	EXISTING DEVICE TO BE DEMOLISHED
DAS	DISTRIBUTED ANTENNA SYSTEM
DIA	DIAMETER
DISC	DISCONNECT
DIST	DISTRIBUTION
D.P.C.S.	DIMMING PANEL CONTROL STATION
E.C.	ELECTRICAL CONTRACTOR
EMS	ENERGY MANAGEMENT CONTROL SYSTEM
EMT	ELECTRICAL METALLIC TUBING
ENT	ELECTRICAL NON-METALLIC TUBING
EWC	ELECTRIC WATER COOLER
E.P.O.	EMERGENCY POWER OFF
E-O-L	END-OF-LINE CIRCUIT TERMINATOR
EF	EXHAUST FAN
EGC or EG or E/G	EQUIPMENT GROUND (GREEN)
(E)	EXISTING DEVICE TO REMAIN
EP	EXPLOSION PROOF
(ER)	EXISTING DEVICE TO BE RELOCATED
FT or '	FEET
FA or F.A.	FIRE ALARM
FLA	FULL LOAD AMPS
GRD	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTION
GE or GEC	GROUNDING ELECTRODE CONDUCTOR
HACR	HEATING AIR CONDITIONING REFRIGERATION
HOA	HAND-OFF-AUTO
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
H.,W.,D.,L.	HEIGHT, WIDTH, DEPTH, LENGTH
HID	HIGH INTENSITY DISCHARGE
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
IN. or "	INCHES
IG	ISOLATED GROUND
IBC	INTERNATIONAL BUILDING CODE
I.D.C.S.	INTEGRATED DIMMING CONTROL PANEL
IDF	INTERMEDIATE DISTRIBUTION FRAME
JBOX	JUNCTION BOX
K	DEGREE KELVIN
KCMIL	THOUSAND CIRCULAR MILS
KVA	KILOVOLT AMPERES
KW	KILOWATT
KWH	KILOWATT HOUR
LCL	LONG CONTINUOUS LOAD
LF, L.F.	LINEAR FEET
LTG, LTS	LIGHTING
LPS	LOW PRESSURE SODIUM
LV	LOW VOLTAGE
MAX.	MAXIMUM
MBJ	MAIN BONDING JUMPER
MDF	MAIN DISTRIBUTION FRAME
MOCP	MAXIMUM OVERCURRENT PROTECTION
MCB	MAIN CIRCUIT BREAKER
MLO	MAIN LUGS ONLY
M.C.	MECHANICAL CONTRACTOR
M	METER
M/M	METER MAIN
MV	MERCURY VAPOR
MH	METAL HALIDE
MIN.	MINIMUM
MCA	MINIMUM CIRCUIT AMPS
MCC	MOTOR CONTROL CENTER
MCM	THOUSAND CIRCULAR MILS
MCP	MOTOR CIRCUIT PROTECTOR
MFR.	MANUFACTURER
MTD	MOUNTED
MW	MICROWAVE
NATS	NON AUTOMATIC DISCONNECT
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NC	NORMALLY CLOSED
NO	NORMALLY OPENED
NF	NON-FUSED
NIC	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
NL	NIGHT LIGHT
NO. or #	NUMBER
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED, OWNER INSTALLED
%Z	PERCENT IMPEDANCE
PH. or ø	PHASE
PC	PHOTOCELL
P.C.	PLUMBING CONTRACTOR
P	POLE
PVC	POLY VINYL CHLORIDE
PDU	POWER DISTRIBUTION UNIT
PRIMARY	OVER 600 VOLTS
PROVIDE	FURNISH, INSTALL AND CONNECT
PT	POTENTIAL TRANSFORMER
PA	PUBLIC ADDRESS
(R)	DENOTES RELOCATED DEVICE LOCATION.
REC, RECEPT	RECEPTACLE
REF	REFRIGERATOR
RGS	RIGID GALVANIZED STEEL
RMS	ROOT MEAN SQUARE
SCC	SHORT CIRCUIT CURRENT
SCCR	SHORT CIRCUIT CURRENT RATING
SCS	STRUCTURED CABLING SYSTEM
SFD	SMOKE FIRE DAMPER
SECONDARY	600 VOLTS AND LESS
SMACNA	SHEET METAL AND AIR COND. CONTRACTOR'S NAT'L ASSOC.
SQ.	SQUARE
SSBJ	SUPPLY SIDE BONDING JUMPER
SBJ	SYSTEM BONDING JUMPER
TC	TIMECLOCK
TEL/DATA	TELEPHONE AND DATA
TV	TELEVISION
T.V.S.S.	TRANSIENT VOLTAGE SURGE SUPPRESSION
TYP	TYPICAL
U.G.P.S.	UNDERGROUND PULL SECTION
U.O.N.	UNLESS OTHERWISE NOTED
U.P.S. or UPS	UNINTERRUPTABLE POWER SYSTEM
VAV	VARIABLE AIR VOLUME
V	VOLTS
VA	VOLT AMPERES
VD	VOLTAGE DROP
WP	WEATHERPROOF
W	WIRE
XFMR	TRANSFORMER

THE PURPOSE OF THIS SHEET IS TO ILLUSTRATE AND DEFINE GRAPHIC SYMBOLS WHICH MAY OCCUR ON THE TECHNOLOGY DRAWING SET. THE ILLUSTRATION OF A SYMBOL OR SYSTEM OF SYMBOLS ON THIS SHEET DOES NOT NECESSARILY INDICATE THAT THE BUILDING COMPONENT REPRESENTED SYSTEM BY THE SYMBOL IS USED AS PART OF THIS PROJECT. REFER TO THE COMPLETE DRAWING PACKAGE AND SPECIFICATIONS TO DETERMINE THE SCOPE OF THE WORK

GENERAL

NOT ALL SYMBOLS MAY BE USED

FLOOR BOX/SPECIALTY WALL BOX/IN-GRADE BOX SYMBOLS

SINGLE SERVICE IN FLOOR BOX. PROVIDE DEVICES PER PLAN. SEE FLOOR BOX DETAILS ON ELECTRICAL SHEETS AND SPECIFICATIONS FOR MORE INFORMATION.

TWO SERVICE IN FLOOR BOX. PROVIDE DEVICES PER PLAN. SEE FLOOR BOX DETAILS ON ELECTRICAL SHEETS AND SPECIFICATIONS FOR MORE INFORMATION.

THREE SERVICE IN FLOOR BOX. PROVIDE DEVICES PER PLAN. SEE FLOOR BOX DETAILS ON ELECTRICAL SHEETS AND SPECIFICATIONS FOR MORE INFORMATION.

PB OR P — FLUSH IN GRADE PULLBOX, SIZED PER N.E.C. OR AS NOTED.

CONDUIT/PATHWAY/BACKBOARD SYMBOLS

T — CONCEALED TELEPHONE/DATA CONDUIT RUN, 1-INCH CONDUIT (MIN) OR AS NOTED ON PLANS. SEE TABLE BELOW FOR CONDUIT SIZE VARIATIONS.

T2 = 1-1/4" C. T3 = 1-1/2" C. T4 = 2" C.

CONCEALED CONDUIT UNLESS OTHERWISE NOTED, SIZE AS NOTED ON PLANS

CONDUIT CONCEALED BELOW GRADE, SIZE AS NOTED ON PLANS

CONDUIT STUB OUT, PROVIDE A BUSHING ON BOTH ENDS

CONDUIT CONTINUATION

CONDUIT CONTINUATION DOWN WALL TO FLOOR BELOW

CONDUIT CONTINUATION UP WALL TO FLOOR ABOVE

SURFACE MOUNTED, LOCKABLE TERMINAL CABINET WITH TERMINAL STRIPS AS REQUIRED.

PAINTED TELEPHONE TERMINAL BACKBOARD SIZED AS NOTED, REFER TO TELECOM SYSTEM GROUND DETAIL.

TELECOM GROUND BUS BAR, REFER TO TELECOM SYSTEM GROUND DETAIL AND SPECIFICATIONS.

TELECOMMUNICATIONS

NOT ALL SYMBOLS MAY BE USED

DATA OUTLET, WALL MOUNTED 4S DEEP BOX WITH 1-GANG RING AND 1" C. STUB UP TO NEAREST ACCESSIBLE CEILING. PROVIDE A BUSHING. "?" = QUANTITY OF CABLES/JACKS REQUIRED. SEE FACEPLATE DETAILS.

DATA OUTLET, WALL MOUNTED 4S DEEP BOX WITH 1-GANG RING AND 1" C. STUB UP TO NEAREST ACCESSIBLE CEILING. PROVIDE A BUSHING. "?" = QUANTITY OF CABLES/JACKS REQUIRED. SEE FACEPLATE DETAILS.

DATA OUTLET BOX FLUSH MOUNTED IN CEILING - MOUNT FLUSH IN FLOOR WHEN INDICATED IN A FLOOR BOX SYMBOL. STUB A 1" C. TO NEAREST ACCESSIBLE CEILING AND PROVIDE A BUSHING. "?" = QUANTITY OF CABLES/JACKS REQUIRED. SEE FACEPLATE DETAILS.

DATA OUTLET BOX FLUSH MOUNTED IN CEILING - MOUNT FLUSH IN FLOOR WHEN INDICATED IN A FLOOR BOX SYMBOL. "?" = QUANTITY OF CABLES/JACKS REQUIRED. SEE FACEPLATE DETAILS.

TV — TELEVISION OUTLET BOX FLUSH MOUNTED IN CEILING - MOUNT FLUSH IN FLOOR WHEN INDICATED IN A FLOOR BOX SYMBOL WITH A 1.25"C STUB UP TO NEAREST ACCESSIBLE CEILING OR AS SHOWN ON PLANS. SEE FACEPLATE DETAILS.

TV — TELEVISION OUTLET, WALL MOUNTED 4S DEEP BOX WITH 1 GANG RING AND 1.25"C STUB UP TO NEAREST ACCESSIBLE CEILING OR AS SHOWN ON PLANS. SEE FLOOR PLANS FOR BOX HEIGHT. SEE FACEPLATE DETAILS.

DATA OUTLET, WALL MOUNTED 6-INCHES ABOVE COUNTER OR SPLASH. STUB A 1" C. TO NEAREST ACCESSIBLE CEILING AND PROVIDE A BUSHING. 4S/DP MINIMUM WITH SINGLE GANG RING. "?" = QUANTITY OF CABLES/JACKS REQUIRED. SEE FACEPLATE DETAILS.

DATA OUTLET BOX, WALL MOUNTED 6-INCHES ABOVE COUNTER OR SPLASH. STUB A 1" C. TO NEAREST ACCESSIBLE CEILING AND PROVIDE A BUSHING. 4S/DP MINIMUM WITH SINGLE GANG RING. "?" = QUANTITY OF CABLES/JACKS REQUIRED. SEE FACEPLATE DETAILS.

WAP — INTERIOR WIRELESS ACCESS POINT OUTLET DATA OUTLET(S) AND 1" CONDUIT WITH CONDUCTORS TO NEAREST ACCESSIBLE CEILING SPACE, OR AS SHOWN ON THE FLOOR PLANS. WHEN INSTALLED AT ACCESSIBLE CEILING TILE LOCATIONS, PROVIDE WAP OUTLET ABOVE ACCESSIBLE CEILING TILE AND MOUNTED TO THREADED ROD ATTACHED TO STRUCTURE ABOVE. REFER TO FACEPLATE DETAILS FOR ADDITIONAL INFORMATION. WAP ELECTRONICS AND ANTENNA ARE CFCI.

WP — EXTERIOR WIRELESS ACCESS POINT OUTLET DATA OUTLET(S) WITH FLUSH 4S DEEP BOX, WEATHERPROOF BLANK PLATE, AND 1" CONDUIT WITH CONDUCTORS TO NEAREST ACCESSIBLE CEILING SPACE, OR AS SHOWN ON THE FLOOR PLANS. REFER TO FACEPLATE DETAILS FOR ADDITIONAL INFORMATION. WAP ELECTRONICS AND ANTENNA ARE CFCI.

AUDIOVISUAL SYSTEMS

NOT ALL SYMBOLS MAY BE USED

S — FLUSH CEILING MOUNTED PUBLIC ADDRESS SPEAKER WITH BACKBOX AND CONDUCTORS PER SPECIFICATIONS.

S — FLUSH WALL MOUNTED PUBLIC ADDRESS SPEAKER WITH BACKBOX, BAFFLE, CONDUCTORS, AND 3/4"C STUB TO ACCESSIBLE CEILING PER SPECIFICATIONS.

IO — WALL MOUNTED HDMI INPUT PLATE, 4S DEEP BOX WITH 1.25"C TO ACCESSIBLE CEILING SPACE UNLESS OTHERWISE SHOWN ON PLANS. REFER TO FACEPLATE DETAILS FOR MORE INFORMATION.

IO — HDMI INPUT PLATE, IN FLOOR BOX WITH 1.25"C TO ACCESSIBLE CEILING SPACE UNLESS OTHERWISE SHOWN ON PLANS. REFER TO FACEPLATE DETAILS FOR MORE INFORMATION.

VIDEO AND INTRUSION ALARM SYSTEMS

NOT ALL SYMBOLS MAY BE USED

WALL MOUNTED VIDEO SURVEILLANCE CAMERA WITH FLUSH 4S DP BOX, 3/4"C TO ACCESSIBLE CEILING AND CONDUCTORS - CAMERA AND MOUNT ARE OWNER FURNISHED CONTRACTOR INSTALLED.

CEILING MOUNTED VIDEO SURVEILLANCE CAMERA WITH BACKBOX AND CONDUCTORS - CAMERA AND MOUNT ARE OWNER FURNISHED CONTRACTOR INSTALLED.

CC — VIDEO SURVEILLANCE SYSTEM CONDUIT WITH CONDUCTORS.

IDF — SECURITY SYSTEM TERMINAL CABINET COMPLETE WITH POWER SUPPLY, TERMINAL BLOCKS, POPITS, ZONE EXPANSION MODULES, ETCETERA. SEE SPECIFICATIONS.

MD — SECURITY ALARM CEILING MOUNTED DUAL TECHNOLOGY MOTION SENSOR WITH CONDUCTORS - SEE SPECIFICATIONS.

KP — SECURITY ALARM KEY PAD COMPLETE WITH 1-GANG FLUSH J-BOX, 3/4"C TO ACCESSIBLE CEILING AND CONDUCTORS - SEE SPECIFICATIONS.

SA — CONCEALED SECURITY ALARM CONDUIT RUN, 3/4-INCH CONDUIT (MIN). SEE TABLE BELOW FOR CONDUIT SIZE VARIATIONS:

SA = 3/4" C. SA1 = 1" C. SA2 = 1-1/4" C. SA3 = 1-1/2" C. SA4 = 2" C.

GENERAL NOTES

APPLIES TO ALL SHEETS IN THIS SET

TELECOMMUNICATIONS PATHWAYS AND GENERAL NOTES:

1. CONDUITS SHALL (a) CONTAIN NO CONTINUOUS SECTIONS LONGER THAN 30M (98 FT.), AND (b) CONTAIN NO MORE THAN (2) 90° BENDS OR (1) REVERSE BEND WITHOUT INSTALLING A PULL BOX. SPLIT CONDUITS IN PLACE OF PULL BOXES ARE UNACCEPTABLE.
2. CONDUITS SHALL CONTAIN PLASTIC OR NYLON PULL TAPE RATED AT 200 LBS. WITH A MINIMUM OF 5 FEET OF EXTRA PULL TAPE COILED AT EACH END.
3. CONDUIT BEND RADIUS SHALL BE (a) A MINIMUM OF 6 TIMES THE INTERNAL CONDUIT DIAMETER FOR CONDUITS 2-INCHES IN DIAMETER OR LESS, AND (b) 10 TIMES THE INTERNAL CONDUIT DIAMETER FOR CONDUITS MORE THAN 2-INCHES IN DIAMETER.
4. TERMINATE CONDUIT STUBS AND SLEEVES THAT PROTRUDE THROUGH STRUCTURAL FLOORS 2-INCHEST TO 3-INCHES ABOVE THE FLOOR SURFACE.
5. INSTALL BUSHINGS OR BELL ENDS AS REQUIRED ON ALL CONDUITS.
6. FLEX CONDUIT IS UNACCEPTABLE FOR USE AS A COMMUNICATIONS CONDUIT EXCEPT AT SEISMIC JOINTS AND/OR IF APPROVED IN WRITING BY THE ENGINEER.
7. ALL UNDER SLAB OR IN-SLAB CONDUITS SHALL BE INSTALLED IN A MANNER THAT PREVENTS WATER INFILTRATION OF THE CONDUIT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE GROUND WATER, RAIN WATER OR CONSTRUCTION WATER IS PREVENTED FROM ENTERING AND/OR REMOVED FROM THE CONDUITS PRIOR TO PLACEMENT OF COMMUNICATIONS CABLES. SEE ELECTRICAL SPECIFICATIONS, DETAILS AND PLANS FOR ADDITIONAL CONDUIT SEALING REQUIREMENTS.
8. WHERE OPEN CEILINGS OCCUR CONDUCTORS SHALL BE INSTALLED INSIDE SURFACE MOUNTED RACEWAY (CONDUIT). PROVIDE ALL SURFACE MOUNTED RACEWAY, CONDUITS AND CONDUIT SLEEVES WHETHER OR NOT SHOWN ON THE PLAN DRAWINGS. THIS APPLIES TO ALL LOW VOLTAGE AND SIGNAL SYSTEMS CONDUCTORS INCLUDING DATA, TELEPHONE, SECURITY, PUBLIC ADDRESS, CLOCKS, AUDIO VISUAL, CATV, SURVEILLANCE CAMERAS, FIRE ALARM, BMS/EMS, ETCETERA.
9. WHERE INACCESSIBLE CEILINGS OCCUR CONDUCTORS SHALL BE INSTALLED INSIDE CONDUIT RACEWAY. PROVIDE ALL CONDUITS AND CONDUIT SLEEVES WHETHER OR NOT SHOWN ON THE PLAN DRAWINGS. THIS APPLIES TO ALL LOW VOLTAGE AND SIGNAL SYSTEMS CONDUCTORS INCLUDING DATA, TELEPHONE, SECURITY, PUBLIC ADDRESS, CLOCKS, AUDIO VISUAL, CATV, SURVEILLANCE CAMERAS, FIRE ALARM, BMS/EMS, ETCETERA.
10. PROVIDE ANY AND ALL CONDUIT SLEEVES AS MAY BE REQUIRED WHENEVER LOW VOLTAGE CONDUCTORS PASS THROUGH AN INTERIOR OR EXTERIOR WALL, FLOOR, OR ANY STRUCTURAL ASSEMBLY. PROPERLY FIRE STOP ALL PENETRATIONS THROUGH FIRE RATED ASSEMBLIES PER THE NEC AND ELECTRICAL SPECIFICATIONS.
11. PROVIDE SOUND STOP MATERIAL FOR ALL CONDUIT PENETRATIONS IN SOUND RATED WALL ASSEMBLIES.
12. ALL PULL BOXES SHALL BE SIZED AND INSTALLED PER ANSI-TIA-569-C. PULL BOXES FOR IN/UNDER SLAB CONDUIT RUNS ARE NOT PERMITTED UNLESS OTHERWISE NOTED. PULL BOXES FOR OVERHEAD CONDUIT RUNS SHALL BE LOCATED ABOVE ACCESSIBLE CEILINGS WITHIN THE ACCESSIBLE CEILING SPACE AND SUPPORTED INDEPENDENTLY FROM THE STRUCTURE AND CONDUIT SUPPORTS. PULL BOXES FOR ROOF MOUNTED OR EXTERIOR ABOVE GRADE APPLICATIONS SHALL BE NEMA 3R RATED. PULL BOXES SHALL BE SIZED ACCORDING TO THE FOLLOWING:

CONDUIT SIZE	WIDTH	LENGTH	DEPTH	WIDTH INCREASE PER ADDITIONAL CONDUIT
1"	4"	16"	3"	2"
2"	8"	36"	4"	5"
3"	12"	48"	5"	6"
4"	15"	60"	8"	8"

FOR OTHER CONDUIT SIZES REFER TO ANSI/TIA 569 C TABLE 12, LATEST PUBLISHED EDITION.

13. CONDUIT(S) SHALL EXIT A PULL BOX ON THE WALL OPPOSITE THE WALL ENTERED.
14. ALL PULL BOXES INSTALLED ON TOP OF ROOFS OR ATTACHED TO CANOPIES SHALL BE RATED NEMA-3R OR NEMA-4. PROVIDE QUANTITY AND SIZE OF PULL BOXES AS REQUIRED TO COMPLY WITH THESE GENERAL PATHWAY NOTES. PAINT BOXES TO MATCH SURROUNDING SURFACES.
15. ALL CONDUITS INSTALLED ON EXTERIOR OF BUILDINGS AND CANOPIES SHALL BE GALVANIZED. PAINT ALL CONDUITS TO MATCH SURROUNDING SURFACES.
16. PROVIDE LABELING OF EACH CONDUIT PER GENERAL ELECTRICAL SPECIFICATIONS.
17. PROVIDE INTERNAL/EXTERNAL GAS AND WATER TIGHT MECHANICAL SEALING/PLUGGING OF EACH UNDERGROUND BUILDING ENTRY CONDUIT AS SPECIFIED ELSEWHERE IN THE DRAWINGS AND SPECIFICATIONS.
18. ALL CONDUITS EXPOSED TO VIEW (I.E.: OPEN CEILING SPACES) SHALL BE PAINTED TO MATCH SURROUNDING SURFACES. CONDUITS INSTALLED ABOVE HARD CEILINGS OR INACCESSIBLE CEILINGS ARE EXEMPT FROM PAINTING.
19. ELECTRICAL CONTRACTOR SHALL REFERENCE ALL E-SERIES, T-SERIES AND AV-SERIES SHEETS FOR ADDITIONAL CONDUIT REQUIREMENTS.

SHEET INDEX

T0.01	LEGEND, SYMBOLS & NOTES
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T1.02	TECHNOLOGY DEMOLITION PLAN
T2.01	TECHNOLOGY FLOOR PLAN
T4.00	TECHNOLOGY BLOCK DIAGRAMS
T4.01	TECHNOLOGY BLOCK DIAGRAMS
T5.01	TECHNOLOGY DETAILS
T5.02	TECHNOLOGY DETAILS

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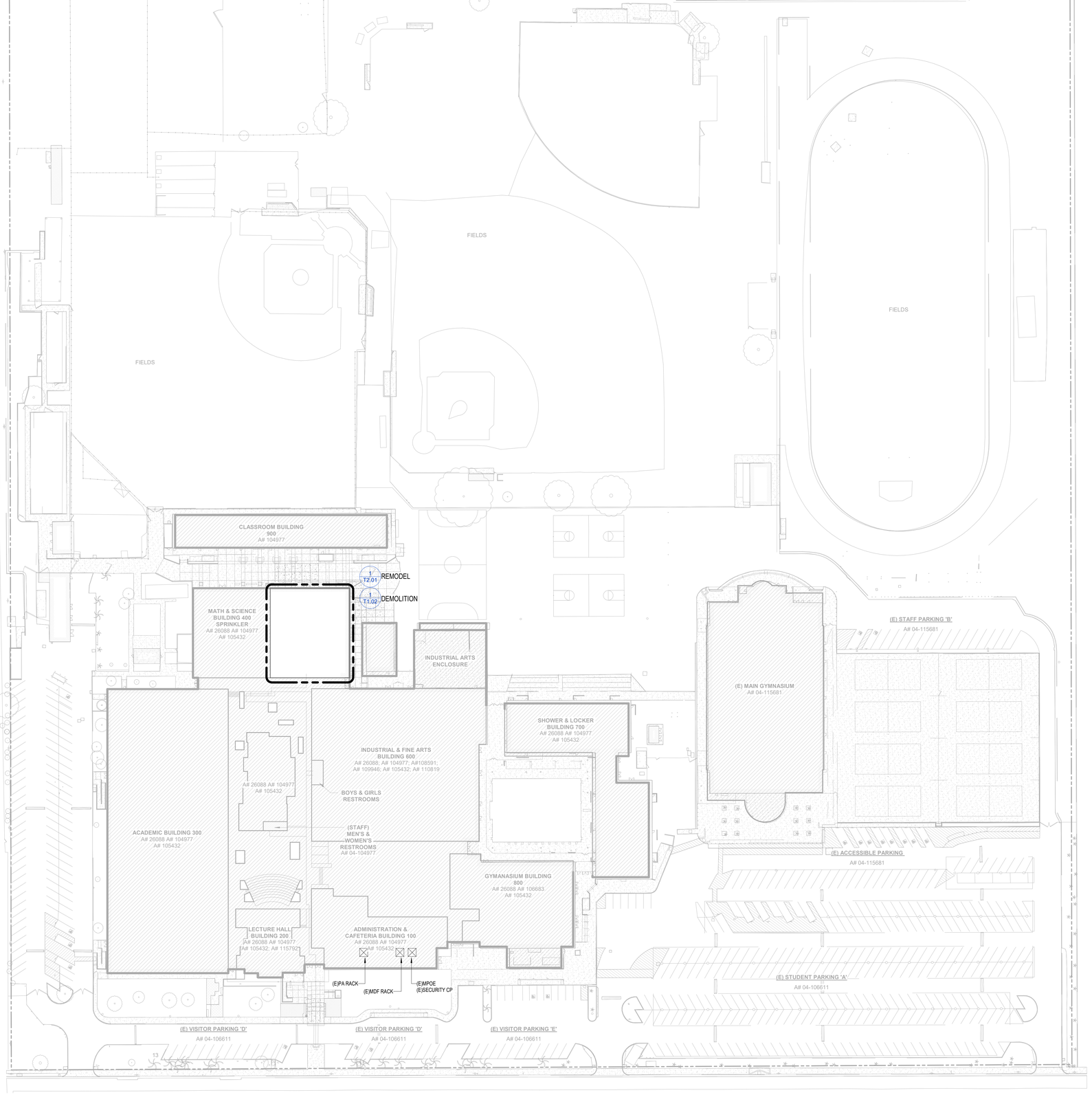
LEGEND, SYMBOLS & NOTES

T0.01



TECHNOLOGY SITE PLAN | 1" = 50'-0" | T0.10 | 1

N

KEYNOTES

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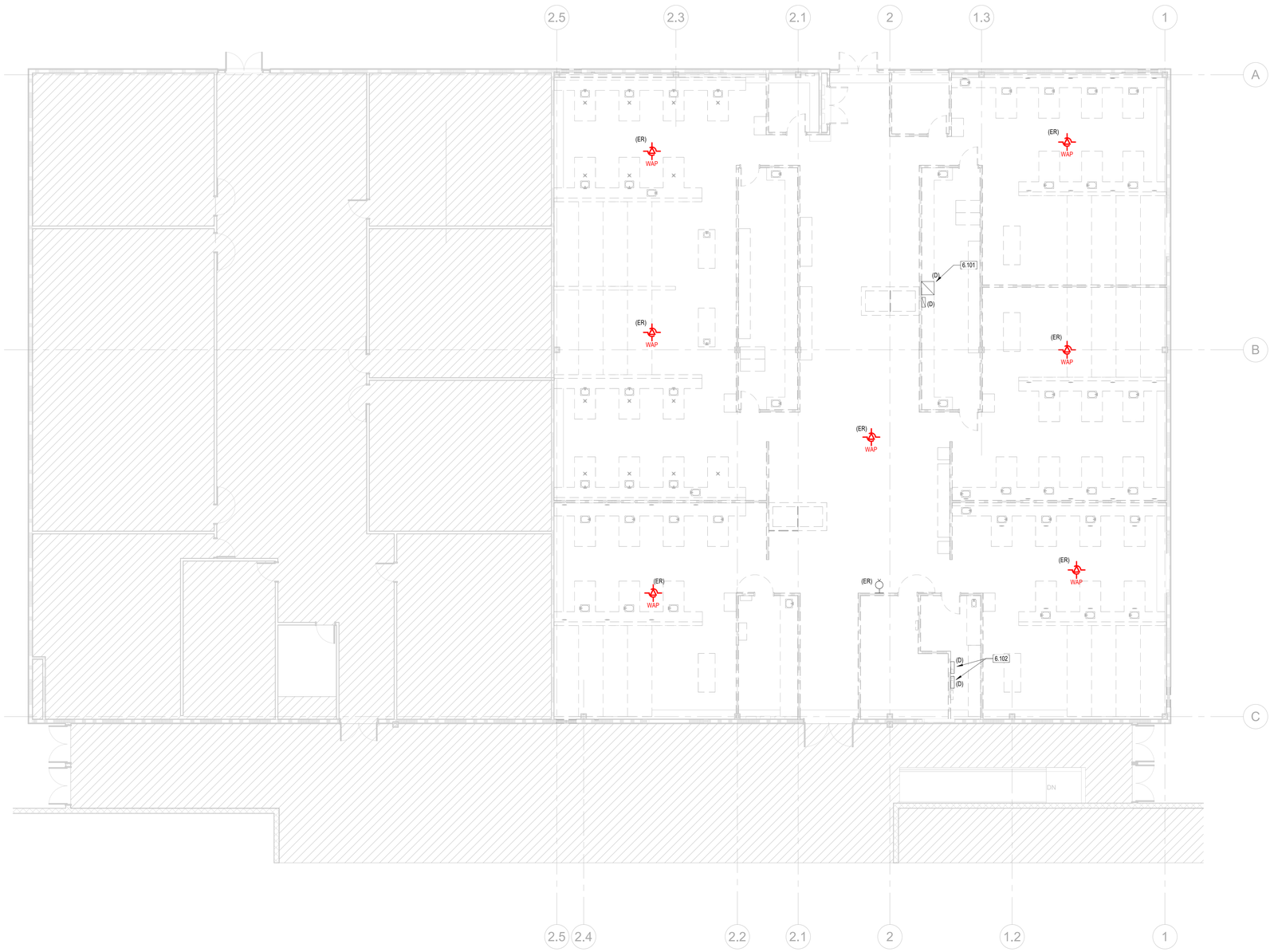
TECHNOLOGY SITE PLAN

T0.10



KEYNOTES

6.101 REMOVE TWO (2) EXISTING WALL MOUNTED IDF CABINETS AND WALL MOUNTED UPS EQUIPMENT. RETURN ALL EQUIPMENT TO DISTRICT. DEMOLISH EXISTING FIBER OPTIC BACKBONE CABLE BACK TO TERMINATION POINT AT MDF.

6.102 DEMOLISH COMPLETE TWO (2) EXISTING SIGNAL CABINETS. DEMO ALL PUBLIC ADDRESS SYSTEM PUNCH BLOCKS AND CONDUCTORS BACK TO POINTS OF FIELD TERMINATION. CONTRACTOR TO DEMOLISH ALL COAXIAL CABLE BACK TO POINTS OF TERMINATION AND HEADEND ORIGINATION. DEMO INTRUSION ALARM SYSTEM COMPONENTS AND CONDUCTORS BACK TO POINTS OF FIELD TERMINATION AND BACK TO HEADEND ORIGINATION.

DEMOLITION GENERAL NOTES:

1. DISCONNECT ALL EXISTING WIRELESS ACCESS POINT ELECTRONICS LOCATED WITHIN THE DEMO AREA AND SAFELY STORE THEM FOR REINSTALLATION DURING CONSTRUCTION PHASE.

2. DEMOLISH ALL PUBLIC ADDRESS SYSTEM SPEAKERS AND ASSOCIATED CABLING.

3. DEMOLISH INTRUSION ALARM SYSTEM KEYPAD, WALL AND CEILING MOUNTED DETECTION DEVICES AND ASSOCIATED CABLING.

4. DEMOLISH ALL LAN / PHONE SYSTEM OUTLETS, AND CABLING BACK TO IDF CABINETS.

5. REMOVE ALL EXISTING INTERIOR VIDEO SURVEILLANCE CAMERAS AND RETURN TO OWNER. DEMOLISH ASSOCIATED CAMERA CABLING.

6. CONTRACTOR SHALL EXERCISE EXTREME CAUTION TO NOT DISRUPT OTHER SYSTEMS LOCATED OUTSIDE THE DEMOLITION SCOPE AREA OF THIS PROJECT.

TECHNOLOGY DEMOLITION PLAN | 1/8" = 1'-0" | T1.02 | 1

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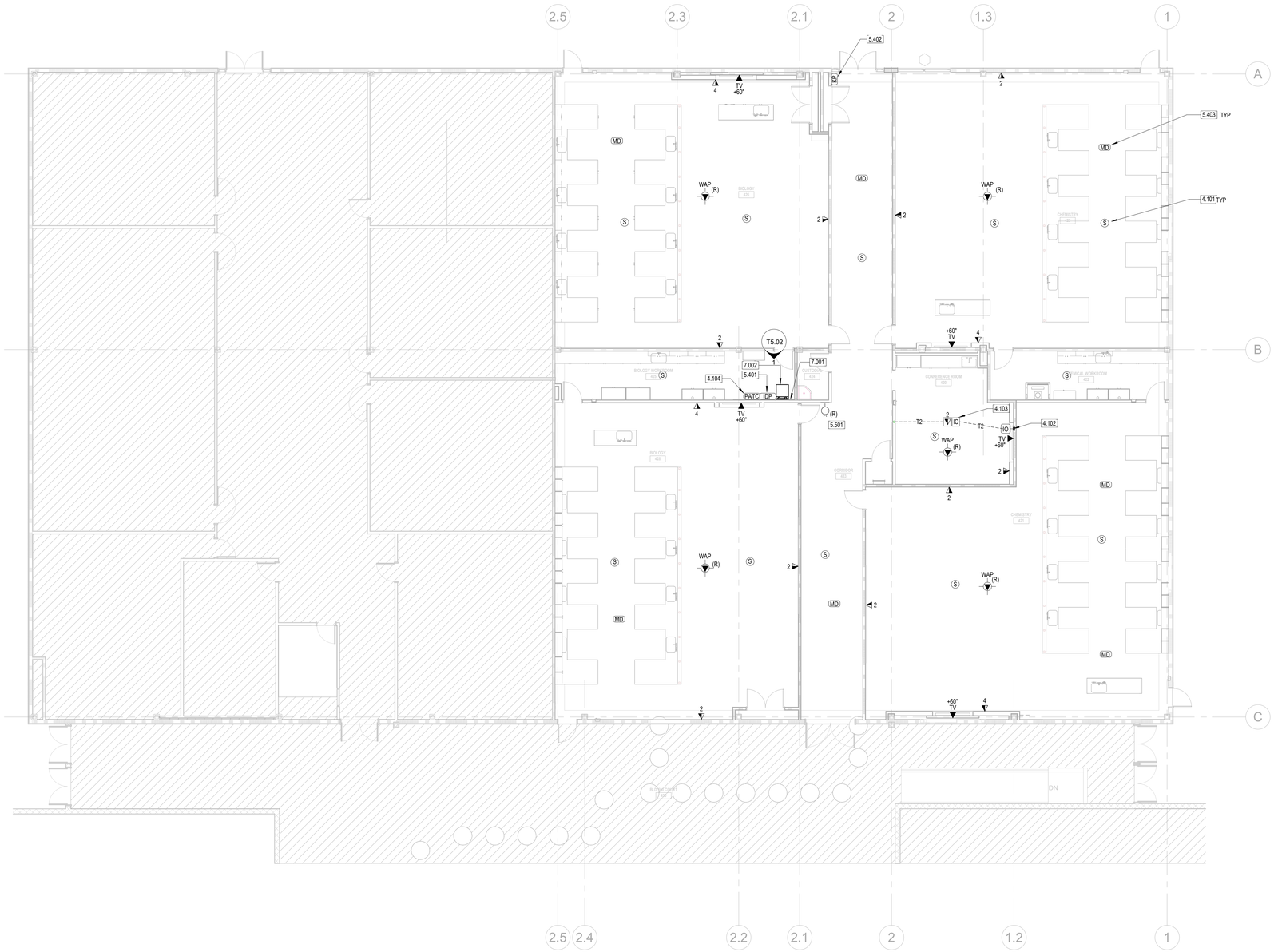
TECHNOLOGY DEMOLITION PLAN

T1.02



KEYNOTES

4.101 CEILING MOUNTED PUBLIC ADDRESS SYSTEM SPEAKER WITH CONDUCTORS. REFER TO SPECIFICATIONS AND SYSTEM BLOCK DIAGRAM FOR MORE INFORMATION.

4.102 HDMI INPUT PLATE WITH 4S DEEP BOX MOUNTED BEHIND TV AND 1.25"C AS SHOWN. REFER TO FACEPLATE DETAILS FOR MORE INFORMATION.

4.103 HDMI INPUT PLACE INSIDE E.C.-PROVIDED FLOOR BOX WITH HDMI CABLE TO HDMI PLATE LOCATED BEHIND TV. COORDINATE WITH E.C. IN FIELD. REFER TO FACEPLATE DETAILS FOR MORE INFORMATION.

4.104 WALL MOUNTED PUBLIC ADDRESS SYSTEM TERMINAL CABINET COMPLETE WITH TERMINAL BLOCK, ETCETERA, AS REQUIRED. REFER TO PA SYSTEM SPECIFICATIONS AND BLOCK DIAGRAM FOR MORE INFORMATION. MOUNT CLOSE TO CEILING.

5.401 INTRUSION ALARM TERMINAL CABINET COMPLETE WITH POWER SUPPLY, ZONE EXPANDERS, POPITS, TERMINAL BLOCK, BATTERY, ETCETERA FOR A COMPLETE SYSTEM. REFER TO SPECIFICATIONS. COORDINATE FINAL MOUNTING LOCATION IN FIELD.

5.402 WALL MOUNTED ARM-DISARM KEYPAD. REFER TO SPECIFICATIONS AND SYSTEM BLOCK DIAGRAM FOR MORE INFORMATION.

5.403 CEILING MOUNTED MOTION SENSOR WITH CONDUCTORS. REFER TO SPECIFICATIONS AND SYSTEM BLOCK DIAGRAM FOR MORE INFORMATION.

5.501 REINSTALL EXISTING VIDEO SURVEILLANCE CAMERA. VERIFY LOCATION IN FIELD WITH OWNER PRIOR TO ROUGH-IN. REFER TO LAN SYSTEM BLOCK DIAGRAM FOR MORE INFORMATION.

7.001 PAINTED PLYWOOD BACKBOARD 8-FT HIGH X 8-FT WIDE X 3/4"D. MOUNT 12 INCHES AFF.

7.002 WALL MOUNTED 24"W X 48"H X 30"D IDF CABINET COMPLETE. REFER TO SPECIFICATIONS AND BLOCK DIAGRAM FOR MORE INFORMATION. MOUNT 18 INCHES AFF.

ASSISTIVE LISTENING SYSTEM (ALS) GENERAL NOTE -
PROVIDE ASSISTIVE LISTENING SYSTEM EQUIPMENT FOR THE REMODEL AREA. REFER TO ALS SYSTEM INFORMATION ON T4.01.

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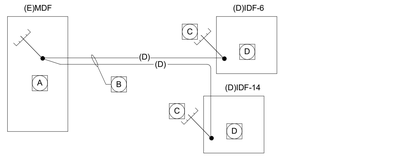
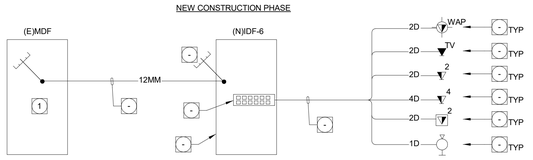
TECHNOLOGY FLOOR PLAN

T2.01





DEMOLITION KEY NOTES:

A EXISTING FLOOR MOUNTED MDF CABINET TO REMAIN PROTECTED IN PLACE. VERIFY LOCATION IN FIELD. DISCONNECT FIBER BACKBONE CABLES THAT FEED IDF-6 AND IDF-14. ALL OTHER FIBER CABLES TO REMAIN PROTECTED IN PLACE.

B COMPLETELY REMOVE EXISTING FIBER BACKBONE CABLE FEEDING EXISTING IDF-6 AND IDF-14.

C DISCONNECT EXISTING FIBER FROM RACK MOUNT FIBER ENCLOSURE. RETURN ENCLOSURE TO DISTRICT I.T. STAFF.

D REMOVE EXISTING IDF CABINET(S) COMPLETE AND RETURN ALL EQUIPMENT TO DISTRICT I.T. STAFF. REFER TO DEMOLITION FLOOR PLANS FOR ADDITIONAL INFORMATION.

NEW CONSTRUCTION KEY NOTES:

1 WAL MOUNTED IDF CABINET PER SPECIFICATIONS. ELECTRONICS ARE OWNER FURNISHED CONTRACTOR INSTALLED. COORDINATE WITH OWNER IN FIELD FOR PLACEMENT OF EQUIPMENT.

2 PROVIDE 48 PORT RACK MOUNT CAT-6A PATCH PANEL(S), QUANTITY AS REQUIRED TO TERMINATE ALL CABLES ON THIS PROJECT. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. COORDINATE FINAL PLACEMENT IN RACK WITH OWNER IN FIELD PRIOR TO ROUGH-IN.

3 CATEGORY-6A UTP 4-PAIR CABLE(S) PER SPECIFICATIONS. CABLE QUANTITIES AT EACH DEVICE AS INDICATED.

4 ABOVE-CEILING MOUNTED OUTLET FOR INTERIOR WIRELESS ACCESS POINT (WAP). QUANTITY AND LOCATIONS PER PLANS. REFER TO FACE PLATE DETAILS AND SPECIFICATIONS FOR MORE INFORMATION.

5 WALL MOUNTED DATA OUTLET FOR TV MONITOR. QUANTITY AND LOCATIONS PER PLANS. REFER TO FACE PLATE DETAILS AND SPECIFICATIONS FOR MORE INFORMATION.

6 DUAL DATA OUTLET. QUANTITY AND LOCATIONS PER PLANS. REFER TO FACE PLATE DETAILS AND SPECIFICATIONS FOR MORE INFORMATION.

7 QUAD DATA OUTLET. QUANTITY AND LOCATIONS PER PLANS. REFER TO FACE PLATE DETAILS AND SPECIFICATIONS FOR MORE INFORMATION.

8 FLUSH FLOOR DATA OUTLET. QUANTITY AND LOCATIONS PER PLANS. REFER TO FACE PLATE DETAILS AND SPECIFICATIONS FOR MORE INFORMATION.

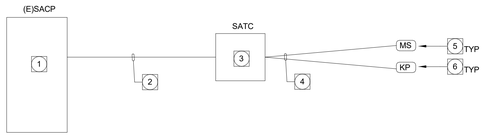
9 VIDEO SURVEILLANCE CAMERA, OWNER FURNISHED CONTRACTOR INSTALLED. QUANTITY AND LOCATIONS PER PLANS. REFER TO SPECIFICATIONS FOR MORE INFORMATION.

CABLE SCHEDULE

DESIGNATOR	CABLE QUANTITY AND TYPE
1D	ONE (1) CATEGORY-6A UTP 4-PAIR CABLE
2D	TWO (2) CATEGORY-6A UTP 4-PAIR CABLES
4D	FOUR (4) CATEGORY-6A UTP 4-PAIR CABLES
12MM	12 STRAND 50-MICRON OM4 MULTIMODE FIBER OPTIC CABLE PLENUM

1 LAN SYSTEM BLOCK DIAGRAM

SCALE: 12" = 1'-0"



SECURITY ALARM SYSTEM BLOCK DIAGRAM KEY NOTES:

1 EXISTING SECURITY ALARM SYSTEM CABINET AND DMP PANEL XR550. MODIFY AS REQUIRED TO ACCOMMODATE ALL DEMOLITION AND NEW CONSTRUCTION WORK ON THIS PROJECT. PROVIDE ADDITIONAL ZONE EXPANDERS, TERMINALS, ETCETERA, AS REQUIRED FOR A COMPLETE AND FULLY FUNCTIONAL SYSTEM.

2 BUS BACKBONE CABLING PER SPECIFICATIONS AND MANUFACTURER'S RECOMMENDATIONS. CABLE SHALL BE RATED FOR THE ENVIRONMENT IN WHICH IT IS INSTALLED, PER NEC.

3 SECURITY TERMINAL CABINET COMPLETE WITH POWER SUPPLY, BATTERY, ZONE EXPANDERS, POPITS, ETCETERA AS REQUIRED. REFER TO FLOOR PLAN FOR LOCATION. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

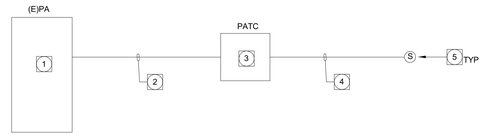
4 DEVICE CABLING PER SPECIFICATIONS AND MANUFACTURER'S RECOMMENDATIONS. CABLE SHALL BE RATED FOR THE ENVIRONMENT IN WHICH IT IS INSTALLED, PER NEC.

5 CEILING MOUNTED SECURITY SYSTEM MOTION DETECTION DEVICE. QUANTITY AND LOCATIONS PER PLANS. REFER TO SPECIFICATIONS FOR MORE INFORMATION.

6 WALL MOUNTED SECURITY SYSTEM ARM-DISARM KEYPAD DEVICE. QUANTITY AND LOCATIONS PER PLANS. REFER TO SPECIFICATIONS FOR MORE INFORMATION.

3 SECURITY ALARM SYSTEM BLOCK DIAGRAM

SCALE: 12" = 1'-0"



PUBLIC ADDRESS DIAGRAM KEY NOTES:

1 EXISTING PUBLIC ADDRESS SYSTEM HEADEND CABINET. MODIFY AS REQUIRED TO ACCOMMODATE ALL DEMOLITION AND NEW CONSTRUCTION WORK ON THIS PROJECT. PROVIDE ADDITIONAL AMPLIFIERS AS REQUIRED FOR A COMPLETE AND FULLY FUNCTIONAL SYSTEM.

2 MULTIPAIR SPEAKER CABLING PER SPECIFICATIONS AND MANUFACTURER'S RECOMMENDATIONS. CABLE SHALL BE RATED FOR THE ENVIRONMENT IN WHICH IT IS INSTALLED, PER NEC.

3 PUBLIC ADDRESS TERMINAL CABINET COMPLETE WITH TERMINAL STRIPS, ETCETERA AS REQUIRED. REFER TO FLOOR PLAN FOR LOCATION. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

4 SPEAKER CABLING PER SPECIFICATIONS AND MANUFACTURER'S RECOMMENDATIONS. CABLE SHALL BE RATED FOR THE ENVIRONMENT IN WHICH IT IS INSTALLED, PER NEC.

5 CEILING MOUNTED PUBLIC ADDRESS SYSTEM SPEAKER AND BACKBOX. QUANTITY AND LOCATIONS PER PLANS. REFER TO SPEAKER MOUNTING DETAIL AND SPECIFICATIONS FOR MORE INFORMATION.

2 PUBLIC ADDRESS SYSTEM BLOCK DIAGRAM

SCALE: 12" = 1'-0"

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Revision	Date

Submittal	Date
SCHEMATIC DESIGN	03/13/2025
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DSA BACK CHECK	01/27/2026

Job Number	32433
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Scale	12" = 1'-0"

TECHNOLOGY BLOCK DIAGRAMS

T4.00

ASSISTIVE LISTENING SYSTEM CALCULATIONS NOTE:

DEVICE QUANTITIES ARE BASED ON CBC 11B-219.3 EXCEPTION 1, AND APRIL 2020 DSA CODE APPEAL INTERPRETATION :

"FOR EACH SCHOOL, PROVIDE 2 PORTABLE ASSISTIVE LISTENING SYSTEMS, EACH WITH A TRANSMITTER AND A MINIMUM OF 2 RECEIVERS FOR USE IN CLASSROOMS WITHOUT AUDIO AMPLIFICATION. THE ASSISTIVE LISTENING RECEIVERS AND TRANSMITTER SHALL BE STORED IN THE SCHOOL SITE ADMINISTRATION OFFICE UNTIL REQUESTED.

"IN ADDITION, PROVIDE AN ASSISTIVE LISTENING SYSTEM FOR ASSEMBLY AREAS SUCH AS MULTI-PURPOSE ROOMS, CAFETERIAS, LECTURE HALLS OR OTHER ASSEMBLY AREAS. IF THE ROOM HAS NO FIXED SEATING, CALCULATE THE NUMBER OF SEATS USING 7 SF PER OCCUPANT. PROVIDE 4% OF ASSISTIVE LISTENING RECEIVERS FOR TOTAL NUMBER OF SEATS IN EACH ASSEMBLY AREA, BUT NO LESS THAN 2. THE ASSISTIVE LISTENING RECEIVERS SHOULD BE STORED IN OR NEAR THE ASSEMBLY AREA."

FOR THE SCIENCE BUILDING REMODEL, PROVIDE THE FOLLOWING ALS EQUIPMENT:

QTY.	DESCRIPTION
(1)	LK-1 LISTEN TALK TRANSCEIVER
(3)	LK-1 LISTEN TALK RECEIVER WITH LA-401 EAR SPKR
(1)	LA-452 HEADSET 2 (OVER HEAD W/ MIC)
(2)	LA-438 ADVANCED INDUCTION NECK LOOPS
(4)	LA-445-BK BREAKAWAY LANYARD
(1)	LA-423 4-PORT USB CHARGER
(1)	LA-436 MIC INPUT/HEADPHONE OUTPUT CABLE
(4)	LA-365 RECHARGEABLE BATT. AA (2-PACK)

ADDITIONAL REQUIRED ITEMS:

(1)	LA-483 SOFT SHELL CASE 4
(1)	LA-304 ALS NOTIFICATION SIGNAGE KIT

1 ASSISTIVE LISTENING SYSTEM SPEC AND INFO

SCALE: 12" = 1'-0"

ASSISTIVE LISTENING SYSTEM SPECIFICATION AND NOTES:

1. PROVIDE COMPLETE PORTABLE ASSISTIVE LISTENING SYSTEM(S) (ALS) WITH ALL CABLES, DEVICES, EQUIPMENT, RECHARGEABLE BATTERIES, CHARGING/CARRYING CASES, ANTENNAS, COMPONENTS, TERMINATIONS AND TESTING FOR COMPLETE AND OPERABLE SYSTEM.
2. DRAWINGS AND LAYOUTS ARE PRIMARILY DIAGRAMMATIC, CONTRACTOR IS RESPONSIBLE FOR FINAL FOOTAGES AND EXACT LOCATIONS.
3. THE ALS SYSTEM SHALL ACCOMMODATE A MINIMUM OF 4% OF TOTAL NUMBER OF SEATS, AS SHOWN ON THE ARCHITECTURAL DRAWINGS AND NOTED IN THE ALS CALCULATION TABLE.
4. QUANTITY OF PORTABLE RECEIVERS REQUIRED SHALL BE CALCULATED PER 2022 CALIFORNIA BUILDING CODE (CBC) 11B-219.3 RECEIVERS EXCEPTION #1 WHICH STATES, "WHERE A BUILDING CONTAINS MORE THAN ONE ASSEMBLY AREA AND THE ASSEMBLY AREAS REQUIRED TO PROVIDE ASSISTIVE LISTENING SYSTEMS ARE UNDER ONE MANAGEMENT, THE TOTAL NUMBER OF REQUIRED RECEIVERS SHALL BE PERMITTED TO BE CALCULATED ACCORDING TO THE TOTAL NUMBER OF SEATS IN THE ASSEMBLY AREAS IN THE BUILDING PROVIDED THAT ALL RECEIVERS ARE USABLE WITH ALL SYSTEMS."
5. EQUIPMENT NUMBERS ABOVE ARE SHOWN FOR REFERENCE. CONTRACTOR IS RESPONSIBLE TO MATCH EXISTING ALS MANUFACTURER AND MODEL ON CAMPUS. PROVIDE MOST CURRENT PRODUCT MODELS AND PART NUMBERS. CONTRACTOR SHALL COORDINATE DIRECTLY WITH OWNER IN FIELD.
6. CONTRACTOR TO PROVIDE ANTENNA(S) AND ASSOCIATED ACCESSORIES/HARDWARE AS REQUIRED, FOR COMPLETE COVERAGE WITHIN ENTIRE PROJECT AREA.
7. PROVIDE ALS SIGNAGE IN THE QUANTITIES AND LOCATIONS AS INDICATED IN ARCHITECTURAL DRAWINGS, AND AS REQUIRED BY 2022 CBC AND 2010 ADA STANDARDS.
8. PROVIDE MANUFACTURER'S 3 YEAR (MINIMUM) WARRANTY FOR ALL PORTABLE TRANSMITTERS AND RECEIVERS.
9. PRIOR TO ORDERING ALS EQUIPMENT, CONTRACTOR SHALL PERFORM A RADIO FREQUENCY (RF) TEST TO DETERMINE AND IDENTIFY ANY POTENTIAL RECEIVED RF INTERFERENCE. CONTRACTOR SHALL BE RESPONSIBLE TO SELECT ALS SYSTEM RADIO FREQUENCIES (72 MHZ OR 216 MHZ) THAT DO NOT RECEIVE RF INTERFERENCE FROM OTHER BUILDING SYSTEMS SUCH AS LIGHTING, POWER, GENERATORS, HVAC, COMPUTERS, AUDIO, PAGING, ETCETERA. FINAL SYSTEM TESTING SHALL BE CONDUCTED WITH ALL BUILDING SYSTEMS TURNED ON TO VERIFY THE ALS SYSTEM IS FREE OF INTERFERENCE. IF RF INTERFERENCE IS DETECTED WITHIN THE FIRST 30 DAYS AFTER PROJECT COMPLETION, CONTRACTOR SHALL REPLACE ALS EQUIPMENT WITH EQUIPMENT ON ANOTHER FREQUENCY AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR SHALL INCLUDE ALL COSTS IN BASE BID.
10. ANY PENETRATIONS THROUGH FIRE-RATED WALLS SHALL BE SEALED BY THE CONTRACTOR AS REQUIRED BY THE 2022 CALIFORNIA ELECTRICAL CODE AND AS DIRECTED BY, AND TO THE SATISFACTION OF, THE OWNER'S PROJECT MANAGER.
11. THE ASSISTIVE LISTENING SYSTEM SIGNS SHALL BE PROVIDED BY THE CONTRACTOR. SIGNS SHALL COMPLY WITH ALS SIGN DETAIL ON A-SERIES OR G-SERIES SHEETS. THE ASSISTIVE LISTENING SYSTEM SIGNS SHALL ALSO MEET THE REQUIREMENTS AS SET FORTH IN THE FOLLOWING SECTION OF THE 2010 ADA STANDARDS:
    a. 216.10. ASSISTIVE LISTENING SYSTEMS. EACH ASSEMBLY AREA REQUIRED BY 219 TO PROVIDE ASSISTIVE LISTENING SYSTEMS SHALL PROVIDE SIGNS INFORMING PATRONS OF THE AVAILABILITY OF THE ASSISTIVE LISTENING SYSTEM. ASSISTIVE LISTENING SIGNS SHALL COMPLY WITH 703.5 AND SHALL INCLUDE THE INTERNATIONAL SYMBOL OF ACCESS FOR HEARING LOSS COMPLYING WITH 703.7.2.4.
    b. EXCEPTION: WHERE TICKET OFFICES OR WINDOWS ARE PROVIDED, SIGNS SHALL NOT BE REQUIRED AT EACH ASSEMBLY AREA PROVIDED THAT SIGNS ARE DISPLAYED AT EACH TICKET OFFICE OR WINDOW INFORMING PATRONS OF THE AVAILABILITY OF ASSISTIVE LISTENING SYSTEMS.
12. THE ASSISTIVE LISTENING SYSTEM SHALL CONFORM TO THE FOLLOWING SECTIONS OF 2022 CALIFORNIA BUILDING CODE (CBC):
    - 11B-706 ASSISTIVE LISTENING SYSTEMS
    - 11B-706.1 GENERAL. ASSISTIVE LISTENING SYSTEMS REQUIRED IN ASSEMBLY AREAS CONFERENCE AND MEETING ROOMS SHALL COMPLY WITH SECTION 11B-706.
    - 11B-706.2 RECEIVER JACKS. RECEIVERS REQUIRED FOR USE WITH AN ASSISTIVE LISTENING SYSTEM SHALL INCLUDE A 1/8 INCH (3.5MM) STANDARD MONO JACK.
    - 11B-706.3 RECEIVER HEARING-AID COMPATIBILITY. RECEIVERS REQUIRED TO BE HEARING-AID COMPATIBLE SHALL INTERFACE WITH TELECOILS IN HEARING AIDS THROUGH THE PROVISION OF NECK LOOPS.
    - 11B-706.4 SOUND PRESSURE LEVEL. ASSISTIVE LISTENING SYSTEMS SHALL BE CAPABLE OF PROVIDING A SOUND PRESSURE LEVEL OF 110 DB MINIMUM AND 118 DB MAXIMUM WITH A DYNAMIC RANGE ON THE VOLUME CONTROL OF 50 DB.
    - 11B-706.5 SIGNAL-TO-NOISE RATIO. THE SIGNAL-TO-NOISE RATIO FOR INTERNALLY GENERATED NOISE IN ASSISTIVE LISTENING SYSTEMS SHALL BE 18 DB MINIMUM.
    - 11B-706.6 PEAK CLIPPING LEVEL. PEAK CLIPPING SHALL NOT EXCEED 18 DB OF CLIPPING RELATIVE TO THE PEAKS OF SPEECH.

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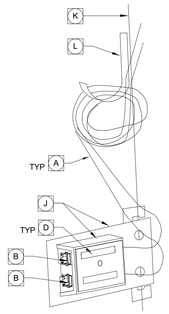
TECHNOLOGY BLOCK DIAGRAMS

T4.01

WHERE THE FOLLOWING SYMBOLS ARE INDICATED ON THE ELECTRICAL DRAWINGS, ARCHITECTURAL DRAWINGS AND/OR STRUCTURED CABLING SYSTEM DRAWINGS:

WAP

THE FOLLOWING SHALL BE PROVIDED, AS DEPICTED IN THE FOLLOWING DIAGRAMMATIC CONNECTIVITY DETAIL.



8 ABOVE CEILING WAP FACEPLATE

SCALE: 12" = 1'-0"

FACEPLATE NOTES:

A. PROVIDE (1) CAT 6A, 4 PAIR UTP CABLE(S) TO IDF RACK/CABINET. TERMINATE STATION END(S) IN CAT-6A STATION CONNECTOR(S) PER DETAILS. TERMINATE RACK END(S) ON CAT-6A PATCH PANEL(S) PER SPECIFICATIONS.

B. PROVIDE DATA CAT-6A STATION CONNECTOR. COLOR OF JACK PER SPECIFICATIONS.

C. PROVIDE FACE PLATE. FACE PLATE MATERIAL AND FINISH SHALL MATCH ADJACENT OR NEARBY POWER FACE PLATES. FACE PLATES SHALL BE EQUIPPED WITH CLEAR WINDOWS FOR LABELING.

D. PROVIDE MACHINE GENERATED FACE PLATE LABELING PER SPECIFICATIONS.

E. BLANK INSERT. ALL UNUSED OPENINGS SHALL BE COVERED WITH A BLANK INSERT MATCHING THE COLOR OF THE FACEPLATE.

F. SURFACE-MOUNT, PLENUM-RATED TWO-PORT HOUSING (LEVITON 41089-2WP OR EQUAL). INSTALL IN E.C.-PROVIDED FLUSH BOX.

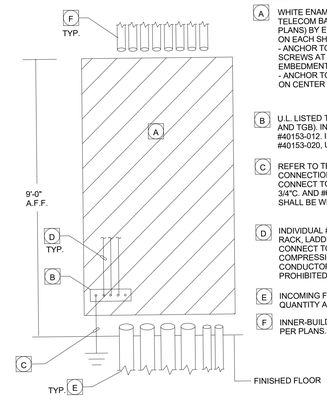
G. SINGLE PORT JACK BOX (AMP #1116697-1 OR EQUAL) WITH CAT-6A PATCH CORD. MOUNT INSIDE FLUSH WEATHERPROOF J-BOX.

H. DEVICE FRAME WITH FACEPLATE, MOUNT INSIDE FLOOR BOX. REFER TO FLOOR BOX MANUFACTURER'S REQUIREMENTS AND COORDINATE IN FIELD.

J. SURFACE-MOUNT, PLENUM-RATED TWO-PORT HOUSING (LEVITON 41089-2WP OR EQUAL). MOUNT TO CONTRACTOR-PROVIDED IN-CEILING BRACKET WITH MULTI-FUNCTION CLIP FOR ROD OR HANGER WIRE MOUNTING (LEVITON 49223-CBC OR EQUAL). PROVIDE 15FT SLACK LOOP ON J-HOOK MOUNTED ABOVE HOUSINGS. MOUNT HOUSING 9 TO 12 INCHES ABOVE ACCESSIBLE CEILING TILE.

K. INSTALL DEDICATED SUSPENDED CEILING WIRE/HANGAR OR SUPPORT ROD/ROD HANGAR DIRECTLY TO STRUCTURAL CEILING ABOVE TO SUPPORT WAP SURFACE MOUNT HOUSING.

L. PROVIDE J-HOOK ABOVE ACCESSIBLE CEILING PER SPECIFICATIONS. J-HOOKS SHALL BE SPACED AT A MAXIMUM OF 5 FEET APART.



BACKBOARD AND GROUNDING DETAIL NOTES:

A. WHITE ENAMEL PAINTED A/C GRADE FIRE RATED PLYWOOD TELECOM BACKBOARD, (8' HIGH x 3/4" THICK x WIDTH PER PLANS) BY E.C.. LEAVE ONE FIRE MARSHAL STAMP UNPAINTED ON EACH SHEET. MOUNT 6" ABOVE FINISHED FLOOR.
- ANCHOR TO WOOD STUD WALL WITH #14 TRUSS HEAD WOOD SCREWS AT 16" ON CENTER. EDGE AND FIELD MINIMUM EMBEDMENT 2" INTO STUDS.
- ANCHOR TO METAL STUD WALL WITH #12 SMS SCREWS AT 16" ON CENTER AT EDGE AND FIELD.

B. U.L. LISTED TELECOMMUNICATIONS GROUND BUS BAR (TMGB AND TGB). IN IDF AND MDF ROOMS PROVIDE TGB, CHATSWORTH #40153-012. IN MPOE ROOMS PROVIDE TMGB CHATSWORTH #40153-020, U.O.N. ON PLANS.

C. REFER TO TELECOM RISER AND GROUNDING DIAGRAM FOR CONNECTION OF TMGB TO MAIN ELECTRICAL SERVICE GROUND. CONNECT TGB'S TO ELECTRICAL PANEL GROUND BUS WITH 3/4"C. AND #6AWG GROUND CONDUCTOR. ALL CONNECTIONS SHALL BE WITH 2-HOLE COMPRESSION LUGS.

D. INDIVIDUAL #6AWG GROUND CONDUCTORS TO EACH CABINET, RACK, LADDER TRAY, CONDUIT, ETC. BY SCS CONTRACTOR. CONNECT TO EQUIPMENT AND TO GROUND BUS BAR VIA 2-HOLE COMPRESSION LUGS ONLY. DAISY-CHAINING OF GROUND CONDUCTOR TO MORE THAN ONE PIECE OF EQUIPMENT IS PROHIBITED.

E. INCOMING FEED CONDUITS AND INNER-BUILDING CONDUITS. QUANTITY AND SIZE PER PLANS.

F. INNER-BUILDING CONDUITS AND SLEEVES. QUANTITY AND SIZE PER PLANS.

TELECOM BACKBOARD & GROUND BUS BAR DETAIL

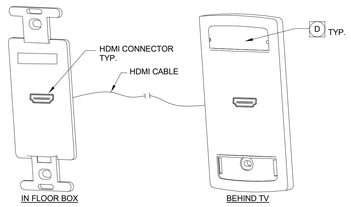
1 BACKBOARD AND TELECOM GROUND BUSBAR

SCALE: NOT TO SCALE

WHERE THE FOLLOWING SYMBOLS ARE INDICATED ON THE ELECTRICAL DRAWINGS ARCHITECTURAL DRAWINGS AND/OR STRUCTURED CABLING SYSTEM DRAWINGS:

IO IO

THE FOLLOWING SHALL BE PROVIDED, AS DEPICTED IN THE FOLLOWING DIAGRAMMATIC CONNECTIVITY DETAIL.



NOTE: INCLUDE ONE (1) HDMI CABLE AND CONNECT THE FLOOR BOX HDMI MEDIA INPUT PLATE TO THE HDMI PLATE LOCATED BEHIND THE WALL MOUNTED TELEVISION. INCLUDE ONE (1) DATA OUTLET AND CABLE IN EACH PLATE. INCLUDE ALL COSTS IN BASE BID.

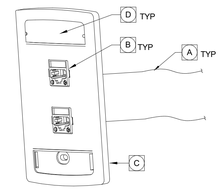
9 HDMI FACEPLATES

SCALE: 12" = 1'-0"

WHERE THE FOLLOWING SYMBOLS ARE INDICATED ON THE ELECTRICAL DRAWINGS, ARCHITECTURAL DRAWINGS AND/OR STRUCTURED CABLING SYSTEM DRAWINGS:

2 TV

THE FOLLOWING SHALL BE PROVIDED, AS DEPICTED IN THE FOLLOWING DIAGRAMMATIC CONNECTIVITY DETAIL.



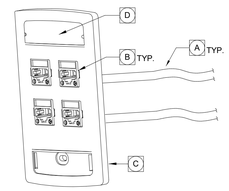
5 DUAL DATA FACEPLATE

SCALE: 12" = 1'-0"

WHERE THE FOLLOWING SYMBOLS ARE INDICATED ON THE ELECTRICAL DRAWINGS, ARCHITECTURAL DRAWINGS AND/OR STRUCTURED CABLING SYSTEM DRAWINGS:

4

THE FOLLOWING SHALL BE PROVIDED, AS DEPICTED IN THE FOLLOWING DIAGRAMMATIC CONNECTIVITY DETAIL.



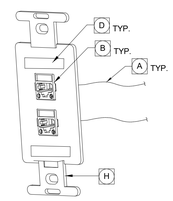
6 QUAD DATA FACEPLATE

SCALE: 12" = 1'-0"

WHERE THE FOLLOWING SYMBOLS ARE INDICATED ON THE ELECTRICAL DRAWINGS, ARCHITECTURAL DRAWINGS AND/OR STRUCTURED CABLING SYSTEM DRAWINGS:

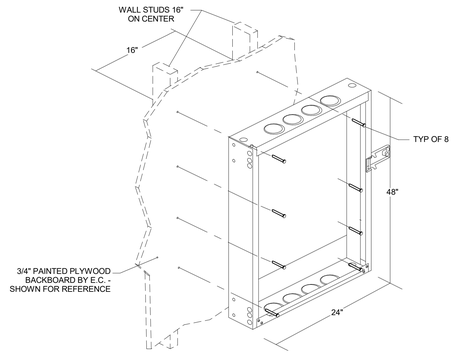
2

THE FOLLOWING SHALL BE PROVIDED, AS DEPICTED IN THE FOLLOWING DIAGRAMMATIC CONNECTIVITY DETAIL.



7 DUAL DATA FLOOR BOX

SCALE: 12" = 1'-0"



GENERAL NOTES:

1. THE REAR FRAME MUST BE SECURED TO WALL AT (8) LOCATIONS AND ARE INTENDED TO GO THROUGH 3/4" PLYWOOD BACKBOARD INTO WALL STUD:

   METAL STUD: PROVIDE #14 x 3" SMS WITH HEX WASHER HEADS CENTERED ON METAL WALL STUDS, 6 TOTAL, 3 PER STUD EQUALLY SPACED.

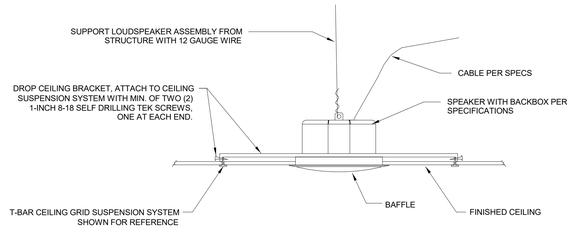
   WOOD STUD: PROVIDE 3/8" DIAMETER X 4" LAG SCREWS AND WASHERS CENTERED ON WOOD WALL STUDS, WITH 2.5" EFF STUD EMBEDMENT, 8 TOTAL, 4 PER STUD EQUALLY SPACED.

2. CONTRACTOR TO INSTALL CABINET TO BACKBOARD. E.C. TO INSTALL PAINTED PLYWOOD BACKBOARD PER ELECTRICAL SPECIFICATIONS.

3. DIMENSIONS: 24"W X 48"H X 30"D. MAXIMUM WEIGHT: 600 POUNDS

3 48" CABINET WALL MOUNTING DETAIL

SCALE: NOT TO SCALE



MAXIMUM INSTALLED WEIGHT 5.75 LBS

ANCHORAGE TO CEILING GRID COMPLIES WITH DSA IR 25-2, SECTION 1.9 AND 1.8.1 REQUIREMENTS.

4 PUBLIC ADDRESS SYSTEM CEILING SPEAKER DETAIL

SCALE: NOT TO SCALE

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Technology Lead - Joe Marotta
WSP Job #:US0043159.0992

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SONORA HIGH SCHOOL
SCIENCE CLASSROOMS MODERNIZATION

401 S PALM STREET
LA HABRA, CA 90631

Developed for
FULLERTON JOINT UNION HIGH SCHOOL DISTRICT

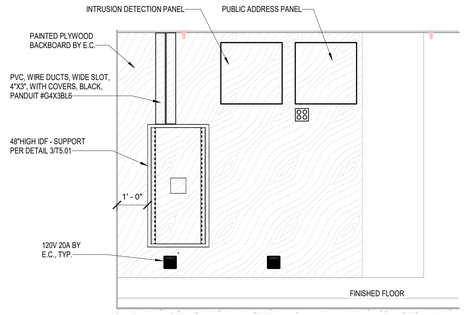
Revision	Date

Submittal	Date
SCHEMATIC DESIGN	03/13/2025
50% DESIGN DEVELOPMENT	06/16/2025
50% CONSTRUCTION DOCUMENTS	09/26/2025
100% CONSTRUCTION DESIGN	11/14/2025
DSA SUBMITTAL	11/21/2025
DSA BACK CHECK	01/27/2026

Job Number	32433
Checked By	Checker
Scale	12" = 1'-0"

TECHNOLOGY DETAILS

T5.01



1 IDF BACKBOARD ELEVATION

SCALE: 1/2" = 1'-0"

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TECHNOLOGY DETAILS

T5.02