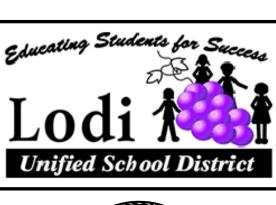
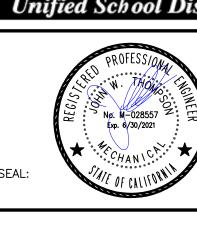
# LODI UNIFIED SCHOOL DISTRICT WOODBRIDGE ELEMENTARY

HVAC REPLACEMENT 1290 LILAC STREET WOODBRIDGE, CA. 95242

APPLICABLE CODES	SHEET INDEX		۱WO	NER			SI	TE PLAN
CALIFORNIA CODE OF REGULATIONS (C.C.R.), TITLE 24	NO. OF DRAWING NO. DRAWING TITLE / DESCRIPTION	DR. CATHY WASH SUPERINTENDENT	HER LODI UNIFIED SCHOOL DISTRICT T 1305 E. VINE STREET	(209)331–70	010	cwasher@lodiusd.net	into an analysis of	in the same of the
<u>CALIFORNIA CODE OF REGULATIONS (C.C.R.)</u> , TITLE 24 —— A PORTION OF THE CALIFORNIA BUILDING STANDARDS CODE, INCLUDE THE FOLLOWING PARTS:	1 MO.00 TITLE SHEET		LODI, CA 95240					
2019 CALIFORNIA ADMINISTRATIVE CODE (C.A.C.)	2 MO.01 MECHANICAL LEGEND, SCHEDULES AND NOTES  3 MO.02 MECHANICAL LEGEND, SCHEDULES AND NOTES		LODE THREED COLLOCK DISTRICT	(000) 774 7	7404			
2019 CALIFORNIA ADMINISTRATIVE CODE (C.A.C.) TITLE 24, PART 1, C.C.R.	4 M1.00 MECHANICAL OVERALL FLOOR PLAN BUILDING A	TIM EDSELL MECHANICAL	LODI UNIFIED SCHOOL DISTRICT 1305 E. VINE STREET	(209) 331–7	/184	mslater@lodiusd.net		
2019 CALIFORNIA BUILDING CODE (C.B.C.) INCORPORATE BY REFERENCE THE 2018 IBC, WITH 2019	5 M1.06 MECHANICAL DEMOLITION FLOOR PLAN BUILDING D	SYSTEMS SUPERVISOR	LODI, CA 95240				SE SESSO	
CALIFORNIA AMENDMENTS —— TITLE 24, PART 2, VOL. 1&2 C.C.R.	6 M1.07 MECHANICAL DEMOLITION FLOOR PLAN BUILDING E							
2019 CALIFORNIA ELECTRICAL CODE (C.E.C.) INCORPORATE BY REFERENCE THE 2017 NATIONAL ELECTRICAL CODE,	7 M1.08 MECHANICAL DEMOLITION FLOOR PLANS 24'X40' PORTABLES 8 M2.01 MECHANICAL FLOOR PLAN BUILDING A							PALLUM
WITH 2019 CALIFORNIA AMENDMENTS —— TITLE 24, PART 3, C.C.R.	9 M2.02 MECHANICAL FLOOR PLAN BUILDING A							
2019 CALIFORNIA MECHANICAL CODE (C.M.C.) INCORPORATE BY REFERENCE THE 2018 IAPMO UNIFORM MECHANICAL CODE,	10 M2.06 MECHANICAL FLOOR PLAN BUILDING D						Woodbride	Te.
WITH 2019 CALIFORNIA AMENDMENTS —— TITLE 24, PART 4, C.C.R.	11 M2.07 MECHANICAL FLOOR PLAN BUILDING E		CONSUL	_TANT	S		Flementary S	chool
2019 CALIFORNIA PLUMBING CODE (C.P.C.) INCORPORATE BY REFERENCE THE 2018 IAPMO UNIFORM PLUMBING CODE,	12 M2.08 MECHANICAL FLOOR PLANS 24'X40' PORTABLES  13 M2.09 MECHANICAL FLOOR PLAN BUILDINGS B & C	<del></del>		1	<del>-</del>	1	_ Liententally &	40001110
WITH 2019 CALIFORNIA AMENDMENTS —— TITLE 24, PART 5, C.C.R.	13 M2.09 MECHANICAL FLOOR PLAN BUILDINGS B & C  14 M3.01 MECHANICAL DEMOLITION ROOF PLAN BUILDING B		COMPANY	PHONE#	FAX#	EMAIL ADDRESS		1290 Lilac St
2019 CALIFORNIA FIRE CODE INCORPORATE BY REFERENCE THE 2018 IFC, WITH 2019	15 M3.02 MECHANICAL DEMOLITION ROOF PLAN BUILDING C	MECHANICAL 1	TURLEY & ASSOCIATES	(916) 325-1065	(916) 325-1075	jthompson@turleymech.co		
CALIFORNIA AMENDMENTS —— TITLE 24, PART 9, C.C.R.	16 M3.03 MECHANICAL DEMOLITION FLOOR PLAN BUILDING A		2431 CAPITOL AVE. SACRAMENTO, CA 95816					
2019 CALIFORNIA REFERENCED STANDARDS CODE CALIFORNIA CODE OF REGULATIONS TITLE 24, PART 12, C.C.R.	17 M3.04 MECHANICAL ROOF PLAN BUILDING A		CONTACT: JOHN THOMPSOM					
	18 M3.11 MECHANICAL ROOF PLAN BUILDING B	CTDLICTLIDAL	BEVIER STRUCTURAL ENGINEERING, INC	(016) 631 3030	(916) 631 9006	hill@havior.not		
SCOPE OF WORK	19 M3.12 MECHANICAL ROOF PLAN BUILDING C 20 M3.13 MECHANICAL ROOF PLAN BUILDING A	ENGINEER 2	2479 SUNRISE BOULEVARD GOLD RIVER, CA 95670—4344	J. (310) 0J1-JUJU	(310) 001-0996	umanevier.ilet		
	21 M3.14 MECHANICAL ROOF PLAN BUILDING A		CONTACT: BILL BEVIER					Frank Stripe (ma)
SCOPE OF WORK IS TO REMOVE AND REPLACE THE EXISTING WALL MOUNTED	22 M5.01 MECHANICAL DETAILS						A CONTRACTOR OF THE PARTY OF TH	
HEAT PUMP UNITS FOR THE PORTABLE BUILDINGS, 6 UNITS TOTAL. REMOVE AND REPLACE THE EXISTING AC UNITS ON ROOF FOR BUILDINGS A, B, C, D, AND E, 25 TOTAL UNITS. PROJECT SHALL HAVE AN INSPECTOR OF RECORD HIRED BY	23 M5.02 MECHANICAL DETAILS		WHITTINGTON ELECTRIC, INC. 1940 INDUSTRIAL DRIVE,	(530) 823-3055 OFFICE		nathan@ whittingtonelectricinc.com	3	
25 TOTAL UNITS. PROJECT SHALL HAVE AN INSPECTOR OF RECORD HIRED BY THE THE DISTRICT.	24 M5.03 MECHANICAL DETAILS		AUBURN, CA 95603	(530) 355-5228		gtoriologiriolilo.com	The same of the sa	
	25 M6.01 MECHANICAL AND PLUMBING SPECIFICATION  26 M6.02 MECHANICAL AND PLUMBING SPECIFICATION							4:
GENERAL NOTES	27 M6.03 MECHANICAL AND PLUMBING SPECIFICATION						THE PARTY OF THE P	
	28 PO.01 PLUMBING LEGEND, SCHEDULES AND NOTES							
FNGINFER OF RECORD (FOR) SHALL SUBMIT ALL ADDENDUM, CHANGE ORDER	29 P2.06 PLUMBING FLOOR PLAN BUILDING D					<del></del>		
<ul> <li>ENGINEER OF RECORD (EOR) SHALL SUBMIT ALL ADDENDUM, CHANGE ORDER OR ANY SUBSTITUTION RELATED TO STRUCTURAL AND FIRE LIFE SAFETY TO DSA FOR REVIEW AND APPROVAL.</li> </ul>	30 P2.07 PLUMBING FLOOR PLAN BUILDING E  31 P3.03 PLUMBING ROOF PLAN BUILDING A		DESIGN	CRITE	RIA		SITE ADDRESS	VICINITY MAP
CONTRACTOR SHALL SUBMIT FOR ALL SUBSTITUTION RELATED TO STRUCTURAL,	32 P3.04 PLUMBING ROOF PLAN BUILDING A							<del></del>
FIRE LIFE SAFETY, ANCHORING AND EQUIPMENT TO EOR FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.	33 P3.05 PLUMBING ROOF PLAN BUILDING B GAS AND CD						WOODBRIDGE ELEMENTARY 1290 LILAC STREET	PORTABLES DSA #49448 #42976 #02-101435
ROOFING WORK SHALL BE BY D7 ROOFING SERVICES INC. CONTACT MARK	P3.06 PLUMBING ROOF PLAN BUILDING C GAS AND CD						WOODBRIDGE, CA. 95242	
WILSON (916)825-4553.	35 T-24.1 TITLE 24 COMPLIANCE  36 T-24.2 TITLE 24 COMPLIANCE	1 Code:	2019 California Building Code (CB	3C)		<b>—</b>		
FABRICATION AND INSTALLATION OF DEFERRED SUBMITTAL ITEMS SHALL NOT BE	36 1-24.2 THEE 24 COMPLIANCE  37 E0.01 ELECTRICAL AND FIRE ALARM COVER SHEET		n Live Loads:	•	<u>Remarks</u>			
STARTED UNTIL CONTRACTOR'S DRAWINGS, SPECIFICATIONS, AND ENGINEERING CALCULATIONS FOR THE ACTUAL SYSTEMS TO BE INSTALLED HAVE BEEN	38 E2.01 ELECTRICAL ROOF PLAN BUILDING A	$\overline{I}$	Area Live Roof A) Flat to < 4:12			Reducible per		
ACCEPTED AND SIGNED BY THE ARCHITECT OR STRUCTURAL ENGINEER AND APPROVED BY THE DSA. LIST DEFERRED SUBMITTAL ITEMS FOR THIS PROJECT.	39 E2.02 ELECTRICAL ROOF PLAN BUILDING A	code	,		Reducible per c	,		
CHANGES TO THE APPROVED DRAWINGS AND SPECIFICATIONS SHALL BE MADE	40 E2.03 ELECTRICAL ROOF PLAN BUILDING B	3. Snow :	•	= N/A psf	Reducible per c	ode	BLDG-C DSA #8791 — #9936	
BY AN ADDENDUM OR A CONSTRUCTION CHANGED DOCUMENT (CCD) APPROVED BY THE DIVISION OF THE STATE ARCHITECT, AS REQUIRED BY SECTION 4-338,	41 E2.04 ELECTRICAL ROOF PLAN BUILDING C  42 E2.05 ELECTRICAL ROOF PLAN BUILDING D		Ground Snow Load Flat—Roof Snow Load		$P_g = N/A$ $P_f = N/A$		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
PART 1, TITLE 24, CCR.	43 E2.06 ELECTRICAL ROOF PLAN BUILDING E		Snow Exposure Factor Snow Load Importance Factor		Ce = N/A $Is = N/A$			
<ul> <li>A "DSA CERTIFIED CLASS 3" PROJECT INSPECTOR EMPLOYED BY THE DISTRICT (OWNER) AND APPROVED BY THE DSA SHALL PROVIDE CONTINUOUS</li> </ul>	44 E2.07 ELECTRICAL FLOOR PLAN PORTABLES	7	Thermal Factor Design Parameters:		Cr = N/A			
INSPECTION OF THE WORK. THE DUTIES OF THE INSPECTOR ARE DEFINED IN	45 E3.01 FIRE ALARM FLOOR PLAN BUILDING A		Ultimate Design Wind Speed (3—s Risk Category	sec gust)	<i>Vult</i> = 100 mph			BLDG-B DSA #4183
SECTION 4-342, PART 1, TITLE 24, CCR.	46 E3.02 FIRE ALARM FLOOR PLAN BUILDING A	<b>I</b>	Exposure Category Internal Pressure Coefficient		 C ±0.18			#7392
A DSA ACCEPTED TESTING LABORATORY DIRECTLY EMPLOYED BY THE DISTRICT (OWNER) SHALL CONDUCT ALL THE REQUIRED TESTS AND INSPECTIONS FOR  THE REQUIRED TESTS.	47 E3.03 FIRE ALARM FLOOR PLAN BUILDING B  48 E3.04 FIRE ALARM FLOOR PLAN BUILDING C		Analysis Method quake Design Parameters:		Directional Proc	edure		
THE PROJECT.	49 E3.05 FIRE ALARM FLOOR PLAN BUILDING D	5. 1.	1. Seismic Importance Factor 2. Risk Category	Ie = 1.25(l)	BLDG)/1.0 (MECI III	H ANCHORAGE)		
<ul> <li>THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS IS THAT THE WORK OF THE ALTERATION, REHABILITATION OR RECONSTRUCTION IS TO BE IN</li> </ul>	50 E3.06 FIRE ALARM FLOOR PLAN BUILDING E	<i>5.3</i> .	3. Soil Site Classification 4. Seismic Design Category		,"D 'Default			BLDG-D DSA #4183
ACCORDANCE WITH TITLE 24, CCR. SHOULD ANY EXISTING CONDITIONS SUCH AS DETERIORATION OR NON—COMPLYING CONSTRUCTION BE DISCOVERED WHICH IS	51 E4.01 PARTIAL ONE-LINE POWER DIAGRAM AND PANEL SCHEDULES 52 E4.02 PARTIAL ONE-LINE POWER DIAGRAM AND PANEL SCHEDULES-PORTABLES	<b></b> <i>5.5</i> .	5. Mapped Spectral Response Acc A) Short period	cel	$S_s = 0.623$			#11451
NOT COVERED BY THE CONTRACT DOCUMENTS WHEREIN THE FINISHED WORK WILL NOT COMPLY WITH TITLE 24, CCR, A CONSTRUCTION CHANGE DOCUMENT	53 E5.01 FIRE ALARM CUT SHEETS AND CSFM LISTINGS 54 E5.02 FIRE ALARM CUT SHEETS AND CSFM LISTINGS	E	B) 1—sec period 6 Design Spectral Response Acce		$S_1 = 0.26$			
(CCD), OR A SEPARATE SET OF PLANS AND SPECIFICATIONS, DETAILING AND SPECIFYING THE REQUIRED WORK SHALL BE SUBMITTED TO AND APPROVED BY	55 E5.03 FIRE ALARM CUT SHEETS AND CSFM LISTINGS		A) Short Period B) 1—sec period		SDS = 0.541 SD1 = 0.329			
DSA BEFORE PROCEEDING WITH THE WORK. (SECTION 4 $-317(C)$ , PART 1, TITLE	56 E6.01 ELECTRICAL SPECIFICATIONS AND DETAILS 57 S1.0 GENERAL NOTES	5.7	B) 1—sec perioa 7 Seismic Force Resisting System 8 Seismic Base Shear	$\gamma$	SD1 = 0.329 $N/A$ $V = N/A$			BLDG-A DSA #292
24, CCR)	58 S2.1 PARTIAL (E) ROOF FRAMING PLAN (BLDG-A)	5.9	9 Seismic Response Coefficient		Cs = N/A			D3A #292
<ul> <li>GRADING PLANS, DRAINAGE IMPROVEMENTS, ROAD AND ACCESS REQUIREMENTS AND ENVIRONMENTAL HEALTH CONSIDERATIONS SHALL COMPLY WITH ALL LOCAL</li> </ul>	59 S2.2 PARTIAL (E) ROOF FRAMING PLAN (BLDG-B) 60 S2.3 PARTIAL (E) ROOF FRAMING PLAN (BLDG-C, D, & E)	5.1	10 Response Modification Factor 11 Component Amplification Factor	r	R = N/A			
ORDINANCES.	61 S2.4 (E) 24'X40' PORTABLES	<u>5.1.</u>	A) HVAC, AC-2 12 Component Response Modificati	ion Factor	$a_P = 2.5$			
<ul> <li>ALL WORK SHALL CONFORM TO 2019 TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR).</li> </ul>		5.1	A) HVAC, AC—2 13 Analysis Procedure		R <sub>P</sub> = 6.0 Equivalent Later	al Force		
							v v—	
								BLDG-E
								DSA #11451
								VICINITY MAP  NOT TO SCALE

DSA 02-118996





TITLE SHEET

M0.00

# DSA EQUIP. ANCHOR. & BRACING NOTES

ALL MECHANICAL, PLUMBING AND ELECTRICAL 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 2019 CBC SECTIONS 1617A.1.18 THROUGH 1617A.1.26 AND ASCE 7-16 CHAPTER 13, 26 AND 30.

1. ALL PERMANENT EQUIPMENT AND COMPONENTS.

M/E/P COMPONENT ANCHORAGE NOTES:

- 2. TEMPORARY OR MOVABLE 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, MOVEABLE 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

THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE, BUT NEED NOT 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 TRAVERSE AND LONGITUDINAL DIRECTIONS.

- A. COMPONENTS WEIGHING LESS THAN 400 POUNDS AND HAVE A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE
- 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 THE DSA. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH THE ABOVE REQUIREMENTS.

#### PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTES:

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENT PRESCRIBED IN ASCE 7-16 SECTION 13.3 AS DEFINED IN ASCE 7-16 SECTION 13.6.5, 13.6.6, 13.6.7, 13.6.8, AND 2019 1617A.1.24, 1617A.1.25 AND 1617A.1.26.

THE METHOD OF SHOWING THE BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEM AREA AS NOTED BELOW. WHEN BRACING AND ATTACHMENTS ARE BASED ON A PREAPPROVED INSTALLATION GUIDE (E.G. OSHPD OPMO FOR 2013 CBC OR LATER), 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

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

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

PRE-APPROVAL (OPM #) #\_\_\_\_\_.

# MECHANICAL ABBREVIATIONS

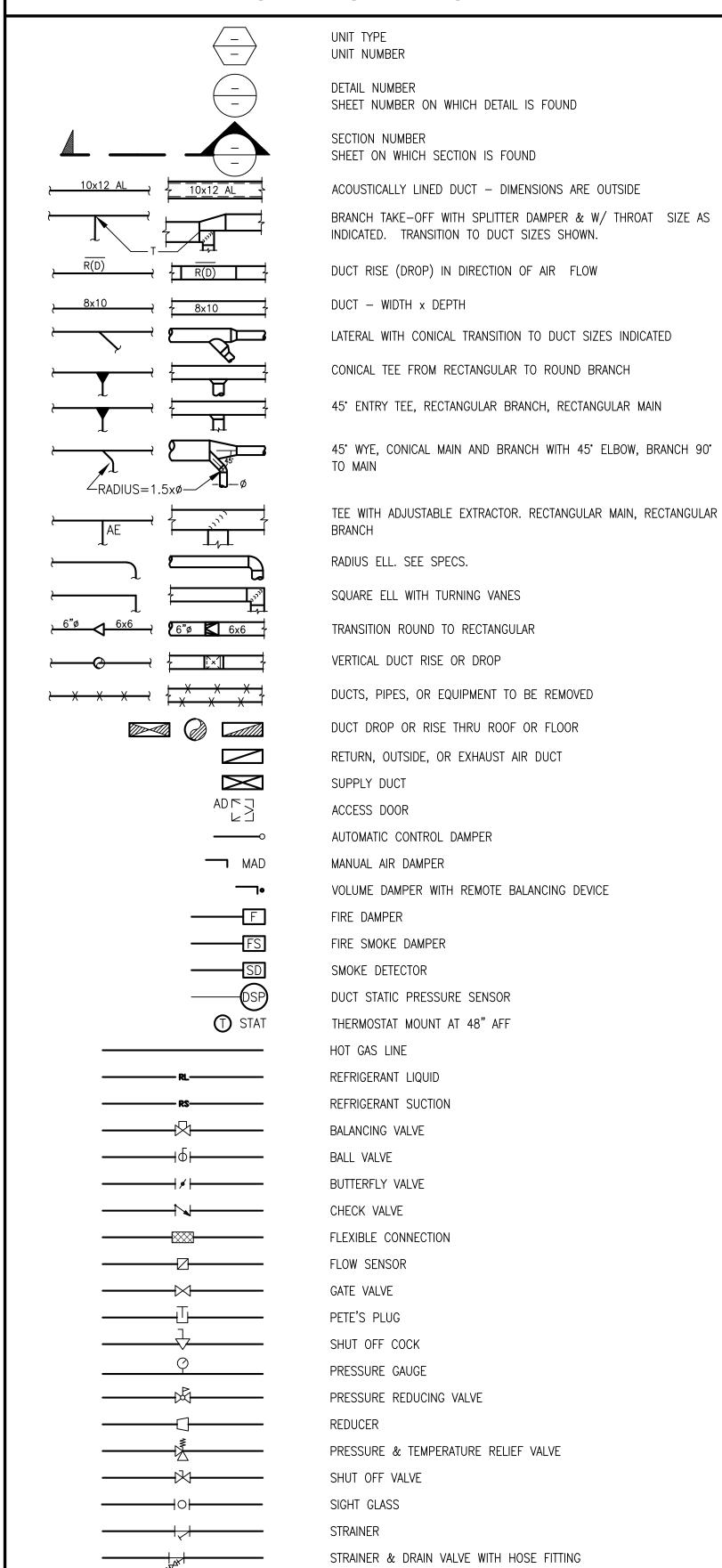
AAV	AUTOMATIC AIR VENT	MBH	BTU PER HOUR (THOUSAND)
ABV	ABOVE	MC	MECHANICAL CONTRACTOR
ABC, OH	ABOVE CEILING, OVERHEAD	MIN	MINIMUM
AC	AIR CONDITIONING	MPS	MEDIUM PRESSURE STEAM
AD	ACCESS DOOR	(N) (E)	NEW, EXISTING
ADA	AMERICANS W/ DISABILITIES ACT	N.Ć.	NORMALLY CLOSED
4E	AIR EXTRACTOR	NEG	NEGATIVE
\FF	ABOVE FINISHED FLOOR	NIC	NOT IN CONTRACT
 \L	ACOUSTICALLY LINED	N.O.	NORMALLY OPEN
.L \HU	AIR HANDLING UNIT	OBD	OPPOSED BLADE DAMPER
APD	AIR PRESSURE DROP	OC	ON CENTER
SHP	BRAKE HORSEPOWER	OP	OPERATING
BOD	BOTTOM OF DUCT	PH	PHASE
BR	BRANCH	POC	POINT OF CONNECTION
TU	BRITISH THERMAL UNIT	PSI	POUNDS PER SQUARE INCH
TUH	BTU PER HOUR	PT	PRESSURE TREATED
AV	CONSTANT AIR VOLUME	PTDF	PRESSURE TREATED DOUGLAS FIR
D	CONDENSATE DRAIN	P&TRV	PRESSURE & TEMPERATURE RELIE
FM, f	CUBIC FEET OF AIR PER MINUTE	DDDD	VALVE
FS	CUBIC FEET PER SECOND	RPBP	REDUCED PRESSURE BACKFLOW
L	CENTERLINE	(=) (=)	PREVENTER
0	CLEANOUT	(R) (D)	RISE, DROP
ONC.	CONCRETE	RD, OFL	ROOF DRAIN, OVERFLOW
ONN.	CONNECT	REF .	ROOF EXHAUST FAN
R	CONDENSATE RETURN (STEAM)	REQ'D	REQUIRED
S	CURRENT SENSOR	RL	REFRIGERANT LIQUID
U	CONDENSING UNIT	RPM	REVOLUTIONS PER MINUTE
U FT	CUBIC FEET	RS	REFRIGERANT SUCTION
U IN	CUBIC INCHES	SAD	SEE ARCHITECTURAL DRAWINGS
VB	CONSTANT VOLUME BOX	SED	SEE ELECTRICAL DRAWINGS
N	COLD WATER	SM	SHEET METAL
3	DRY BULB	SMS	SHEET METAL SCREWS
<del>.</del>	DOUGLAS FIR	SOV	SHUT OFF VALVE
A, Ø	DIAMETER	SS	STAINLESS STEEL
, SP	DUCT STATIC PRESSURE SENSOR	SSD	SEE STRUCTURAL DRAWING
	EXHAUST, OUTSIDE, RETURN &	STL	STEEL
, , , , , , , , , , , , , , , , , , , ,	SUPPLY AIR	TA, FA	TO ABOVE, FROM ABOVE
.C.	ELECTRICAL CONTRACTOR	TB, FB	TO BELOW, FROM BELOW
SP	EXTERNAL STATIC PRESSURE	TBR	TO BE REMOVED
/T	ENTERING WATER TEMPERATURE	TCC	TEMPERATURE CONTROL
· I	FACE AREA (SQUARE FEET)	100	CONTRACTOR
<b>)</b>	FLEXIBLE CONNECTION	TCP	TEMPERATURE CONTROL PANEL
_A	FULL LOAD AMPS	THK	THICK
_A P		TR	TO REMAIN
	FINS PER INCH		
PM ALV	FEET PER MINUTE	TSP	TOTAL STATIC PRESSURE
ALV.	GALVANIZED	TV	TURNING VANES
4	GAUGE	TYP	TYPICAL
C	GENERAL CONTRACTOR	UG, UF	UNDERGROUND, UNDER FLOOR
SM -	GALVANIZED SHEET METAL	UON	UNLESS OTHERWISE NOTED
)	HORSE POWER	UTR	UP THROUGH ROOF
WS	HOT WATER SUPPLY	VAC	VOLTS ALTERNATING CURRENT
WR	HOT WATER RETURN	VFD	VARIABLE FREQUENCY DRIVE
Z	FREQUENCY (HERTZ)	VIF	VERIFY IN FIELD
3S	POUNDS	WB	WET BULB
RA	LOCKED ROTOR AMPS	WG	WATER GAUGE
WT	LEAVING WATER TEMPERATURE	WOG	WATER OIL GAS PRESSURE RATIN
<b>I</b> AV	MANUAL AIR VENT	WP	WATER PRESSURE
IAX	MAXIMUM	WPD	WATER PRESSURE DROP
		WT, AT	WATERTIGHT, AIRTIGHT

## COMPLIANCE NOTES

MECHANICAL AND PLUMBING EQUIPMENT SHALL CONFORM TO THE FOLLOWING AS STATED IN THE ENERGY EFFICIENCY STANDARDS, 2019.

- 1. BE CERTIFIED BY THE MANUFACTURER AS COMPLYING WITH THE EFFICIENCY REQUIREMENTS AS PRESCRIBED IN SECTIONS:
  - 110.1 APPLIANCES REGULATED BY THE APPLIANCE EFFICIENCY STANDARDS:
  - 110.2 HVAC EQUIPMENT EFFICIENCY AND PACKAGED CONTROLS: 110.3 SERVICE WATER HEATING EFFICIENCY AND CONTROLS:
  - 110.4 POOL AND SPA HEATING EFFICIENCY AND CONTROLS: 110.5 RESTRICTIONS ON PILOT LIGHTS:
- 2. BE SPECIFIED AND INSTALLED IN ACCORDANCE WITH SECTIONS.
  - 120.1 REQUIREMENTS FOR VENTILATION: 120.2 REQUIRED CONTROLS FOR HVAC SYSTEMS:
    - 102.2 (H) DEMAND SHED CONTROLS. 120.2 (I) ECONOMIZER FAULT DETECTION & DIAGNOSTIC.
  - 120.3 REQUIRÈMENTS FOR PIPE INSULATION:
  - 120.4 REQUIREMENTS FOR DUCT INSULATION:
  - 120.5 REQUIREMENTS FOR MECHANICAL SYSTEMS
  - 120.8 BUILDING COMMISSIONING 120.9 REQUIREMENTS FOR COMMERCIAL BOILERS

#### MECHANICAL LEGEND



# APPLICABLE CODES

SOLENOID VALVE

THERMOMETER

TWO WAY CONTROL VALVE

THREE WAY CONTROL VALVE

ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE APPLICABLE REGULATIONS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

- A) STATE OF CALIFORNIA CODE OF REGULATIONS (CCR) TITLE 24, BUILDING STANDARDS: 2019 EDITION OF THE CALIFORNIA BUILDING CODE. 2019 EDITION OF THE CALIFORNIA ELECTRICAL CODE. 2019 EDITION OF THE CALIFORNIA MECHANICAL CODE 2019 EDITION OF THE CALIFORNIA PLUMBING CODE.
- 2019 EDITION OF THE CALIFORNIA ENERGY CODE. B) NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) LIFE SAFETY CODE, CR.

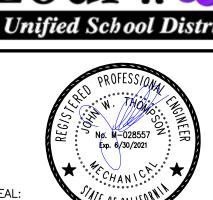
IDENTIFICATION STAMP DIV. OF THE STATE ARCHITEC APP: 02-118996 INC: REVIEWED FOR SS 🗹 FLS 🗹 ACS 🗹 DATE: 06/16/2021

DSA 02-118996

AGENCY APPROVAL:

HANICAL INEERINC IUP, INC. 16) 325-1069 16) 325-1079 16) 325-1079 ပပဝ စစ် E E E 





SHEET TITLE:

**MECHANICAL** LEGEND, SCHEDULES, AND NOTES

M0.01

	AIR CONDITIONING UNIT																								
					COOLIN	G CAP	ACITY				FAN			NG CAF		COMPRESSOR	CONDENSER		UNIT ELI	ECTRIC/	AL.				
SYMBOL	MANUFACTURER	MODEL	NOMINAL TONS	TOTAL MBH	SENSIBLE MBH	EDB °F	EWB °F	AMB °F	SEER ARI	CFM	ESP IN WG	FLA	MBH INPUT	MBH OUTPUT	- AFUE	RLA	FLA	VOLTS	PHASE	HZ	MCA	МОСР	MIN. UNIT OA CFM	OPERATING WEIGHT LBS.	REMARKS
AC 2A	LENNOX	LGH092H4M	7.5	88.2	63.1	80	67	105	12.5 EER	3000	0.8	7.5	130	104	80	26.2	4.8	208	3	60	42	50	270/410	1350	1,2,3,4,6
AC 3A	LENNOX	LGH092H4M	7.5	88.2	63.1	80	67	105	12.5 EER	3000	0.8	7.5	130	104	80	26.2	4.8	208	3	60	42	50	270/410	1350	1,2,3,4,6
AC 4A	LENNOX	LGH048H4E	4	48.3	35.8	80	67	105	17.6	1500	0.8	6.1	60	48	80	11.7	4.1	208	3	60	25	35	185/285	800	1,2,3,4,6
AC 5A	LENNOX	LGH048H4E	4	48.3	35.8	80	67	105	17.6	1600	0.8	6.1	60	48	80	11.7	4.1	208	3	60	25	35	150/330	800	1,2,3,4,6
AC 6A	LENNOX	LGH048H4E	4	48.3	35.8	80	67	105	17.6	1600	0.8	6.1	60	48	80	11.7	4.1	208	3	60	25	35	120/320	800	1,2,3,4,6
AC $7A$	LENNOX	LGH060H4E	5	60.9	45.1	80	67	105	17.1	2000	0.8	7.4	60	48	80	14.0	4.1	208	3	60	29	40	225/450	875	1,2,3,4,6
AC 8A	LENNOX	LGH048H4E	4	48.3	35.8	80	67	105	17.6	1600	0.8	6.1	60	48	80	11.7	4.1	208	3	60	25	35	145/375	800	1,2,3,4,6
AC 9A	LENNOX	LGH048H4E	4	48.3	35.8	80	67	105	17.6	1500	0.8	6.1	60	48	80	11.7	4.1	208	3	60	25	35	100/345	800	1,2,3,4,6
AC 10A	LENNOX	LGH048H4E	4	48.3	35.8	80	67	105	17.6	1500	0.8	6.1	60	48	80	11.7	4.1	208	3	60	25	35	100/345	800	1,2,3,4,6
AC 11A	LENNOX	LGH060H4E	5	60.9	45.1	80	67	105	17.1	2000	0.8	7.4	60	48	80	14.0	4.1	208	3	60	29	40	180/450	875	1,2,3,4,6
AC 1B	LENNOX	LGH048H4E	4	48.3	35.8	80	67	105	17.6	1600	0.8	6.1	60	48	80	11.7	4.1	208	3	60	25	35	140/345	800	1,2,3,4,6
AC 1C	LENNOX	LGH060H4E	5	60.9	45.1	80	67	105	17.1	2000	0.8	7.4	60	48	80	14.0	4.1	208	3	60	29	40	130/420	875	1,2,3,4,6
AC 2C	LENNOX	LGH048H4E	4	48.3	35.8	80	67	105	17.6	1600	0.8	6.1	60	48	80	11.7	4.1	208	3	60	25	35	125/375	800	1,2,3,4,6
AC 1D	LENNOX	LGH060H4E	5	60.9	45.1	80	67	105	17.1	1900	0.8	7.4	60	48	80	14.0	4.1	208	3	60	29	40	135/445	875	2,3,4,5,6
AC 2D	LENNOX	LGH060H4E	5	60.9	45.1	80	67	105	17.1	1900	0.8	7.4	60	48	80	14.0	4.1	208	3	60	29	40	125/445	875	2,3,4,5,6
AC $3D$	LENNOX	LGH060H4E	5	60.9	45.1	80	67	105	17.1	1950	0.8	7.4	60	48	80	14.0	4.1	208	3	60	29	40	110/445	875	2,3,4,5,6
AC 4E	LENNOX	LGH060H4E	5	60.9	45.1	80	67	105	17.1	1950	0.8	7.4	60	48	80	14.0	4.1	208	3	60	29	40	145/405	875	2,3,4,5,6
AC 5E	LENNOX	LGH060H4E	5	60.9	45.1	80	67	105	17.1	1950	0.8	7.4	60	48	80	14.0	4.1	208	3	60	29	40	145/405	875	2,3,4,5,6
AC 6E	LENNOX	LGH060H4E	5	60.9	45.1	80	67	105	17.1	1950	0.8	7.4	60	48	80	14.0	4.1	208	3	60	29	40	145/405	875	2,3,4,5,6
AC 7E	LENNOX	LGH060H4E	5	60.9	45.1	80	67	105	17.1	1950	0.8	7.4	60	48	80	14.0	4.1	208	3	60	29	40	145/405	875	2,3,4,5,6
AC 8E	LENNOX	LGH060H4E	5	60.9	45.1	80	67	105	17.1	1950	0.8	7.4	60	48	80	14.0	4.1	208	3	60	29	40	145/405	875	2,3,4,5,6
AC 9E	LENNOX	LGH060H4E	5	60.9	45.1	80	67	105	17.1	1950	0.8	7.4	60	48	80	14.0	4.1	208	3	60	29	40	145/405	875	2,3,4,5,6
NOTES:																									

# NOTES: 1) PROVIDE 12" ROOF CURB.

2) PROVIDE COMPLETE ECONOMIZER (OUTDOOR INTAKE HOOD) WITH BAROMETRIC RELIEF HOOD

3) T-24 COMPLIANT FAULT DETECTION & DIAGNOSTIC (FDD)

4) PROVIDE MINIMUM OF 2" THICK MERV-13 DISPOSABLE FILTERS
5) PROVIDE CDI MODEL 1-5005-2060 CURB ADAPTOR, CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS FOR PROPER SIZING.

6) 7 DAY PROGRAMMABLE THERMOSTAT, "PELICAN" TS-250 WIRELESS WITH CO2 SENSOR. PROVIDE PELICAN PEARL CONTROLLER FOR DEMAND VENTILATION FOR UNITS WITH ECONOMIZERS.

7) AUTOMATIC UNIT SHUT DOWN IS PROVIDED THROUGH THE TOTAL AREA COVERAGE BUILDING SMOKE DETECTION FIRE ALARM SYSTEM, SEE SHEET EO.01.

	HEAT PUMP UNIT																								
					COOLIN	IG CAP	ACITY				FAN	Н	IEATING C	CAPACITY	SU	JPPLEMENTAL	L HEAT		UNIT	ELECTR	ICAL				
SYMBOL	MANUFACTURER	MODEL	NOMINAL TONS	TOTAL MBH	SENSIBLE MBH	EDB *F	EWB •F	AMB •F	EER @ ARI	CFM	ESP IN WG	FLA INTERO	OTAL GRATED IBH	AMB E	DB F	KW I	FLA	VOLTS	PHASE	HZ	MCA	MOCP	MIN. UNIT OA CFM	OPERATING WEIGHT LBS.	REMARKS
HP 19	BARD	T48H1	4	43.2	34.7	80	67	105	11.0	1550	0.2	2.5 30	0.5	30 6	88	8 3	33.3	230	1	60	79	90	135/435	575	1,2,3,4,5,6
HP 20	BARD	T48H1	4	43.2	34.7	80	67	105	11.0	1550	0.2	2.5 30	0.5	30 6	58	8 3	33.3	230	1	60	79	90	135/435	575	1,2,3,4,5,6
HP 21	BARD	T48H1	4	43.2	34.7	80	67	105	11.0	1550	0.2	2.5 30	0.5	30 6	88	8 .	33.3	230	1	60	79	90	135/435	575	1,2,3,4,5,6
HP 22	BARD	T48H1	4	43.2	34.7	80	67	105	11.0	1550	0.2	2.5 30	0.5	30 6	58	8 3	33.3	230	1	60	79	90	135/435	575	1,2,3,4,5,6
HP 23	BARD	T48H1	4	43.2	34.7	80	67	105	11.0	1550	0.2	2.5 30	0.5	30 6	88	8 .	33.3	230	1	60	79	90	135/435	575	1,2,3,4,5,6
HP 24	BARD	T48H1	4	43.2	34.7	80	67	105	11.0	1550	0.2	2.5	0.5	30 6	88	8	33.3	230	1	60	79	90	135/435	575	1,2,3,4,5,6

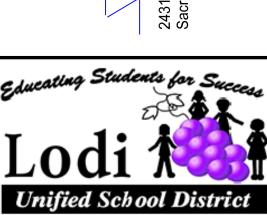
1. 7 DAY PROGRAMMABLE THERMOSTAT, "PELICAN" TS-250 WIRELESS WITH CO2 SENSOR. PROVIDE PELICAN PEARL CONTROLLER FOR DEMAND VENTILATION FOR UNITS WITH ECONOMIZERS.

DISPOSABLE FILTER, 2" THICK PLEATED, MERV 13.
 R-410A REFRIGERANT.

4. BUILT-IN ECONOMIZER (ECONWMT) WITH RELAY KIT (BARD 8620-220 2-STAGE HEAT PUMP WITH ECONOMIZER). ECONOMIZER WITH BUILT-IN EXHAUST AIR DAMPER, CO2 CONTROL.
5. DAMPER ACTUATOR SHALL BE BELIMO
6. SINGLE CIRCUIT ELECTRICAL.

APP: 02-118996 INC: REVIEWED FOR SS 🗹 FLS 🗹 ACS 🗹

DSA 02-118996

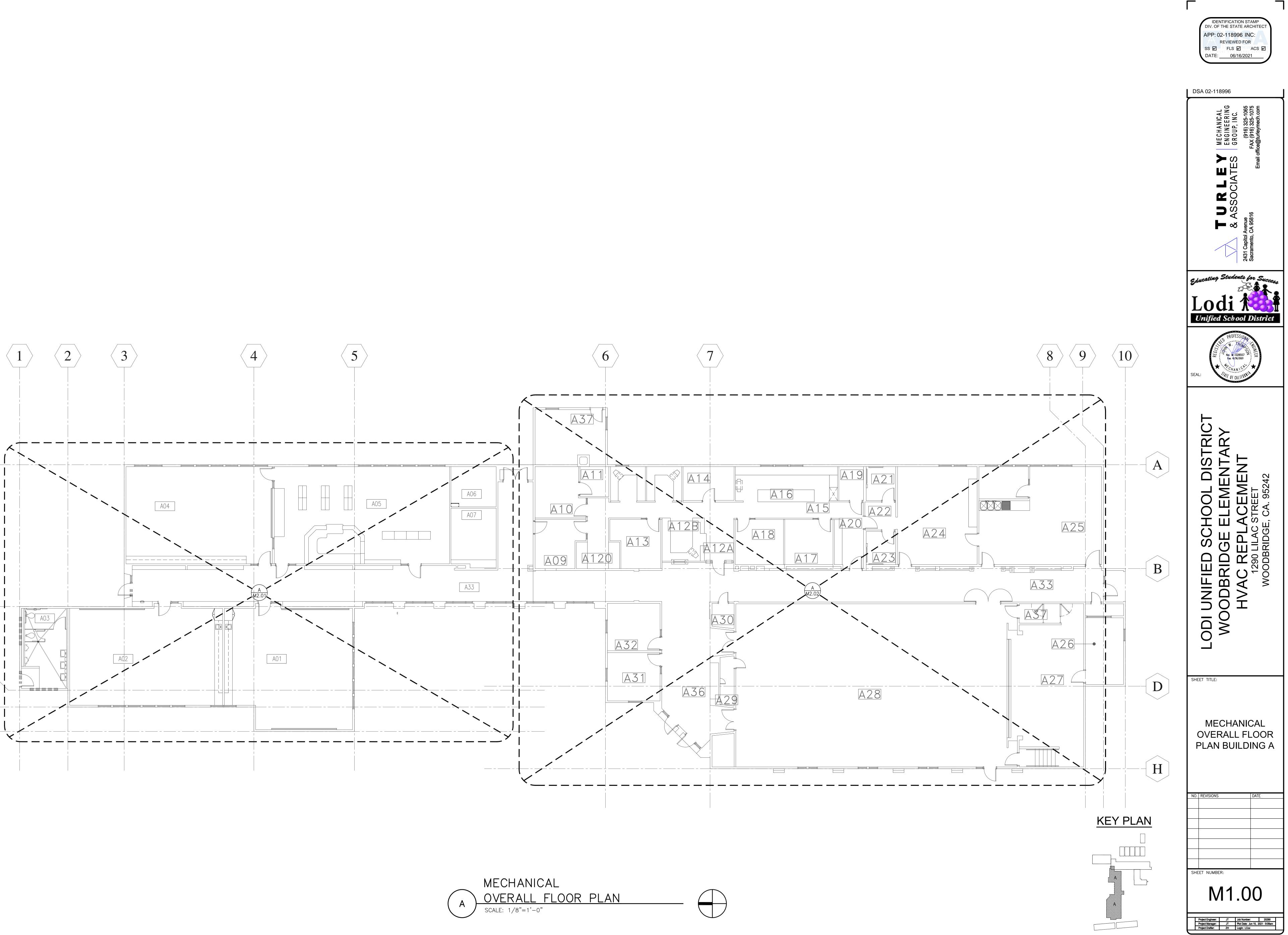




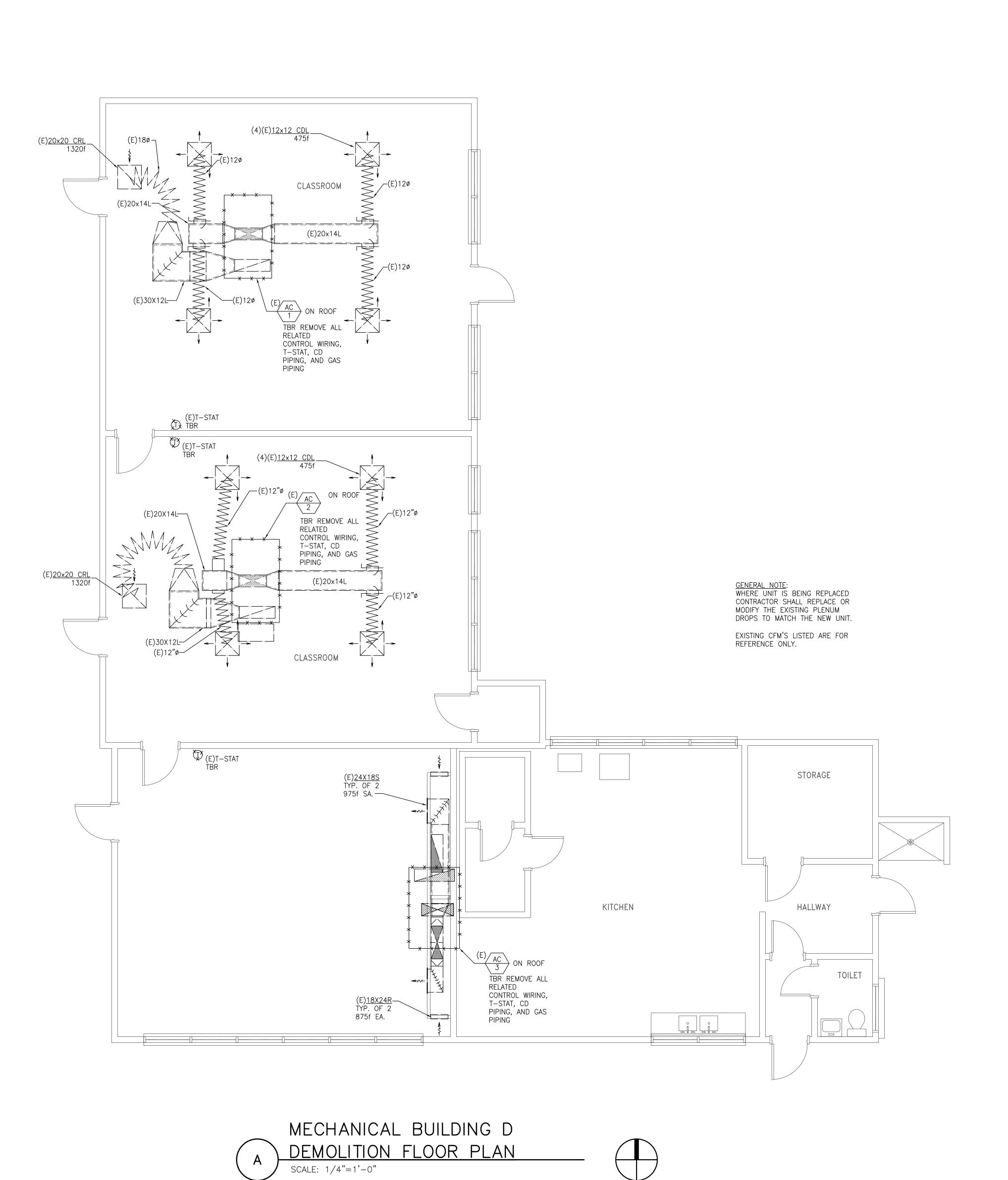
SHEET TITLE:

MECHANICAL LEGEND, SCHEDULES, AND NOTES

M0.02



AGENCY APPROVAL:



IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT

APP: 02-118996 INC:

REVIEWED FOR

SS FLS ACS D

DATE: 06/16/2021

TURLEY
ENGINEERING
& ASSOCIATES
GROUP, INC.

(916) 325-1065
Email office@turleymech.com





DDI UNIFIED SCHOOL DISTRIC WOODBRIDGE ELEMENTARY HVAC REPLACEMENT

SHEET TITLE:

MECHANICAL DEMOLITION FLOOR PLAN BUILDING D

NO. REVISIONS

**KEY PLAN** 

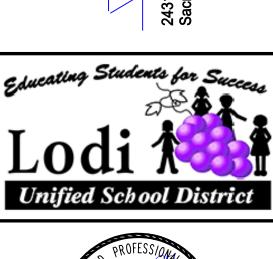
SHEET NUMBER:

M1.06

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 02-118996 INC:
REVIEWED FOR
SS FLS ACS D
DATE: 06/16/2021

WECHANICAL ENGINEERING ENGINEERING GROUP, INC.

(916) 325-1065
FAX (916) 325-1075
Email office@turleymech.com





ODI UNIFIED SCHOOL DISTRI
WOODBRIDGE ELEMENTARY
HVAC REPLACEMENT

SHEET TITLE:

MECHANICAL DEMOLITION FLOOR PLAN BUILDING E

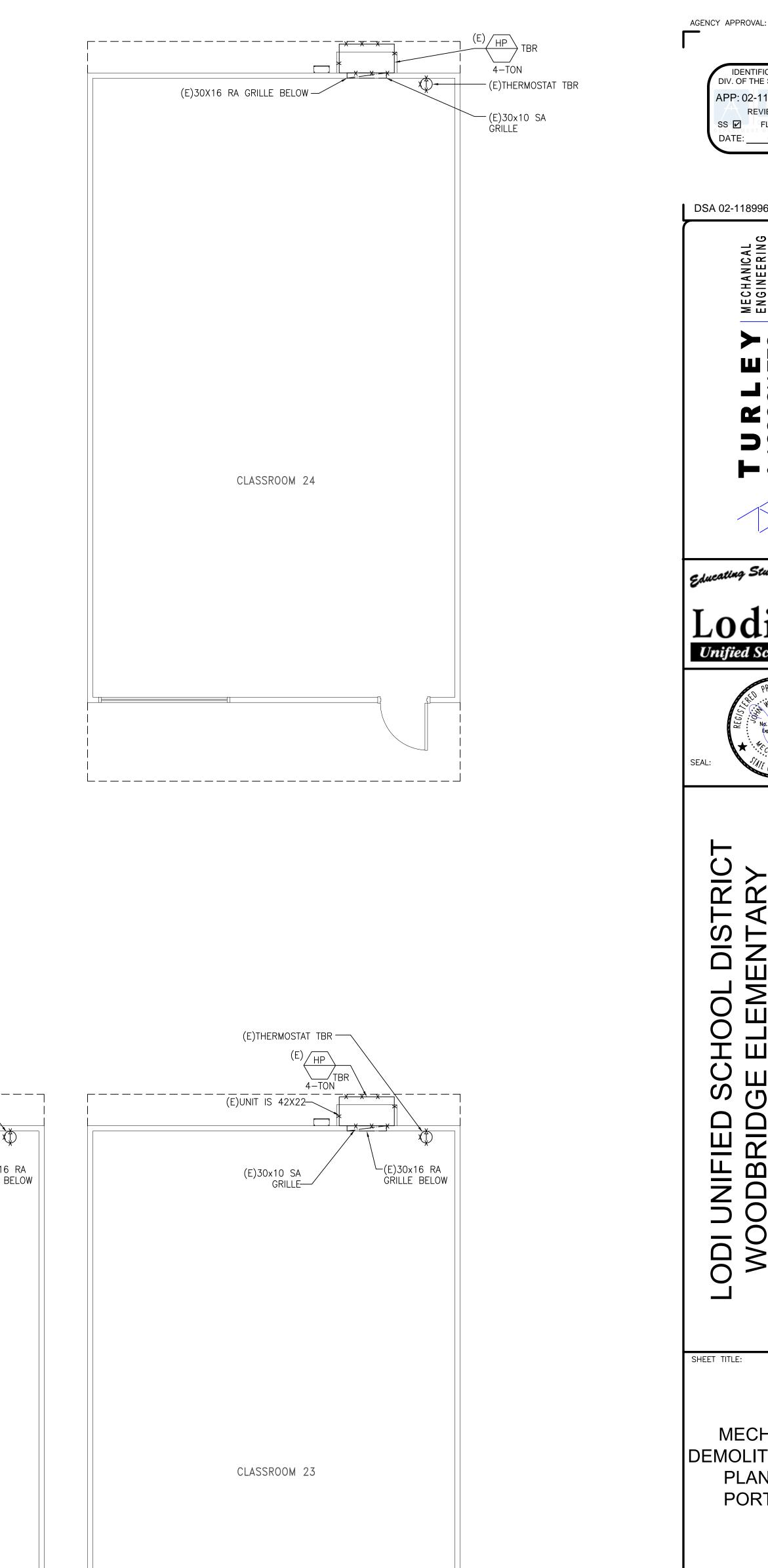
NO. REVISIONS DATE

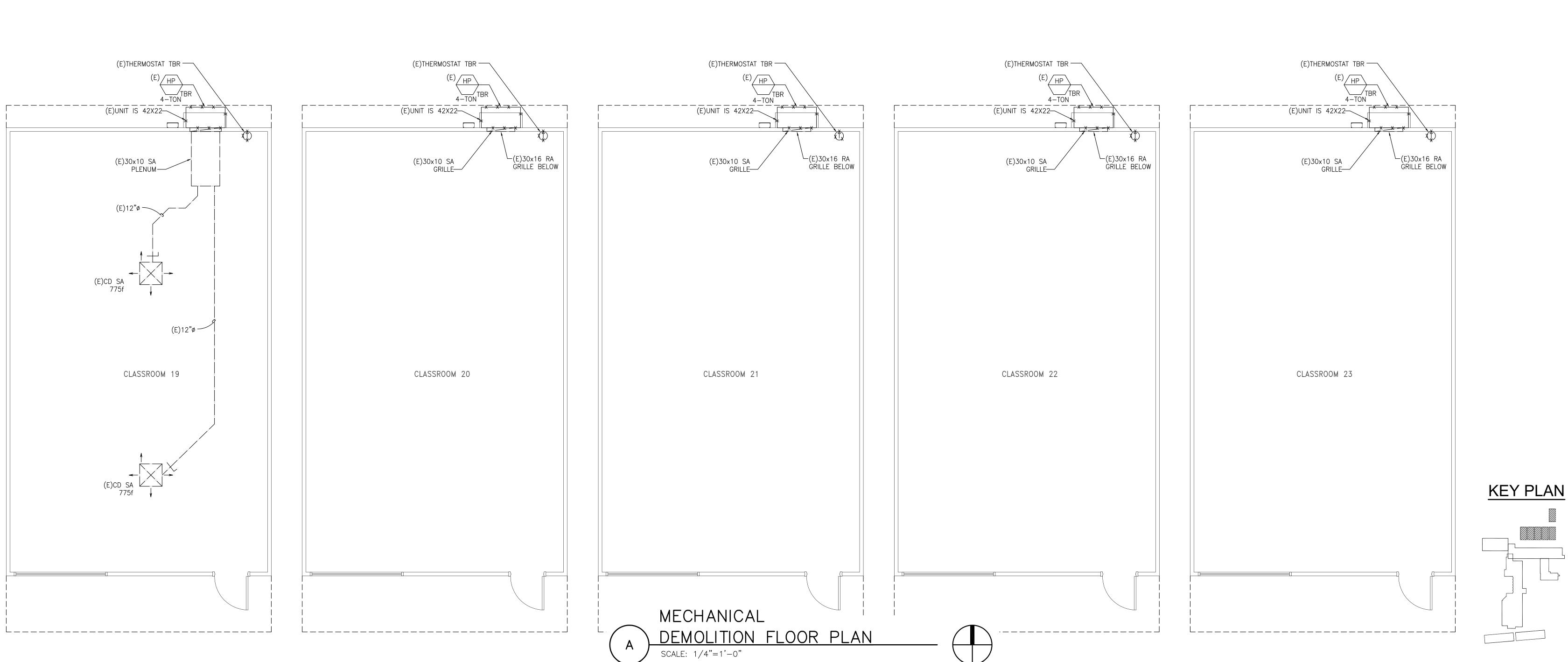
SHEET NUMBER:

M1.07

Project Engineer: JT Job Number: 20290
Project Manager: JT Plot Date: Jun 15, 2021 - 9:08am
Project Drafter: ZH Login: LCox

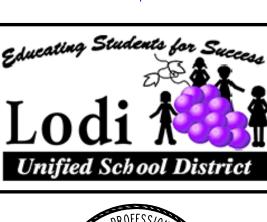
A/M1.07 —





IDENTIFICATION STAMP DIV. OF THE STATE ARCHITECT APP: 02-118996 INC: REVIEWED FOR SS 🗹 FLS 🗹 ACS 🗹

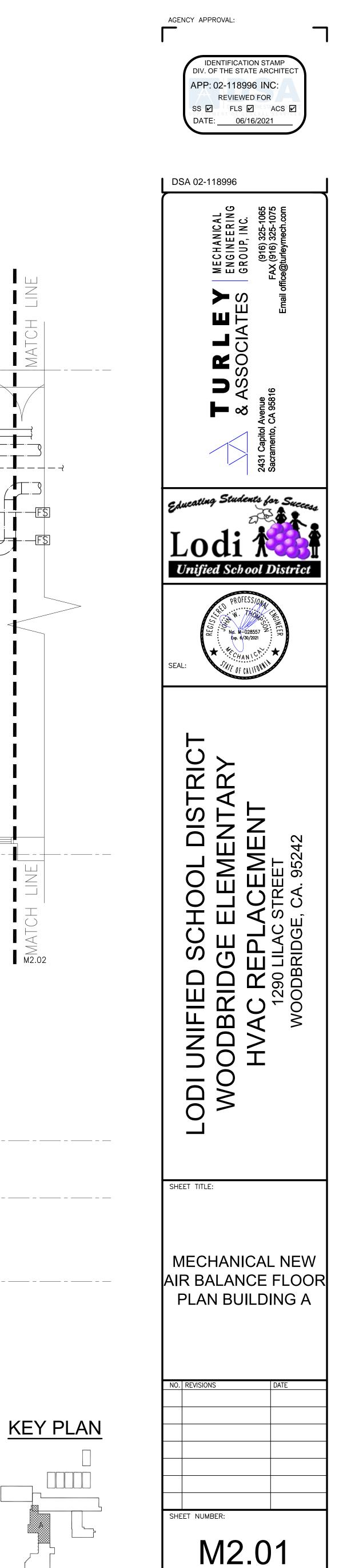
DSA 02-118996





MECHANICAL DEMOLITION FLOOR PLAN 24'x40' PORTABLES

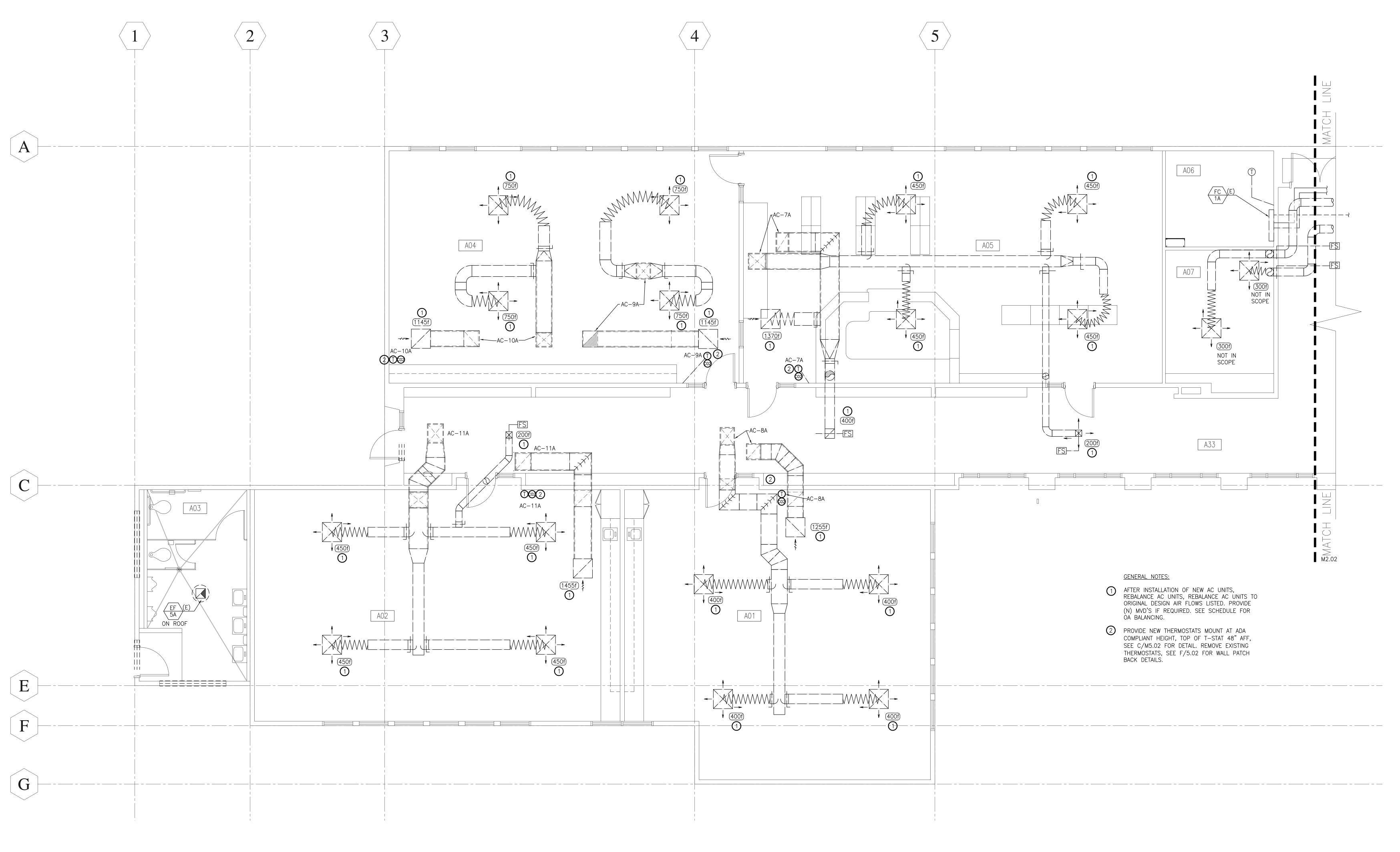
SHEET NUMBER:



 Project Engineer:
 JT
 Job Number:
 20290

 Project Manager:
 JT
 Plot Date: Jun 15, 2021 - 9:08am

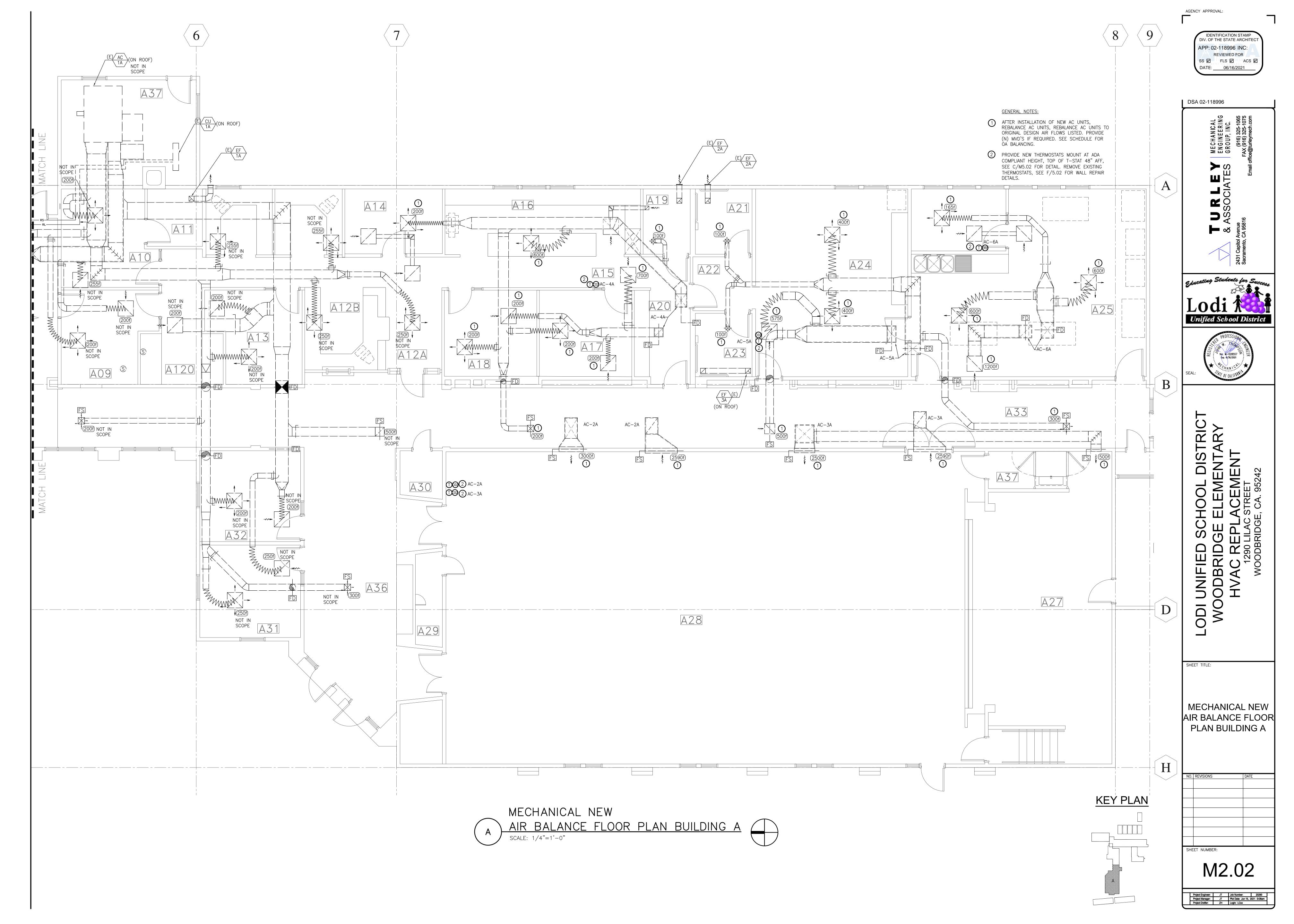
 Project Drafter:
 ZH
 Login: LCox



MECHANICAL NEW

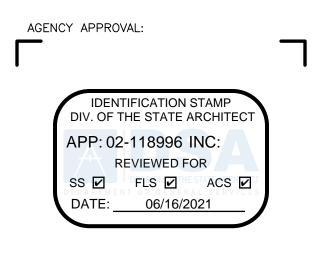
AIR BALANCE FLOOR PLAN BUILDING A

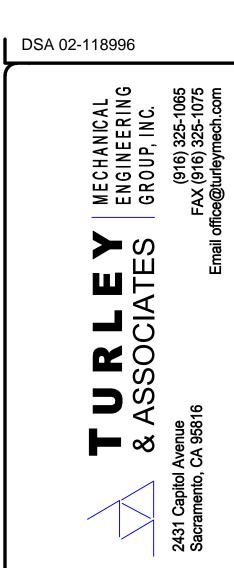
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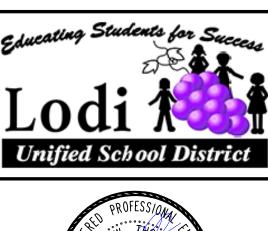


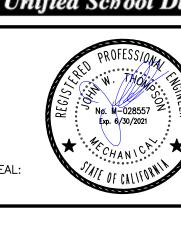
MECHANICAL FLOOR PLAN BLDG-D

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









ODI UNIFIED SCHOOL DISTR WOODBRIDGE ELEMENTAR HVAC REPLACEMENT

SHEET TITLE:

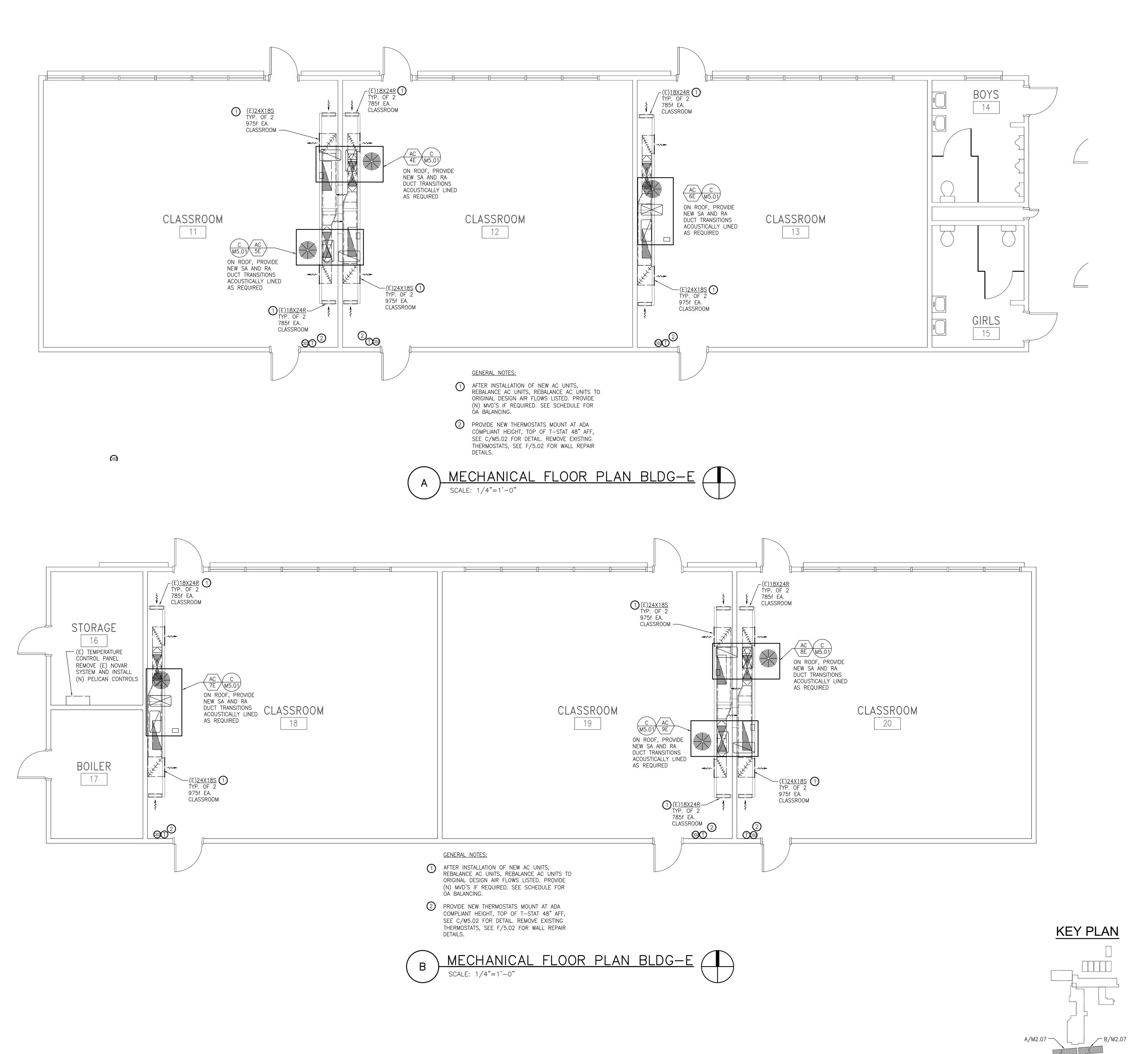
MECHANICAL FLOOR PLAN BUILDING D

NO. REVISIONS DATE

KEY PLAN

SHEET NUMBER:

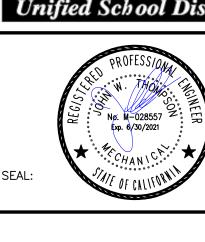
M2.06



AGENCY APPROVAL: IDENTIFICATION STAMP DIV. OF THE STATE ARCHITEC APP: 02-118996 INC: REVIEWED FOR SS 🗹 FLS 🗹 ACS 🗹 DATE: 06/16/2021

DSA 02-118996

Unified School District

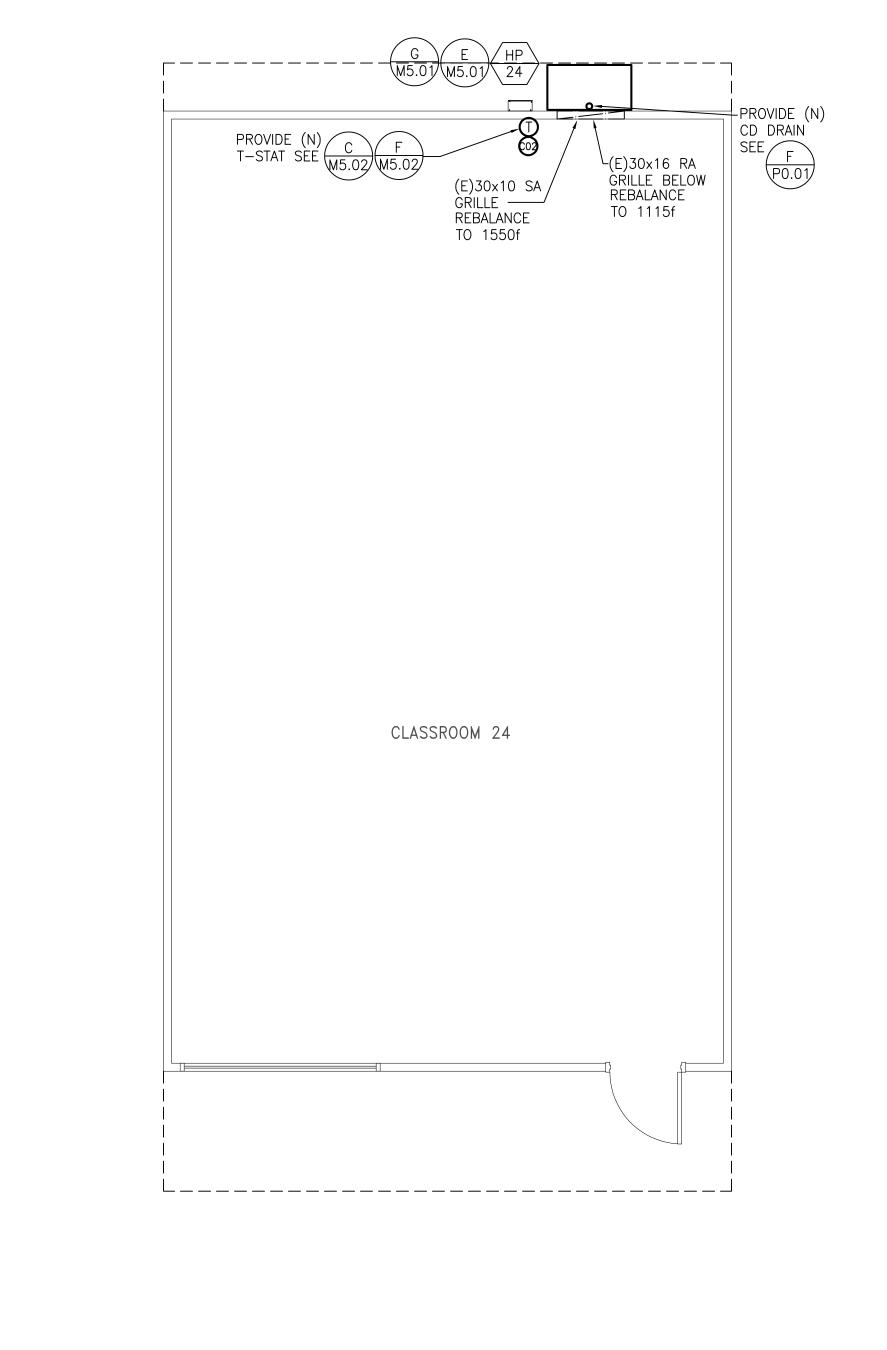


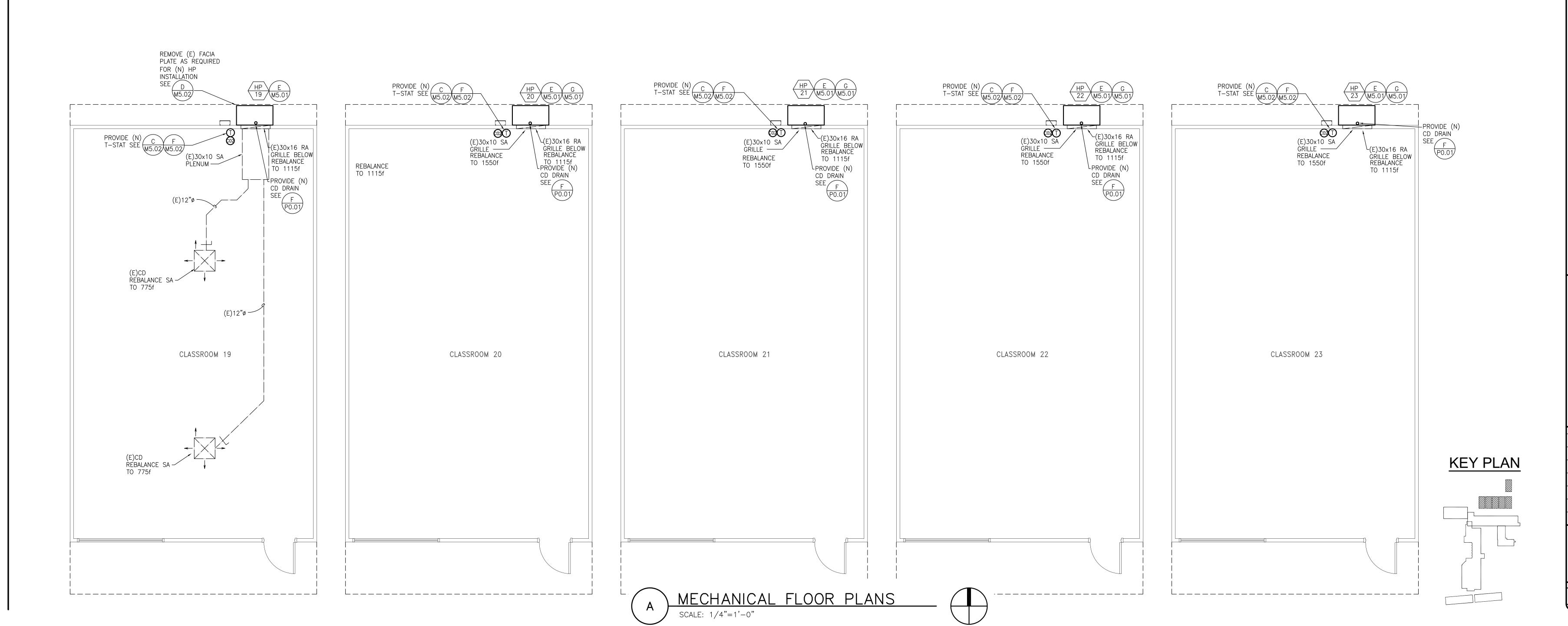
SHEET TITLE:

MECHANICAL FLOOR PLAN BUILDING E

SHEET NUMBER:

M2.07





IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT

APP: 02-118996 INC:

REVIEWED FOR

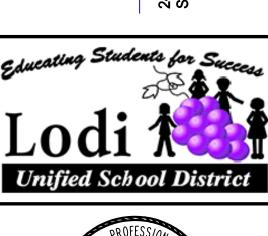
SS P FLS P ACS D

DATE: 06/16/2021

MECHANICAL ENGINEERING 6ROUP, INC. (916) 325-1065 AX (916) 325-1075 ce@turleymech.com

TURLEY
ENGINEERING
& ASSOCIATES GROUP, INC.

pitol Avenue
FAX (916) 325-1065
FAX (916) 325-1075
Email office@turleymech.com





ODI UNIFIED SCHOOL DISTRICT
WOODBRIDGE ELEMENTARY
HVAC REPLACEMENT
1290 LILAC STREET
WOODBRIDGE, CA. 95242

SHEET TITLE:

MECHANICAL FLOOR PLANS 24'x40' PORTABLES

NO. REVISIONS DATE

M2.08

SHEET NUMBER:

MECHANICAL BALANCE FLOOR PLAN — BUILDING C

SCALE: 3/16"=1'-0"

GENERAL NOTE:

SPECIAL

EDUCATION

CLASSROOM
B01

(E)(4)<u>12×12 CDL</u> 1 400 f

— (E)SA(D) FA (N)AC-1B

(E)14x14 —

MECHANICAL BALANCE FLOOR PLAN — BUILDING B
SCALE: 3/16"=1"-0"

KEYPLAN

UNISEX TOILET ROOM [BO2]— AFTER INSTALLATION OF NEW AC UNIT,
RE-BALANCE THE EXISTING GRILLES TO THE
ORIGINAL CFM'S LISTED. PROVIDE (N) MVD'S
IF REQUIRED. SEE SCHEDULE FOR OA CFMS.

NEW THERMOSTAT MOUNT AT ADA COMPLIANT HEIGHT, TOP OF T-STAT 48" AFF, SEE C/M5.02 FOR DETAILS. SEE F/M5.02 FOR (E) THERMOSTAT WALL REPAIR DETAILS.

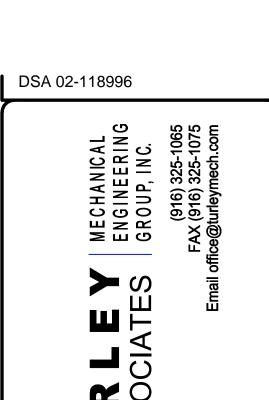
IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT

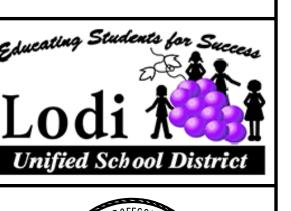
APP: 02-118996 INC:

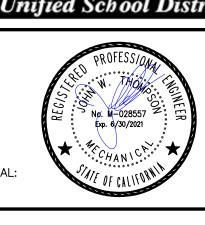
REVIEWED FOR
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DATE: 06/16/2021

AGENCY APPROVAL:



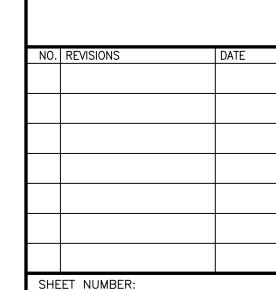




# INIFIED SCHOOL DISTRICATION STREET AND SCHOOL DISTRICATION 1290 LILAC STREET

SHEET TITLE:

MECHANICAL FLOOR PLAN BUILDING B & C



 Project Engineer:
 JT
 Job Number:
 20290

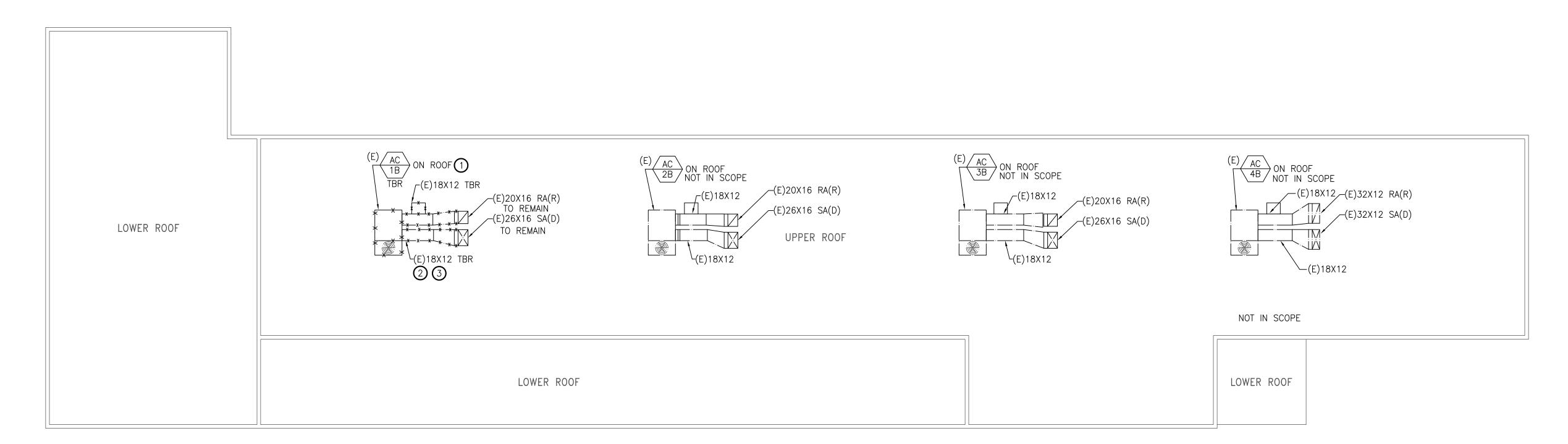
 Project Manager:
 JT
 Plot Date: Jun 15, 2021 - 9:08am

 Project Drafter:
 ZH
 Login: LCox

SHEET NUMBER:

M2.09

<u>GENERAL NOTES:</u> ① DISCONNECT EXISTING GAS PIPING AND CONDENSATE DRAIN PIPE. 2 REMOVE ALL EXISTING DUCT SUPPORTS. 3 ALL ROOFING WORK SHALL BE COMPLETED NY LICENCED ROOFING CONTRACTOR, SUBMIT ALL MATERIALS COMPATIBLE WITH AND SIMILAR TO THE EXISTING ROOFING SYSTEM. FIELD VERIFY THE EXISTING ROOFING SYSTEM FOR EACH BUILDING. SUBMIT ROOFING MATERIAL FOR EACH BUILDING SEPARATELY. PROVIDE 5 YEAR WARRANTY FOR ROOFING REPAIRS. PROVIDE ROOFING REPAIRS FOR ALL AREAS OF MODIFICATIONS, AND DEMOLITION WHERE EQUIPMENT, PIPES, OR DUCTS WERE REMOVED ETC.

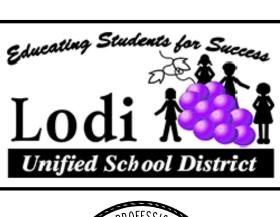






MECHANICAL ENGINEERING GROUP, INC. (916) 325-1065 FAX (916) 325-1075 ice@turleymech.com

TURLEY
ENGINE
& ASSOCIATES GROUP,
2431 Capitol Avenue
Sacramento, CA 95816
Email office@turleyme
Email office@turleyme





ODI UNIFIED SCHOOL DISTRI
WOODBRIDGE ELEMENTARY
HVAC REPLACEMENT
1290 LILAC STREET
WOODBRIDGE, CA. 95242

SHEET TITLE:

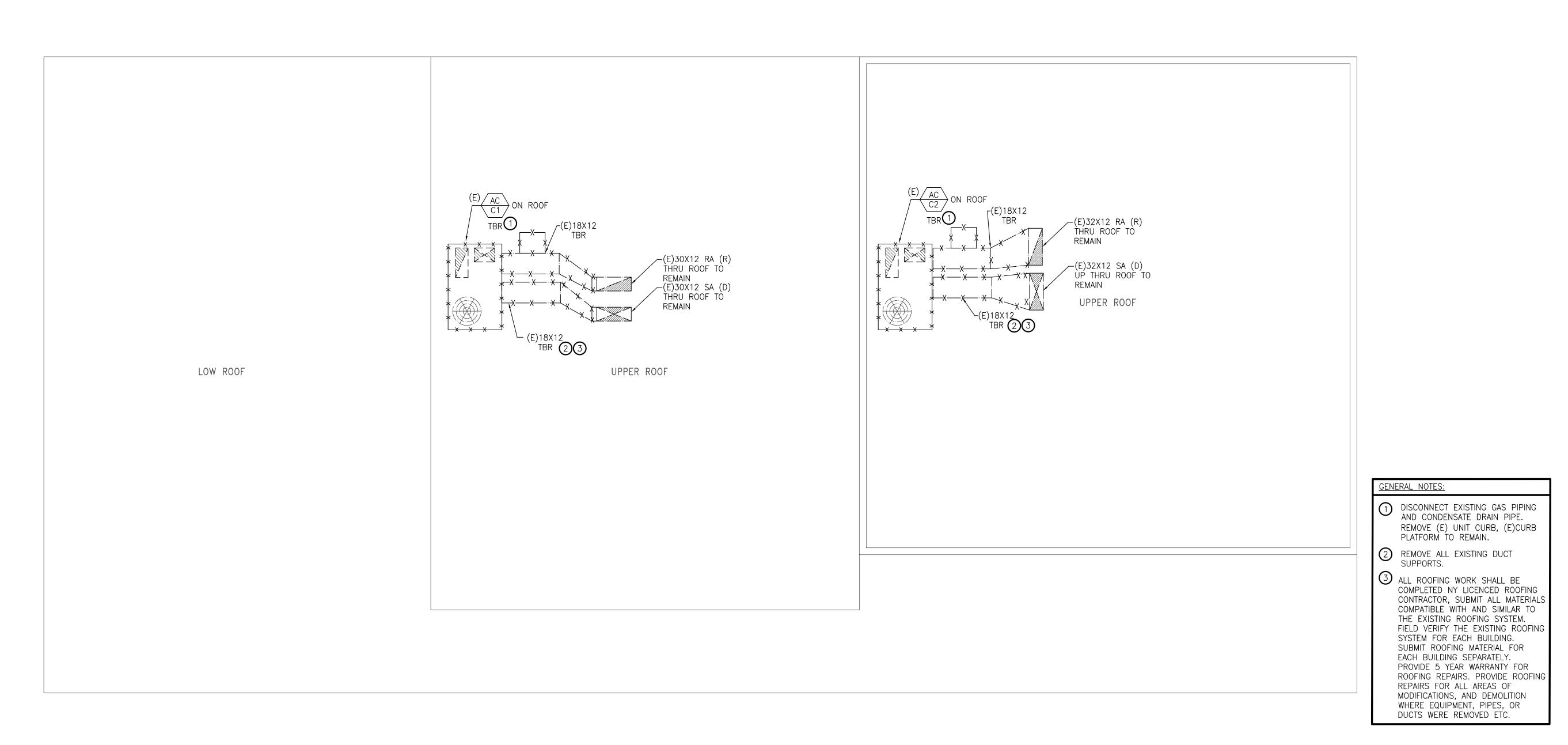
**KEY PLAN** 

MECHANICAL DEMOLITION ROOF PLAN BUILDING B

NO. REVISIONS DATE

SHEET NUMBER:

M3.01



MECHANICAL

DEMOLITION ROOF PLAN BUILDING C

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



IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT

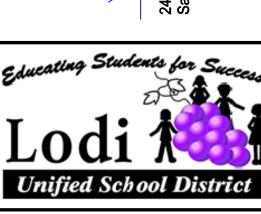
APP: 02-118996 INC:
REVIEWED FOR
SS FLS FLS ACS D

DATE: 06/16/2021

DSA 02-118996

MECHANICAL ENGINEERING ENGINEERING ENGINEERING GROUP, INC.

1) Avenue FAX (916) 325-1065 FAX (916) 325-1075 Email office@turleymech.com





L DISTRICT
JENTARY
MENT

LODI UNIFIED SCHOOL DI WOODBRIDGE ELEMEN HVAC REPLACEMEN 1290 LILAC STREET WOODBRIDGE, CA. 95242

SHEET TITLE:

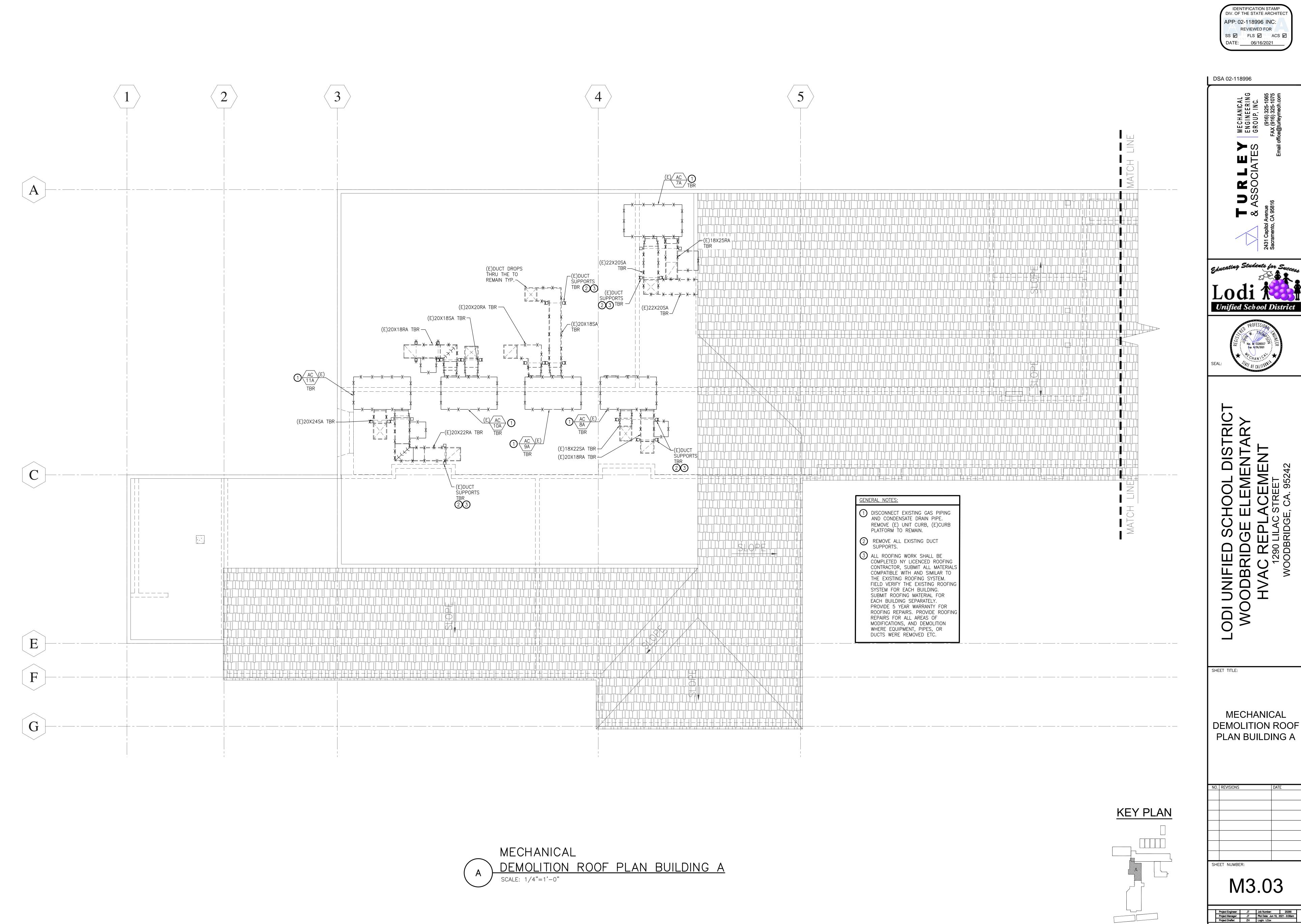
MECHANICAL DEMOLITION ROOF PLAN BUILDING C

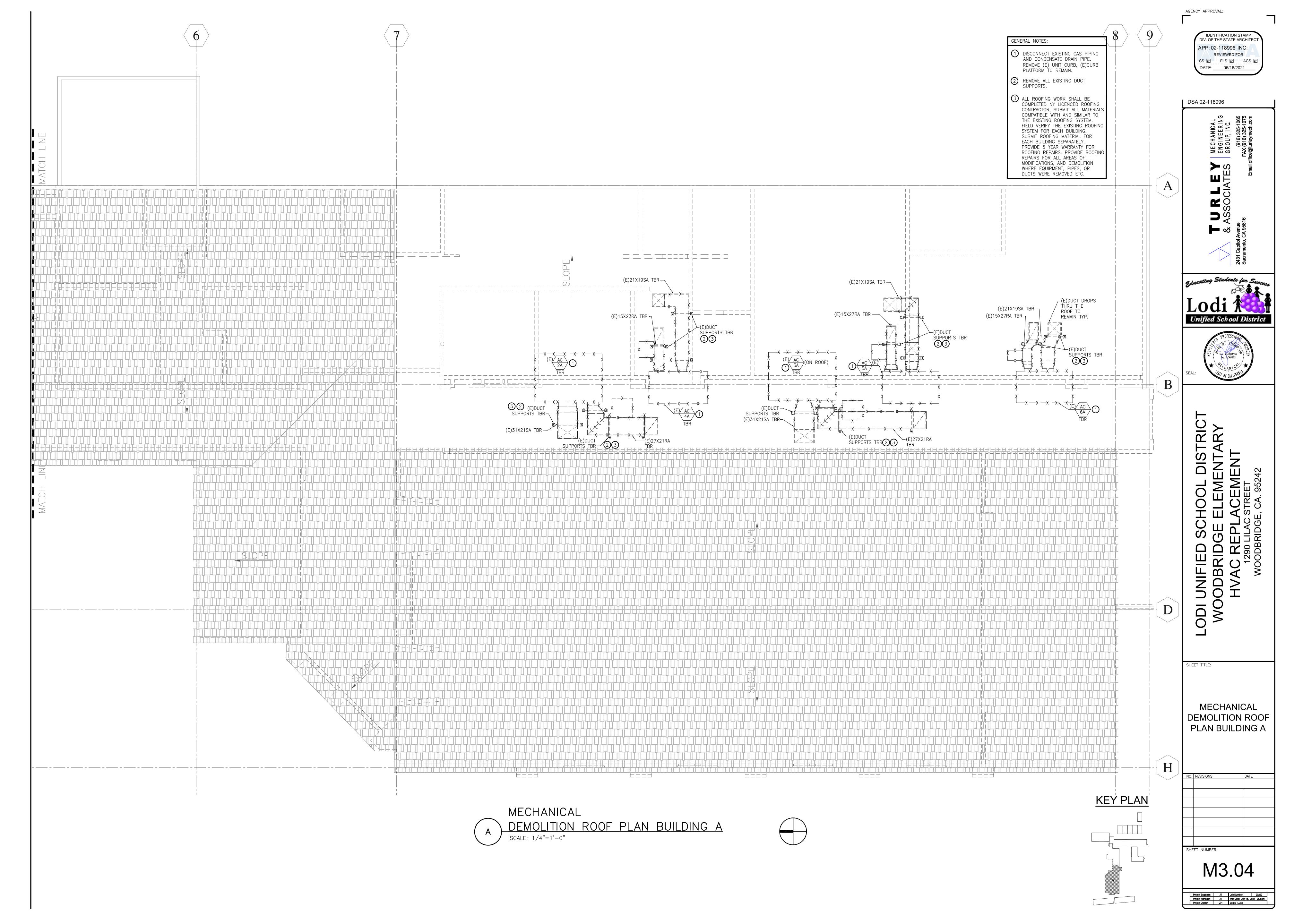
NO. REVISIONS DATE

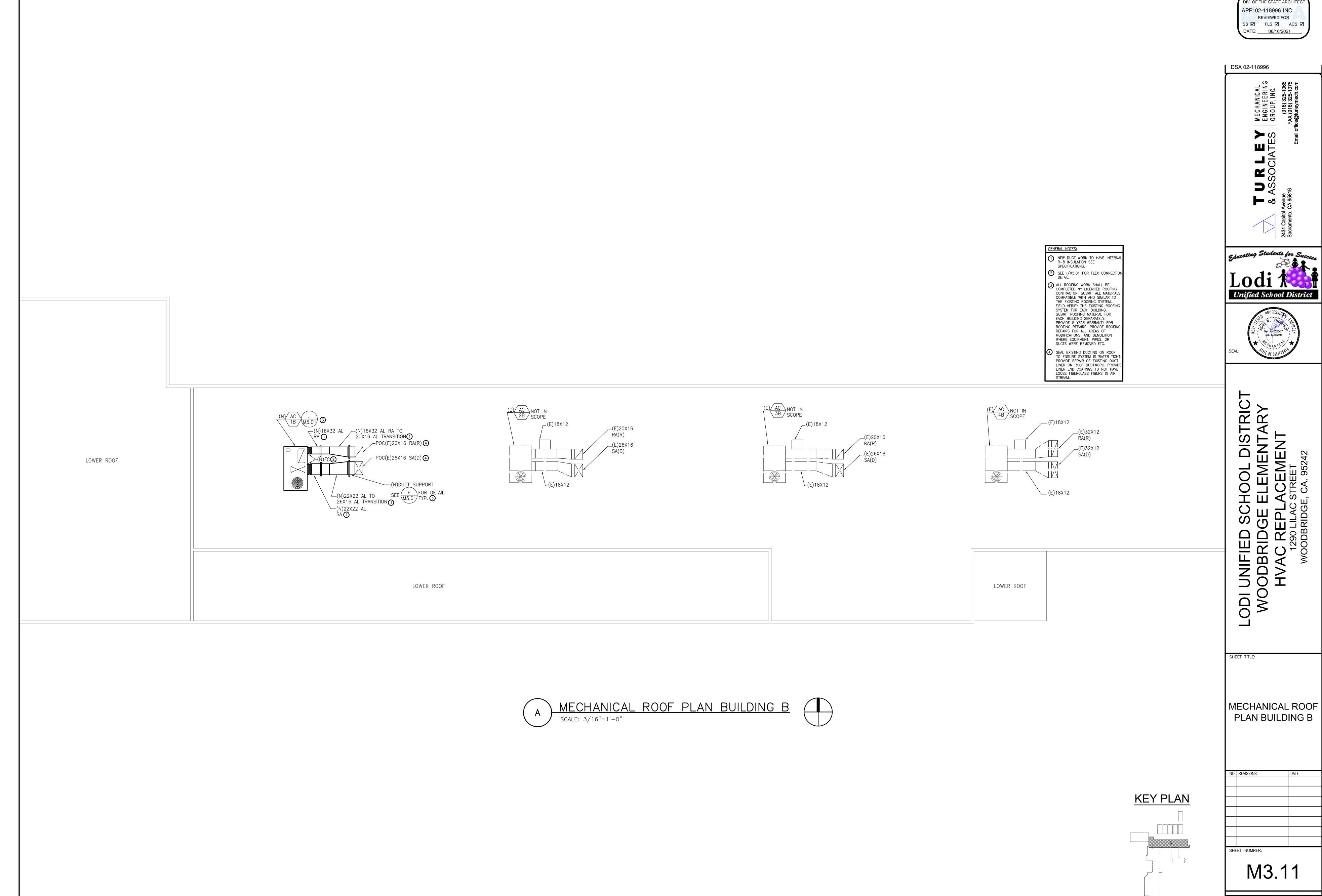
**KEY PLAN** 

SHEET NUMBER: M3.02

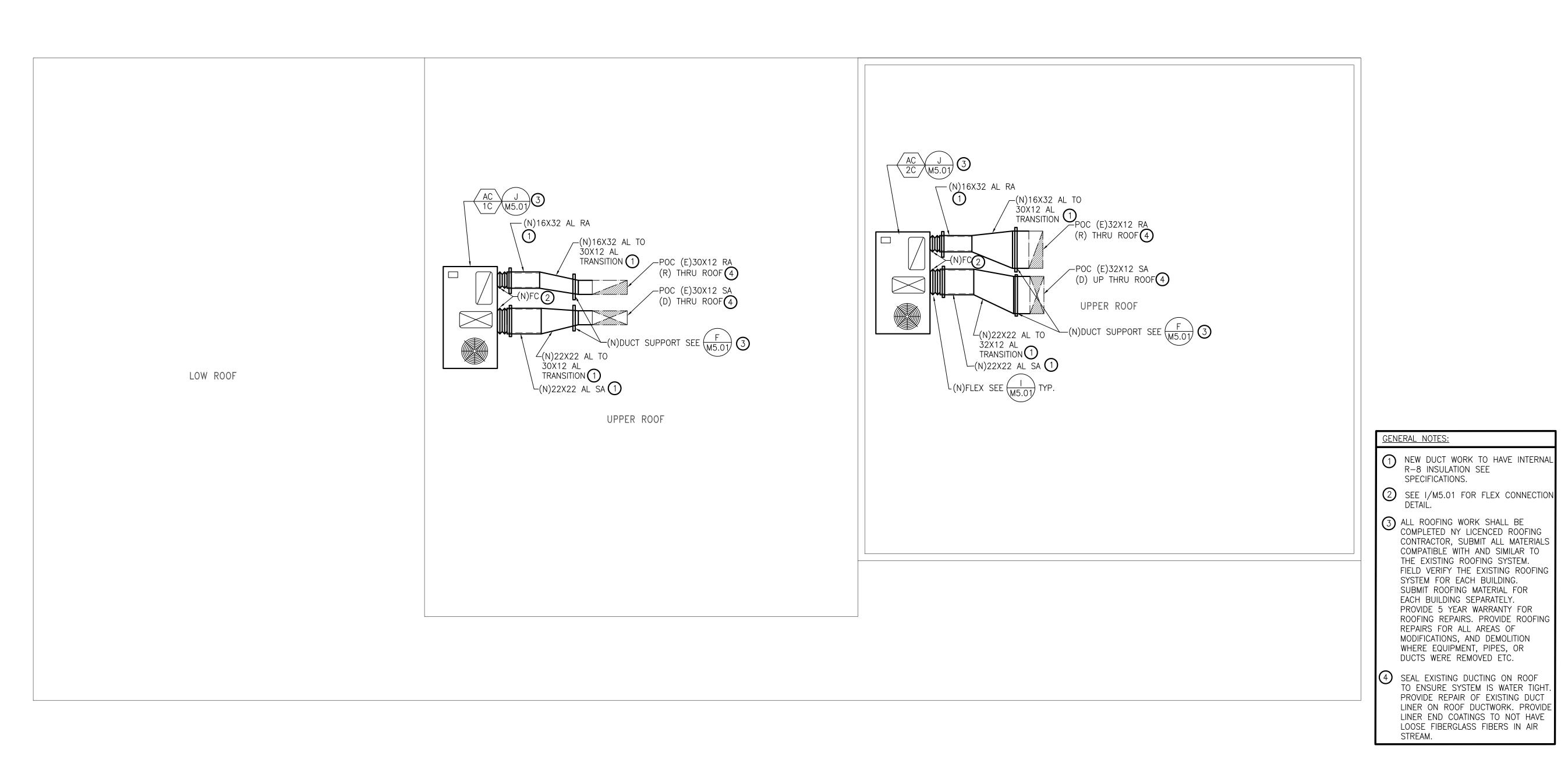
Project Engineer: JT Job Number: 20290
Project Manager: JT Plot Date: Jun 15, 2021 - 9:08am





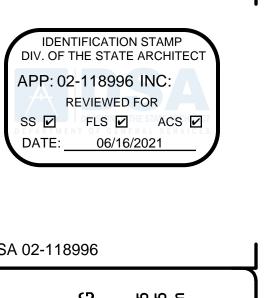


AGENCY APPROVAL: IDENTIFICATION STAMP DIV. OF THE STATE ARCHITECT



MECHANICAL ROOF PLAN BUILDING C

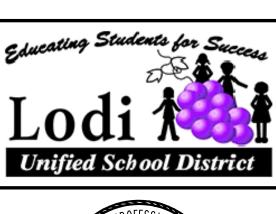
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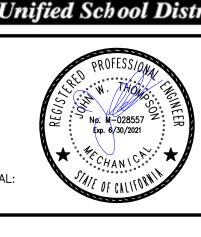


AGENCY APPROVAL:

TURLEY
ENGINEERING
RASSOCIATES
GROUP, INC.

(916) 325-1065
Email office@turleymech.com





LODI UNIFIED SCHOOL DISTRICT
WOODBRIDGE ELEMENT
HVAC REPLACEMENT
1290 LILAC STREET
WOODBRIDGE, CA. 95242

SHEET TITLE:

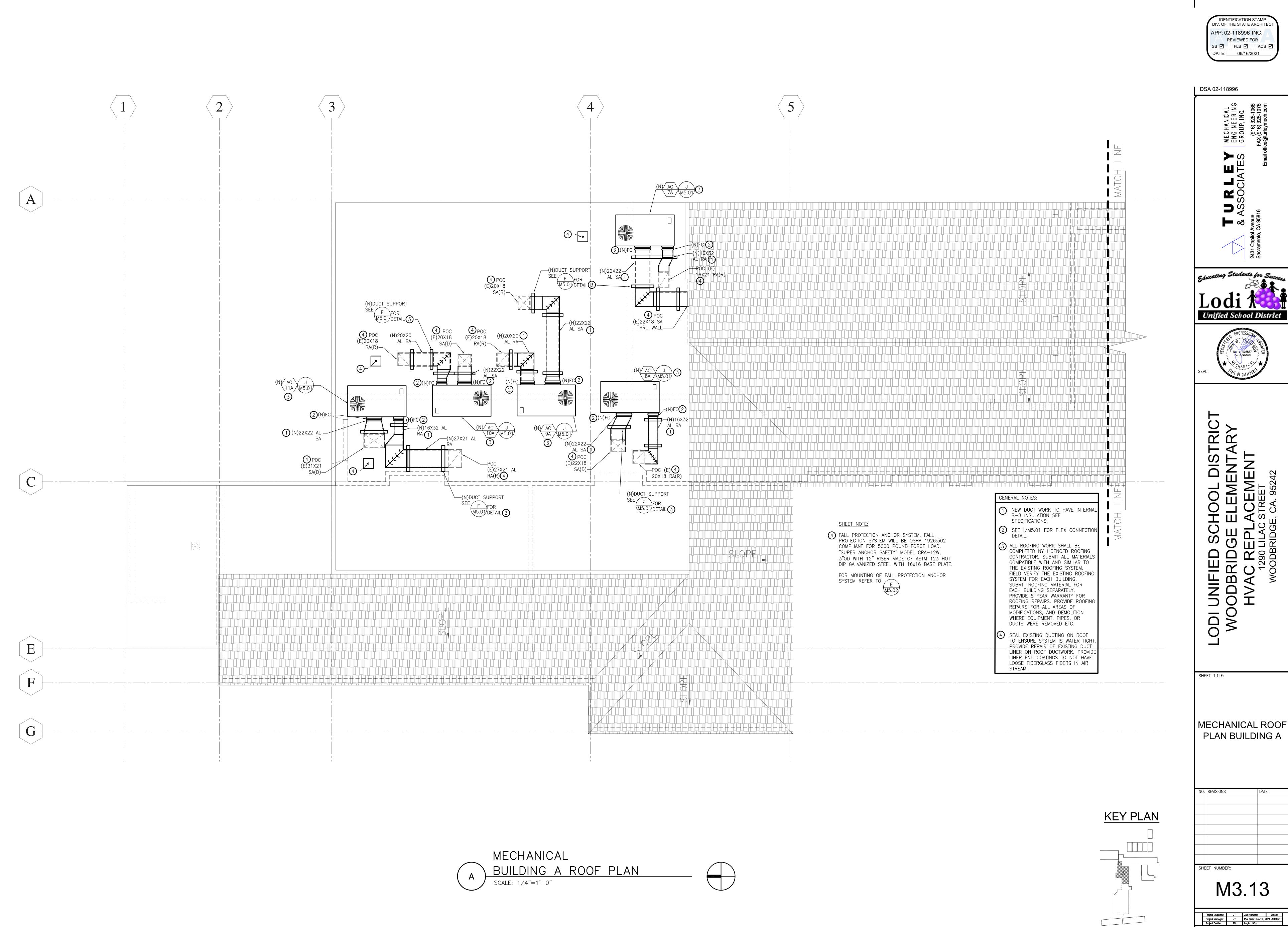
MECHANICAL ROOF PLAN BUILDING C

NO. REVISIONS DATE

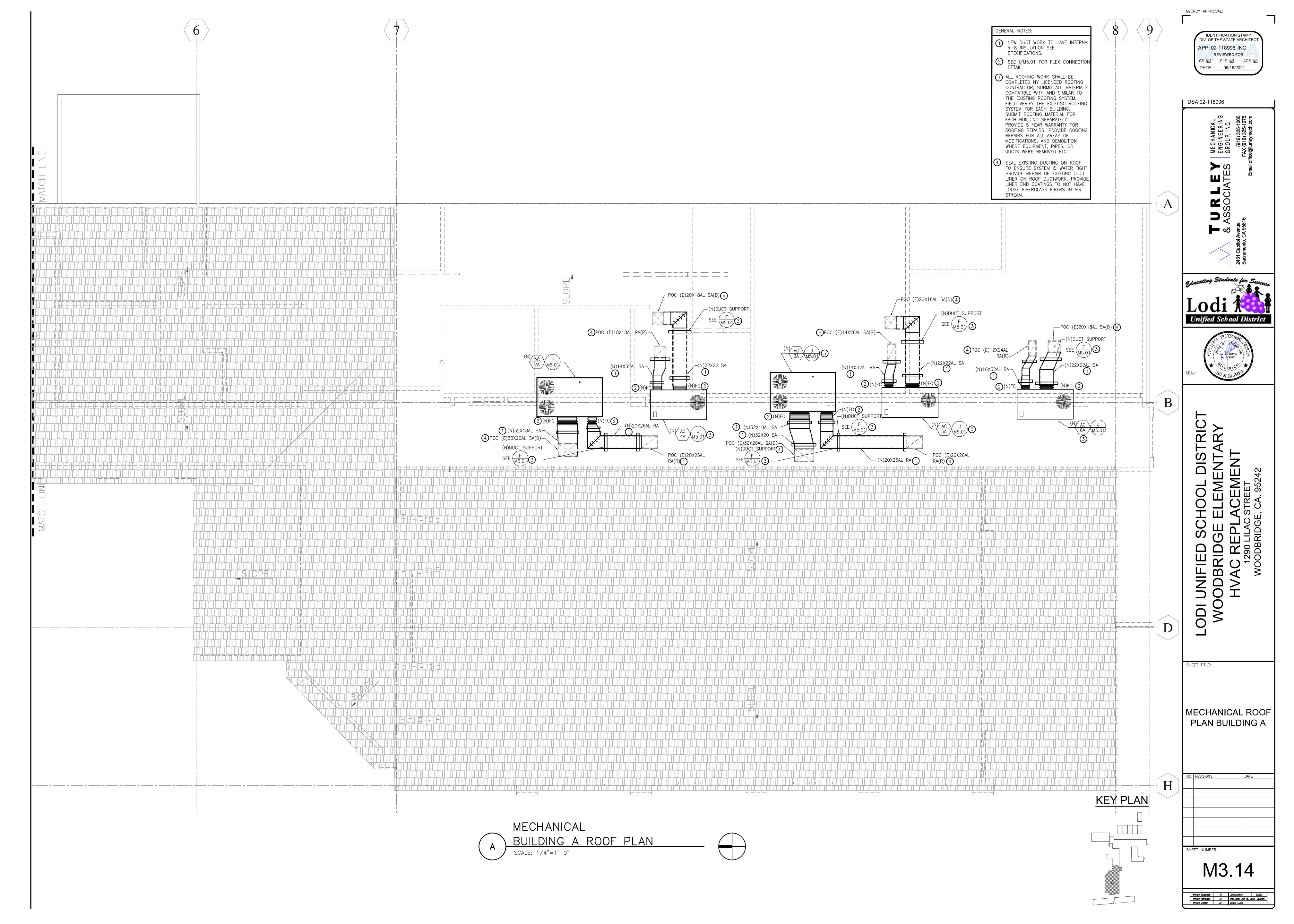
SHEET NUMBER:

**KEY PLAN** 

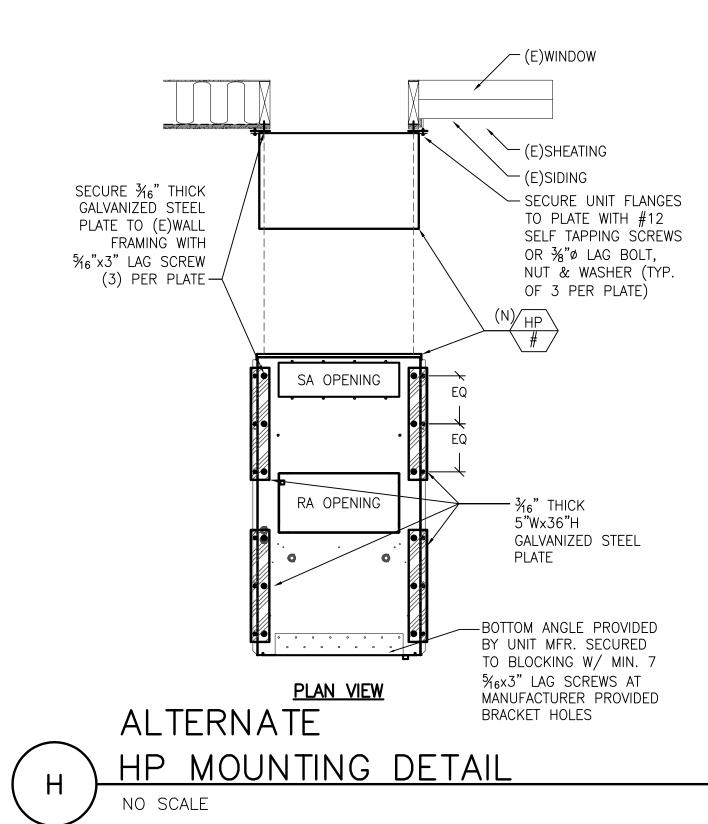
M3.12

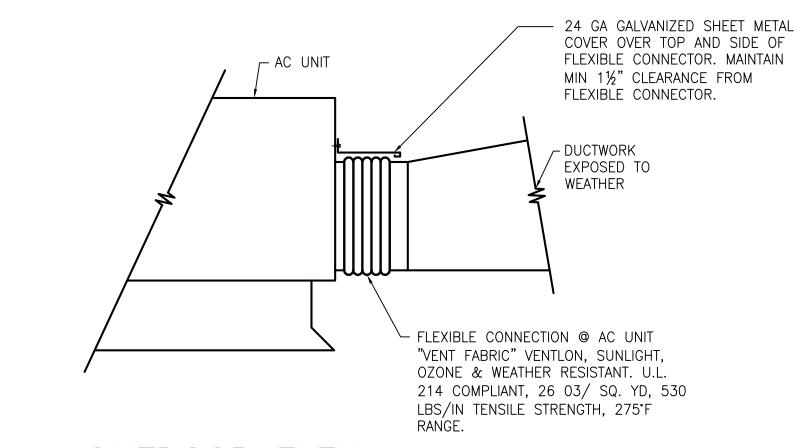




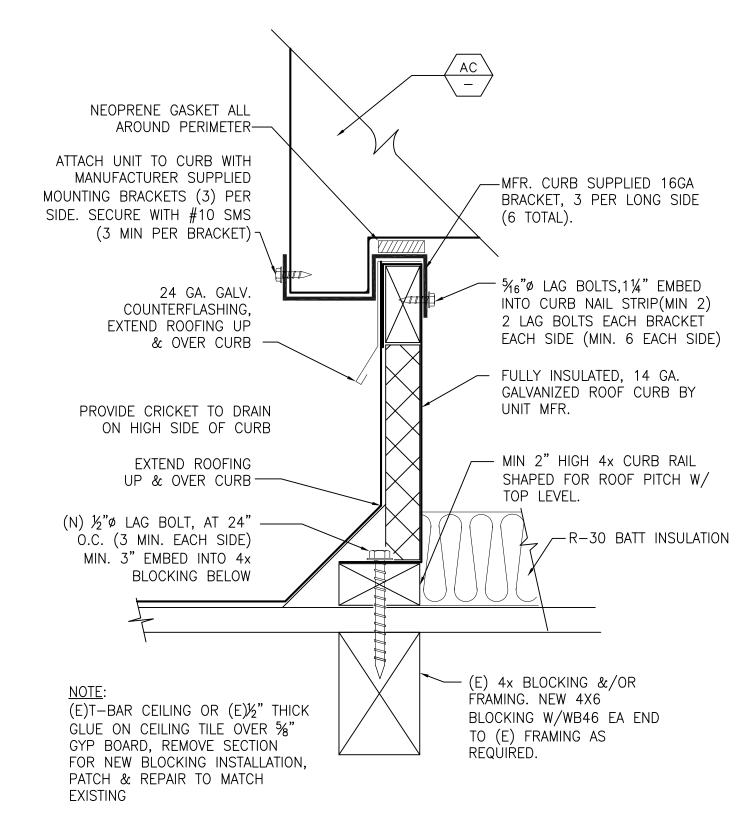


GENERAL NOTE: EXPOSED METAL AND FASTENERS SHALL BE GALVANIZED OR STAINLESS STEEL.

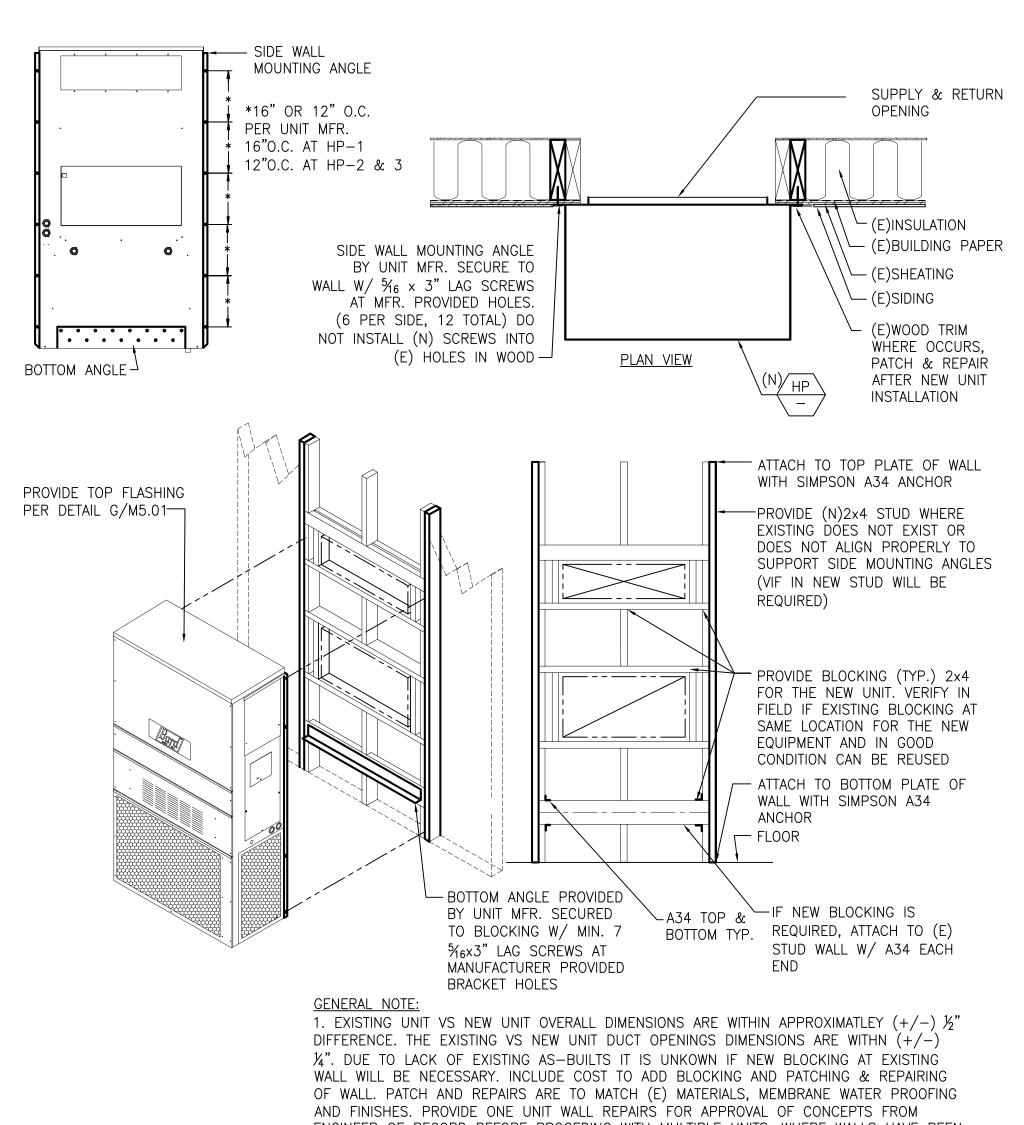




# OUTDOOR FLEX CONNECTION @ AC UNIT NO SCALE

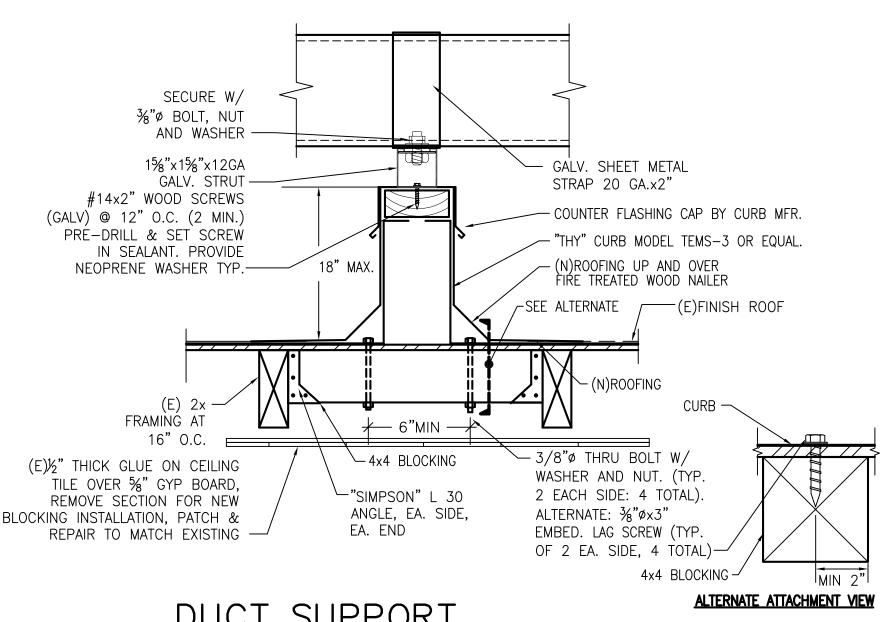


AC UNIT MOUNTING DETAIL

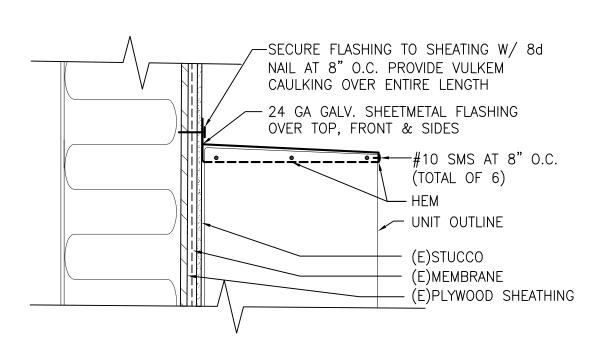


ENGINEER OF RECORD BEFORE PROCEDING WITH MULTIPLE UNITS. WHERE WALLS HAVE BEEN REPAIRED, FINISH PAINT TO MATCH EXISTING

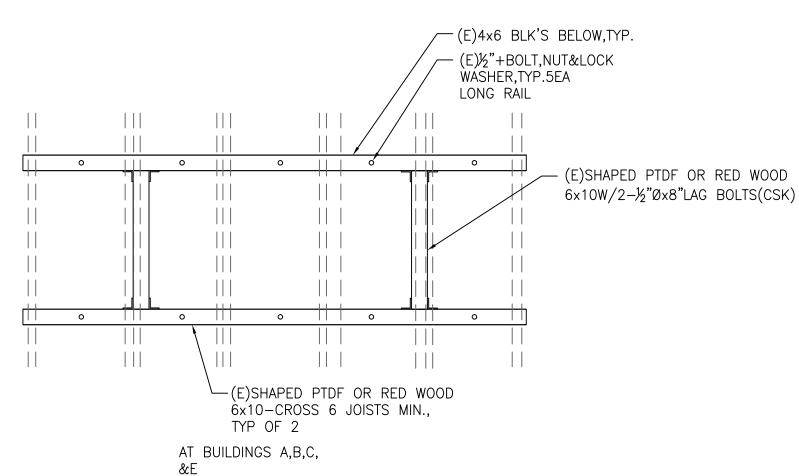
# WALL MOUNTED HEAT PUMP DETAIL NO SCALE



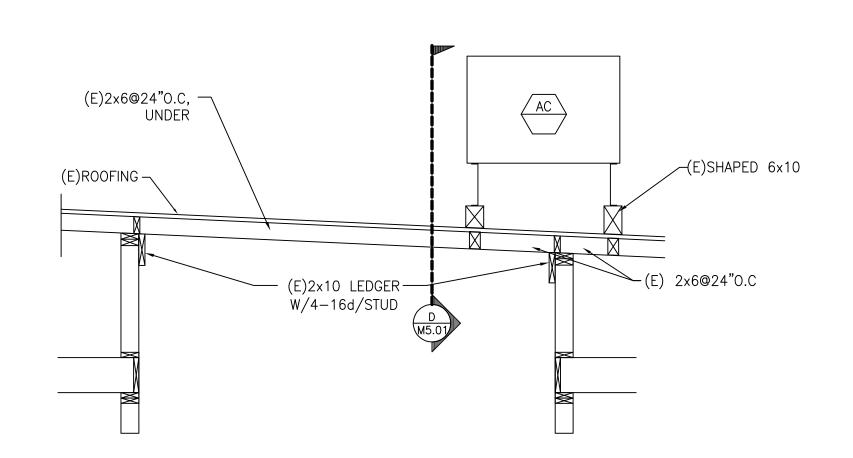
DUCT SUPPORT NEW RAIL ATTACHMENT DEAIL NO SCALE

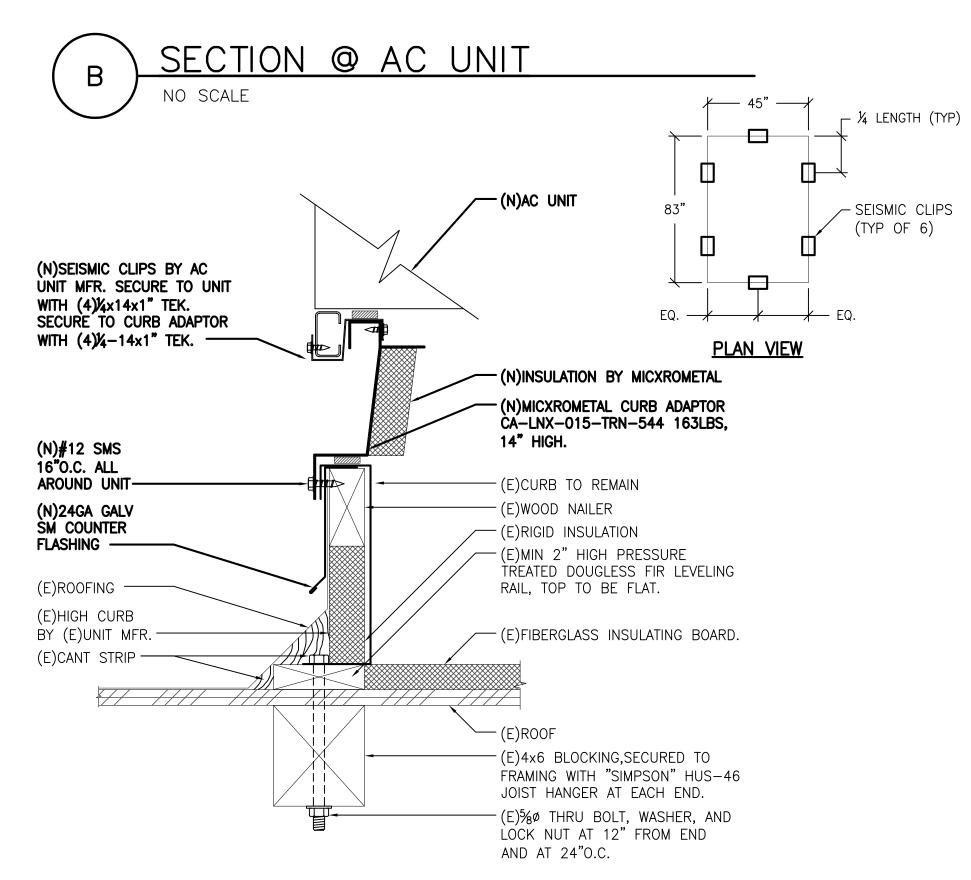


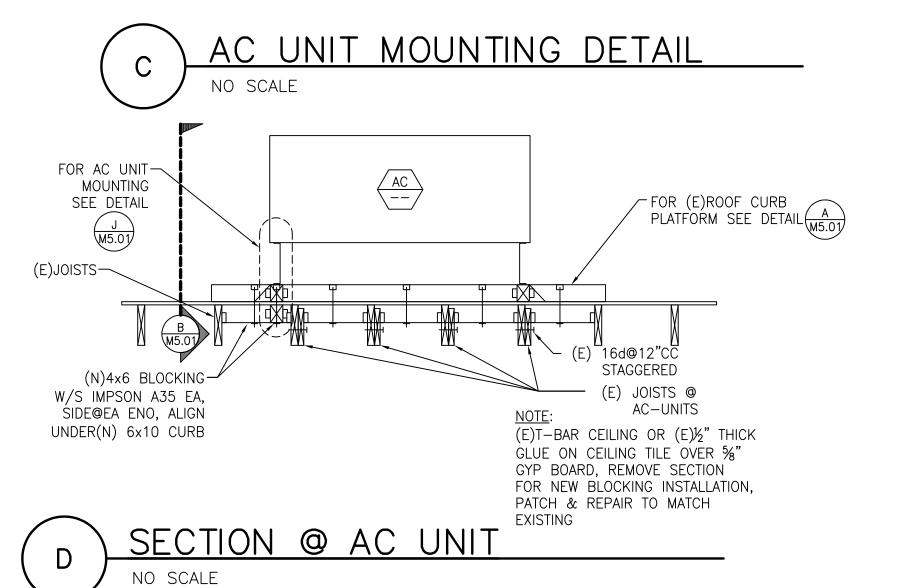
FLASHING TOP OF UNIT



EXISTING ROOF CURB PLATFORM PLAN NO SCALE





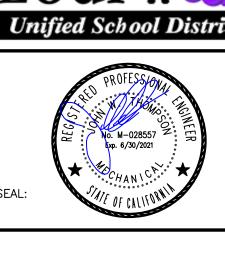


IDENTIFICATION STAMP DIV. OF THE STATE ARCHITEC APP: 02-118996 INC: REVIEWED FOR SS 🗹 FLS 🗹 ACS 🗹 DATE: 06/16/2021

AGENCY APPROVAL:

DSA 02-118996 MECHANICAL ENGINEERING GROUP, INC. (916) 325-1065 =AX (916) 325-1075 \_\_\_\_





DISTRIC= ENTARY

SHEET TITLE:

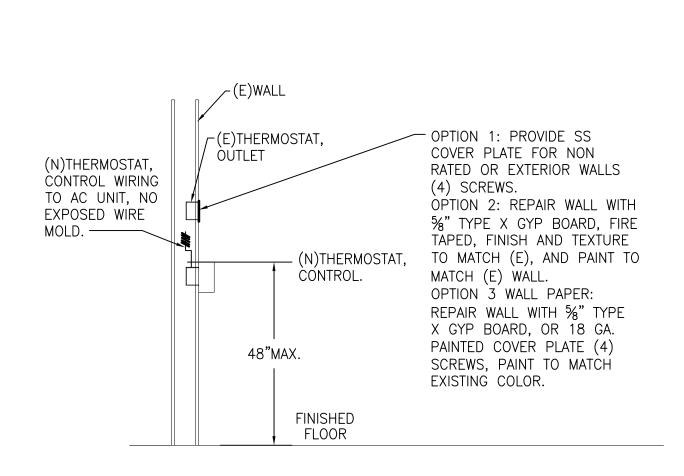
**MECHANICAL DETAILS** 

SHEET NUMBER: M5.01

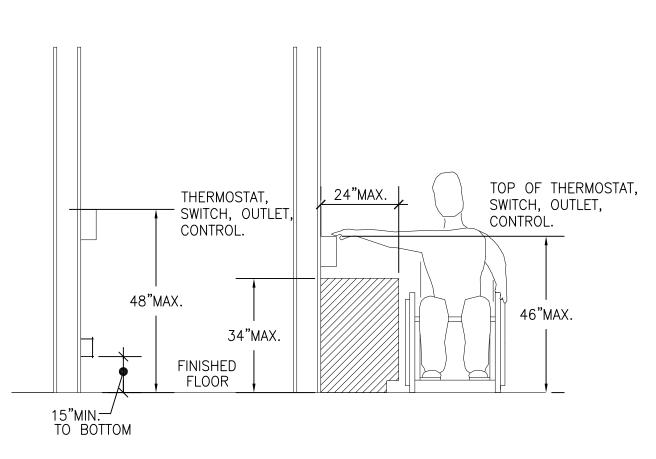
 Project Engineer:
 JT
 Job Number:
 20290

 Project Manager:
 JT
 Plot Date: Jun 15, 2021 - 3:05pm

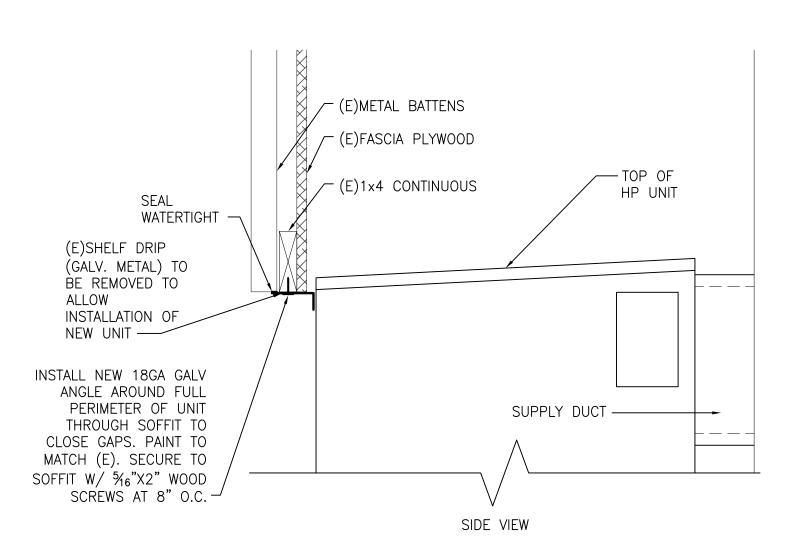
 Project Drafter:
 ZH
 Login: TFlagg



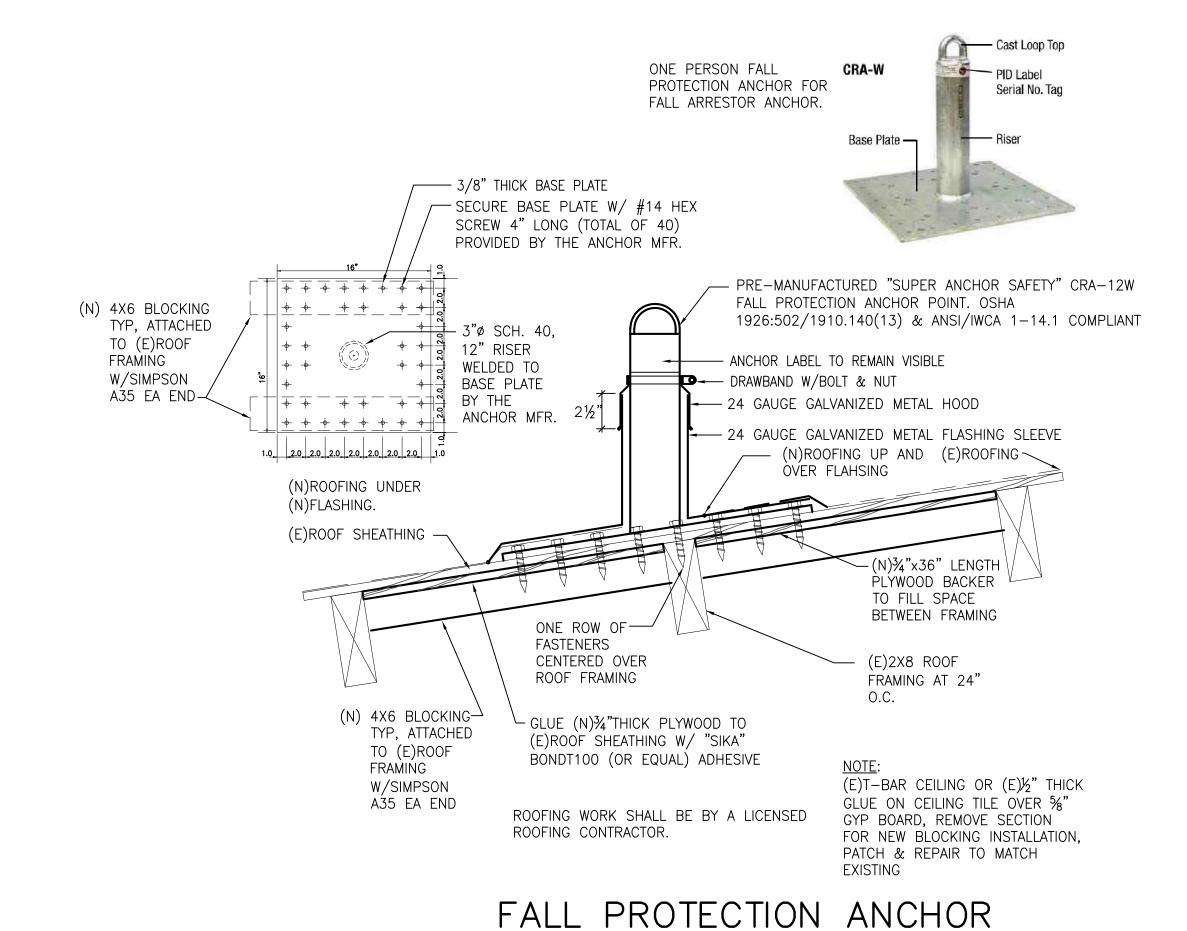
THERMOSTAT WALL PATCH DETAIL SCALE: NO SCALE



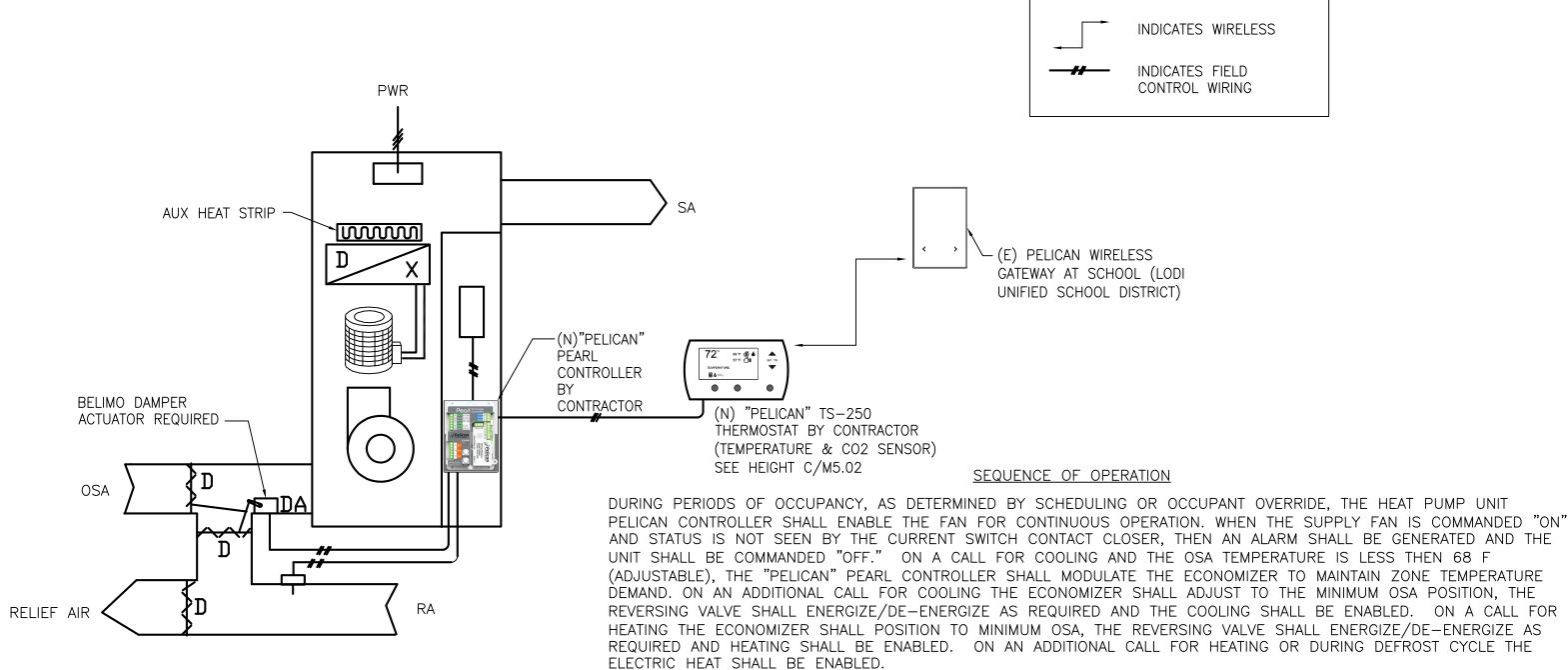
THERMOSTAT MOUNTING DETAIL SCALE: NO SCALE



TOP CLOSURE TRIM AT SOFFIT



POINT INSTALLATION DETAIL



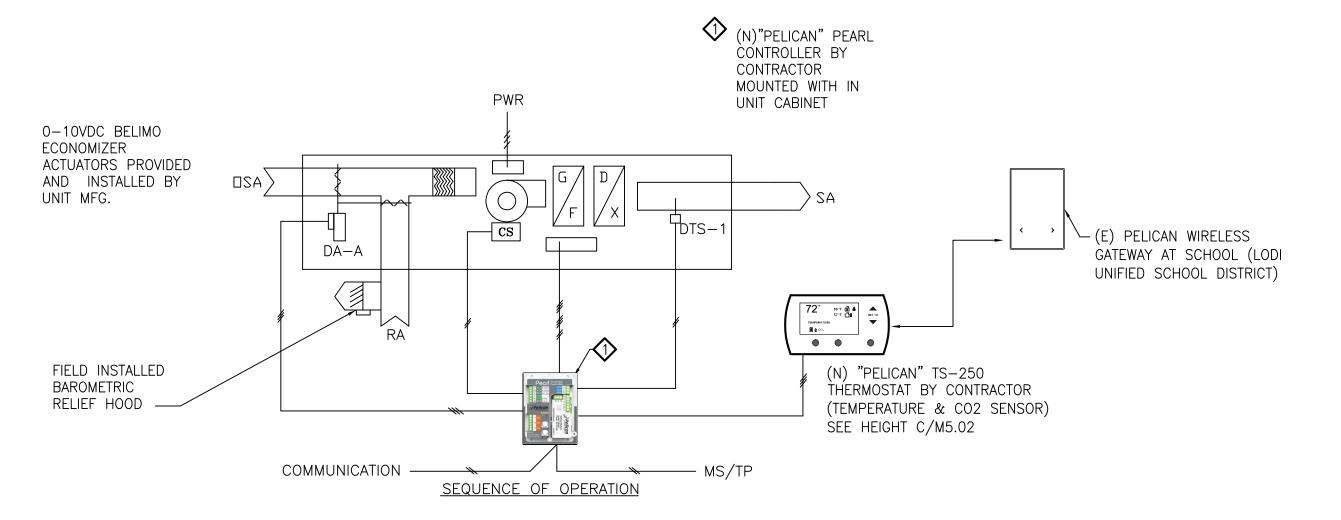
FOLLOWING SCHEDULE (ADJ.).

1. QUANITIES TO BE DETERMINED AT JOB WALK 2. EXISTING TS-200 SPACE TEMPERATURE SENSORS TO BE REMOVED & NEW (TS-250) TO BE LOCATED AT SAME EXISTING LOCATION. CONFRIM EXISTNIG LOCATION IS ADA COMPLIANT MAX. 48" ABOVE FINISHED FLOOR

SPACE CO2 (PPM)	MIN. OA POSITION
<900 PPM	OUTSIDE AIR MIN. DMPR. POS 0.15 CFM/SQFT = 135 CFM
>901 PPM	OUTSIDE AIR DAMPER POSITION - 15 CFM/OCC. = 450 CFM

CO2 AND MINIMUM DAMPER CONTROL: CO2 SENSOR (CO2) SHALL RESET THE MINIMUM OUTSIDE AIR ACCORDING TO THE

# TYP. "BARD" HEAT PUMP UNIT CONTROL DIAGRAM WITH ECONOMIZER NO SCALE



DURING PERIODS OF OCCUPANCY, AS DETERMINED BY SCHEDULING OR OCCUPANT OVERRIDE, THE UNIT PEARL CONTROLLER SHALL ENABLE THE FAN FOR CONTINUOUS OPERATION. WHEN THE SUPPLY FAN IS COMMANDED "ON" AND STATUS IS NOT SEEN BY THE CALL FOR COOLING AND THE OSA TEMPERATURE IS LESS THEN 72 F (ADJUSTABLE), THE EMS SHALL MODULATE THE ECONOMIZER TO MAINTAIN ZONE TEMPERATURE DEMAND. ON AN ADDITIONAL CALL FOR COOLING THE ECONOMIZER SHALL ADJUST TO THE MINIMUM OSA POSITION, THE REVERSING VALVE SHALL ENERGIZE/DE-ENERGIZE AS REQUIRED AND THE COOLING SHALL BE ENABLED. ON A CALL FOR HEATING THE ECONOMIZER SHALL POSITION TO MINIMUM OSA, AND HEATING SHALL BE ENABLED

PROVIDE TITLE 24 REQUIRED CO2 SENSORS OR OCCUPIANCY SENSORS FOR EACH UNIT. ECONOMIZER CONTROL SHALL BE LISTED WITH CEC AS AN APPROVED FDD ECONOMIZER CONTROLLER WITH FAULT DETECTION LIGHT AT SPACE TEMPERATURE SENSOR. CO2 AND MINIMUM DAMPER CONTROL: CO2 SENSOR (CO2) SHALL RESET THE MINIMUM OUTSIDE AIR ACCORDING TO THE FOLLOWING SCHEDULE (ADJ.).

SPACE CO2 (PPM)	MIN. OA POSITION
<900 PPM	OUTSIDE AIR MIN. DMPR. POS 0.15 CFM/SQFT - ADJUST TO SPECIFIED AMOUNT ON MO.2
>901 PPM	OUTSIDE AIR DAMPER POSITION - 15 CFM/OCC ADJUST TO SPECIFIED AMOUNT ON MO.2

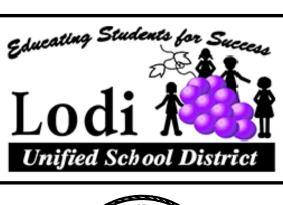
ROOFTOP PACKAGED AIR CONDITION UNIT WITH ECONOMIZER CONTROL

IDENTIFICATION STAMP DIV. OF THE STATE ARCHITEC APP: 02-118996 INC: REVIEWED FOR SS 🗹 FLS 🗹 ACS 🗹 DATE: 06/16/2021

AGENCY APPROVAL:

DSA 02-118996

MECHANICAL ENGINEERING GROUP, INC. (916) 325-1065 FAX (916) 325-1075 \_\_\_\_





SHEET TITLE:

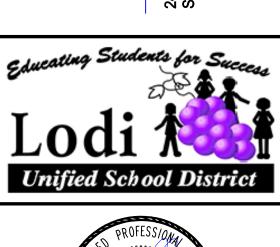
**MECHANICAL DETAILS** 

M5.02

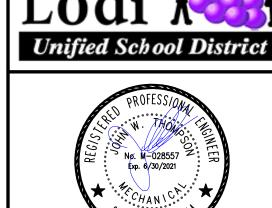
APP: 02-118996 INC: REVIEWED FOR SS 🗹 FLS 🗹 ACS 🗹 DSA 02-118996 | MECHANICAL | ENGINEERING | GROUP, INC. | (916) 325-1055 | FAX (916) 325-1075 Sheet Notes HP-19 HP-22 HP-24 1 LOCATED IN BUILDING E STORAGE 16 72°F 72°F 72° AC-7A AC-2A AC-4A AC-3A AC-5A AC-6A GATEWAY(E) AREA ETHERNET NETWORK 72\* 72°F 72\* CAT 6e CABLE AC-2B AC-1B AC-8A NETWORK SWITCH Unified School District 72°F 72\* 72\* HP-19 **AC-3B** REPEATER(E,TYP) AC-2D WR400 72\* 72°F 72°F 72\* 72°F 72°F 72℉ LAN ARCHITECTURE LAN ARCHITECTURE SHEET TITLE: MECHANICAL **DETAILS** M5.03

IDENTIFICATION STAMP DIV. OF THE STATE ARCHITECT

AGENCY APPROVAL:



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2. INSTALL ACOUSTICAL LINING IN ALL SUPPLY, RETURN AND MIXED AIR DUCTS AND PLENUMS EXPOSED OUTSIDE THE BUILDING AND WHERE MARKED: EXTERIOR DUCT INSULATION TO BE R-8 "ARMAFLEX" SR. 2" THICK, CLOSED CELL, WITH MICROBAN. LINING SHALL BE AS SPECIFIED.

3. SEAL AIRTIGHT ALL SEAMS OF ALL SUPPLY, RETURN AND EXHAUST DUCTS EXCEPT THOSE EXPOSED IN THE CONDITIONED SPACE WITH HARDCAST INC. FOIL GRIP 1402 181 BFX INDOOR / OUTDOOR ROLL SEALANT WITH 12 MIL. BUTYL BACKING.

4. SEAL WATERTIGHT ALL JOINTS OF ALL DUCTWORK EXPOSED TO THE

3.15 **EQUIPMENT IDENTIFICATION:** 

IDENTIFICATION. INDICATE ON EACH PIECE OF EQUIPMENT SUITE SERVED BY EQUIPMENT. FOR EXAMPLE: AC-2 SUITE 401.

OUTLETS, AND RUNNING EQUIPMENT SHALL BE PROPERLY PROTECTED BY GUARDS AS REQUIRED BY THE CCR, TITLE 8, DIVISION OF INDUSTRIAL SAFETY, SUB CHAPTER 7, GENERAL INDUSTRY SAFETY ORDERS, ARTICLES 31 THROUGH 36, WHETHER SHOWN ON THE DRAWINGS OR NOT.

D. CONSTRUCTION: GUARDS SHALL BE FACTORY FURNISHED OR MADE OF EXPANDED METAL WITH ANGLE IRON FRAMEWORK. GUARDS FOR BELT DRIVES SHALL HAVE AN EASILY REMOVABLE SECTION FOR REPLACEMENT OF BELTS. OPENINGS SHALL BE PROVIDED AT SHAFT ENDS FOR TAKING RPM READINGS.

UNDER CONTINUOUS DEMAND WITHOUT OBJECTIONABLE VIBRATION. CONTRACTOR SHALL BE SURE THAT ABOVE RESULT IS ACHIEVED.

B. AIR CONDITIONING UNITS AND ALL FANS SHALL BE SUPPORTED ON ANTI-VIBRATION BASES OR HANGERS, OR AS OTHERWISE SHOWN ON DRAWINGS. OTHER EQUIPMENT AND PUMPS SHALL BE SUPPORTED ON ANTI-VIBRATION BASES, PADS OR HANGERS, WHEN SHOWN ON DRAWINGS OR SPECIFIED WITH EQUIPMENT. ISOLATORS AND SUPPORTING BASES SHALL BE SUPPLIED BY SINGLE MANUFACTURER, KINETICS, MASON, OR EQUAL. TYPE OF MOUNTING AND SUPPORTING BASE FOR EACH PIECE OF EQUIPMENT SHALL BE AS TABULATED ON EQUIPMENT SCHEDULE OR AS HEREINAFTER SPECIFIED. INDIVIDUAL MOUNTS SHALL BE KINETICS TYPE FPS, OR EQUAL. CONTRACTOR SHALL PROVIDE CALCULATIONS FOR ISOLATORS AND MOUNTING ACCEPTABLE TO REVIEWING AUTHORITY.

SPEED OF EQUIPMENT SUPPORTED.

A. ENSURE AREAS ARE KEPT CLEAN AND NEAT THROUGHOUT PROJECT. REMOVE SURPLUS MATERIALS.

A. FURNISH AND INSTALL ACCESS DOORS WHEREVER REQUIRED WHETHER SHOWN OR NOT FOR EASY MAINTENANCE OF MECHANICAL SYSTEM; FOR EXAMPLE, AT CONCEALED VALVES, STRAINER, TRAPS, ARRESTORS, CLEANOUTS, DAMPERS, MOTORS, CONTROLS, OPERATING EQUIPMENT, ETC. ACCESS DOORS SHALL PROVIDE FOR COMPLETE REMOVAL AND REPLACEMENT OF EQUIPMENT.

3.13 NOT USED:

3.12 ACCESS DOORS:

3.14 INSULATION WORK: A. GENERAL:

1. ALL INSULATION SHALL BE DONE BY A CONTRACTOR SPECIFICALLY LICENSED FOR INSULATION WORK. INSULATION APPLIED BY THE MECHANICAL AND PLUMBING CONTRACTOR IS NOT ACCEPTABLE.

2. THE TERM "PIPING" USED HEREIN SHALL INCLUDE PIPE, AIR SEPARATORS, VALVES, STRAINERS AND FITTINGS. APPLY INSULATING CEMENT TO FITTINGS, VALVES AND STRAINERS AND TROWEL SMOOTH TO THE THICKNESS OF ADJACENT COVERING. COVER WITH JACKET TO MATCH PIPING. EXTEND COVERING ON VALVES UP TO THE BONNET. LEAVE STRAINER CLEANOUT PLUGS ACCESSIBLE. VALVE AND FITTING COVERS MAY BE PREFORMED PVC. PROVIDE RIGID INSULATION, 18" MINIMUM LENGTH AT EACH PIPE HANGER. SEAL ENDS OF INSULATION WITH

3. DO NOT INSULATE FLANGES AND UNIONS ON HIGH TEMPERATURE PIPING. INSULATE UNIONS AND PUMP BODIES ON CHILLED WATER AND COMBINATION HOT AND CHILLED WATER SYSTEMS WITH THREE HEAVY LAYERS OF MORTELL'S NO-DRIP PAINT, 1/16" MINIMUM TOTAL THICKNESS OR ARMSTRONG ARMAFLEX TAPE PER MANUFACTURER'S RECOMMENDATIONS.

4. CLEAN THOROUGHLY, TEST, AND HAVE APPROVED, ALL PIPING AND EQUIPMENT BEFORE INSTALLING COVERING.

5. ALL INSULATION, ADHESIVE COVERINGS AND JACKETS INCLUDING PRE-INSULATED FLEXIBLE DUCTWORK SHALL HAVE A FLAME SPREAD OF 25 OR LESS AND DEVELOPED SMOKE RATING OF 50 OR LESS TESTED IN ACCORDANCE WITH ASTM E84.

6. REPAIR ALL DAMAGE TO EXISTING PIPE AND DUCT INSULATION WHETHER OR NOT IT WAS CAUSED DURING THE WORK OF THIS CONTRACT, TO MATCH EXISTING ADJACENT INSULATION FOR THICKNESS AND FINISH BUT CONFORMING TO FLAME SPREAD AND SMOKE RATINGS SPECIFIED ABOVE.

B. DUCT INSULATION:

1. WRAP ALL UNLINED CONCEALED SUPPLY AND RETURN DUCTS WITH O.C. FIBERGLAS ALL-SERVICE DUCT WRAP WITH A REINFORCED FOIL KRAFT VAPOR BARRIER FACING 2" THICK AND 3/4# PER CUBIC FOOT DENSITY. WRAP INSULATION ENTIRELY AROUND DUCT AND WIRE SECURELY IN PLACE WITH #16 WIRE 12" O.C. AND EACH SIDE OF EACH STANDING SEAM AND OVER EACH INSULATION JOINT. LAP ALL INSULATION JOINTS 3" MINIMUM. INSULATE DUCTS INSTALLED TIGHT AGAINST OTHER WORK BEFORE HANGING IN PLACE.

WEATHER WITH FOIL GRIP 1402 181 BFX.

B. IDENTIFY EACH PIECE OF EQUIPMENT WITH 2" HIGH STENCIL PAINTED

3.17 <u>GUARDS:</u>

C. GENERAL: BELT DRIVE, GEAR DRIVE SHAFTS, COUPLINGS, FAN INLETS AND

3.18 ANTI-VIBRATION BASES AND HANGERS:

A. ALL VENTILATING AND AIR CONDITIONING EQUIPMENT SHALL OPERATE ISOLATE ALL EQUIPMENT CONNECTIONS, INCLUDING CONDUIT, PIPING,

C. ISOLATOR MANUFACTURER'S SUBMITTAL SHALL INCLUDE COMPLETE DESIGN FOR SUPPLEMENTARY BASES, TABULATION OF DESIGN DATA ON ISOLATORS, INCLUDING O.D. FREE OPERATING, AND SOLID HEIGHTS OF SPRINGS, FREE AND OPERATING HEIGHTS OF NEOPRENE OR FIBERGLASS ISOLATORS. AND ISOLATION EFFICIENCY BASED ON LOWEST OPERATING

3.19 <u>NOT USED:</u>

3.21 <u>NOT USED:</u>

3.22 <u>CARE AND CLEANING:</u>

END OF SECTION

SECTION 230500- MECHANICAL WORK- GENERAL REQUIREMENTS

A.INFORMATION ON THE DRAWINGS RELATIVE TO EXISTING CONDITIONS IS APPROXIMATE ONLY. DEVIATIONS FOUND NECESSARY DURING PROGRESS OF CONSTRUCTION TO CONFORM TO ACTUAL CONDITIONS, AS APPROVED BY THE ARCHITECT, SHALL BE MADE WITHOUT ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY DAMAGE CAUSED TO EXISTING SERVICES. PROMPTLY NOTIFY THE ARCHITECT IF SERVICES ARE FOUND WHICH ARE NOT SHOWN ON

1.08 GUARANTEE

1.07 SITE CONDITIONS:

A.REPAIR OR REPLACE ANY DEFECTIVE WORK. MATERIALS OR PART WHICH MAY APPEAR WITHIN 1 YEAR OF THE DATE OF ACCEPTANCE. THIS SHALL INCLUDE DAMAGE BY LEAKS.

B.ON FAILURE TO COMPLY WITH THE ABOVE GUARANTEE WITHIN A REASONABLE LENGTH OF TIME AFTER NOTIFICATION IS GIVEN, THE ARCHITECT SHALL HAVE THE REPAIRS MADE AT THE CONTRACTOR'S EXPENSE.

1.09 MAINTENANCE AND OPERATING INSTRUCTIONS:

A.INSTRUCT THE OWNER'S AUTHORIZED REPRESENTATIVES IN OPERATION, ADJUSTMENT AND MAINTENANCE OF ALL MECHANICAL EQUIPMENT AND SYSTEMS. PROVIDE THREE COPIES OF CERTIFICATE SIGNED BY OWNER'S REPRESENTATIVES ATTESTING TO THEIR HAVING BEEN INSTRUCTED.

B.FURNISH THREE COMPLETE SETS OF OPERATING AND MAINTENANCE INSTRUCTIONS BOUND IN A HARDBACK BINDER AND INDEXED. START COMPILING THE DATA UPON APPROVAL OF LIST OF MATERIALS. FINAL OBSERVATION WILL NOT BE MADE UNTIL BOOKLETS ARE APPROVED BY ARCHITECT.

C.THESE SETS SHALL INCORPORATE THE FOLLOWING:

1. COMPLETE OPERATING INSTRUCTIONS FOR EACH ITEM OF HEATING,

VENTILATING, AIR CONDITIONING AND PLUMBING EQUIPMENT. 2. TEST DATA AND AIR AND WATER BALANCING REPORTS AS SPECIFIED.

3. TYPEWRITTEN MAINTENANCE INSTRUCTIONS FOR EACH ITEM OF EQUIPMENT LISTING IN DETAIL THE LUBRICANT TO BE USED, FREQUENCY OF LUBRICATION, INSPECTIONS REQUIRED, ADJUSTMENT, ETC.

4. MANUFACTURER'S BULLETINS WITH PARTS NUMBERS, INSTRUCTIONS, ETC., FOR EACH ITEM OF EQUIPMENT, PROPERLY STRIPPED AND ASSEMBLED.

5. TEMPERATURE CONTROL DIAGRAMS AND LITERATURE.

6. A COMPLETE LIST OR SCHEDULE OF ALL MAJOR VALVES GIVING THE NUMBER OF THE VALVE, LOCATION AND THE ROOMS OR AREA CONTROLLED BY THE VALVE. IDENTIFY EACH VALVE WITH A PERMANENTLY ATTACHED METAL TAG STAMPED WITH NUMBER TO MATCH SCHEDULE. POST LIST IN FRAME UNDER PLASTIC ON WALL IN MECHANICAL ROOM OR WHERE DIRECTED

1.10 <u>SCHEDULE OF WORK:</u>

A.ALL TEMPORARY CONNECTIONS REQUIRED TO MAINTAIN SERVICES. INCLUDING ADEQUATE HEAT AND COOLING, DURING THE COURSE OF THIS CONTRACT SHALL BE MADE WITHOUT ADDITIONAL COST TO THE OWNER. THE NORMAL FUNCTION OF THE BUILDING MUST NOT BE INTERRUPTED; NOTIFY THE OWNER SEVEN (7) DAYS IN ADVANCE BEFORE DISTURBING ANY

1.11 <u>RECORD DRAWINGS:</u>

A.UPON COMPLETION OF THE WORK AND AS A PRECEDENT TO FINAL PAYMENT, DELIVER TO THE ARCHITECT ORIGINALS OF ALL DRAWINGS SHOWING THE WORK EXACTLY AS INSTALLED. ALSO DELIVER TO THE ARCHITECT ONE COMPLETE SET OF REPRODUCIBLES OF ALL DRAWINGS SHOWING THE WORK EXACTLY AS INSTALLED. ALL RECORD DRAWINGS SHALL BE SIGNED BY THE CONTRACTOR VERIFYING THEIR ACCURACY.

A.ALL EQUIPMENT, DUCTING AND PIPING DELIVERED TO SITE SHALL BE PROTECTED FROM THE WEATHER, HUMIDITY AND TEMPERATURE VARIATIONS, DIRT AND DUST AND OTHER CONTAMINANTS.

PART 2 - PRODUCTS 2.01 <u>GENERAL:</u>

A.MATERIALS OR EQUIPMENT OF THE SAME TYPE SHALL BE OF THE SAME BRAND WHEREVER POSSIBLE. ALL MATERIALS SHALL BE NEW AND IN

A.SHALL BE ALLIS-CHALMERS, GENERAL ELECTRIC, GOULD, LINCOLN, OR EQUAL, SELECTED FOR QUIET OPERATION. FURNISH MOTORS WITH SPLASHPROOF OR WEATHERPROOF HOUSINGS, WHERE REQUIRED OR RATING WITH THE ELECTRICAL SERVICE SUPPLIED. CHECK ELECTRICAL DRAWINGS. PROVIDE A TRANSFORMER FOR EACH MOTOR NOT WOUND SPECIFICALLY FOR SYSTEM VOLTAGE. THE MINIMUM EFFICIENCIES SHALL BE AS DEFINED BY IEEE 112 TEST METHOD B AND NEMA STANDARD

A.FURNISH STARTERS WITH THE PROPER SIZE THERMAL OVERLOAD UNITS. AMBIENT COMPENSATED. PROVIDE 3-PHASE MOTOR STARTERS WITH 3-PHASE OVERLOADS. MAGNETIC STARTERS SHALL HAVE HAND-OFF-AUTOMATIC SWITCHES AND CONTROL TRANSFORMERS FURNISHED INTEGRAL WITH THE STARTER WHEN STARTER IS SERVING AN AUTOMATICALLY CONTROLLED MOTOR. STARTERS SHALL BE SQUARE D ALLEN BRADLEY, OR EQUAL, IN NEMA TYPE I ENCLOSURE INSIDE AND NEMA TYPE IIIR OUTSIDE AS REQUIRED. MINIMUM STARTER SIZE SHALL BE

2.05 <u>PIPE HANGERS AND SUPPORTS:</u>

1. FOR REFRIGERATION. AIR CONDITIONING. HYDRAULIC. PNEUMATIC. AND OTHER VIBRATING SYSTEM APPLICATIONS, USE A CLAMP THAT HAS A VIBRATION DAMPENING INSERT AND A NYLON INSERTED LOCKNUT. FOR COPPER AND STEEL TUBING USE TOLSTRUT CUSHION CLAMP.

2. FOR LARGER TUBING OR PIPING SUBJECTED TO VIBRATION, USE NEOPRENE OR SPRING HANGERS AS REQUIRED, OR AS SPECIFIED ELSEWHERE.

3. FOR BASE MOUNTED EQUIPMENT USE VIBRATION PADS, MOLDED NEOPRENE MOUNTS, OR SPRING AS REQUIRED. REFER TO DRAWINGS FOR REQUIREMENTS.

O.ACCESSORIES

1. HANGER RODS SHALL BE THREADED BOTH ENDS, OR CONTINUOUS THREADED RODS OF CIRCULAR CROSS SECTION TOLCO FIG. 100 OR FIG. 103. USE ADJUSTING LOCKNUTS AT UPPER ATTACHMENTS AND HANGERS. NO WIRE, CHAIN, OR PERFORATED STRAPS ARE ALLOWED.

 Project Engineer:
 JT
 Job Number:
 20290

 Project Manager:
 JT
 Plot Date:
 Jun 15, 2021 - 9:09am

 Project Drafter:
 ZH
 Login:
 LCox

**SPECIFICATION** 

MECHANICAL AND

PLUMBING

SHEET TITLE:

SHEET NUMBER:

WORK - GENERAL REQUIREMENTS. SPECIFIED NECESSARY TO PROVIDE THE COMPLETE SYSTEM. 1.02 SERVICES:

A. MAKE ALL ARRANGEMENTS FOR THE UTILITIES REQUIRED. PAY ALL COSTS INVOLVED IN OBTAINING THE SERVICES, INCLUDING GAS SERVICE AND METER,

C. DETERMINE STORM AND SANITARY SEWER ELEVATION AT POINT OF CONNECTION BEFORE INSTALLING ANY SEWER PIPING. NOTIFY ARCHITECT IMMEDIATELY

1.03 <u>RECORD DRAWINGS:</u>

A PRINT OF THE PLUMBING PLAN SHOWING UNDERGROUND PIPING WILL BE FURNISHED BY THE CONTRACTOR ON WHICH HE SHALL INDICATE THE

2.01 <u>NOT USED:</u>

2.02 PIPE AND FITTINGS INSIDE BUILDING:

A. SEE GENERAL REQUIREMENTS, SECTION 230500, FOR DIELECTRIC FITTINGS AND PIPE PROTECTION. TERMINATE 5'-0" OUTSIDE THE BUILDING LINE OR

B. WASTE AND VENT PIPE ABOVE GROUND CONDENSATE DRAINS SHALL BE TYPE L OR TYPE DWV HARD COPPER, WITH LONG SWEEP ELBOWS AND CLEANOUT TEES AT EACH CHANGE IN DIRECTION. CONNECT CONDENSATE DRAINS TO AIR CONDITIONING UNITS WITH P-TRAP AND RUN TO AN

2.03 PIPE AND FITTINGS OUTSIDE BUILDINGS:

2.05 NOT USED:

PART 3 - EXECUTION

3.01 SERVICES: B. MAKE ALL ARRANGEMENTS FOR THE UTILITIES REQUIRED. PAY ALL COSTS INVOLVED IN OBTAINING THE SERVICES INCLUDING GAS SERVICE AND METER.

WATER METER, PRESSURE REDUCING VALVE, ACCESS BUXES, STREET WORK

IF INDICATED GRADES CANNOT BE MAINTAINED.

A. A PRINT OF THE PLUMBING PLAN SHOWING UNDERGROUND PIPING WILL BE FURNISHED TO THE CONTRACTOR ON WHICH HE SHALL INDICATE THE

SECTION 220500 - PLUMBING AND UTILITIES

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK: A. THE REQUIREMENTS OF THE GENERAL CONDITIONS APPLY TO ALL WORK HEREUNDER; ALSO, APPLICABLE PROVISIONS OF SECTION 230500 MECHANICAL

SECTION 220500 — PLUMBING AND UTILITIES

B. FURNISH AND INSTALL ALL PLUMBING WORK INDICATED ON THE DRAWINGS AND DESCRIBED HEREIN. ALSO, ANY INCIDENTAL WORK NOT SHOWN OR

WATER METER AND ACCESS BOX, STREET WORK, IN LIEU FEES FOR SEWER, ETC.

B. VERIFY THE LOCATION OF ALL SERVICES. NO EXTRA COST SHALL BE ALLOWED IF SERVICES ARE NOT AS SHOWN.

IF INDICATED GRADES CANNOT BE MAINTAINED.

LOCATIONS OF THE UNDERGROUND INSTALLATIONS AS THE WORK PROGRESSES. THIS SHALL BE RETURNED TO ARCHITECT AT COMPLETION OF JOB.

PART 2 - PRODUCTS

APPROVED RECEPTOR AND DRY WELL OR LANDSCAPE.

A. SEE GENERAL REQUIREMENTS SECTION FOR DIELECTRIC FITTINGS AND PIPE CORROSIVE PROTECTION. CONNECT TO BUILDING SERVICES WHERE TERMINATED 5' OUTSIDE FOOTING LINE.

2.04 NOT USED:

C. VERIFY THE LOCATION OF ALL SERVICES. NO EXTRA COST SHALL BE ALLOWED IF SERVICES ARE NOT AS SHOWN. D. DETERMINE STORM AND SANITARY SEWER ELEVATION AT POINT OF CONNECTION BEFORE INSTALLING ANY SEWER PIPING. NOTIFY ARCHITECT IMMEDIATELY

3.02 <u>RECORD DRAWINGS:</u>

LOCATIONS OF THE UNDERGROUND INSTALLATIONS AS THE WORK PROGRESSES. THIS SHALL BE RETURNED TO THE ARCHITECT AT COMPLETION OF JOB.

END OF SECTION

A. EXAMINE ALL DRAWINGS PRIOR TO BIDDING OF WORK AND REPORT ANY DISCREPANCIES IN WRITING TO THE ARCHITECT.

A. THIS SECTION APPLIES FOR ALL DIVISION 23 MECHANICAL SECTIONS. ALL

B. FURNISH AND INSTALL ANY INCIDENTAL WORK NOT SHOWN OR SPECIFIED

WHICH IS NECESSARY TO PROVIDE A COMPLETE AND WORKABLE SYSTEM.

CONDITIONS AND MATERIALS ARE PERTINENT TO THE OTHER SECTIONS AS

<u>SECTION 230500 - MECHANICAL WORK - GENERAL REQUIREMENTS</u>

CONDITIONS OF CONTRACT APPLY TO THIS SECTION.

IF REPEATED IN THOSE SECTIONS.

PART 1 – GENERAL

1.01 <u>INCLUSIONS:</u>

THE SCOPE.

MENTIONED IN BOTH.

CONTRACTOR SHALL VISIT THE SITE OF WORK AND EXAMINE EXISTING CONDITIONS IN ORDER TO BECOME FAMILIAR WITH THE SCOPE. IF DIMENSIONS ARE SHOWN ON THE PLANS, THEY SHALL BE VERIFIED AT THE SITE. DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT. FAILURE TO EXAMINE THE SITE SHALL NOT CONSTITUTE BASIS FOR CLAIMS FOR ADDITIONAL WORK BECAUSE OF LACK OF KNOWLEDGE OR LOCATION OF HIDDEN CONDITIONS WHICH COULD AFFECT

B. DRAWINGS SHOWING LOCATION OF EQUIPMENT, PIPING, DUCTWORK, ETC., ARE DIAGRAMMATIC AND JOB CONDITIONS WILL NOT ALWAYS PERMIT THEIR INSTALLATION IN THE LOCATION SHOWN. THE MECHANICAL DRAWINGS SHOW THE GENERAL ARRANGEMENT OF ALL PIPING, DUCTWORK, EQUIPMENT, ETC., AND SHALL BE FOLLOWED AS CLOSELY AS EXISTING CONDITIONS, ACTUAL BUILDING CONSTRUCTION AND THE WORK OF OTHER TRADES WILL PERMIT. THE ARCHITECTURAL AND STRUCTURAL DRAWINGS SHALL BE CONSIDERED A PART OF THE WORK INSOFAR AS THESE DRAWINGS FURNISH THE CONTRACTOR WITH INFORMATION RELATING TO DESIGN AND CONSTRUCTION OF THE BUILDING. ARCHITECTURAL DRAWINGS SHALL TAKE PRECEDENCE OVER MECHANICAL DRAWINGS. BECAUSE OF THE SMALL SCALE OF THE MECHANICAL DRAWING, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS. FITTINGS AND ACCESSORIES WHICH MAY BE REQUIRED. THE CONTRACTOR SHALL INVESTIGATE THE STRUCTURAL AND FINISH CONDITIONS AFFECTING THE WORK AND SHALL ARRANGE HIS WORK ACCORDINGLY PROVIDING SUCH FITTINGS, VALVES AND ACCESSORIES AS MAY BE REQUIRED TO MEET CONDITIONS. WHEN JOB CONDITIONS DO NOT PERMIT INSTALLATION OF EQUIPMENT, PIPING, DUCTWORK, ETC., IN THE LOCATIONS SHOWN, IT SHALL BE BROUGHT TO THE ARCHITECT'S ATTENTION IMMEDIATELY AND THE RELOCATION DETERMINED IN A JOINT CONFERENCE. CONTRACTOR WILL BE HELD RESPONSIBLE FOR THE RELOCATION OF ANY ITEMS WITHOUT FIRST OBTAINING THE ARCHITECT'S APPROVAL. CONTRACTOR SHALL REMOVE AND RELOCATE SUCH ITEMS AT HIS OWN EXPENSE IF SO DIRECTED BY

THE ARCHITECT C. EXECUTE WORK MENTIONED IN THE SPECIFICATIONS AND NOT SHOWN ON THE DRAWINGS, OR VICE VERSA, THE SAME AS IF SPECIFICALLY

1.03 <u>CODES:</u> A. PROVIDE ALL WORK AND MATERIALS IN FULL ACCORDANCE WITH THE LATEST RULES AND REGULATIONS OF THE CALIFORNIA CODE OF REGULATIONS (CCR), TITLE 21, TITLE 22, AND TITLE 24, AS APPLICABLE, SAFETY ORDERS OF THE DIVISION OF INDUSTRIAL SAFETY, (CAL OSHA); THE CALIFORNIA ELECTRIC CODE: THE CALIFORNIA PLUMBING CODE: THE CALIFORNIA BUILDING CODE; CALIFORNIA MECHANICAL CODE; CALIFORNIA FIRE CODE; STATE FIRE MARSHAL; AND OTHER APPLICABLE LAWS OR REGULATIONS. NOTHING IN THESE PLANS OR SPECIFICATIONS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

FURNISH WITHOUT EXTRA CHARGE, ANY ADDITIONAL MATERIAL AND LABOR REQUIRED TO COMPLY WITH THESE RULES AND REGULATIONS. B. WHERE MATERIAL OR EQUIPMENT IS SPECIFIED TO CONFORM TO STANDARDS SUCH AS AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM), UNDERWRITERS' LABORATORIES, INC., (UL), AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) AND THE LIKE, IT SHALL BE ASSUMED THAT

THE MOST RECENT EDITION OF THE STANDARD IN EFFECT AT THE TIME

A. PROCURE AND PAY FOR ALL PERMITS AND LICENSES REQUIRED. 1.05 FRAMING, CUTTING AND PATCHING: A. SPECIAL FRAMING, RECESSES, CHASES AND BACKING FOR WORK OF THIS SECTION, UNLESS SPECIFIED OTHERWISE, IS COVERED UNDER OTHER

SECTIONS. BE RESPONSIBLE FOR PROPER PLACEMENT OF ALL PIPE SLEEVES, HANGERS AND SUPPORTS AND LOCATION AND SIZING OF OPENINGS FOR WORK OF THIS SECTION.

OF BID SHALL BE USED.

1.04 <u>FEES AND PERMITS:</u>

1.06 <u>SUBSTITUTIONS AND MATERIAL LIST:</u> A. PRODUCT NAMES ARE USED AS STANDARDS OF QUALITY, ITEMS FURNISHED AS STANDARD ON SPECIFIED EQUIPMENT SHALL BE FURNISHED ON ALL SUBSTITUTED EQUIPMENT AT NO EXTRA COST TO THE CONTRACT REGARDLESS OF DISPOSITION OF SUBMITTAL DATA; OTHER MATERIALS OR METHODS SHALL NOT BE USED UNLESS APPROVED IN WRITING BY THE ARCHITECT. THE BURDEN OF PROOF AS TO THE EQUALITY OF ANY PROPOSED MATERIAL SHALL BE UPON THE CONTRACTOR; ARCHITECT'S DECISION IS FINAL. ONLY ONE REQUEST FOR SUBSTITUTION SHALL BE CONSIDERED FOR EACH ITEM. EQUIPMENT CAPACITIES SPECIFIED ARE MINIMUM ACCEPTABLE. SUBMITTALS WILL NOT

BE ACCEPTED UNTIL COMPLIANCE WITH THE REQUIREMENTS OF CONTRACT DOCUMENTS HAS BEEN CONFIRMED BY THE CONTRACTOR. B. UNLESS STIPULATED OTHERWISE IN GENERAL CONDITIONS AND DIVISION 1, SUBMIT A LIST OF 7 COPIES OF MATERIALS FOR APPROVAL WITHIN 35 DAYS AFTER THE AWARD OF THE CONTRACT. IT SHALL BE ACCOMPANIED BY SHOP DRAWINGS. PUMP PERFORMANCE CURVES. FAN CURVES. AND OTHER PERTINENT DATA, SHOWING THE SIZE AND CAPACITY OF THE PROPOSED MATERIALS. ALL MATERIALS TO BE USED, WHETHER

SUBSTITUTIONS OR NOT, SHALL BE LISTED IN THE ORDER IN WHICH THEY APPEAR IN THE SPECIFICATIONS. C. ANY MECHANICAL, ELECTRICAL, STRUCTURAL OR OTHER CHANGES REQUIRED FOR THE INSTALLATION OF ANY APPROVED SUBSTITUTED EQUIPMENT SHALL BE MADE TO THE SATISFACTION OF THE ARCHITECT AND WITHOUT ADDITIONAL COST TO THE OWNER. APPROVAL BY THE ARCHITECT OF THE SUBSTITUTED EQUIPMENT AND/OR DIMENSIONAL DRAWINGS DOES NOT WAIVE THESE REQUIREMENTS. UPON REQUEST, SUBMIT DRAWINGS OF MECHANICAL EQUIPMENT SPACES SHOWING

D. REVIEW OF MATERIAL SHALL NOT BE CONSTRUED AS AUTHORIZING ANY DEVIATIONS FROM THE SPECIFICATIONS UNLESS THE ATTENTION OF THE ARCHITECT HAS BEEN DIRECTED TO THE SPECIFIC DEVIATIONS. E.FURNISH TO THE PROJECT REPRESENTATIVE, UPON REQUEST, COMPLETE INSTALLATION INSTRUCTIONS ON ALL MATERIALS AND EQUIPMENT BEFORE

F.SUBMITTALS SHALL BEAR THE SPECIFICATION REFERENCE OR DRAWING

LOCATION WHERE THEY ARE SPECIFIED. SUBMITTALS SHALL NOT BE ACCEPTED IN INCOMPLETE FORM. SUBMITTALS SHALL BE ORGANIZED

INTO BOOKLETS FOR EACH SPECIFICATION SECTION AND SUBMITTED IN

INDEXED LOOSE LEAF BINDERS WITH NOTATION WHEN IT IS A DEVIATION

SUBSTITUTED EQUIPMENT BEFORE INSTALLATION.

STARTING INSTALLATION OF SAME.

FROM THE SPECIFICATIONS. G. HAVE FIRE DAMPER INSTALLATION INSTRUCTIONS AVAILABLE AT THE SITE DURING CONSTRUCTION FOR USE BY THE INSPECTOR.

1.12 <u>DELIVERY AND STORAGE:</u>

GOOD CONDITION. 2.02 <u>ELECTRIC MOTORS:</u> RECOMMENDED BY THE MANUFACTURER. MATCH THE NAMEPLATE VOLTAGE

MGI-112-53B.

2.03 <u>MOTOR STARTERS:</u>

2.04 <u>NOT USED:</u>

N. VIBRATION ISOLATION AND SUPPORTS

2. SHIELDS SHALL BE 180° GALVANIZED SHEET METAL, 12 INCH MINIMUM LENGTH, 18 GAUGE MINIMUM THICKNESS, DESIGNED TO MATCH OUTSIDE DIAMETER OF THE INSULATED PIPE, TOLCO FIG. 220.

IN ACCORDANCE WITH ASTM B633 - SC3. 3. STRUT CHANNELS SHALL BE PRE-GALVANIZED IN ACCORDANCE WITH ASTM

P.INDOOR FINISHES

A653 G90.

Q.OUTDOOR AREA FINISHES 1. HANGERS AND STRUT LOCATED OUTDOORS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALL HANGER HARDWARE SHALL BE HOT DIP GALVANIZED. ZINC PLATED HARDWARE IS NOT ACCEPTABLE FOR OUTDOOR OR CORROSIVE USE.

1. HANGERS AND CLAMPS FOR SUPPORT OF BARE COPPER PIPING SHALL BE

COATED WITH COPPER COLORED EPOXY PAINT. ADDITIONAL PVC COATING

2. HANGERS FOR OTHER THAN BARE COPPER PIPE SHALL BE ZINC PLATED

OF THE EPOXY PAINTED HANGER SHALL BE USED WHERE NECESSARY.

2.06 <u>SERVICE MARKERS:</u>

A.4" ROUND BY 30" LONG CONCRETE MARKER, HALEY MFG., CO., PINKERTON, OR EQUAL WITH ENGRAVED BRASS IDENTIFICATION PLATE

2.07 <u>NOT USED:</u>

MILCOR, NEWMAN, OR EQUAL, WITH CONCEALED HINGES, SCREWDRIVER LOCKS, PRIME COATED WITH RUST INHIBITIVE PAINT, AND STYLE OF DOOR TO SUIT CEILING OR WALL CONSTRUCTION. ACCESS DOORS IN ACOUSTICAL TILE CEILINGS SHALL BE "SESAME" WITH TILE RECESS DOORS SHALL BE 14 GAGE C.R. STEEL AND SHALL BE 22" X 30", 24" X 24" IN TILE CEILING, UNLESS OTHERWISE NOTED OR REQUIRED, FIRE RATED TO MATCH RATING OF SURFACE IN WHICH INSTALLED. DOORS IN WALLS OF TOILET ROOMS, SHALL BE STAINLESS STEEL.

2.09 <u>NOT USED:</u>

2.10 INSULATION: A.REFER TO PART 3.

2.11 <u>NOT USED:</u>

ALL FLASHINGS SHALL BE MADE OF FOUR POUND SHEET LEAD WITH 8" MINIMUM SKIRT, SEMCO S1100-2 OR S1100-4, STONEMAN #1110-2 OR 1110-4, OR EQUAL, AND COUNTER FLASHING.

PART 3 - EXECUTION 3.01 ELECTRICAL REQUIREMENTS:

COES OR ORDINANCES. THE MECHANICAL WORK SHALL BE COORDINATED WITH THE ELECTRICAL WORK IN ORDER TO COMPLY WITH THESE REQUIREMENTS. ANY WORK WHICH DOES NOT CONFORM TO THESE REGULATIONS SHALL BE PROPERLY CORRECTED WITHOUT ADDITIONAL COST B. FURNISH AND SET IN PLACE ALL MOTORS. FURNISH NECESSARY CONTROL DIAGRAMS AND INSTRUCTIONS FOR CONTROLS. BEFORE PERMITTING

MODIFIED UNDER THIS SECTION, REVIEW ALL ASSOCIATED ELECTRICAL WORK

A. PROVIDE ADEQUATE WORKING SPACE AROUND ELECTRICAL FOUIPMENT IN

COMPLIANCE WITH THE CALIFORNIA ELECTRIC CODE AND OTHER APPLICABLE

RESPONSIBILITY FOR CORRECTNESS OF ELECTRICAL CONNECTIONS AND PROTECTIVE DEVICES. C. MOTORS AND CONTROL EQUIPMENT SHALL CONFORM TO STANDARDS OF NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION. ALL EQUIPMENT AND CONNECTIONS EXPOSED TO THE WEATHER SHALL BE NEMA IIIR WITH FACTORY WIRED STRIP HEATERS IN EACH STARTER ENCLOSURE, AND

D. ALL POWER WIRING, CONDUIT, FUSES, THERMAL OVERLOADS, AND

TEMPERATURE CONTROL PANEL TO INHIBIT CONDENSATION.

OPERATION OF ANY EQUIPMENT WHICH IS FURNISHED, INSTALLED OR

INCLUDING OVERLOAD PROTECTION DEVICES AND ASSUME COMPLETE

DISCONNECT SWITCHES, AND CONNECTION OF ALL MOTORS ARE UNDER ELECTRICAL WORK, DIVISION 26. ALL WIRING AND CONDUIT ASSOCIATED WITH THE TEMPERATURE CONTROL AND INDICATING SYSTEM IS INCLUDED IN THIS SECTION. RUN ALL WIRING IN CONDUIT IN ACCORDANCE WITH DIVISION 26. E. ELECTRIC MOTORS: ALL MOTORS SHALL BE RATED FOR CONTINUOUS OPERATION AT 115% OF NAMEPLATE AMPERAGE THROUGHOUT THE ENTIRE

OPERATING CYCLE. MOTORS FOUND EXCEEDING THE NAMEPLATE AMPERAGE

HORSEPOWERS SHOWN ARE MINIMUM AND SHALL BE INCREASED AS NECESSARY TO COMPLY WITH ABOVE REQUIREMENTS. F. MOTOR STARTERS: FURNISH MAGNETIC MOTOR STARTER FOR ALL

EQUIPMENT FURNISHED UNDER THIS SECTION EXCEPT THOSE SHOWN IN

SHALL BE PROMPTLY REPLACED AT NOT COST TO THE OWNER.

G. PROVIDE OSHA LABEL INDICATING DEVICE STARTS AUTOMATICALLY. 3.02 PRIMING AND PAINTING:

A. PERFORM ALL PRIMING AND PAINTING ON THE EQUIPMENT AND MATERIALS AS SPECIFIED HEREIN. B. PRIMING: EXPOSED FERROUS METALS, INCLUDING PIPING, WHICH ARE NOT GALVANIZED OR FACTORY FINISHED SHALL BE PRIMED. BLACK STEEL PIPE EXPOSED TO THE WEATHER SHALL BE PAINTED ONE COAT OF RUST-OLEUM #769 PRIMER AND ONE COAT OF #960 PRIMER. ITEMS TO BE PRIMED SHALL BE PROPERLY CLEANED BY EFFECTIVE MEANS, FREE OF RUST, DIRT, SCALE, GREASE, WAX AND OTHER DELETERIOUS MATTER. ANY ABRASION OR OTHER DAMAGE TO THE SHOP OR FIELD PRIME COAT SHALL

BE PROPERLY REPAIRED AND TOUCHED UP WITH THE SAME MATERIAL USED FOR THE ORIGINAL PRIMING.

C. FINISH PAINTING: 1. EQUIPMENT AND MACHINERY LOCATED AT LOCATIONS WHEN SPECIFIED, SHALL BE FURNISHED WITH A STANDARD FACTORY—APPLIED BAKED ENAMEL FINISH IN APPROVED UNIFORM COLORS. AT THE CONTRACTOR'S OPTION, EQUIPMENT AND MACHINERY MAY BE FIELD-PAINTED HEREUNDER WITH TWO COATS CONSISTING OF AN AIR-DRIED SYNTHETIC INDUSTRIAL ENAMEL UNDERCOATER AND ENAMEL AS APPROVED OVER THE SHOP OR FACTORY-APPLIED PRIMER. ALL EXPOSED FERROUS METALS SHALL BE

D. SEE PAINTING SECTION FOR DETAIL REQUIREMENTS AND FINISHES.

3.03 <u>NOT USED:</u> 3.04 <u>NOT USED:</u>

3.07 <u>NOT USED:</u> 3.08 <u>NOT USED:</u>

3.09 <u>NOT USED:</u>

3.11 <u>NOT USED:</u>

MOTOR CONTROL CENTERS.

PAINTED ONE COAT OF AN APPROVED PAINT, OF COLOR SELECTED, OVER

3.05 <u>NOT USED:</u> 3.06 <u>NOT USED:</u>

3.10 <u>NOT USED:</u>

# SECTION 230510 - HEATING, VENTILATING AND AIR CONDITIONING

SECTION 230510 - HEATING, VENTILATING AND AIR CONDITIONING

CONDITIONS OF THE CONTRACT APPLY TO THIS SECTION.

PART 1 – GENERAL 1.01 RELATED DOCUMENTS:

- A. THE REQUIREMENTS OF THE GENERAL CONDITIONS APPLY TO ALL WORK HEREUNDER, ALSO APPLICABLE PROVISIONS OF SECTION 230500 MECHANICAL WORK - GENERAL REQUIREMENTS.
- B. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS APPLY TO THE WORK OF THIS
- 1.02 <u>DESCRIPTION OF WORK:</u>
- A. FURNISH AND INSTALL ALL HEATING, VENTILATING AND AIR CONDITIONING WORK INDICATED ON THE DRAWINGS AND DESCRIBED HEREIN. ALSO ANY INCIDENTAL WORK NOT SHOWN OR SPECIFIED THAT IS NECESSARY TO PROVIDE THE COMPLETE SYSTEM.
- 1.03 COORDINATED LAYOUTS:
- A. SINCE SCALE OF CONTRACT DRAWINGS IS SMALL AND ALL OFFSETS AND FITTINGS ARE NOT SHOWN, CONTRACTOR SHALL MAKE ALLOWANCES IN BID FOR ADDITIONAL COORDINATION TIME, DETAILING, FITTINGS, OFFSETS, HANGERS AND THE LIKE TO ACHIEVE A FULLY COORDINATED INSTALLATION. IF CHANGES IN DUCT SIZE ARE REQUIRED, EQUIVALENT AREA SHALL BE MAINTAINED AND THE ASPECT RATIO SHALL NOT BE IN EXCESS OF 2 TO 1 UNLESS APPROVED BY THE ENGINEER. DRAWINGS SHALL BE SUBMITTED FOR REVIEW PRIOR TO FABRICATION AND INSTALLATION.
- B. CHECK ROUTING ON ALL DUCTWORK BEFORE FABRICATING. REPORT ANY DISCREPANCIES TO ARCHITECT. NO EXTRA COST WILL BE ALLOWED FOR FAILURE TO CONFORM TO ABOVE.
- C.IT SHALL BE RESPONSIBILITY OF HEATING, VENTILATING AND AIR ELECTRICAL TRADES SO THAT COMPLETE JOB IS NEAT AND IN CONFORMITY WITH PLANS AND SPECIFICATIONS.
- 1.04 PLUMBING:

ALL MATERIALS SHALL BE NEW AND SHALL MATCH EXISTING.

- A. ALL PLUMBING WORK REQUIRED IN THE COURSE OF THIS CONTRACT SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ALL CODES AND REGULATIONS. PLUMBING WORK DONE UNDER THIS CONTRACT SHALL NOT ADVERSELY AFFECT THE OPERATION OF THE EXISTING PLUMBING SYSTEMS.
- PART 2 PRODUCTS 2.01 PIPE AND FITTINGS:
- B. WATER DRAIN, OR GAS CONNECTIONS TO EQUIPMENT SHALL MATCH CONNECTED PIPING.
- C. CONDENSATE DRAIN PIPING: TYPE DWV COPPER TUBING AND FITTINGS 2.02 <u>FANS:</u>
- A.ALL FANS AMCA LABELED WITH SELF ALIGNING, ENCLOSED BALL BEARINGS, ACCESSIBLE FOR LUBRICATION, UNLESS SPECIFIED OTHERWISE.
- 2.03 FAN DRIVES: A. DRIVE DESIGN: THE DESIGN HORSEPOWER RATING OF EACH DRIVE SHALL BE AT LEAST 1.5 TIMES, SINGLE BELT DRIVES 2 TIMES, THE NAME PLATE RATING OF THE MOTOR WITH PROPER ALLOWANCES FOR SHEAVE
- 1. ALL DRIVES SHALL BE VARIABLE SPEED, DAYCO, BROWNING OR WOODS ALLOW FOR REPLACEMENT OF FAN DRIVE AND BELT AS REQUIRED TO SUITE THE BALANCE REQUIREMENTS OF THE PROJECT.

DIAMETERS, SPEED RATIO, ARCS OF CONTACT AND BELT LENGTH.

- 2. ALL DRIVES FOR 5 HORSEPOWER MOTORS AND LARGER SHALL HAVE A MINIMUM OF 2 BELTS.
- 3. BELTS SHALL BE WITHIN 1 DEGREE 30 MINUTES OF TRUE ALIGNMENT IN
- 4. ALL VARIABLE SPEED DRIVES SHALL BE SELECTED TO ALLOW AN INCREASE OR DECREASE OF MINIMUM OF 10% OF DESIGN FAN SPEED. 5. MOTORS OF 25 HP AND LESS SHALL HAVE ADJUSTABLE PITCH SHEAVES; SHEAVES ON MOTORS ABOVE 25 HP MAY BE NON-ADJUSTABLE. CHANGE, 3.07 DAMPERS:
- AT NO EXTRA COST TO OWNER, THE NON-ADJUSTABLE SHEAVES TO OBTAIN DESIRED AIR QUANTITIES. B. SHEAVES: SHEAVES SHALL BE CAST OR FABRICATED, BORED TO SIZE OR BUSHED WITH FULLY SPLIT TAPERED BUSHINGS TO FIT PROPERLY ON THE SHAFTS. ALL SHEAVES SHALL BE SECURED WITH KEYS AND SET SCREWS.
- C. BELTS: ALL BELTS SHALL BE FURNISHED IN MATCHED SETS.
- THE DRAWINGS.
- B. AIR FILTERS SHALL BE OF AN APPROVED TYPE TESTED IN ACCORDANCE WITH TEST METHOD SFM-12-71-1 AS SHOWN IN PART 12, TITLE 24, CALIFORNIA CODE OF REGULATIONS. PREFORMED FILTERS HAVING COMBUSTIBLE FRAMING SHALL BE TESTED AS A COMPLETE ASSEMBLY.

A. FILTERS SHALL BE 2" THICK FARR 30/30, THROWAWAY AS SCHEDULED ON

- C. AIR FILTERS SHALL BE ACCESSIBLE FOR CLEANING. 2.05 <u>DAMPERS:</u>
- A. BACKDRAFT DAMPERS: RUSKIN CBD2, COUNTERBALANCED
- B. MANUAL AIR AND BALANCE DAMPERS: RUSKIN CD35, OPPOSED BLADE
- A. GALVANIZED SHEET METAL, SEE PART 3
- 2.07 TEMPERATURE CONTROL SYSTEM:
- SEE CONTROLS SPECIFICATIONS
- PART 3 EXECUTION 3.01 <u>EQUIPMENT START-UP:</u>
- A. INITIAL START-UP OF SUPPLY, EXHAUST AND RETURN FAN SYSTEMS AND PUMPS SHALL BE UNDER THE DIRECT SUPERVISION OF THE TESTING AND BALANCING CONTRACTOR.
- 3.02 <u>NOT USED:</u>
- 3.03 <u>NOT USED:</u>
- 3.04 ANTI-VIBRATION BASES AND HANGERS:
- A. ISOLATE ALL VENTILATING AND AIR CONDITIONING EQUIPMENT CONNECTIONS INCLUDING CONDUIT, PIPING, DRAINS, ETC., SO THAT EQUIPMENT WILL OPERATE UNDER CONTINUOUS DEMAND WITHOUT OBJECTIONABLE VIBRATION.
- B. SET ALL AIR CONDITIONING UNITS ON NEOPRENE GASKETS. OTHER EQUIPMENT SHALL BE SUPPORTED ON ANTI-VIBRATION BASES, PADS, OR HANGERS, AS SHOWN ON THE DRAWINGS OR SPECIFIED WITH THE EQUIPMENT. INDIVIDUAL FANS SHALL HAVE INTEGRAL FAN AND MOTOR BASES, SPRING-TYPED UNLESS NOTED.
- . SELECTION OF THE BASES OR SUPPORTING UNITS SHALL BE IN ACCORDANCE WITH THE VIBRATION ELIMINATOR MANUFACTURER'S RECOMMENDATIONS. MINIMUM STATIC DEFLECTION SHALL BE 1-1/2" OR AS MARKED ON THE DRAWINGS.
- D. THE EQUIPMENT MANUFACTURER SHALL FURNISH THE WEIGHT OF EQUIPMENT AT EACH POINT OF SUPPORT.

#### 3.05 SHEET METAL WORK:

SEMCO, OR EQUAL.

- A. CONSTRUCT AND INSTALL ALL SHEET METAL IN ACCORDANCE WITH LATEST SMACNA RECOMMENDATIONS FOR 2" STATIC PRESSURE. PROVIDE VARIATIONS IN DUCT SIZE, AND ADDITIONAL DUCT FITTINGS AS REQUIRED TO CLEAR OBSTRUCTIONS AND MAINTAIN CLEARANCES, AS APPROVED BY THE ARCHITECT, AT NO EXTRA COST TO OWNER.
- B. PROVIDE DRIVE SLIP OR EQUIVALENT FLAT SEAMS FOR DUCTS WHERE NECESSARY DUE TO SPACE LIMITATIONS. ON DUCTS WITH FLAT SEAMS, PROVIDE STANDARD REINFORCING ON INSIDE OF DUCT. DUCT CONNECTION TO OUTLET ON EXPOSED DUCT SHALL BE FULL SIZE OF OUTER PERIMETER OF OUTLET FLANGE.
- 1. DUCTS EXPOSED IN THE CONDITIONED SPACE SHALL BE FREE OF DENTS AND BLEMISHES AND BE MOUNTED TIGHT AGAINST ADJACENT SURFACE WITH FLAT HANGERS.
- 2. ALL DUCTWORK, ADHESIVES, LINING, SEALANTS, FLEX DUCT AND THE LIKE SHALL HAVE A FLAME SPREAD OF 25 OR LESS AND DEVELOPED SMOKE RATING OF 50 OR LESS WHEN TESTED IN ACCORDANCE WITH ASTM E84.
- C. ROUND DUCTS WITH EQUIVALENT EFFECTIVE CROSS SECTIONAL AREA AS DETERMINED BY ASHRAE GUIDE. LATEST EDITION. MAY BE USED IN LIEU OF CONCEALED RECTANGULAR DUCTS SHOWN, SPACE PERMITTING. ROUND AND OVAL SHEET METAL DUCTS SHALL BE SPIRAL LOCK SEAM OR LONGITUDINAL CONSTRUCTION SEAM CONSTRUCTION. FITTINGS SHALL BE CONTINUOUS WELD OR SPOT WELD AND SEAL. UNITED SHEET METAL,
- D. THE THROAT RADIUS OF ALL BENDS SHALL BE 1-1/2 TIMES THE WIDTH OF THE DUCT WHEREVER POSSIBLE AND IN NO CASE SHALL THE THROAT RADIUS BE LESS THAN ONE WIDTH OF THE BRANCH DUCT. PROVIDE SQUARE ELBOWS WITH TITUS OR HEP DOUBLE THICKNESS TURNING VANES WHERE SPACE DOES NOT PERMIT THE ABOVE RADIUS, OR WHERE SQUARE
- CONDITIONING CONTRACTOR TO COORDINATE THE OTHER MECHANICAL AND E. THE SLOPES OF TRANSITIONS SHALL BE APPROXIMATELY ONE TO FIVE UNLESS SHOWN OTHERWISE, AND NO ABRUPT CHANGES OR OFFSETS OF ANY KIND IN THE DUCT SYSTEM SHALL BE PERMITTED.
  - F. PROVIDE SHEET METAL ANGLE FRAME AT ALL DUCT PENETRATIONS TO WALL, FLOOR, OR CEILING. G. ALL ROUND DUCTWORK SHALL BE UNITED SHEET METAL SPIRAL DUCT AND
  - FITTINGS. ASSEMBLE WITH HARDCAST VERSA GRIP 181 DUCT SEALER AND SHEET METAL SCREWS. H. EXPOSED ROUND DUCTS SHALL BE UNITED SHEET METAL SPIRAL DUCT
- AND FITTINGS, 22 GAUGE MINIMUM FOR DUCT, 20 GAUGE MINIMUM FOR FITTINGS. ASSEMBLE WITH HARDCAST VERSA GRIP 181 DUCT SEALER AND A. SEE GENERAL REQUIREMENTS SECTION FOR DIELECTRIC FITTINGS AND PIPE I. PROVIDE VENTLON FLEXIBLE CONNECTIONS ON INLET AND OUTLET OF AC
  - UNIT, AIR HANDLER, AND HEATING/EVAPORATIVE COOLER UNIT. PROVIDE GALVANIZED WEATHER HOOD OVER FLEXIBLE CONNECTIONS EXPOSED TO J. DUCT SIZE SHOWN ON LINED DUCT IS THE OUTSIDE DIMENSION.
  - L. FLEXIBLE DUCTS NOT USED M.PROVIDE SEISMIC BRACING PER SMACNA STANDARDS FOR DUCTWORK 28"

K. PAINT INSIDE OF DUCTS, VISIBLE THROUGH GRILLE, DULL BLACK.

- DIAMETER AND LARGER AND DUCTWORK 6 SQUARE FEET AND LARGER. N. DUCTS SHALL CLEAR COMBUSTIBLE CONSTRUCTION BY 1" MINIMUM. O. SEAL AIRTIGHT TRANSVERSE SEAMS OF ALL SUPPLY AND RETURN DUCTS
- P. PROVIDE VENTLOK #699 TEST HOLE FITTINGS WHERE INDICATED OR

WITH HARDCAST FOIL GRIP 1402-181 BFX; SEAL INSULATED DUCTS

- Q. ALL MATERIALS EXCEPT SHEET METAL INCLUDING DUCT LINER SHALL BE APPROVED BEFORE INSTALLATION. 3.06 ANTI-VIBRATION ISOLATION:
- A. ISOLATE ALL VENTILATING AND AIR CONDITIONING EQUIPMENT CONNECTIONS INCLUDING CONDUIT, PIPING, DRAINS, ETC., SO THAT EQUIPMENT WILL OPERATE UNDER CONTINUOUS DEMAND WITHOUT OBJECTIONABLE

- A. ALL DAMPERS AUTOMATICALLY CONTROLLED BY DAMPER MOTORS ARE SPECIFIED UNDER "TEMPERATURE CONTROL SYSTEM" EXCEPT THOSE SPECIFIED WITH ITEMS OF EQUIPMENT.
- B. PROVIDE OPPOSED BLADE MANUAL AIR DAMPERS AT EACH BRANCH DUCT CONNECTION AND AT LOCATIONS INDICATED ON THE DRAWINGS AND WHERE NECESSARY TO CONTROL AIR FLOW FOR BALANCING SYSTEM. PROVIDE VENTLOK REGULATORS WITH LOCKING QUADRANT AND STANDOFF. DAMPER BLADES SHALL BE 16 GAUGE MINIMUM GALVANIZED STEEL WITH 3/8" MINIMUM SHAFT, AND 10" MAXIMUM BLADE WIDTH. PROVIDE AN ACCESS PANEL OR VENTLOK FLUSH-TYPE DAMPER REGULATOR ON CEILING OR WALL FOR EACH CONCEALED DAMPER.
- 1. PROVIDE VENTLOK ACCESS DOORS WITH SERIES 100 HARDWARE FOR CONVENIENT ACCESS TO ALL AUTOMATIC DAMPERS AND OTHER COMPONENTS OF THE SYSTEM, INSULATED TYPE IN INSULATED DUCTS. PROVIDE VENTLOK #202 FOR LIGHT DUTY UP TO 2" THICK DOORS, #260 HEAVY DUTY UP TO 2"K THICK DOORS AND #310 HEAVY DUTY FOR GREATER THAN 2" THICK DOORS. PROVIDE #260 HINGES ON ALL HINGED AND PERSONNEL ACCESS DOORS, INCLUDE GASKETING.
- 3.08 AIR INLETS AND OUTLETS:
- NOT USED
- A. EACH CEILING-MOUNTED FAN SHALL HAVE AN INTEGRAL BACKDRAFT
- B. COMPLETELY LINE SUPPLY, RETURN OR EXHAUST FAN CABINETS WITH 1" THICK, 3/4 LBS. DENSITY ACOUSTIC INSULATION SECURELY CEMENTED IN
- C. ROOF FANS SHALL BE MOUNTED LEVEL. 3.10 <u>TEMPERATURE CONTROL SYSTEM:</u>
- B. COORDINATE WITH THE REQUIREMENTS OF THIS SECTION.

#### 3.11 EQUIPMENT CHECK, TEST AND START:

- A. THE CHECK, TEST AND START OF EACH AIR CONDITIONING UNIT, MAKE-UP AIR UNIT, AIR HANDLER UNIT AND GAS UNIT HEATER SHALL BE PERFORMED. THE COMPANY SHALL HAVE HAD EXPERIENCE ON SIMILAR PROJECTS AND SHALL HAVE DEMONSTRATED BY PAST PERFORMANCE THAT THE PERSONNEL ARE QUALIFIED TO DO SUCH WORK. THE FIRM SELECTED SHALL HAVE APPROVAL OF THE ARCHITECT PRIOR TO START OF
- B. THE COMPANY SHALL PROVIDE ALL PERSONNEL, TEST INSTRUMENTS, AND EQUIPMENT TO PROPERLY PERFORM THE CHECK, TEST AND START. C. THE CHECK, TEST AND START OF EACH ITEM OF EQUIPMENT SHALL BE IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTRUCTIONS. THREE (3) COPIES OF THE COMPLETED CHECK, TEST AND START REPORT OF EACH ITEM OF EQUIPMENT SHALL BE BOUND WITH THE OPERATING AND
- D. UPON COMPLETION OF THE WORK, PROVIDE A SCHEDULE OF PLANNED MAINTENANCE INDICATING FREQUENCY OF SERVICE FOR ALL EQUIPMENT COMPONENTS. POST SCHEDULE WHERE DIRECTED UNDER PLASTIC.
- 3.12 TESTING AND BALANCING:
- BALANCING OF AIR CONDITIONING SYSTEMS. B. COORDINATE WORK DONE BY TESTING AND BALANCING AGENCY WITH WORK
- TESTING AND BALANCING AGENCY, AS A PART OF ITS CONTRACT, SHALL ACT AS AUTHORIZED INSPECTION AGENCY AND SHALL REPORT ANY DISCREPANCIES OR ITEMS NOT INSTALLED IN ACCORDANCE WITH CONTRACT DRAWINGS AND/OR SPECIFICATIONS PERTAINING TO AIR AND WATER DISTRIBUTION, AND EXHAUST SYSTEMS.
- ACCORDANCE WITH AABC NATIONAL STANDARDS FOR FIELD MEASUREMENT AND INSTRUMENTATION, VOLUME FOUR. TESTING AND BALANCING SHALL BE PERFORMED ON AIR DISTRIBUTION SYSTEM AND OTHER SYSTEMS SHOWN ON DRAWING WITH DESIGN FLOWS LISTED.
- GIVEN ON DRAWINGS. MEASURE THE TOTAL AIR QUANTITY AT EACH FAN. MEASURE THE TOTAL AIR QUANTITY AT EACH SUPPLY FAN WITH MAXIMUM OUTSIDE AIR AND WITH MINIMUM OUTSIDE AIR. MEASURE THE AMPERE READING OF EACH MOTOR INPUT AFTER FINAL ADJUSTMENTS HAVE BEEN MADE. PROVIDE STATIC PRESSURE PROFILE FOR EACH AIR MOVING EQUIPMENT. UPON SATISFACTORY COMPLETION OF BALANCE AND OPERATIONAL TEST, SUBMIT THREE (3) SETS OF REPORTS TO THE ARCHITECT ON BALANCE FINAL READINGS, SUMMARY OF FAN CFM
- NAMEPLATE RATINGS SHALL BE LISTED WITH MEASURED READINGS. G. INSTRUMENTS USED FOR TESTING AND BALANCING OF SYSTEMS SHALL HAVE BEEN CALIBRATED WITHIN A PERIOD OF SIX (6) MONTHS AND SHALL
- H. THREE (3) COPIES OF COMPLETE TEST REPORT SHALL BE SUBMITTED PRIOR TO FINAL ACCEPTANCE OF PROJECT.

#### I. TABULATE MAGNETIC STARTERS SIZE, TYPE, AND MANUFACTURER WITH HEATER STRIP SIZE, TYPE AND RATING ALONG WITH MOTOR NAMEPLATE

- K. ADJUST SINGLE OR DOUBLE DEFLECTION REGISTERS AND VARIABLE PATTERN DIFFUSERS TO EVENLY DISTRIBUTE AIR WITHIN THE CONDITIONED SPACE. THE TERMINAL AIR VELOCITY AT 5' ABOVE THE FLOOR SHALL NOT EXCEED 50 FPM IN NORMAL AIR CONDITIONED SPACES. . MEASURE THE AMPERE READING OF EACH MOTOR INPUT AFTER FINAL ADJUSTMENTS HAVE BEEN MADE.
- COMPLIANCE WITH DRAWINGS DETAILS. ALTERNATE ANCHORAGE METHODS

#### WIRELESS ENERGY MANAGEMENT SYSTEM PART 1 GENERAL

SECTION 23 09 23

1. SYSTEM CONFIGURATION DIAGRAMS IN SIMPLIFIED BLOCK FORMAT.

4. COMPLETE BILL OF MATERIALS. SEQUENCE OF OPERATIONS.

AUTOCAD DRAWINGS.

OF SYSTEMS OF THIS SECTION.

FOR A COMPLETE AND OPERABLE SYSTEM.

1.04 SCOPE OF WORK

FOR OWNER'S PERSONNE

HAVING JURISDICTION.

1.05 SYSTEM DESCRIPTION

THE SUBCONTRACTORS

C. RELATED WORK

MAXIMUM OF 48" ABOVE THE FLOOR.

D. EQUIPMENT START-UP AND SERVICING

MAINTENANCE, AND OPERATION OF ALL PURCHASED ITEMS.

2. ALL INPUT/OUTPUT OBJECT LISTINGS AND AN ALARM POINT SUMMARY

3. ELECTRICAL DRAWINGS THAT SHOW ALL SYSTEM INTERNAL AND EXTERNAL

5. MANUFACTURER'S INSTRUCTIONS AND DRAWINGS FOR INSTALLATION,

6. OVERALL SYSTEM OPERATION AND MAINTENANCE INSTRUCTIONS—-INCLUDING

INCLUDING MANUFACTURES DESCRIPTIVE LITERATURE. OPERATING

INSTRUCTIONS AND MAINTENANCE AND REPAIR DATA ALL IN ACCORDANCE

WITH THE REQUIREMENTS OF THE GENERAL MECHANICAL SPECIFICATION

PREVENTIVE MAINTENANCE AND TROUBLESHOOTING INSTRUCTIONS.

C. ALL SHOP DRAWINGS SHALL BE PREPARED IN AUTOCAD 2010 OR NEWER. IN ADDITION.

INFORMATION TO OTHER TRADES AS REQUIRED. DRAWINGS SHALL BE SUBMITTED ON

D. ALL SUBMITTALS SHALL BE BOUND OR IN A THREE RING BINDER WITH A TABLE OF

. SHOP DRAWINGS SHALL INCLUDE BASIC FLOOR PLANS DEPICTING LOCATIONS OF ALL

5. SUBMITTAL DATA SHALL CONTAIN MANUFACTURER'S DATA ON ALL HARDWARE AND

FOR REVIEW PRIOR TO ORDERING OR FABRICATION OF THE EQUIPMENT. THE

SOFTWARE PRODUCTS, BILL OF MATERIALS, SEQUENCE OF OPERATION, ENGINEERED

3. SUBMIT FIVE (6) COPIES OF SUBMITTAL DATA AND SHOP DRAWINGS TO THE ENGINEER

CONTRACTOR PRIOR TO SUBMITTING SHALL CHECK ALL DOCUMENTS FOR ACCURACY.

MADE TO THE SATISFACTION OF THE DISTRICTS ENGINEER AND THE SUBMITTALS ARE

A. EXCEPT AS OTHERWISE NOTED, THE CONTROL SYSTEM SHALL CONSIST OF ALL NEW

B. THE EMS CONTRACTOR SHALL REVIEW AND STUDY EXISTING BUILDING/SITE CONDITIONS

THEMSELVES WITH THE EQUIPMENT AND SYSTEM OPERATION PRIOR TO BIDDING AND

SUBMITTAL OF A BID/PRICE AND NOTIFY THE OWNER IMMEDIATELY OF ANY CONFLICTS

D. WHEN THE EMS SYSTEM IS FULLY INSTALLED AND OPERATIONAL, THE EMS CONTRACTOR

THE OWNER TO REVIEW THE AS-INSTALLED CONDITION OF THE SYSTEM. AT THAT TIME

INCLUDING ALL NECESSARY HARDWARE AND ALL OPERATING AND APPLICATIONS SOFTWARE

EXIST OR AS REQUIRED BY TITLE 24 OR THE SPECIFICATION AND CRITERIA DRAWINGS.

WHERE HVAC UNITS HAVE ECONOMIZERS. NEW ECONOMIZER CONTROLS ARE REQUIRED.

WITH DEMAND VENTILATION (PER TITLE 24). WHERE HVAC UNITS DO NOT HAVE

H. ALL WORK PERFORMED UNDER THIS SECTION OF THE SPECIFICATIONS WILL BE IN

COMPLIANCE WITH ALL CODES AND REGULATIONS AS MANDATED BY THE AUTHORITY

A. THE ENERGY MANAGEMENT SYSTEM (EMS) SHALL CONSIST OF THERMOSTATS, WIRING,

PROGRAMMING FOR A COMPLETE AND FULLY OPERATIONAL WEB BASED MANAGEMENT

BE ACCESSIBLE EITHER LOCALLY OR REMOTELY VIA THE INTERNET.

A. THE EMS CONTRACTOR SHALL COORDINATE WITH THE SUBCONTRACTORS CONTINUOUSLY

B. LOW VOLTAGE THERMOSTAT WIRING BETWEEN EQUIPMENT AND THERMOSTAT LOCATIONS SHALL BE FURNISHED AND INSTALLED. UNLESS NOTED OTHERWISE ALL NEW LOW

VOLTAGE WIRING SHALL BE MULTIPLE CONDUCTOR THERMOSTAT WIRING. (WIRING IN

MANUFACTURER'S STANDARD SPECIFICATIONS, MULTIPLE C CONDUCTOR/24 GAUGE

CONDUCTOR COUNTS DEPENDING ON HEATING AND COOLING MODES OF EXISTING

THERMOSTAT WIRING PREFERRED - SEE INSTALLATION INSTRUCTIONS FOR SPECIFIC

TO ACHIEVE A COMPLETE AND NEAT INSTALLATION. THE OWNER'S REPRESENTATIVE SHALL

BE IMMEDIATELY NOTIFIED IF AN AREA OF CONFLICT OCCURS BETWEEN TRADES PRIOR TO

FABRICATION AND INSTALLATION. EMS CONTRACTOR SHALL PROVIDE FIELD SUPERVISION TO

EXISTING INSTALLATIONS SHALL BE MINIMUM 3 CONDUCTOR / 24 GAUGE WIRES PER EMS

EQUIPMENT.) ALL THERMOSTATS SHALL BE INSTALLED TO MEET ADA REQUIREMENTS AT A

1. 110 V OUTLETS SHALL BE PROVIDED WITHIN 5 FEET OF EACH GATEWAY

2. 1 DATA PORT SHALL BE PROVIDED WITHIN 10 FEET OF EACH GATEWAY

2. CALIFORNIA ENERGY COMMISSION OCCUPANT CONTROL SMART THERMOSTAT

THE ENTIRE ENERGY MANAGEMENT SOLUTION (EMS) SHALL INCLUDE A NETWORK

OF COMMERCIAL INTERNET PROGRAMMABLE THERMOSTATS WHICH USE IEEE

802.15.4 MESH WIRELESS COMMUNICATION PROTOCOL TO REACH A WIRELESS

GATEWAY (WG). THE WG MUST CONNECT TO THE OWNER'S WIDE AREA NETWORK

(WAN) OVFR A TCP/IP CONNECTION, ACCESS AND CONTROL OF EMS IS THROUGH

A WEB BASED MANAGEMENT TOOL WHICH SITS ON A CLOUD SERVER AND MUST

GATEWAYS AND RELATED ACCESSORIES AS INDICATED BELOW AND ALL RELATED

SYSTEM USING A CLOUD SERVER PROGRAM COMPLYING WITH THE FOLLOWING

F. PROVIDE TECHNICAL SUPPORT NECESSARY FOR COMMISSIONING OF SYSTEM

NECESSARY TO PERFORM THE CONTROL SEQUENCES OF OPERATION AS THEY CURRENTLY

ECONOMIZERS. NEW EMS CONTROLS ARE REQUIRED WITHOUT NEW ECONOMIZERS. WHERE

FXHAUST FANS ARE INTERLOCKED WITH HVAC UNITS. MAINTAIN OPERATION OF FXHAUST

G. CONTRACTOR SHALL PROVIDE ONE TRAINING SESSION IN THE OPERATION OF THE SYSTEM,

FANS TO OPERATE IN SIMILAR SEQUENCE. PROVIDE APPROPRIATE RELAYS AND WIRING.

. THE CONTRACTOR SHALL FURNISH AND INSTALL A COMPLETE EMS CONTROL SYSTEM

WILL MAKE THEMSELVES AVAILABLE TO MEET WITH THE DESIGNATED REPRESENTATIVES OF

AND AND THE ENTIRE PROJECT SPECIFICATIONS AND CRITERIA TO FAMILIARIZE

C. ALL EQUIPMENT AND INSTALLATION OF CONTROL DEVICES ASSOCIATED WITH THE

EQUIPMENT LISTED BELOW SHALL BE PROVIDED UNDER THIS CONTRACTOR.

THAT IT COMPLIES WITH THE INTENT OF THE DRAWINGS AND SPECIFICATIONS.

BETWEEN THE PROJECT AND THE SCOPE OF WORK OF THIS SECTION.

TO THE CONTRACTOR. THE CONTRACTOR WILL THEN RESUBMIT WITH THE CORRECTED OR

ADDITIONAL DATA. THIS PROCEDURE SHALL BE REPEATED UNTIL ALL CORRECTIONS ARE

THERMOSTATS, AND GATEWAYS TO FILL THE INTENT OF THE SPECIFICATION AND PROVIDE

EQUIPMENT AND WIRING, INSTALLED BY OTHERS, TO BE CONTROLLED BY SYSTEM AND

LOCATIONS OF THERMOSTATS, GATEWAYS AND OTHER EQUIPMENT PROVIDED UNDER THIS

WIRING AND DATA PORTS, PROVIDED BY OTHERS, REQUIRED FOR PROPER INSTALLATION

SECTION. DRAWINGS SHALL ALSO SHOW LOCATION OF ELECTRICAL POWER, LOW VOLTAGE

CONTRACTOR SHALL PROVIDE DRAWINGS IN ELECTRONIC FORMAT WITH X-REF AND LAYER

CONTENTS AND RELATED SECTION TABS. SUBMITTALS SHALL ALSO BE ELECTRONIC IN PDF

CONNECTION POINTS, TERMINAL BLOCK LAYOUTS, AND TERMINAL

1.01 SUMMARY SECTION INCLUDES EQUIPMENT AND PERFORMANCE CRITERIA FOR FURNISHING ALL LABOR AND MATERIALS FOR THE INSTALLATION AND PROGRAMMING FOR ENERGY MANAGEMENT SYSTEM FOR HVAC SYSTEMS UTILIZING WIRELESS (NON DDC) COMMUNICATION WITH CLOUD BASED SERVERS.

- 1.02 RELATED SECTIONS: A. SECTION 23: HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC) 1.03 SUBMITTALS:
- A. FIELD SURVEY. PROVIDE FIELD SURVEY OF THE SCHOOL TO UNDERSTAND THE SCOPE, QUANTITY OF SYSTEMS, RESTRAINTS, ROUTING LOCATIONS, ETC. FIELD SURVEY OF EACH MAINTENANCE INSTRUCTIONS. VERIFY ECONOMIZER CYCLE, HEATING SCHOOL IS MANDATORY PRIOR TO BID. CYCLE, AND COOLING CYCLE EACH PERFORM PROPERLY. B. SYSTEM DOCUMENTATION INCLUDE THE FOLLOWING IN SUBMITTAL PACKAGE:
- A. OBTAIN THE SERVICE OF AN INDEPENDENT TEST AND BALANCE AGENCY THAT SPECIALIZED IN, AND WHOSE BUSINESS IS LIMITED TO, TESTING AND
- OF OTHER TRADES.
- D. CONTRACTOR SHALL PROVIDE FOR ADJUSTMENTS AND/OR ADDITIONS OR MODIFICATIONS TO FAN AND MOTOR SHEAVES, BELTS, DAMPER LINKAGES AND THE LIKE TO ACHIEVE PROPER AIR BALANCE AT NO ADDITIONAL
- E. TESTING AND BALANCING SHALL BE PERFORMED IN COMPLETE
- F. BALANCE AIR QUANTITIES OF SUPPLY AND EXHAUST TO ACHIEVE THOSE
- DELIVERY RATES, STATIC PRESSURE RATINGS, MOTOR AMPERE INPUT, AND GENERAL SUMMARY OF TEST RESULTS. SPECIFIED RATINGS AND MOTOR
- BE CHECKED FOR ACCURACY PRIOR TO START OF WORK.

- J. AIR BALANCE SHALL BE ACHIEVED USING VARIABLE FAN SPEEDS.
- M. MEASURE SUPPLY AIR, OUTSIDE AIR, AND MIXED AIR TEMPERATURE FOR EACH CYCLE OF AIR CONDITIONING SYSTEM (HEATING, COOLING, AND
- 3.13 **EQUIPMENT MOUNTING:**
- A. MOUNTING AND ANCHORAGE OF EQUIPMENT SHALL BE IN STRICT WILL NOT BE CONSIDERED FOR ROOF MOUNTED EQUIPMENT.

# END OF SECTION

A. THE EMS CONTRACTOR SHALL PROVIDE TRAINING FOR TWO (6) OWNER'S REPRESENTATIVES AND/OR MAINTENANCE PERSONNEL. THE EMS CONTRACTOR SHALL PROVIDE ON-SITE TRAINING TO THE DISTRICT'S REPRESENTATIVE(S) AND MAINTENANCE PERSONNEL PER THE FOLLOWING DESCRIPTION:

- THE CURRICULUM SHALL INCLUDE
- SYSTEM ACCESS
- 5. CHANGING SET POINTS AND OTHER ATTRIBUTES
- SCHEDULING 7. EDITING PROGRAMMED VARIABLES
- RUNNING REPORTS
- 11 APPLICATION PROGRAMMING
- 13. EQUIPMENT MAINTENANCE
- 14. ADDITION OF DEVICES, ZONES, SENSORS, CONTROLLERS 15. REPLACEMENT OF FAILED SYSTEM COMPONENTS.

#### 1.10 OPERATING AND MAINTENANCE MANUALS

NECESSARY FOR THE OPERATION, MAINTENANCE, REPLACEMENT, INSTALLATION, AND PARTS PROCUREMENT FOR THE ENTIRE EMS. THIS DOCUMENTATION SHALL INCLUDE SPECIFIC SECTION. PROVIDE ELECTRONIC COPIES OF ALL CONTROL SYSTEM AS-BUILT B. FOLLOWING PROJECT COMPLETION AND TESTING, THE EMS CONTRACTOR WILL SUBMIT

- A. THE EMS CONTRACTOR SHALL WARRANT THE SYSTEM FOR 24 MONTHS AFTER SYSTEM ACCEPTANCE AND BENEFICIAL USE BY THE DISTRICT. DURING THE WARRANTY PERIOD HE EMS CONTRACTOR SHALL BE RESPONSIBLE FOR ALL NECESSARY REVISIONS TO THE SOFTWARE AS REQUIRED TO PROVIDE A COMPLETE AND WORKABLE SYSTEM CONSISTENT WITH THE LETTER AND INTENT OF THE SEQUENCE OF OPERATION SECTION OF THE
- SPECIFICATION. EMS EQUIPMENT SHALL BE WARRANTED FOR A PERIOD OF 5 YEARS FROM THE TIME OF SYSTEM ACCEPTANCE B. WARRANTY OF EQUIPMENT IS LIMITED TO REPLACEMENT OF DEFECTIVE PRODUCTS. PART 2 PRODUCTS
- A. UNLESS NOTED OTHERWISE, ALL PRODUCTS SHALL BE OF A SINGLE MANUFACTURER. THE STANDARD OF DESIGN AND QUALITY SHALL BE PRODUCTS AS MANUFACTURED BY PELICAN WIRELESS SYSTEMS. BE SUBMITTED WITH COMPLETE TECHNICAL DATA AND REFERENCES TO ALLOW FOR 1. THE DISTRICTS REVIEWING ENGINEER WILL MAKE CORRECTIONS, IF REQUIRED, AND RETURN
  - A. A SINGLE WG SHALL BE CAPABLE OF PROVIDING COMMUNICATION BETWEEN A DEDICATED CLOUD SERVER USING TCP/IP AND THE ON-SITE INTERNET PROGRAMMABLE THERMOSTATS USING THE IFFE 802.15.4 WIRELESS COMMUNICATION PROTOCOL, ADDITIONAL WGS CAN BE
  - THE WG MUST PROVIDE THE FOLLOWING HARDWARE FEATURES AS A MINIMUM:
  - ETHERNET PORT(S). 2. MICRO-USB 5VDC POWER INPUTS
- C. THE WG SHALL PROVIDE THE COMMUNICATION LINK BETWEEN THE ENTIRE SYSTEM AND A CLOUD BASED SERVER. COMMUNICATION WITH CLOUD SERVER SHALL BE SECURED USING AES (ADVANCED ENCRYPTION STANDARD). THE EMS CONTRACTOR SHALL DEMONSTRATE THE OPERATION OF THE SYSTEM AND PROVE D. THE WG SHALL BE ABLE TO SUPPORT 2000 INTERNET PROGRAMMABLE THERMOSTATS.
  - . INTERNET PROGRAMMABLE THERMOSTAT SHALL BE A WIRELESS COMMUNICATING COMMERCIAL PROGRAMMABLE THERMOSTAT THAT USES IEEE 802.15.4 FOR NETWORKING
  - B. THE IPT SHALL PROVIDE A KEYPAD FOR SETTING:
    - 2. SYSTEM MODE (HEAT, COOL, AUTO, OFF).
    - 3. FAN MODE (AUTO, ON).
  - LIGHT BUTTON. C. THE IPT SHALL INCLUDE A WIRING TERMINAL FOR CONTROLLING A SINGLE ZONE HVAC UNIT. THE WIRING TERMINAL MUST BE ABLE TO BE REMOVED FROM THE IPT FOR INSTALLATIONS WHERE ONLY 3-WIRES EXIST OR ARE AVAILABLE BETWEEN WHERE THE IPT OVER THESE 3-WIRES THE THERMOSTAT MUST STILL BE ABLE TO CONTROL THE HVAC UNIT BASED ON THESE SPECIFICATIONS
  - HEAT PUMP -B, SHALL BE DONE AT THE THERMOSTAT. WEB BASED CONFIGURATION SETTING OPTIONS SHALL INCLUDE:
  - 3. HEAT PUMP OR CONVENTIONAL SYSTEM SETTING.
  - 7. CALIBRATION DEGREES  $(2.0^{\circ}F -2.0^{\circ}F)$

  - 11. FAN STAGES (1 2)
  - 12. FAN CIRCULATION MINUTES PER HOUR.
  - 14. HEAT RANGE TEMPERATURE SETTING LIMITATION
  - 15. COOL RANGE TEMPERATURE SETTING LIMITATION
  - 17. HEAT CONSUMPTION (KW, BTU, TON, OR WATT)
  - 18. COOL CONSUMPTION (KW, BTU, TON, OR WATT) 19. NOTIFICATION SENSITIVITY (HIGH, MEDIUM, LOW)
  - 20. ALARM OF EXCEEDING TEMPERATURE BASED ON A SAFE RANGE
  - 1. SPACE TEMPERATURE
- 4. CALIFORNIA ENERGY COMMISSION BUILDING ENERGY EFFICIENCY STANDARDS TITLE 24 2016.

A. PROVIDE EMS COMPONENTS AND ANCILLARY EQUIPMENT WHICH ARE CODE COMPLIANT.

C. ALL PRODUCTS OF THE EMS SHALL RESIDE WITH THE FOLLOWING AGENCY APPROVALS.

B. ALL WIRING SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE

CALIFORNIA 2016 TITLE 24 COMPLIANT.

(OCST) CERTIFIED.

OPENADR2.0 CERTIFIED

- 1.08 SYSTEM STARTUP & COMMISSIONING A. EACH EMS COMPONENT IN THE SYSTEM SHALL BE TESTED FOR BOTH HARDWARE AND SOFTWARE FUNCTIONALITY. EACH MECHANICAL AND ELECTRICAL SYSTEM UNDER CONTROL OF THE EMS WILL BE REQUIRED TO BE TESTED AGAINST THE APPROPRIATE SEQUENCE OF OPERATION. SUCCESSFUL COMPLETION OF THE SYSTEM TEST SHALL CONSTITUTE THE BEGINNING OF THE WARRANTY PERIOD. A WRITTEN REPORT WILL BE SUBMITTED TO THE
- OWNER INDICATING THAT THE INSTALLED SYSTEM FUNCTIONS IN ACCORDANCE WITH THE PROJECT CRITERIA AND APPROVED SUBMITTALS. B. THE EMS CONTRACTOR SHALL PROVIDE ALL MANPOWER AND ENGINEERING SERVICES REQUIRED AND ASSIST THE BALANCING CONTRACTOR IN TESTING. ADJUSTING. AND BALANCING ALL SYSTEMS IN THE BUILDING. THE EMS CONTRACTOR SHALL HAVE A TRAINED TECHNICIAN AVAILABLE ON REQUEST DURING THE BALANCING OF THE SYSTEMS THE EMS CONTRACTOR SHALL COORDINATE ALL REQUIREMENTS TO PROVIDE A COMPLETE AIR BALANCE WITH THE BALANCING CONTRACTOR AND SHALL INCLUDE ALL LABOR AND MATERIALS IN HIS CONTRACT TO ASSIST WITH FUNCTIONAL TESTING OF SYSTEM AS IT

#### 2.04 GENERAL SYSTEM REQUIREMENTS EACH AC. HEAT PUMP. SPLIT SYSTEM UNIT TO BE CONTROLLED MUST BE PROVIDED

- B. ON-SITE TRAINING SHALL CONSIST OF A MINIMUM OF THREE (4) HOUR SESSIONS. OF HANDS-ON INSTRUCTION GEARED AT THE OPERATION AND MAINTENANCE OF THE SYSTEMS.
  - SYSTEM OVERVIEW
  - 2. SYSTEM SOFTWARE AND OPERATION
  - 4. SOFTWARE FEATURES OVERVIEW
  - 8. DISPLAYING COLOR GRAPHICS

  - WORKSTATION MAINTENANCE
  - 12. OPERATIONAL SEQUENCES INCLUDING START-UP, SHUTDOWN, ADJUSTING AND
- '. UPON COMPLETION OF THE WORK, PROVIDE A SET OF 'RECORD DRAWINGS' A. THE OPERATION AND MAINTENANCE MANUALS SHALL CONTAIN ALL INFORMATION
  - AS-BUILT DOCUMENTATION REFLECTING THE EXACT INSTALLATION OF THE SYSTEM.

  - 2.01 ACCEPTABLE MANUFACTURERS
  - B. PRODUCTS OF OTHER MANUFACTURERS WILL BE CONSIDERED FOR ACCEPTANCE PROVIDED THEY EQUAL OR EXCEED THE MATERIAL REQUIREMENTS AND FUNCTIONAL REQUIREMENTS OF THE SPECIFIED PRODUCT. A REQUEST FOR ARCHITECT/ENGINEER'S APPROVAL MUST PROPER EVALUATION.
  - USED FOR A SINGLE SITE, BUT EACH WG MUST MEET OR EXCEED THESE REQUIREMENTS. PROVIDE EXTENDED RANGE GATEWAYS GW 400.

  - 3. 2.4 GHZ IEEE STD. 802.15.4 BUILT-IN COMMUNICATION PROCESSOR.
  - 2.03 INTERNET PROGRAMMABLE THERMOSTAT (IPT)
  - COMMUNICATION AND A WIRING TERMINAL BLOCK FOR CONTROLLING A SINGLE ZONE HVAC
  - 1. TEMPERATURE SET POINTS.

  - WILL BE PLACED AND ITS CONNECTION WITH THE HVAC UNIT IT WILL BE CONTROLLING. D. THE IPT MUST BE CONFIGURABLE USING A WEB BASED APP. NO THERMOSTAT CONFIGURATION, OTHER THAN SETTING THE IPT TO CONVENTIONAL, HEAT PUMP - O, OR
    - NAMING THE THERMOSTAT 2. GROUPING MULTIPLE THERMOSTATS.
  - 4. IF HEAT PUMP; REVERSING VALVE O OR B SETTING. 5. CYCLES PER HOUR (1 - 6). 6. ANTICIPATION DEGREES (0°F - 0.5°F)
  - 8. HEAT STAGES (0 2) 9. IF HEAT PUMP; AUX HEAT (DISABLED AND/OR ENABLED OPTION)
  - 10. COOL STAGES (0 2)

  - 13. TEMPERATURE DISPLAY (FAHRENHEIT OR CELSIUS)
  - 16. ABILITY TO DISABLE AND ENABLE KEYPAD CONTROL THROUGH SCHEDULE.

  - 21. SCHEDULE SET TIMES (2, 3, 4, OR VARIABLE).
  - E. IIPT SETTINGS AND CONTROL THROUGH THE WEB BASE APP SHALL BE IN REAL-TIME AND
    - SYSTEM MODE (HEAT, COOL, AUTO, OFF). 3. FAN MODE (AUTO, ON).

RELAY STATUS (HEAT/COOL AND FAN).

6. HISTORICAL TREND GRAPHS. SCHEDULING

8. LOCK AND UNLOCK ENTIRE THERMOSTAT'S KEYPAD

9. LOCK AND UNLOCK THE THERMOSTAT'S FAN MODE SETTING ONLY

2.05 WEB BASED GRAPHICAL USER INTERFACE

CONTROLS, FCONOMIZER CONTROLS FOR SYSTEMS THAT HAVE EXISTING FCONOMIZERS. CO2 DEMAND VENTILATION CONTROLS FOR AC UNITS (AC. HEAT PUMPS, SPLIT SYSTEMS, ETC...) THAT HAVE ECONOMIZERS (IN ACCORDANCE WITH TITLE 24)(PROVIDE UNITS WITH HONEYWELL JADE ECONOMIZER/DEMAND VENTILATION CONTROLLER W7220 AS NEEDED FOR EACH UNIT WITH CO2 DEMAND VENTILATION), START STOP FUNCTIONS. ITEMS NOT REQUIRED FOR WIRELESS CONTROLS ARE: FAULT DETECTION AND

WITH A HARDWIRED SLIPPLY AIR TEMPERATURE SENSOR HARD WIRED THERMOSTAT

- DIAGNOSTICS FDD (AC UNITS ARE EXISTING AND FDD IS ONLY REQUIRED ON NEW SYSTEMS), AUTOMATED DEMAND SHED CONTROLS (NOT REQUIRED SINCE SYSTEMS IS NOT A DDC CONTROLLED).
- SAFARI, CHROME, FIREFOX, OR ANY OTHER WEB BROWSER THAT MEETS THESE BROWSERS' FUNCTIONALITY. THE WBA PLATFORM SHALL BE ABLE TO RUN ON ANY INTERNET ACCESSIBLE
- SMARTPHONE AND/OR TABLET THAT HAS A WEB BROWSER COMPATIBLE WITH THE WBA SHALL ALLOW UP TO A MINIMUM OF 100 SIMULTANEOUS USERS/CLIENTS

THE WEB BASED APP (WBA) SHALL BE ABLE TO RUN ON ANY PC THAT USES

- TO ACCESS THE ENERGY MANAGEMENT SYSTEM.
- THE WEB BASED CLIENT SHALL SUPPORT AT A MINIMUM, THE FOLLOWING
- 1. USER LOG-ON IDENTIFICATION AND PASSWORD SHALL BE REQUIRED. 2. HTML PROGRAMMING SHALL NOT BE REQUIRED TO DISPLAY ANY GRAPHICS OR DATA ON THE WEB PAGE.
- 3. STORAGE OF DATA SHALL RESIDE WITHIN THE CLOUD SERVER AND SHALL NOT SIT WITHIN THE CLIENT'S COMPUTER OR DEVICE. EMS THAT REQUIRES DATA STORAGE ON A CLIENT COMPUTER OR AN ON-SITE SERVER IS NOT

4. USERS SHALL HAVE ADMINISTRATOR AND USER DEFINABLE ACCESS

1. THE WBA SHALL PROVIDE USER WITH ACCESS TO SETTING INTERNET

- 5. OPENAPI INTERFACE WITH XML DATA OUTPUT.
- PROGRAMMABLE THERMOSTAT (IPT) SCHEDULES. UP TO 12 SCHEDULE PERIODS PER DAY SHALL BE AVAILABLE FOR EACH IPT. 2. SCHEDULES SHALL BE AVAILABLE AS WEEKLY (7-DAY), DAILY, OR
- WEEKDAY/WEEKEND (5\_2). 3. THE WBA SHALL PROVIDE THE USER THE ABILITY TO:

a. VIEW SCHEDULES.

d. DELETE SCHEDULES.

- b. ADD/MODIFY SCHEDULES. c. ASSIGN THERMOSTAT TO A GROUP SCHEDULE.
- 1. THE WBA SHALL PROVIDE REAL-TIME TREND INFORMATION ON:

TREND DATA SHALL INCLUDE:

- a. EACH IPT'S SPACE TEMPERATURE. b. EACH IPT'S TEMPERATURE SET POINTS.
- c. EACH IPT'S CURRENT CALL; HEAT, COOL, AND/OR FAN. 2. THE WBA SHALL BE ABLE TO RECORD AND PROVIDE AT LEAST TWO YEARS OF PAST TREND DATA FOR EVERY THERMOSTAT IN THE WIRELESS NETWORK.
- b. IPT'S TEMPERATURE SET POINTS. c. INDICATION OF WHETHER THE THERMOSTAT WAS CALLING FOR; HEAT, COOL,
- 3. TREND DATA SHALL BE VIEWABLE ON THE WBS

1. THE WBA SHALL PROVIDE AUTOMATIC ALARMING FUNCTIONALLY BASED ON

a. SPACE TEMPERATURE; WITH RESOLUTION OF EVERY 1/10TH OF A DEGREE

a. SPACE TEMPERATURE AND TEMPERATURE CHANGE. b. IPT'S TEMPERATURE SET POINTS.

c. IPT'S CURRENT CALL; HEAT, COOL, AND/OR FAN.

THE THERMOSTAT HEAT/COOL CALL TIME.

REAL-TIME MONITORING OF AT LEAST:

- 2. THE WBA SHALL BE ABLE TO PROVIDE A USER WITH THE ABILITY TO: a. VIEW ALARMS. b. SET ALARM NOTIFICATION SENSITIVITY LEVEL TO HIGH, MEDIUM, OR LOW.
- c. DELETE ALARMS. 3. ALARMS SHALL BE ABLE TO BE SENT VIA EMAIL AND/OR TEXT MESSAGE TO UP TO 100 OR MORE CLIENTS.
- THE WBA SHALL BE ABLE TO CALCULATE AND GRAPHICALLY DISPLAY THE CONSUMPTION OF RUNNING A SINGLE ZONE HVAC UNIT BASED ON A USER DEFINED HVAC UNIT HEAT AND/OR COOL CONSUMPTION RATE MULTIPLIED BY

THE WBA SHALL BE ABLE TO CALCULATE AND GRAPHICALLY DISPLAY THE

- COST OF CONSUMPTION OF RUNNING A SINGLE ZONE HVAC UNIT BASED ON TAKING A USER DEFINED HVAC UNIT HEAT AND/OR COOL CONSUMPTION AND MULTIPLYING THAT BY THE CLIENT DEFINED COST PER KW AND/OR THERM. 3. THE WBA SHALL BE ABLE TO DISPLAY CONSUMPTION USAGE FOR A SINGLE THERMOSTAT, MULTIPLE THERMOSTATS AT A SINGLE TIME, OR ALL THE
- 4. THE WBA SHALL BE ABLE TO RECORD AND DISPLAY UP TO AT LEAST TWO YEARS OF CONSUMPTION USAGE INFORMATION. 2.06 WIRED REMOTE TEMPERATURE SENSORS AND DIGITAL ALARM INPUT
- A. INPUT TEMPERATURE SENSOR (ITS).

1. THE ITS SHALL CONNECT WITH THE INTERNET PROGRAMMABLE THERMOSTAT

3. WEB BASED APP SHALL BE ABLE TO RECORD AND PROVIDE AT LEAST TWO

2. ITS SHALL PROVIDE A 10K TYPE II THERMISTOR TEMPERATURE SENSOR

YEARS OF PAST TEMPERATURE DATA FOR ITS.

THERMOSTATS IN THE EMS.

4. THE TREND DATA SHALL BE VIEWABLE ON THE WBA. 5. ITS MUST BE ACCURATE TO ±1.0?F

OVER 3-WIRES.

6. ITS MUST BE ABLE TO BE INSTALLED UP TO 500' AWAY FROM IPT USING STANDARD THERMOSTAT WIRING. 2.07 WIRELESS PROXIMITY SENSORS

A. WIRELESS PROXIMITY SENSOR (WPS).

SPACE IS OCCUPIED.

AVAILABLE FOR FUTURE USE)

1. THE WPS SHALL CONNECT WITH THE INTERNET PROGRAMMABLE THERMOSTAT OVER THE 802.15.4 WIRELESS NETWORK. 2. WPS SHALL BE POWERED BY 2 AA BATTERIES OR EQUIVALENT 3. WPS MUST BE ABLE TO BE USED FOR EITHER:

a. ACCEPTING A MOTION SENSOR'S 2-WIRE DRY CONTACT OUTPUT.

i. THE WPS SHALL BE ABLE TO NOTIFY AN INTERNET PROGRAMMABLE

iii. DRY CONTACT CLOSED POSITION WILL INDICATE THAT THE SPACE IS

THERMOSTAT IF A MOTION SENSOR'S DRY CONTACT IS IN EITHER THE OPEN OR ii. DRY CONTACT OPEN POSITIONS WILL INDICATE THAT THE SPACE IS OCCUPIED AND THE IPT MUST BE ABLE TO AUTOMATICALLY SETBACK ITS TEMPERATURE

UNOCCUPIED AND SET THE TEMPERATURE TO A COMFORT SETTING WHEN THE

iv. SETBACK SETTINGS AND COMFORT SETTINGS MUST BE SETTABLE THROUGH

THE INTERNET PROGRAMMABLE THERMOSTAT'S SCHEDULE ON THE WEB BASED v. WEB BASED APP MUST BE ABLE TO DISPLAY THAT A SPACED IS "UNOCCUPIED".

b. DETECTING IF A WINDOW OR DOOR IS OPENED OR CLOSED (NOT USED BUT

- THE WPS MUST HAVE A BUILT-IN MAGNETIC SENSOR AND COME WITH A MAGNET THAT CAN BE INSTALLED ON A DOOR OR WINDOW. THE WPS MUST BE ABLE TO NOTIFY AN INTERNET PROGRAMMABLE THERMOSTAT IF
- THE DOOR IS OPEN AND THE IPT MUST AUTOMATICALLY TURN TO THE OFF THE WPS MUST BE ABLE TO NOTIFY AN INTERNET PROGRAMMABLE THERMOSTAT IF

THE DOOR IS CLOSED AND THE IPT MUST AUTOMATICALLY RETURN TO ITS LAST

- TEMPERATURE AND SYSTEM SETTINGS. WEB BASED APP MUST BE ABLE TO DISPLAY IF THE DOOR OR WINDOW IS OPEN AND MUST BE ABLE TO SAY "DOOR" OR "WINDOW" 4. WEB BASED APP SHALL BE ABLE TO NOTIFY IF THE WPS BATTERIES ARE
- OCCUPANCY AND/OR DOOR/WINDOW STATUS FOR EACH SPACE A WPS IS 5. THE TREND DATA SHALL BE VIEWABLE ON THE WEB BASED APP. 6. INTERNET PROGRAMMABLE THERMOSTAT MUST BE ABLE TO CONNECT WITH AT LEAST 8 WPS FACH WPS MUST HAVE A LINIQUE SERIAL NUMBER AND FACH WPS SHALL BE SETTABLE, THROUGH THE WEB BASED APP, AS EITHER A MOTION

LOW AND RECORD AND PROVIDE AT LEAST TWO YEARS OF PAST HISTORY ON

7. EACH THERMOSTAT SYSTEM REQUIRES A \$3/YEAR SERVICE FEE FOR CLOUD STORAGE OF TRENDING DATA. PAY FOR THE FIRST TWO YEARS OF SERVICE FEE FOR THE PROJECT. DURATION IS TO BE INITIATED AT THE TIME OF OWNER

SENSOR INPUT OR AS A DOOR/WINDOW SENSOR.

PRIOR WRITTEN APPROVAL OF THE OWNER.

# 3.01 CONTRACTOR RESPONSIBILITIES

B. DEMOLITION

C. ACCESS TO SITE

F. CLEANUP

RECOMMENDATIONS.

3.02 WIRING, CONDUIT, AND CABLE

- A. GENERAL INSTALLATION OF THE ENERGY MANAGEMENT SYSTEM SHALL BE PERFORMED BY AN APPROVED CONTRACTOR. THE CONTRACTOR SHALL CERTIFY ALL WORK AS PROPER AND COMPLETE. UNDER NO CIRCUMSTANCES SHALL THE DESIGN, REQUIREMENTS FOR THE PROJECT BE DELEGATED TO A SUBCONTRACTOR WITHOUT
- REMOVE CONTROLS WHICH DO NOT REMAIN AS PART OF THE ENERGY MANAGEMENT SYSTEM. THE OWNER WILL INFORM THE CONTRACTOR OF ANY EQUIPMENT WHICH IS TO BE REMOVED THAT WILL REMAIN THE PROPERTY OF THE DWNER. ALL OTHER EQUIPMENT WHICH IS REMOVED WILL BE DISPOSED OF BY THE CONTRACTOR.
- . UNLESS NOTIFIED OTHERWISE, ENTRANCE TO BUILDING IS RESTRICTED. NO ONE WILL BE PERMITTED TO ENTER THE BUILDING UNLESS THEIR NAMES HAVE BEEN CLEARED WITH THE DISTRICT OR THE DISTRICT'S REPRESENTATIVE. D. CODE COMPLIANCE

ALL WIRING SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE

ELECTRICAL CODES AND WILL COMPLY WITH EQUIPMENT MANUFACTURER'S

- 1. AT THE COMPLETION OF THE WORK, ALL EQUIPMENT PERTINENT TO THIS CONTRACT SHALL BE CHECKED AND THOROUGHLY CLEANED, AND ALL OTHER AREAS SHALL BE CLEANED AROUND EQUIPMENT PROVIDED UNDER THIS CONTRACT.
- ALL CONTROL WIRES BETWEEN HVAC UNITS AND THERMOSTAT LOCATIONS TO BE FURNISHED AND INSTALLED. THE EMS CONTRACTOR SHALL PROVIDE WIRING BETWEEN REMOTE TEMPERATURE SENSORS, TA1 AND THERMOSTATS AS REQUIRED. ALL ELECTRIC WIRING AND ALL INSTALLATION WORK INCLUDING PIPING OF
- CONTROL AND INDICATING SYSTEMS SHALL BE DONE BY AN AUTHORIZED REPRESENTATIVE WHOSE PRIMARY BUSINESS IS THE INSTALLATION AND MAINTENANCE OF TEMPERATURE CONTROL AND INDICATING SYSTEMS. WIRING SHALL CONFORM TO NATIONAL ELECTRIC CODE. INSTALL IN ACCORDANCE WITH TITLE 24 AND MANUFACTURER'S INSTRUCTIONS.

PROVIDE ALL MISCELLANFOUS DEVICES, HARDWARE, SOFTWARE, INTERCONNECTIONS,

INSTALLATION. AND PROGRAMMING REQUIRED TO ENSURE A COMPLETE OPERATING

CONTROL SYSTEMS AND INTERNAL WIRING OF PANELS FOR TEMPERATURE

A. INSTALLATION PRACTICES FOR DEVICES ALL DEVICES ARE TO BE MOUNTED LEVEL/PLUMB AND PER THE

MANUFACTURER'S INSTALLATION DOCUMENTATION.

BLACK OR BLUE BACKGROUND.

SYSTEM IN ACCORDANCE WITH THE SEQUENCES OF OPERATION.

IDENTIFY ALL CONTROL WIRES WITH LABELING TAPE OR SLEEVES USING WORDS, LETTERS, OR NUMBERS THAT CAN BE EXACTLY CROSS-REFERENCED WITH

ALL FIELD ENCLOSURES, OTHER THAN CONTROLLERS, SHALL BE IDENTIFIED

WITH A BAKELITE NAMEPLATE. THE LETTERING SHALL BE IN WHITE AGAINST A

JUNCTION BOX COVERS WILL BE MARKED TO INDICATE THAT THEY ARE A PART OF THE EMS SYSTEM. 4. ALL I/O FIELD DEVICES (EXCEPT SPACE SENSORS) THAT ARE NOT MOUNTED

WITHIN FIP'S SHALL BE IDENTIFIED WITH NAME PLATES.

5. ALL I/O FIELD DEVICES INSIDE FIP'S SHALL BE LABELED.

- EXISTING CONTROLS EXISTING CONTROLS ARE NOT TO BE REUSED. ALL EMS COMPONENTS WILL BE NEW. WHERE EXISTING ACTUATORS ARE COMPATIBLE WITH NEW CONTROL
- SWITCH-OVER. SUFFICIENT INSTALLATION MECHANICS WILL BE ON SITE SO THAT. THE ENTIRE SWITCH-OVER CAN BE ACCOMPLISHED IN A REASONABLE TIME FRAME ACCEPTABLE TO THE DISTRICT. THE LOCATION OF SENSORS IS TO MATCH APPROXIMATE LOCATIONS THAT ARE EXISTING, EXCEPT THAT NEW LOCATIONS ARE REQUIRED TO MEET ADA COMPLIANCE REQUIREMENTS.

THE CONTRACTOR SHALL MINIMIZE CONTROL SYSTEM DOWNTIME DURING

SPACE HUMIDITY OR TEMPERATURE SENSORS WILL BE MOUNTED AWAY FROM

OUTDOOR AIR SENSORS WILL BE MOUNTED ON THE NORTH BUILDING FACE

MACHINERY GENERATING HEAT, DIRECT LIGHT AND DIFFUSER AIR STREAMS.

IRECTLY IN THE OUTSIDE AIR. INSTALL THESE SENSORS SUCH THAT THI

EFFECTS OF HEAT RADIATED FROM THE BUILDING OR SUNLIGHT IS MINIMIZED.

#### 4. FIELD ENCLOSURES SHALL BE LOCATED IMMEDIATELY ADJACENT TO THE CONTROLLER PANEL(S) TO WHICH IT IS BEING INTERFACED AND SHALL BE

. CONTROL SYSTEM SWITCH-OVER

3.04 SYSTEM PROGRAMMING THE CONTRACTOR SHALL PROVIDE ALL LABOR NECESSARY TO INSTALL, INITIALIZE, START-UP AND DEBUG ALL SYSTEM SOFTWARE AS DESCRIBED IN THIS

CONTRACTOR SHALL WORK WITH OWNER'S REPRESENTATIVE TO DETERMINE

TESTED FOR PROPER INSTALLATION AND FUNCTIONAL OPERATION. TEST SHALL

RESPONDING TO SIGNALS SENT FROM CLOUD BASED SERVERS AND RESPONDING

INCLUDE ON-SITE CONTROL TEST TO VERIFY EACH WIRELESS DEVICE IS

IN ACCORDANCE WITH MANUFACTURE'S SPECIFICATIONS. REFER TO

PROGRAMMING PARAMETERS INCLUDING BUT NOT LIMITED TO HOURS OF

3.05 COMMISSIONING AND SYSTEM STARTUP A. EMS DEVICE FUNCTIONAL TESTING. EACH SYSTEM FOR WHICH A EMS DEVICE HAS BEEN INSTALLED SHALL BE

OPERATION, SET POINT AND SYSTEM VARIABLES.

COMMISSIONING SPECIFICATIONS.

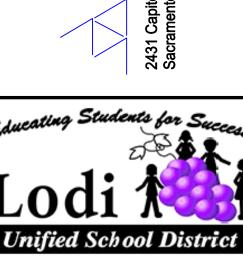
B. SYSTEM ACCEPTANCE TESTING

SECTION. THIS INCLUDES ANY OPERATING SYSTEM SOFTWARE.

1. ALL APPLICATION SOFTWARE WILL BE VERIFIED AND COMPARED AGAINST THE SEQUENCES OF OPERATION. CONTROL LOOPS WILL BE EXERCISED BY INDUCING A SET POINT SHIFT OF AT LEAST 10% AND OBSERVING WHETHER THE SYSTEM SUCCESSFULLY RETURNS THE PROCESS VARIABLE TO SET POINT. RECORD ALL TEST RESULTS AND ATTACH TO THE TEST RESULTS SHEET. REFER TO COMMISSIONING SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS

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SHEET TITLE:

**PLUMBING SPECIFICATION** 

MECHANICAL AND

 Project Engineer:
 JT
 Job Number:
 20290

 Project Manager:
 JT
 Plot Date:
 Jun 15, 2021 - 9:09am

 Project Drafter:
 ZH
 Login:
 LCox

SHEET NUMBER:

# SECTION 075216- ROOFING WORK- GENERAL REQUIREMENTS

SECTION 075216.11 - SBS MODIFIED BITUMINOUS MEMBRANE ROOFING, HOT-APPLIED

1.1 RELATED DOCUMENTS

A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT.

A. SECTION INCLUDED

1.2 SUMMARY

1. [HYBRID] STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS MEMBRANE ROOFING SYSTEM ON WOOD DECK, INCLUDING BUT NOT LIMITED TO:

A. ROOF MEMBRANE AND MEMBRANE BASE FLASHINGS.

B. ROOF SURFACING CONSISTING OF MINERAL GRANULATED CAP SHEET

1.3 **DEFINITIONS** 

A. ROOFING TERMINOLOGY: SEE ASTM D 1079 AND GLOSSARY OF NRCA'S "THE NRCA ROOFING AND WATERPROOFING MANUAL" FOR DEFINITION OF TERMS RELATED TO ROOFING WORK IN THIS

B. HOT ROOFING ASPHALT: ROOFING ASPHALT HEATED TO ITS EQUIVISCOUS TEMPERATURE, THE TEMPERATURE AT WHICH ITS VISCOSITY IS 125 CENTIPOISE FOR MOP-APPLIED ROOFING ASPHALT AND 75 CENTIPOISE FOR MECHANICAL SPREADER-APPLIED ROOFING ASPHALT, WITHIN A RANGE OF PLUS OR MINUS 25 DEG. F, MEASURED AT THE MOP CART OR MECHANICAL SPREADER IMMEDIATELY BEFORE APPLICATION.

1.4 ACTION SUBMITTALS

A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED.

1.5 INFORMATIONAL SUBMITTALS

A. CONTRACTOR'S PRODUCT CERTIFICATE: SUBMIT CERTIFICATE, INDICATING PRODUCTS INTENDED FOR WORK OF THIS SECTION, INCLUDING PRODUCT NAMES AND NUMBERS AND MANUFACTURERS' NAMES, WITH STATEMENT INDICATING THAT PRODUCTS TO BE PROVIDED MEET THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

B. QUALIFICATION DATA: FOR INSTALLER, MANUFACTURER, AND ROOFING INSPECTOR.

1. INCLUDE LETTER FROM MANUFACTURER WRITTEN FOR THIS PROJECT INDICATING APPROVAL OF INSTALLER.

C. MANUFACTURER CERTIFICATES: SIGNED BY ROOFING MANUFACTURER CERTIFYING THAT ROOFING SYSTEM COMPLIES WITH REQUIREMENTS SPECIFIED IN "PERFORMANCE REQUIREMENTS" ARTICLE.

1. SUBMIT EVIDENCE OF COMPLIANCE WITH PERFORMANCE REQUIREMENTS, INCLUDING UL

2. INDICATE THAT PROPOSED SYSTEM COMPONENTS ARE COMPATIBLE.

D. PRODUCT TEST REPORTS: BASED ON EVALUATION OF COMPREHENSIVE TESTS PERFORMED BY MANUFACTURER AND WITNESSED BY A QUALIFIED TESTING AGENCY, FOR COMPONENTS OF BUILT-UP ROOFING.

E. WARRANTIES: UNEXECUTED SAMPLE COPIES OF SPECIAL WARRANTIES.

F. FIELD QUALITY CONTROL REPORTS: DAILY REPORTS OF ROOFING INSPECTOR. INCLUDE WEATHER CONDITIONS, DESCRIPTION OF WORK PERFORMED, TESTS PERFORMED, DEFECTIVE WORK OBSERVED, AND CORRECTIVE ACTIONS TAKEN TO CORRECT DEFECTIVE WORK.

1.6 CLOSEOUT SUBMITTALS

A. MAINTENANCE DATA: TO INCLUDE IN MAINTENANCE MANUALS.

B. WARRANTIES: EXECUTED COPIES OF WARRANTIES.

1.7 QUALITY ASSURANCE

A. INSTALLER QUALIFICATIONS: AN EMPLOYER OF WORKERS TRAINED AND CERTIFIED BY MANUFACTURER, INCLUDING A FULL-TIME ON-SITE SUPERVISOR WITH A MINIMUM OF FIVE YEARS' EXPERIENCE INSTALLING PRODUCTS COMPARABLE TO THOSE SPECIFIED, ABLE TO COMMUNICATE VERBALLY WITH CONTRACTOR, ARCHITECT, AND EMPLOYEES, AND QUALIFIED BY THE MANUFACTURER TO INSTALL MANUFACTURER'S PRODUCT AND FURNISH WARRANTY OF TYPE

B. MANUFACTURER QUALIFICATIONS: APPROVED MANUFACTURER WITH UL LISTED ROOFING SYSTEMS COMPARABLE TO THOSE SPECIFIED FOR THIS PROJECT, WITH MINIMUM FIVE YEARS' EXPERIENCE IN MANUFACTURE OF COMPARABLE PRODUCTS IN SUCCESSFUL USE IN SIMILAR APPLICATIONS, AND ABLE TO FURNISH WARRANTY WITH PROVISIONS MATCHING SPECIFIED REQUIREMENTS.

C. MANUFACTURER'S INSTALLATION INSTRUCTIONS: OBTAIN AND MAINTAIN ON-SITE MANUFACTURER'S WRITTEN RECOMMENDATIONS AND INSTRUCTIONS FOR INSTALLATION OF

1.8 DELIVERY, STORAGE, AND HANDLING

A. DELIVER ROOFING MATERIALS TO PROJECT SITE IN ORIGINAL CONTAINERS WITH SEALS UNBROKEN AND LABELED WITH MANUFACTURER'S NAME, PRODUCT BRAND NAME AND TYPE, DATE OF MANUFACTURE, APPROVAL OR LISTING AGENCY MARKINGS, AND DIRECTIONS FOR STORING AND MIXING WITH OTHER COMPONENTS.

B. STORE LIQUID MATERIALS IN THEIR ORIGINAL UNDAMAGED CONTAINERS IN A CLEAN, DRY, PROTECTED LOCATION AND WITHIN THE TEMPERATURE RANGE REQUIRED BY ROOFING SYSTEM MANUFACTURER. PROTECT STORED LIQUID MATERIAL FROM DIRECT SUNLIGHT.

1. DISCARD AND LEGALLY DISPOSE OF LIQUID MATERIAL THAT CANNOT BE APPLIED WITHIN ITS STATED SHELF LIFE.

C. PROTECT ROOF INSULATION MATERIALS FROM PHYSICAL DAMAGE AND FROM DETERIORATION BY SUNLIGHT, MOISTURE, SOILING, AND OTHER SOURCES. STORE IN A DRY LOCATION. COMPLY WITH INSULATION MANUFACTURER'S WRITTEN INSTRUCTIONS FOR HANDLING, STORING, AND PROTECTING DURING INSTALLATION.

D. HANDLE AND STORE ROOFING MATERIALS AND PLACE EQUIPMENT IN A MANNER TO AVOID PERMANENT DEFLECTION OF DECK.

1.9 PROJECT CONDITIONS

A. WEATHER LIMITATIONS: PROCEED WITH INSTALLATION ONLY WHEN EXISTING AND FORECASTED WEATHER CONDITIONS PERMIT ROOFING SYSTEM TO BE INSTALLED ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS AND WARRANTY REQUIREMENTS.

COMPONENTS OF ROOFING SYSTEM NOT PERMANENTLY EXPOSED ARE NOT SUBJECTED TO PRECIPITATION OR LEFT UNCOVERED AT THE END OF THE WORKDAY OR WHEN RAIN IS FORECAST. 1. PROVIDE TIE-OFFS AT END OF EACH DAY'S WORK TO COVER EXPOSED ROOFING AND

B. DAILY PROTECTION: COORDINATE INSTALLATION OF ROOFING SO INSULATION AND OTHER

INSULATION WITH A COURSE OF ROOFING SHEET SECURELY IN PLACE WITH JOINTS AND EDGES

2. COMPLETE TERMINATIONS AND BASE FLASHINGS AND PROVIDE TEMPORARY SEALS TO PREVENT WATER FROM ENTERING COMPLETED SECTIONS OF ROOFING.

3. REMOVE TEMPORARY PLUGS FROM ROOF DRAINS AT END OF EACH DAY.

4. REMOVE AND DISCARD TEMPORARY SEALS BEFORE BEGINNING WORK ON ADJOINING ROOFING.

1.10 WARRANTY

A. WARRANTY, GENERAL: WARRANTIES SPECIFIED SHALL BE IN ADDITION TO, AND RUN CONCURRENT WITH, OTHER WARRANTIES REQUIRED BY THE CONTRACT DOCUMENTS. MANUFACTURER'S DISCLAIMERS AND LIMITATIONS ON PRODUCT WARRANTIES DO NOT RELIEVE CONTRACTOR OF OBLIGATIONS UNDER REQUIREMENTS OF THE CONTRACT DOCUMENTS.

B. MANUFACTURER'S WARRANTY: MANUFACTURER'S STANDARD OR CUSTOMIZED FORM, IN WHICH MANUFACTURER AGREES TO REPAIR OR REPLACE COMPONENTS OF ROOFING SYSTEM THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN SPECIFIED WARRANTY PERIOD. FAILURE INCLUDES ROOF

1. MANUFACTURER'S WARRANTY INCLUDES ROOFING MEMBRANE, BASE FLASHINGS, FASTENERS,

ROOFING MEMBRANE ACCESSORIES AND OTHER COMPONENTS OF ROOFING SYSTEM SPECIFIED IN THIS SECTION.

2. WARRANTY PERIOD: 20 YEARS FROM DATE OF SUBSTANTIAL COMPLETION.

C. INSTALLER'S WARRANTY: SUBMIT ROOFING INSTALLER'S WARRANTY, COVERING THE WORK OF THIS SECTION, INCLUDING ALL COMPONENTS OF ROOFING SYSTEM SUCH AS ROOFING MEMBRANE, BASE FLASHING, FASTENERS, COVER BOARDS, SUBSTRATE BOARDS, VAPOR RETARDERS, AND WALKWAY PRODUCTS, FOR THE FOLLOWING WARRANTY PERIOD:

1. WARRANTY PERIOD: TWO YEARS FROM DATE OF SUBSTANTIAL COMPLETION

PRODUCTS

2.1 MANUFACTURERS

A. BASIS-OF-DESIGN MANUFACTURER/PRODUCT: THE ROOF SYSTEM SPECIFIED IN THIS SECTION IS BASED UPON PRODUCTS OF TREMCO, INC., NAMED IN OTHER PART 2 ARTICLES. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE THE NAMED PRODUCT OR AN ARCHITECT APPROVED

B. SOURCE LIMITATIONS: OBTAIN COMPONENTS FOR ROOFING SYSTEM FROM SAME MANUFACTURER AS MEMBRANE ROOFING OR MANUFACTURER APPROVED BY MEMBRANE ROOFING MANUFACTURER.

2.2 PERFORMANCE REQUIREMENTS

A. GENERAL PERFORMANCE: ROOFING SHALL WITHSTAND EXPOSURE TO WEATHER WITHOUT FAILURE OR LEAKS DUE TO DEFECTIVE MANUFACTURE OR INSTALLATION.

ACCELERATED WEATHERING: ROOFING SYSTEM SHALL WITHSTAND 2000 HOURS OF EXPOSURE WHEN TESTED ACCORDING TO ASTM G 152, ASTM G 154, OR ASTM G 155.

2. IMPACT RESISTANCE: ROOFING SYSTEM SHALL RESIST IMPACT DAMAGE WHEN TESTED ACCORDING TO ASTM D 3746 OR ASTM D 4272.

B. MATERIAL COMPATIBILITY: PROVIDE ROOFING MATERIALS THAT ARE COMPATIBLE WITH ONE ANOTHER UNDER CONDITIONS OF SERVICE AND APPLICATION REOUIRED. AS DEMONSTRATED BY MEMBRANE ROOFING MANUFACTURER BASED ON TESTING AND FIELD EXPERIENCE.

C. FLASHINGS AND FASTENING: COMPLY WITH REQUIREMENTS OF DIVISION 07 SECTIONS "SHEET METAL FLASHING AND TRIM" AND "ROOF SPECIALTIES." PROVIDE BASE FLASHINGS, PERIMETER FLASHINGS, DETAIL FLASHINGS AND COMPONENT MATERIALS AND INSTALLATION TECHNIQUES THAT COMPLY WITH REQUIREMENTS AND RECOMMENDATIONS OF THE FOLLOWING:

1. NRCA ROOFING MANUAL (SIXTH EDITION) FOR CONSTRUCTION DETAILS AND

2. SMACNA ARCHITECTURAL SHEET METAL MANUAL (SEVENTH EDITION) FOR CONSTRUCTION

D. EXTERIOR FIRE-TEST EXPOSURE: ASTM E 108, CLASS A; FOR APPLICATION AND ROOF SLOPES INDICATED, AS DETERMINED BY TESTING IDENTICAL MEMBRANE ROOFING MATERIALS BY A QUALIFIED TESTING AGENCY. MATERIALS SHALL BE IDENTIFIED WITH APPROPRIATE MARKINGS OF APPLICABLE TESTING AGENCY

E. FIRE-RESISTANCE RATINGS: WHERE INDICATED, PROVIDE FIRE-RESISTANCE-RATED ROOF ASSEMBLIES IDENTICAL TO THOSE OF ASSEMBLIES TESTED FOR FIRE RESISTANCE PER ASTM E 119 BY A QUALIFIED TESTING AGENCY. IDENTIFY PRODUCTS WITH APPROPRIATE MARKINGS OF APPLICABLE TESTING AGENCY.

F. ENERGY PERFORMANCE: ROOFING SYSTEM SHALL HAVE AN INITIAL SOLAR REFLECTANCE INDEX OF NOT LESS THAN 0.70 AND AN EMISSIVITY OF NOT LESS THAN 0.75 WHEN TESTED ACCORDING TO

2.3 ROOFING MEMBRANE MATERIALS

A. SHEATHING PAPER: RED ROSIN TYPE, MINIMUM 3 LB./100 SQ. FT. (0.16 KG/SQ. M).

B. HYBRID SYSTEM ASPHALT PLY SHEETS:

1. ASTM D 2178 TYPE IV ASPHALT-IMPREGNATED GLASS-FIBER PLY SHEET.

A. BASIS OF DESIGN PRODUCT: TREMCO, THERMGLASS TYPE IV.

B. NET DRY MASS, ASTM D 146: 7.5 LB/100 SQ FT. C. BREAKING STRENGTH, ASTM D 146: 44 LBF/IN.

C. SBS MODIFIED BITUMINOUS CAP SHEET:

ASTM D 6163 TYPE I GRADE G SBS-MODIFIED ASPHALT-COATED GLASS-FIBER-REINFORCED SHEET, GRANULAR SURFACED.

A. BASIS OF DESIGN PRODUCT: TREMCO, POWERPLY STANDARD FR.

B. EXTERIOR FIRE-TEST EXPOSURE, ASTM E 108: CLASS A. C. TENSILE STRENGTH AT 73 DEG. F (23 DEG. C), MINIMUM, ASTM D 5147: MACHINE DIRECTION

80.0 LBF/IN (14.0 KN/M); CROSS MACHINE DIRECTION 70.0 LBF/IN (12.0 KN/M). D. TEAR STRENGTH AT 73 DEG. F (23 DEG. C), MINIMUM, ASTM D 5147: MACHINE DIRECTION, 100 LBF (440 N); CROSS MACHINE DIRECTION 100 LBF (440 N).

E. ELONGATION AT 73 DEG. F (23 DEG. C), MINIMUM, ASTM D 5147: MACHINE DIRECTION 7.5 PERCENT; CROSS MACHINE DIRECTION 7.5 PERCENT.

F. LOW TEMPERATURE FLEX, MAXIMUM, ASTM D 5147: -15 DEG. F (-26 DEG. C).

G. THICKNESS, MINIMUM, ASTM D 5147: 0.120 INCH (3 MM).

D. BASE FLASHING BACKER SHEET:

1. ASTM D 4601 TYPE II NONPERFORATED ASPHALT-IMPREGNATED, POLYESTER REINFORCED, AND ASPHALT COATED GLASS-FIBER SHEET, DUSTED WITH FINE MINERAL SURFACING ON BOTH

A. BASIS OF DESIGN PRODUCT: TREMCO, BURMASTIC COMPOSITE PLY HT.

SHEET, GRANULAR SURFACED.

1. ASTM D 6163 TYPE I GRADE G SBS-MODIFIED ASPHALT-COATED GLASS-FIBER-REINFORCED

A. BASIS OF DESIGN PRODUCT: TREMCO, POWERPLY STANDARD FR.

B. EXTERIOR FIRE-TEST EXPOSURE, ASTM E 108: CLASS A.

TENSILE STRENGTH AT 73 DEG. F (23 DEG. C), MINIMUM, ASTM D 5147: MACHINE DIRECTION 80.0 LBF/IN (14.0 KN/M); CROSS MACHINE DIRECTION 70.0 LBF/IN (12.0 KN/M).

D. TEAR STRENGTH AT 73 DEG. F (23 DEG. C), MINIMUM, ASTM D 5147: MACHINE DIRECTION, 100 LBF (440 N); CROSS MACHINE DIRECTION 100 LBF (440 N).

E. ELONGATION AT 73 DEG. F (23 DEG. C), MINIMUM, ASTM D 5147: MACHINE DIRECTION 7.5 PERCENT; CROSS MACHINE DIRECTION 7.5 PERCENT.

F. LOW TEMPERATURE FLEX, MAXIMUM, ASTM D 5147: -15 DEG. F (-26 DEG. C).

G. THICKNESS, MINIMUM, ASTM D 5147: 0.120 INCH (3 MM).

F. DETAILING FABRIC:

WOVEN GLASS FIBER MESH. VINYL-COATED: NON-SHRINKING. NON-ROTTING. VINYL-COATED WOVEN GLASS MESH FOR REINFORCING FLASHING SEAMS, MEMBRANE LAPS, AND OTHER ROOF

A. BASIS OF DESIGN PRODUCT: TREMCO, BURMESH.

B. TENSILE STRENGTH, 70 DEG. F, ASTM D 146: WARP, 65 LBF/IN (289 N); FILL, 75 LBF/IN (311 N)

2.4 ASPHALT MATERIALS

A. ASPHALT PRIMER, WATER-BASED, POLYMER MODIFIED.

1. BASIS OF DESIGN PRODUCT: TREMCO, TREMPRIME WB.

B. ASTM D 312 TYPE IV HOT-MELT ASPHALT.

1. BASIS OF DESIGN PRODUCT: TREMCO, PREMIUM IV.

2. SOFTENING POINT, MIN/MAX, ASTM D 36: 215-225 DEG. F (102-107 DEG. C).

2. VOLATILE ORGANIC COMPOUNDS (VOC), MAXIMUM, ASTM D 3960: 2 G/L.

3. DUCTILITY AT 77 DEG. F, MINIMUM, ASTM D 113: 2.5 CM. 4. PENETRATION AT 77 DEG. F (25 DEG. C), MIN/MAX, ASTM D 5: 15-30 DMM.

C. ASPHALT ROOFING CEMENT: ASTM D 4586, ASBESTOS FREE, OF CONSISTENCY REQUIRED BY ROOFING SYSTEM MANUFACTURER FOR APPLICATION.

2.5 AUXILIARY ROOFING MATERIALS

A. GENERAL: AUXILIARY MATERIALS RECOMMENDED BY ROOFING SYSTEM MANUFACTURER FOR INTENDED USE AND COMPATIBLE WITH ROOFING MEMBRANE.

1. LIQUID-TYPE AUXILIARY MATERIALS SHALL COMPLY WITH VOC LIMITS OF AUTHORITIES

B. JOINT SEALANT: ELASTOMERIC JOINT SEALANT COMPATIBLE WITH ROOFING MATERIALS, WITH MOVEMENT CAPABILITY APPROPRIATE FOR APPLICATION.

1. JOINT SEALANT, POLYURETHANE: ASTM C 920, TYPE S, GRADE NS, CLASS 50 SINGLE-COMPONENT MOISTURE CURING SEALANT, FORMULATED FOR COMPATIBILITY AND USE IN DYNAMIC AND STATIC JOINTS; PAINTABLE..

A. BASIS OF DESIGN PRODUCT: TREMCO, TREMSEAL PRO.

B. VOLATILE ORGANIC COMPOUNDS (VOC), MAXIMUM, ASTM D 3960: 40 G/L.

C. HARDNESS, SHORE A, ASTM C 661: 40. D. ADHESION TO CONCRETE, ASTM C 794: 35 PLI.

E. TENSILE STRENGTH, ASTM D 412: 350 PSI.

F. COLOR: CLOSEST MATCH TO SUBSTRATE

C. FASTENERS: FACTORY-COATED STEEL FASTENERS AND METAL OR PLASTIC PLATES MEETING CORROSION-RESISTANCE PROVISIONS IN FM GLOBAL 4470, DESIGNED FOR FASTENING ROOFING COMPONENTS TO SUBSTRATE, TESTED BY MANUFACTURER FOR REQUIRED PULLOUT STRENGTH, AND ACCEPTABLE TO ROOFING SYSTEM MANUFACTURER.

D. METAL FLASHING SHEET: METAL FLASHING SHEET IS SPECIFIED IN DIVISION 07 SECTION "SHEET

E. MISCELLANEOUS ACCESSORIES: PROVIDE MISCELLANEOUS ACCESSORIES RECOMMENDED BY ROOFING SYSTEM MANUFACTURER

2.6 SURFACING MATERIALS

A. ACRYLIC ROOF COATING, HIGHLY-REFLECTIVE ELASTOMERIC: HIGH-SOLIDS ACRYLIC LATEX ELASTOMERIC ROOF COATING FORMULATED FOR USE ON BITUMINOUS ROOF SURFACES; WATER-BASED, ENERGY STAR QUALIFIED, CRRC LISTED AND CALIFORNIA TITLE 24 ENERGY CODE

1. BASIS OF DESIGN PRODUCT: TREMCO, ICE COATING.

2. VOLATILE ORGANIC COMPOUNDS (VOC), ASTM D 3960: 40 G/L.

3. EMISSIVITY, MINIMUM, ASTM C 1370: 0.83.

5. REFLECTANCE, MINIMUM, ASTM C 1549: 84 PERCENT.

4. SOLAR REFLECTANCE INDEX (SRI), ASTM E 1980: 103.

6. SOLIDS, BY VOLUME: 65 PERCENT.

3.1 EXAMINATION

PART 3 - EXECUTION

A. EXAMINE SUBSTRATES, AREAS, AND CONDITIONS, WITH INSTALLER PRESENT, FOR COMPLIANCE WITH THE FOLLOWING REQUIREMENTS AND OTHER CONDITIONS AFFECTING PERFORMANCE OF

PENETRATIONS AND TERMINATIONS AND THAT NAILERS MATCH THICKNESSES OF INSULATION. 2. WOOD ROOF DECK: VERIFY THAT WOOD DECK IS SECURELY FASTENED WITH NO PROJECTING

1. VERIFY THAT, BLOCKING, CURBS, AND NAILERS ARE SECURELY ANCHORED TO ROOF DECK AT

FASTENERS AND WITH NO ADJACENT UNITS IN EXCESS OF 1/16 INCH (1.6 MM) OUT OF PLANE RELATIVE TO ADJOINING DECK.

B. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

3.2 PREPARATION A. CLEAN SUBSTRATE OF DUST, DEBRIS, MOISTURE, AND OTHER SUBSTANCES DETRIMENTAL TO ROOFING INSTALLATION ACCORDING TO ROOFING SYSTEM MANUFACTURER'S WRITTEN

3. VERIFY THAT EXISTING INSULATION AND SUBSTRATE IS SOUND AND DRY.

B. PREVENT MATERIALS FROM ENTERING AND CLOGGING ROOF DRAINS AND CONDUCTORS AND FROM SPILLING OR MIGRATING ONTO SURFACES OF OTHER CONSTRUCTION. REMOVE ROOF-DRAIN PLUGS WHEN NO WORK IS TAKING PLACE OR WHEN RAIN IS FORECAST.

INSTRUCTIONS. REMOVE SHARP PROJECTIONS.

3.3 INSTALLATION, GENERAL A. INSTALL ROOFING SYSTEM IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

3.4 INSULATION INSTALLATION A. COMPLY WITH BUILT-UP ROOFING MANUFACTURER'S WRITTEN INSTRUCTIONS FOR INSTALLING

B. CANT STRIPS: INSTALL AND SECURE PREFORMED 45-DEGREE CANT STRIPS AT JUNCTURES OF BUILT-UP ROOFING WITH VERTICAL SURFACES OR ANGLE CHANGES GREATER THAN 45 DEGREE

D. INSTALL TAPERED EDGE STRIPS AT PERIMETER EDGES OF ROOF THAT DO NOT TERMINATE AT

3.5 HOT-APPLIED ROOFING MEMBRANE INSTALLATION, GENERAL

H. INSTALL ROOFING MEMBRANE SYSTEM ACCORDING TO ROOFING SYSTEM MANUFACTURER'S WRITTEN INSTRUCTIONS AND APPLICABLE RECOMMENDATIONS IN ARMA/NRCA'S "QUALITY CONTROL GUIDELINES FOR THE APPLICATION OF POLYMER MODIFIED BITUMEN ROOFING" AND AS

1. DECK TYPE: WOOD DECK.

2. NUMBER OF GLASS-FIBER BASE-PLY SHEETS: THREE.

3. GRANULAR-SURFACED SBS-MODIFIED ASPHALT CAP SHEET:

A. ADHERING METHOD: MOPPED.

A. ADHERING METHOD: MOPPED.

I. START INSTALLATION OF ROOFING MEMBRANE IN PRESENCE OF ROOFING SYSTEM MANUFACTURER'S TECHNICAL PERSONNEL.

J. COOPERATE WITH TESTING AGENCIES ENGAGED OR REQUIRED TO PERFORM SERVICES FOR

THE ROOFING MEMBRANE SYSTEM NOT PERMANENTLY EXPOSED ARE NOT SUBJECTED TO PRECIPITATION OR LEFT UNCOVERED AT THE END OF THE WORKDAY OR WHEN RAIN IS FORECAST. 1. PROVIDE TIE-OFFS AT END OF EACH DAY'S WORK CONFIGURED AS RECOMMENDED BY NRCA

K. COORDINATE INSTALLATION OF ROOFING SYSTEM SO INSULATION AND OTHER COMPONENTS OF

[AND EXISTING] ROOFING. 2. COMPLETE TERMINATIONS AND BASE FLASHINGS AND PROVIDE TEMPORARY SEALS TO

4. REMOVE AND DISCARD TEMPORARY SEALS BEFORE BEGINNING WORK ON ADJOINING ROOFING.

AT A TEMPERATURE EXCEEDING FINISHED BLOWING TEMPERATURE FOR MORE THAN FOUR HOURS.

ROOFING MANUAL APPENDIX: QUALITY CONTROL GUIDELINES - INSULATION TO PROTECT NEW

3. REMOVE TEMPORARY PLUGS FROM ROOF DRAINS AT END OF EACH DAY

L. HOT ROOFING ASPHALT HEATING: HEAT ASPHALT TO ITS EQUIVISCOUS TEMPERATURE, MEASURED AT THE MOP CART OR MECHANICAL SPREADER IMMEDIATELY BEFORE APPLICATION. CIRCULATE ASPHALT DURING HEATING. DO NOT RAISE ASPHALT TEMPERATURE ABOVE EQUIVISCOUS TEMPERATURE RANGE MORE THAN ONE HOUR BEFORE TIME OF APPLICATION. DO NOT EXCEED ASPHALT MANUFACTURER'S RECOMMENDED TEMPERATURE LIMITS DURING ASPHALT HEATING. DO NOT HEAT ASPHALT WITHIN 25 DEG. F (14 DEG. C) OF FLASH POINT. DISCARD ASPHALT MAINTAINED

PREVENT WATER FROM ENTERING COMPLETED SECTIONS OF ROOFING.

1. APPLY HOT ROOFING ASPHALT WITHIN PLUS OR MINUS 25 DEG. F (14 DEG. C) OF EQUIVISCOUS TEMPERATURE AND ADHERE COMPONENTS TO ASPHALT HEATED TO NOT LESS THAN 425 DEG. F (236 DEG. C)

F. SUBSTRATE-JOINT PENETRATIONS: PREVENT ROOFING ASPHALT AND ADHESIVES FROM PENETRATING SUBSTRATE JOINTS. ENTERING BUILDING, OR DAMAGING ROOFING SYSTEM COMPONENTS OR ADJACENT BUILDING CONSTRUCTION.

3.6 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

A. INSTALL MODIFIED BITUMINOUS ROOFING MEMBRANE SHEET AND CAP SHEET ACCORDING TO ROOFING MANUFACTURER'S WRITTEN INSTRUCTIONS, STARTING AT LOW POINT OF ROOFING SYSTEM. EXTEND ROOFING MEMBRANE SHEETS OVER AND TERMINATE BEYOND CANTS, INSTALLING AS FOLLOWS:

1. UNROLL ROOFING MEMBRANE SHEETS AND ALLOW THEM TO RELAX FOR MINIMUM TIME PERIOD REQUIRED BY MANUFACTURER.

2. ADHERE TO SUBSTRATE IN A SOLID MOPPING OF HOT ROOFING ASPHALT APPLIED AT NOT LESS THAN 425 DEG. F (236 DEG. C).

B. LAPS: ACCURATELY ALIGN ROOFING MEMBRANE SHEETS, WITHOUT STRETCHING, AND MAINTAIN UNIFORM SIDE AND END LAPS. STAGGER END LAPS. INSTALL ROOFING MEMBRANE SHEETS SO SIDE AND END LAPS SHED WATER. COMPLETELY BOND AND SEAL LAPS, LEAVING NO VOIDS.

1. REPAIR TEARS AND VOIDS IN LAPS AND LAPPED SEAMS NOT COMPLETELY SEALED.

2. APPLY ROOFING GRANULES TO COVER EXUDED BEAD AT LAPS WHILE BEAD IS HOT.

BUILT-UP ROOFING AND 6 INCHES (150 MM) ONTO FIELD OF ROOF MEMBRANE.

3.7 FLASHING AND STRIPPING INSTALLATION

MOPPING OF HOT ROOFING ASPHALT.

A. INSTALL BASE FLASHING OVER CANT STRIPS AND OTHER SLOPED AND VERTICAL SURFACES, AT ROOF EDGES. AND AT PENETRATIONS THROUGH ROOF: SECURE TO SUBSTRATES ACCORDING TO ROOFING SYSTEM MANUFACTURER'S WRITTEN INSTRUCTIONS, AND AS FOLLOWS:

1. EXTEND BASE FLASHING UP WALLS OR PARAPETS A MINIMUM OF 12 INCHES (300 MM) ABOVE

2. PRIME SUBSTRATES WITH ASPHALT PRIMER IF REQUIRED BY ROOFING SYSTEM MANUFACTURER.

3. BACKER SHEET APPLICATION: INSTALL BACKER SHEET AND ADHERE TO SUBSTRATE IN A SOLID

4. FLASHING SHEET APPLICATION: ADHERE FLASHING SHEET TO SUBSTRATE IN A SOLID MOPPING OF HOT ROOFING ASPHALT APPLIED AT NOT LESS THAN 425 DEG. F (236 DEG. C). APPLY HOT ROOFING ASPHALT TO BACK OF FLASHING SHEET IF RECOMMENDED BY ROOFING SYSTEM MANUFACTURER. MECHANICALLY FASTEN TOP OF BASE FLASHING SECURELY AT TERMINATIONS AND PERIMETER OF ROOFING.

5. FLASHING SHEET BOTTOM TERMINATION: ADHERE FLASHING SHEET TO ROOF MEMBRANE SHEET CONTINUOUSLY ALONG BOTTOM OF FLASHING SHEET.

B. SEAL TOP TERMINATION OF BASE FLASHING WITH A METAL TERMINATION BAR.

C. INSTALL ROOFING MEMBRANE CAP-SHEET STRIPPING WHERE METAL FLANGES AND EDGINGS ARE SET ON MEMBRANE ROOFING ACCORDING TO ROOFING SYSTEM MANUFACTURER'S WRITTEN

D. ROOF DRAINS: SET 30 BY 30 INCH (760 BY 760 MM) SQUARE METAL FLASHING IN BED OF ASPHALT

ROOFING CEMENT ON COMPLETED ROOFING MEMBRANE. COVER METAL FLASHING WITH ROOFING

1. INSTALL STRIPPING ACCORDING TO ROOFING SYSTEM MANUFACTURER'S WRITTEN

MEMBRANE CAP-SHEET STRIPPING AND EXTEND A MINIMUM OF 6 INCHES BEYOND EDGE OF METAL

FLASHING ONTO FIELD OF ROOFING MEMBRANE. CLAMP ROOFING MEMBRANE, METAL FLASHING, AND STRIPPING INTO ROOF-DRAIN CLAMPING RING.

3.8 SURFACING AND COATING INSTALLATION

A. ACRYLIC EMULSION COATING

3.9 FIELD QUALITY CONTROL

1. ACRYLIC EMULSION COATING: APPLY COATING TO ROOFING MEMBRANE AND BASE FLASHINGS IN NOT LESS THAN TWO COATS, WITH NUMBER OF COATS, THICKNESS OF APPLICATION, AND APPLICATION METHOD AS RECOMMENDED IN WRITING BY COATING MANUFACTURER.

A. FINAL ROOF INSPECTION: ARRANGE FOR ROOFING SYSTEM MANUFACTURER'S TECHNICAL PERSONNEL TO INSPECT ROOFING INSTALLATION AT COMMENCEMENT AND UPON COMPLETION.

1. NOTIFY ARCHITECT AND OWNER 48 HOURS IN ADVANCE OF DATE AND TIME OF INSPECTION.

INSPECTIONS INDICATE THAT THEY DO NOT COMPLY WITH SPECIFIED REQUIREMENTS.

B. REPAIR OR REMOVE AND REPLACE COMPONENTS OF BUILT-UP ROOFING WHERE TEST RESULTS OR

1. ADDITIONAL TESTING AND INSPECTING, AT CONTRACTOR'S EXPENSE, WILL BE PERFORMED TO DETERMINE IF REPLACED OR ADDITIONAL WORK COMPLIES WITH SPECIFIED REQUIREMENTS.

**END OF SECTION 075216.11** 

ACCORDING TO WARRANTY REQUIREMENTS.

3.10 PROTECTING AND CLEANING A. PROTECT ROOFING SYSTEM FROM DAMAGE AND WEAR DURING REMAINDER OF CONSTRUCTION PERIOD. WHEN REMAINING CONSTRUCTION WILL NOT AFFECT OR ENDANGER ROOFING, INSPECT ROOFING FOR DETERIORATION AND DAMAGE, DESCRIBING ITS NATURE AND EXTENT IN A WRITTEN

REPORT, WITH COPIES TO ARCHITECT AND OWNER. B. CORRECT DEFICIENCIES IN OR REMOVE ROOFING SYSTEM THAT DOES NOT COMPLY WITH REQUIREMENTS, REPAIR SUBSTRATES, AND REPAIR OR REINSTALL ROOFING SYSTEM TO A CONDITION FREE OF DAMAGE AND DETERIORATION AT TIME OF SUBSTANTIAL COMPLETION AND

C. CLEAN OVERSPRAY AND SPILLAGE FROM ADJACENT CONSTRUCTION USING CLEANING AGENTS AND PROCEDURES RECOMMENDED BY MANUFACTURER OF AFFECTED CONSTRUCTION.

APP: 02-118996 INC: REVIEWED FOR SS 🗹 FLS 🗹 ACS 🗹

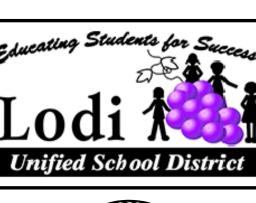
DATE: 06/16/2021

IDENTIFICATION STAMP DIV. OF THE STATE ARCHITEC

DSA 02-118996

AGENCY APPROVAL

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SHEET TITLE:

MECHANICAL AND

SHEET NUMBER:

#### GENERAL PIPE SUPPORT SCHEDULE GENERAL NOTES: . SEE TABLE BELOW FOR GENERAL PIPE SUPPORT SPACING COPPER PIPE HORIZONTAL STEEL PIPE (GAS PIPING) CONDENSATE PIPING NOMINAL PIPE SIZE | MAXIMUM SPACING MAXIMUM SPACING 6'0" 6'0" ¾", 1", 1¼",& 1½ 8'0" 6'0"

NOTES: 1. PROVIDE MEANS OF PREVENTING DISSIMILAR METAL CONTACT SUCH AS FELT OR NON ADHESIVE ISOLATION TAPE. GALVANIZED FELT ISOLATORS SIZED FOR COPPER TUBING MAY ALSO BE USED, TOLCO FIG.83.

10'0"

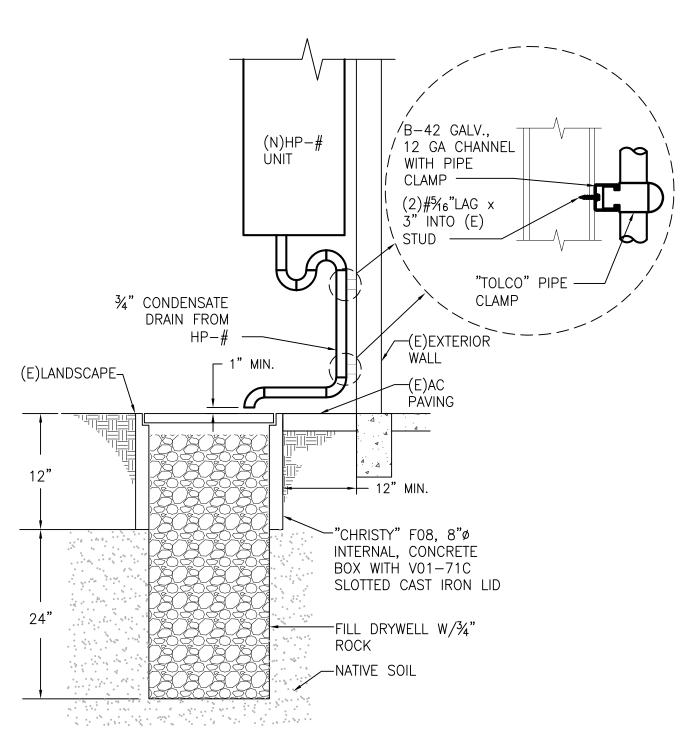
2" & LARGER

10'0"

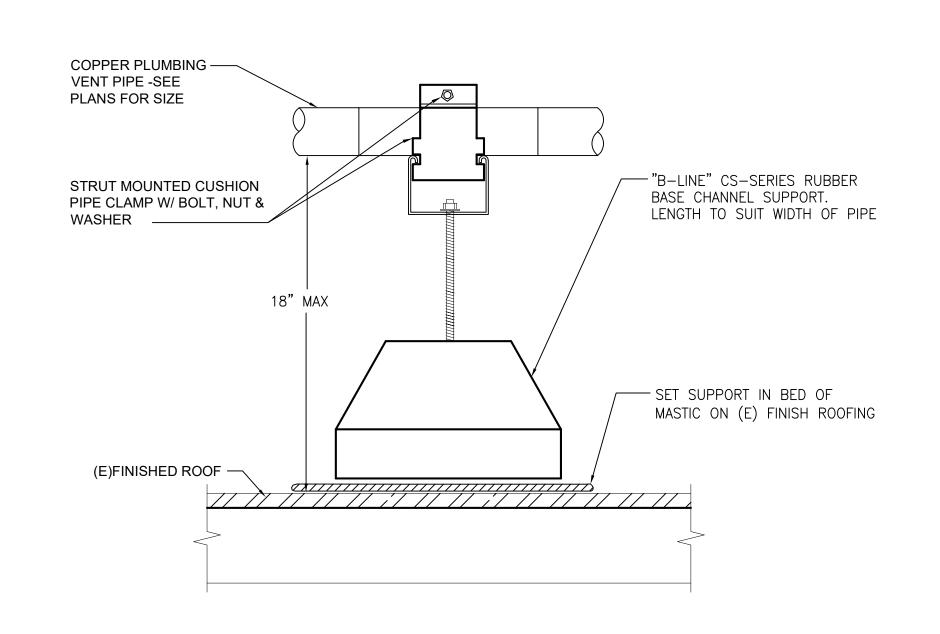
### 2. INSTALL SUPPORT TO PROVIDE A MINIMUM OF ½ INCH SPACE BETWEEN FINISHED COVERING AND ADJACENT WORK.

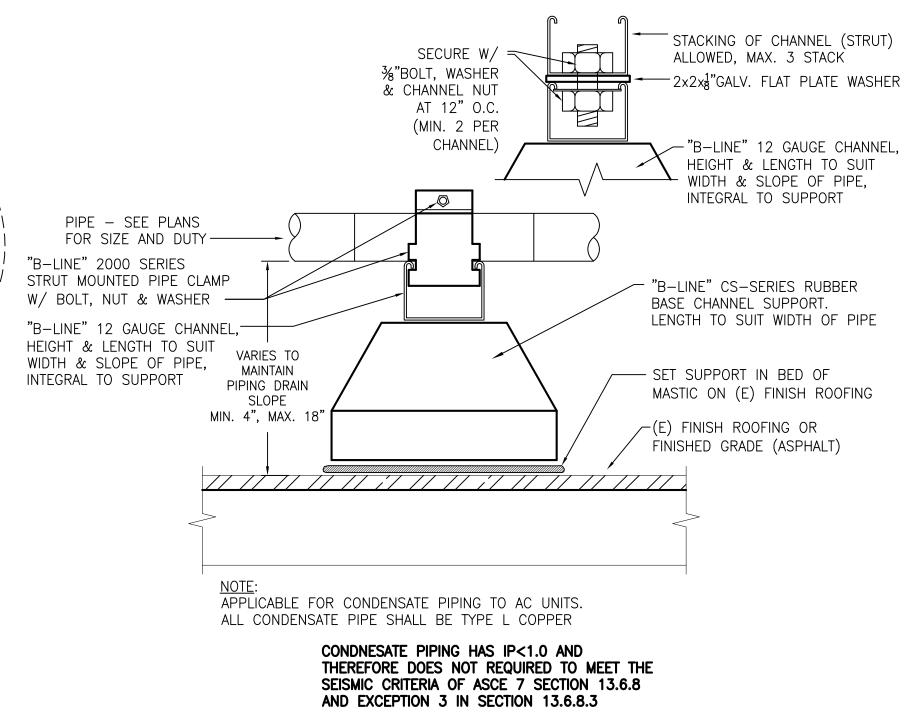
3. SUPPORT SHALL BE INSTALLED WITHIN 12" OF EACH HORIZONTAL ELBOW OR BRANCH CONNECTION

# PIPE SUPPORT SCHEDULE

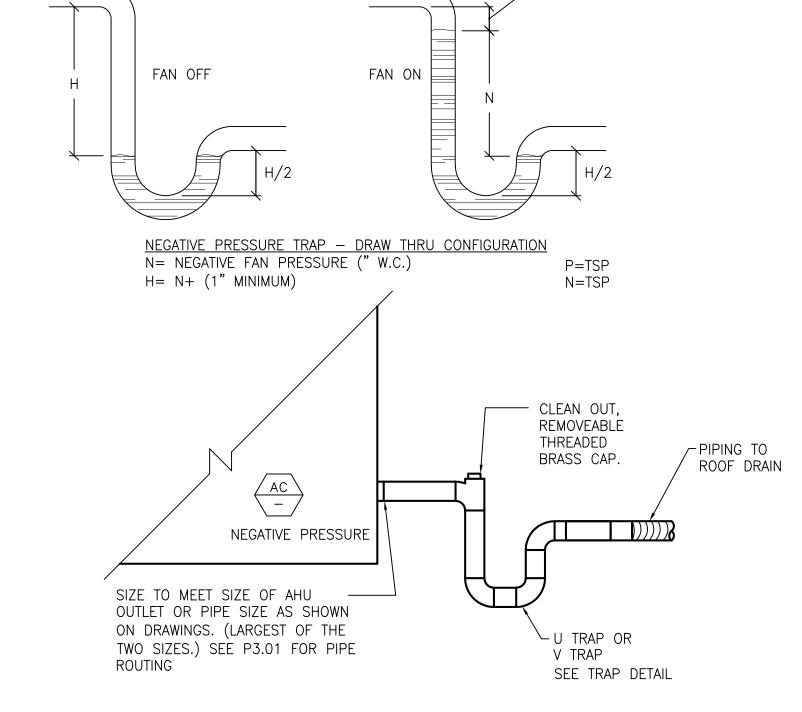


NO SCALE





CONDENSATE PIPE SUPPORT DETAIL NO SCALE



CONDENSATE DRAIN P-TRAP AT AC UNIT

# PIPING MATERIAL SCHEDULE

- CONDENSATE PIPE: TYPE L COPPER TUBING, HARD TEMPER, WITH WROUGHT COPPER FITTINGS. CAPPED OR PLUGGED OUTLETS SHALL BE SCHEDULE 40 SCREWED BRASS. PROVIDE FULL SOLDER CUP
- GAS PIPE: SCHEDULE 40 GALVANIZED STEEL WITH MALLEABLE GALVANIZED IRON SCREWED FITTINGS ABOVE GRADE. CONNECT TO EACH ITEM OF GAS—FIRED EQUIPMENT WITH DRIP LEG AND VALVE. PROVIDE FLEX CONNECTION IN APPROVED SIZES WHERE APPLICABLE

#### EQUIP. ANCHOR. & BRACING NOTES M/E/P COMPONENT ANCHORAGE NOTES:

ALL MECHANICAL, PLUMBING AND ELECTRICAL 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 2019 CBC SECTIONS 1617A.1.18 THROUGH 1617A.1.26 AND ASCE 7-16 CHAPTER 13, 26 AND 30.

- 1. ALL PERMANENT EQUIPMENT AND COMPONENTS.
- 2. TEMPORARY OR MOVABLE 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
- 3. TEMPORARY, MOVEABLE 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

THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE, BUT NEED NOT 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 TRAVERSE AND LONGITUDINAL DIRECTIONS.

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

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 THE DSA. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH THE ABOVE REQUIREMENTS.

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTES

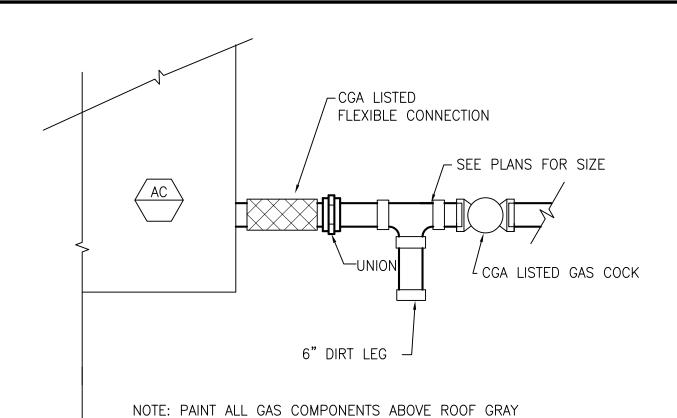
PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENT PRESCRIBED IN ASCE 7-16 SECTION 13.3 AS DEFINED IN ASCE 7-16 SECTION 13.6.5, 13.6.6, 13.6.7, 13.6.8, AND 2019 1617A.1.24, 1617A.1.25 AND 1617A.1.26.

THE METHOD OF SHOWING THE BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEM AREA AS NOTED BELOW. WHEN BRACING AND ATTACHMENTS ARE BASED ON A PREAPPROVED INSTALLATION GUIDE (F.G. OSHPD OPMO FOR 2013 CBC OR LATER) 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

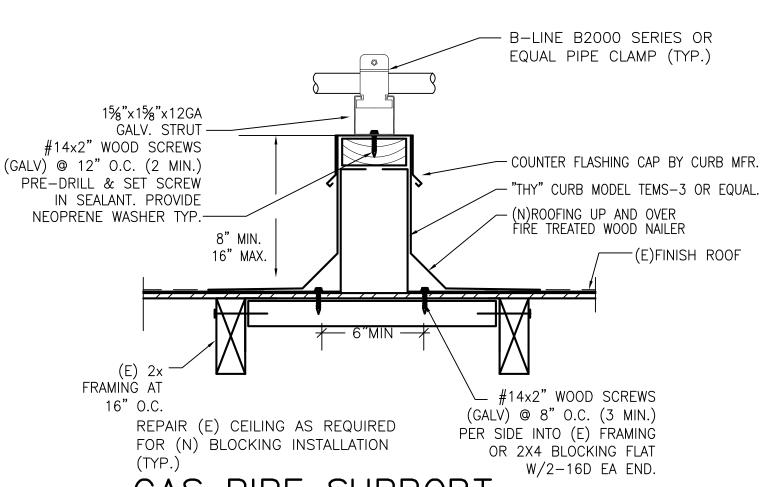
MECHANICAL PIPING (MP), MECHANICAL DUCTS (MD), PLUMBING PIPING (PP), ELECTRICAL DISTRIBUTION

- OPTION 1: DETAILED ON THE APPROVED DRAWINGS WITH PROJECT SPECIFIC NOTES AND DETAILS.

- OPTION 2: SHALL COMPLY WITH THE APPLICABLE OSHPD  $\square$  MP  $\square$  MD  $\square$  PP  $\square$  E PRE-APPROVAL (OPM #) #\_\_\_\_\_



GAS CONNECTION AT AC UNIT NO SCALE



GAS PIPE SUPPORT NEW RAIL ATTACHMENT DEAIL

# PLUMBING LEGEND

COLD WATER LINE CONDENSATE DRAIN FIRE SERVICE LINE GAS HOT WATER LINE \_\_\_\_\_ HOT WATER RETURN LIQUID PETROLEUM GAS \_\_\_\_\_LPG-\_\_\_\_ OVERFLOW \_\_\_\_\_OFL \_\_\_\_ PIPING OR EQUIPMENT TO BE REMOVED -X X X XRAINWATER LEADER RISE OR DROP IN DIRECTION OF FLOW SANITARY SOIL OR WASTE LINE SECONDARY CONDENSATE DRAIN LINE TRAP PRIMER LINE VENT \_\_\_\_\_ CLEANOUT & WALL CLEANOUT FIRE DEPARTMENT CONNECTION FLOOR/ GRADE CLEAN OUT FLOOR DRAIN HOSE BIBB/ WALL HYDRANT TRAP PRIMER BALANCING VALVE BALL VALVE BUTTERFLY VALVE CHECK VALVE FLEXIBLE CONNECTION GATE VALVE SHUT OFF COCK PRESSURE GAUGE PRESSURE REDUCING VALVE REDUCER PRESSURE & TEMPERATURE RELIEF VALVE SHUT OFF VALVE STRAINER STRAINER & DRAIN VALVE WITH HOSE FITTING SOLENOID VALVE

THERMOMETER UNION ABOVE ABOVE CEILING, OVERHEAD ABC, OH ACCESS DOOR AMERICANS WITH DISABILITIES ACT ABOVE FINISHED FLOOR CENTERLINE CLEANOUT COLD WATER DOMESTIC HOT WATER DHWR DOMESTIC HOT WATER RETURN DIA, Ø DIAMETER FLEXIBLE CONNECTION FLOOR CLEANOUT FLOOR DRAIN FSR FIRE SPRINKLER RISER GRADE CLEANOUT HW HOT WATER HOT WATER RETURN INVERT ELEVATION NEW, EXISTING NOT IN CONTRACT NIC POC POINT OF CONNECTION P, TRV PRESSURE & TEMPERATURE RELIEF VALVE RPBP REDUCED PRESSURE BACKFLOW PREVENTER (R) (D) RISE, DROP ROOF DRAIN, OVERFLOW RD, OFL ROUGH-IN RUN-OUT SMS SHEET METAL SCREWS SOV SHUT OFF VALVE TA, FA TO ABOVE, FROM ABOVE TO BELOW, FROM BELOW TBR TO BE REMOVED TRAP PRIMER UG, UF

# APPLICABLE CODES

UNDERGROUND, UNDERFLOOR

VENT, VENT RISER, VENT THRU ROOF

UNLESS OTHERWISE NOTED

UP THROUGH ROOF

WATERTIGHT

ZONE VALVE

WALL CLEANOUT

UON

UTR

V, VR, VTR

ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE APPLICABLE REGULATIONS,

A) STATE OF CALIFORNIA CODE OF REGULATIONS (CCR) TITLE 24, BUILDING STANDARDS: 2019 EDITION OF THE CALIFORNIA BUILDING CODE. 2019 EDITION OF THE CALIFORNIA ELECTRICAL CODE. 2019 EDITION OF THE CALIFORNIA MECHANICAL CODE 2019 EDITION OF THE CALIFORNIA PLUMBING CODE.

INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

2019 EDITION OF THE CALIFORNIA ENERGY CODE.

B) NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) LIFE SAFETY CODE, CR.

IDENTIFICATION STAMP DIV. OF THE STATE ARCHITEC APP: 02-118996 INC: REVIEWED FOR SS 🗹 FLS 🗹 ACS 🗹 DATE: 06/16/2021

DSA 02-118996

AGENCY APPROVAL

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SHEET TITLE:

PLUMBING LEGEND, SCHEDULES, AND NOTES

P0.01

SHEET NUMBER:

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DIV. OF THE STATE ARCHITECT

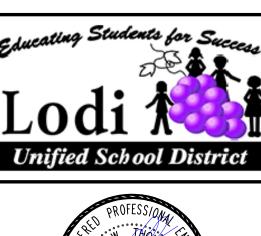
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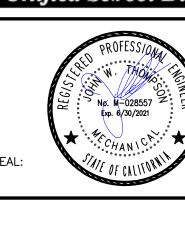
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SS FLS ACS D

DATE: 06/16/2021

TURLEY
ENGINEERING
RASSOCIATES
GROUP, INC.

(916) 325-1065
FAX (916) 325-1075
Email office@turleymech.com





ODI UNIFIED SCHOOL DISTRICT WOODBRIDGE ELEMENTARY HVAC REPLACEMENT 1290 LILAC STREET WOODBRIDGE, CA. 95242

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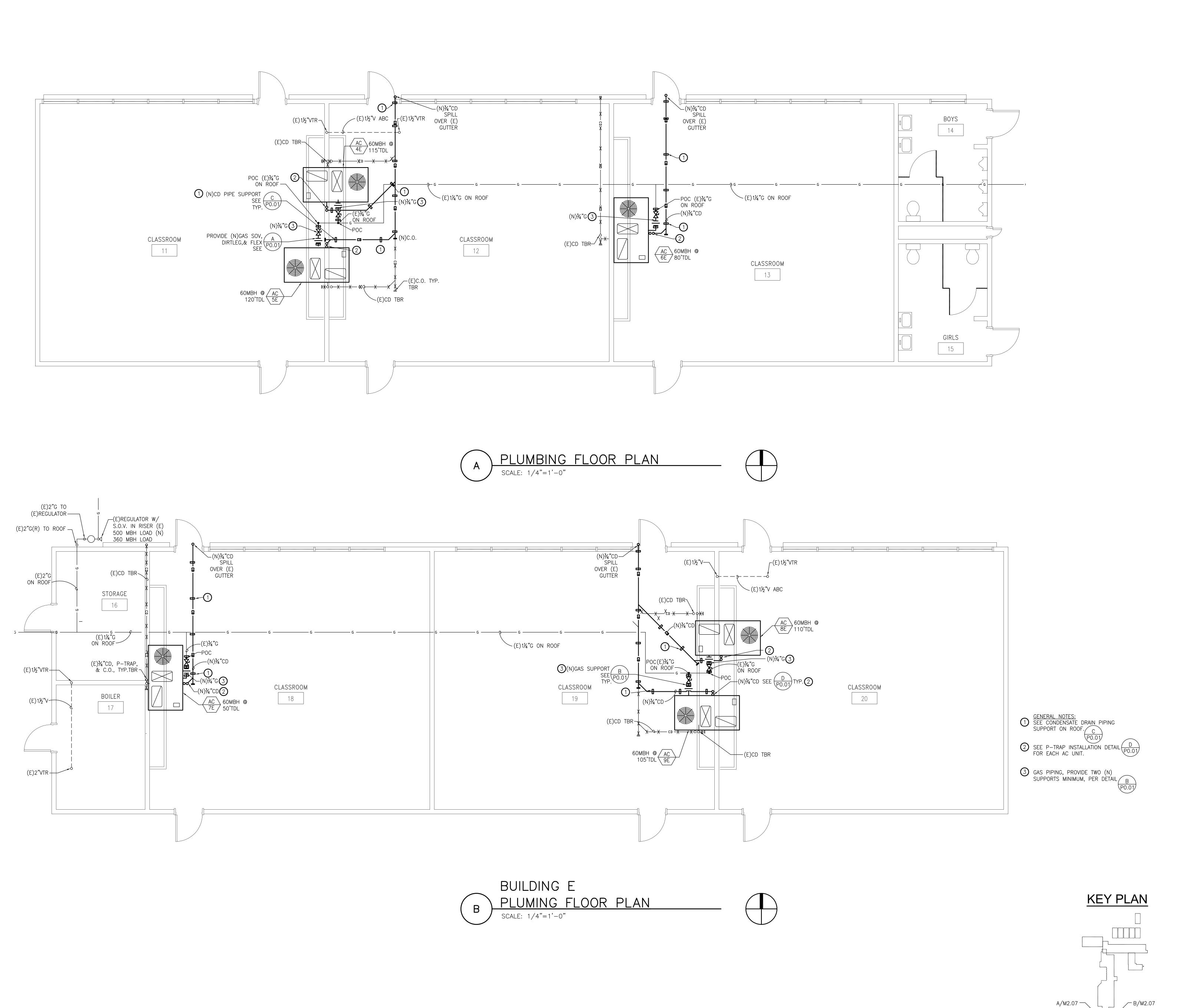
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NO. REVISIONS DATE

**KEY PLAN** 

P2.06

SHEET NUMBER:



IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 02-118996 INC:
REVIEWED FOR
SS FLS ACS D
DATE: 06/16/2021

TURLEY
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Educating Students for Success

Lodi

Unified School District



ODI UNIFIED SCHOOL DISTRICT
WOODBRIDGE ELEMENT
1290 LILAC STREET
WOODBRIDGE, CA. 95242

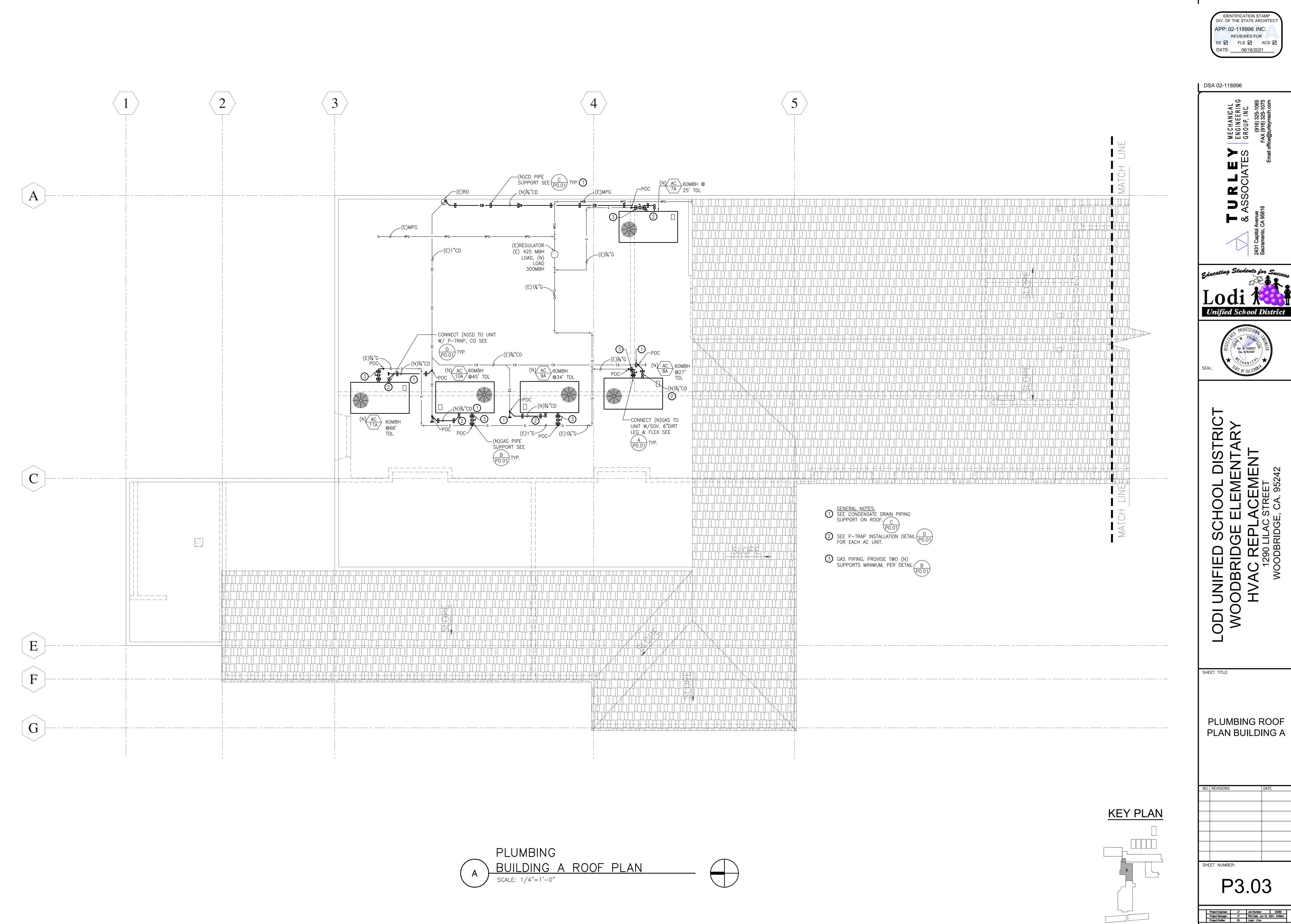
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PLUMBING FLOOR PLAN BUILDING E

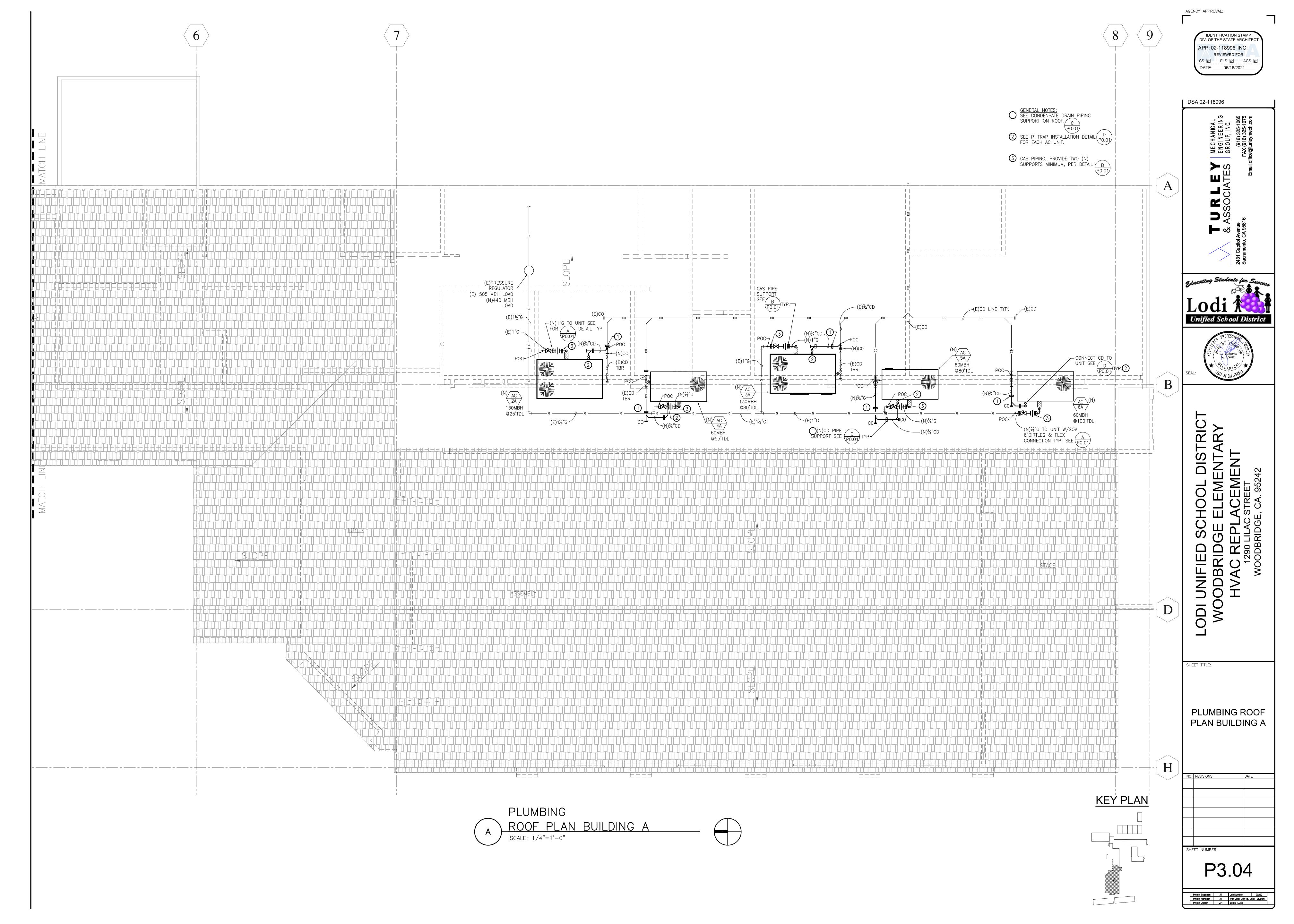
NO. REVISIONS DATE

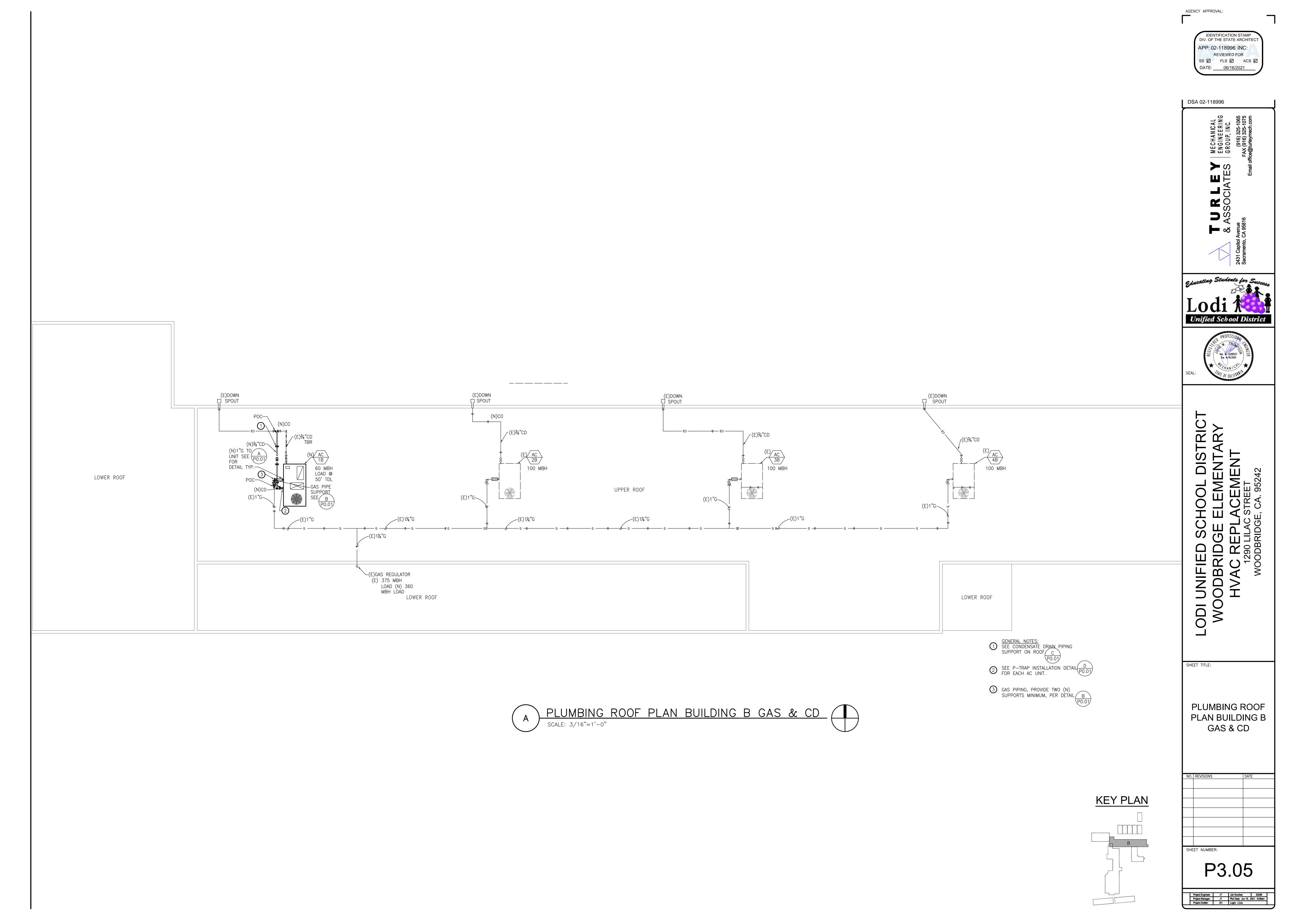
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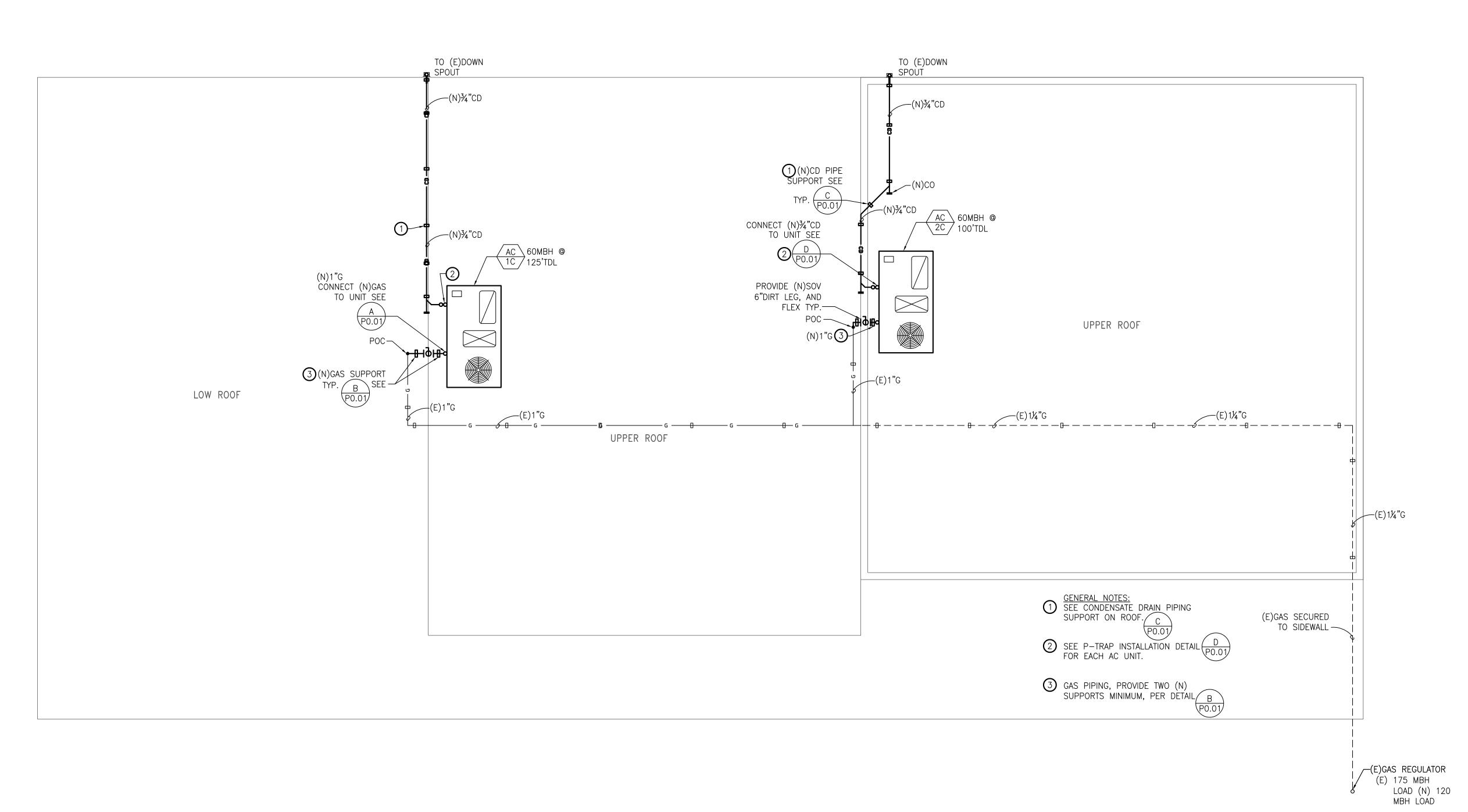
P2.07



AGENCY APPROVAL:







PLUMBING ROOF PLAN BUILDING C GAS & CD

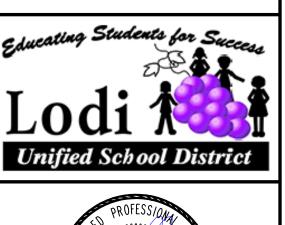
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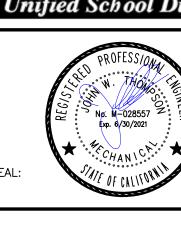
IDENTIFICATION STAMP
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APP: 02-118996 INC:
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DATE: 06/16/2021

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Email office@turleymech.com
Email office@turleymech.com





ODI UNIFIED SCHOOL DISTR WOODBRIDGE ELEMENTAR HVAC REPLACEMENT

SHEET TITLE:

PLUMBING ROOF PLAN BUILDING C GAS & CD

NO. REVISIONS DATE

SHEET NUMBER:

**KEY PLAN** 

P3.06

**BUILDING ENERGY ANALYSIS REPORT** 

PROJECT:

WOODBRIDGE ES HVAC REPLACEMENT

1290 LILAC STREET

WOODBRIDGE, CA 95242

**Project Designer:** 

Turley & Associates

2431 Capitol Ave

Sacramento, CA 95816 916-325-1065

Report Prepared by:

TIM FLAGG

Turley & Associates

2431 Capitol Ave Sacramento, CA 95816

916-325-1065

Job Number:

20290

3/19/2021

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is

authorized by the California Energy Commission for use with both the Residential and Nonresidential 2019 Building Energy Efficiency Standards. This program developed by EnergySoft Software – www.energysoft.com.

**TABLE OF CONTENTS** 

SA 02-	118996		
	MECHANICAL ENGINEERING GROUP, INC.	(916) 325-1065 FAX (916) 325-1075 Email office@turleymech.com	

Unified School District



SHEET TITLE:

COMPLIANCE

T-24.1

STATE OF CALIFORNIA Mechanical Systems CALIFORNIA ENERGY COMMISSION NRCC-MCH-E CERTIFICATE OF COMPLIANCE NRCC-MCH-E WOODBRIDGE ES HVAC REPLACEMENT Report Page: Project Name: (Page 4 of 17 1290 LILAC STREET Date Prepared: 3/19/2021 Project Address:

H. FAN SYSTEMS & AIR ECONOMIZERS Economizer Designed per §140.4(e) and System Fan Type: Variable Air Volume Controls: Name: Fan Power Pressure Drop Adjustment - Table 140.4-Fan Name or Maximum Design Supply Airflow Design Airflow through Fan Function Item Tag Device (CFM) SF Supply BHP Total System Design Maximum System Fan Total System Design Supply Airflow (CFM): (B)HP: Power (B)HP: Economizer Designed per §140.4(e) and HP-23 Economizer: NA: <=54 kBtu/h cooling System Fan Type: Variable Air Volume Name: Controls: an Power Pressure Drop Adjustment - Table 140.4an Name o Maximum Design Supply Airflow Design HP Design Airflow through Item Tag (CFM) Device (CFM) Supply BHP Total System Design Total System Design Supply Airflow (CFM): (B)HP: Power (B)HP: Economizer: NA: <=54 kBtu/h cooling System Fan Type: Variable Air Volume Name: Controls: an Power Pressure Drop Adjustment - Table 140.4-Fan Name or Maximum Design Supply Airflow Fan Function Design Airflow through Item Tag Device (CFM) BHP Maximum System Fan Total System Design Total System Design Supply Airflow (CFM):

> Registration Provider: Energysoft CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance Report Generated: 2021-03-19 12:10:50

STATE OF CALIFORNIA

NRCC-MCH-E

Project Name:

Project Address:

2 Climate Zone

B. PROJECT SCOPE

STATE OF CALIFORNIA

NRCC-MCH-E

Project Name:

Office (B)

3 Occupancy Types Within Project:

Hotel/ Motel Guest Rooms (R-1)

High-Rise Residential (R-2/R-3)

140.4, or <u>§141.0(b)2</u> for alterations.

Heating Air System

Cooling Air System

Air System(s)

Mechanical Controls

Mechanical Controls (existing to remain, altered

Mechanical Systems

CERTIFICATE OF COMPLIANCE

path outlined in <u>§140.4</u>, or <u>§141.0(b)2</u> for alterations.

Registration Date/Time: Report Version: 2019.1.003 Schema Version: rev 20200601

This document is used to demonstrate compliance for mechanical systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive

1290 LILAC STREET Date Prepared:

This table Includes mechanical systems or components that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in

Water Economizer

System Piping

Pumps

☐ Cooling Towers

Chillers

Boilers

Wet System Components

04 Total Conditioned Floor Area

Healthcare Facility (I)

Other (write in)

5 Total Unconditioned Floor Area

☐ Non-refrigerated Warehouse (S)

06 # of Stories (Habitable Above Grade)

WOODBRIDGE ES HVAC REPLACEMENT Report Page:

Retail (M)

☐ School (E)

Relocatable Class Bldg (E)

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CALIFORNIA ENERGY COMMISSION

CALIFORNIA ENERGY COMMISSION

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Cover Page

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Form NRCC-MCH-E Mechanical Systems

CALIFORNIA ENERGY COMMISSION

See Table J

Dry System Components

Ductwork (existing to remain, altered or new)

Air Economizer

Fan Systems

Ventilation

Zonal Systems/ Terminal Boxes

☐ Electric Resistance Heat

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Mechanical Systems CERTIFICATE OF COMPLIANCE WOODBRIDGE ES HVAC REPLACEMENT Report Page: 1290 LILAC STREET Date Prepared

Table C will indicate if the project data input into the compliance document is compliant with mechanical requirements. This table is not editable by the user. If this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D., or the table indicated as not compliant for auidance. Summary Controls Cooling Towers Controls: §140.4(k) §140.4(c), §110.2(e)2 Compliance Results §140.4(d) §140.4(I) 
 (See Table G)
 (See Table H)
 (See Table H)

 D
 AND
 Yes
 AND
 Mandatory Measures Compliance (See Table O for Details COMPLIES

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. F. HVAC SYSTEM SUMMARY (DRY & WET SYSTEMS) This section does not apply to this project. This section does not apply to this project.

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STATE OF CALIFORNIA Mechanical Systems NRCC-MCH-E CERTIFICATE OF COMPLIANCE WOODBRIDGE ES HVAC REPLACEMENT Report Page: Project Name: 1290 LILAC STREET Date Prepared: Project Address:

H. FAN SYST	EMS & AIR ECONC	MIZERS								
				escriptive requirements four be included in Table H.	nd in <u>§140</u>	).4(c), <u>§</u>	140.4(e) o	and <u>§140.4(m)</u> for fan	systems. Fan systems servin	g only process loads are
System Name:	HP-19	Econor	mizer:1	NA: <=54 kBtu/h cooling	Econor Contr		Designe	ed per <u>§140.4(e)</u> and (m)	System Fan Type:	Variable Air Volume
01	02		03	04			05	06	07	08
Fan Name or				Maximum Design Supply	Airflow				Fan Power Pressure Drop	Adjustment - Table 140.4-B
Item Tag	Fan Function   Oty			(CFM)	Alliow	НР	Unit <sup>2</sup>	Design HP	Device	Design Airflow through Device (CFM)
SF	Supply		1	0		1	BHP	0	NA	NA
Total System Design Supply Airflow (CFM):				0	Total 9	ystem (B)HP:	Design	0	Maximum System Fan Power (B)HP:	0
System Name:	HP-20	Econor	mizer:1	NA: <=54 kBtu/h cooling	Econor Contr		Designe	ed per <u>§140.4(e)</u> and (m)	System Fan Type:	Variable Air Volume
01	02		03	04			05	06	07	08
Fan Name or				Maximum Design Supply	Airflow				Fan Power Pressure Drop	Adjustment - Table 140.4-B
Item Tag	Fan Functio	on	Qty	(CFM)	AIIIIOW	HP	Unit <sup>2</sup>	Design HP	Device	Design Airflow through Device (CFM)
SF	Supply		1	0		-	BHP	0	NA	NA
Total Sys	tem Design Supply A	Airflow (CF	·M):	0	Total S	ystem (B)HP:	Design	0	Maximum System Fan Power (B)HP:	0
System Name:	HP-21	Econor	mizer:1	NA: <=54 kBtu/h cooling	Econor Contr		Designe	ed per <u>§140.4(e)</u> and (m)	System Fan Type:	Variable Air Volume
01	02		03	04			05	06	07	08
Fan Name or	ian Nama ar			Maximum Design Supply	Airflow				Fan Power Pressure Drop /	Adjustment - Table 140.4-B
Item Tag	I Fan Function I Oty		Qty	(CFM)	Annow	HP	Unit <sup>2</sup>	Design HP	Device	Design Airflow through Device (CFM)
SF	Supply		1	0		1	BHP	0	NA	NA
Total System Design Supply Airflow (CFM):				0	Total S	ystem (B)HP:	Design	0	Maximum System Fan Power (B)HP:	0

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H. FAN SYSTEM	IS & AIR ECONO	MIZERS								
System Name:	AC-7A	Econor	nizer:1	Differential Temperature	Econor		Designe	d per <u>§140.4(e)</u> and (m)	System Fan Type:	Variable Air Volume
01	02		03	04			05	06	07	08
Fan Name or	_			Maximum Design Supply	Airflow				Fan Power Pressure Drop	Adjustment - Table 140.4
Item Tag	I Fan Function I Otv			(CFM)	Alliow	HP	Unit <sup>2</sup>	Design HP	Device	Design Airflow throug Device (CFM)
SF	Supply		1	0		E	3HP	0	NA	NA
Total System Design Supply Airflow (CFM):				0	System (B)HP:	Design	0	Maximum System Fan Power (B)HP:	0	
System Name:	AC-8A	Econor	nizer:1	NA: <=54 kBtu/h cooling	Econor Contr		Designe	ed per <u>§140.4(e)</u> and (m)	System Fan Type:	Variable Air Volume
01	02		03	04			05	06	07	08
Fan Name or				Maximum Design Supply	Airflow				Fan Power Pressure Drop	Adjustment - Table 140.4
Item Tag	Fan Functio	on	Qty	(CFM)	Airilow	HP		Design HP	Device	Design Airflow throug Device (CFM)
SF	Supply		1	0		E	3HP	0	NA	NA
Total Syster	n Design Supply A	Airflow (CF	M):	0	Total S	System (B)HP:	Design	0	Maximum System Fan Power (B)HP:	0
System Name:	AC-9A	Econor	nizer:1	NA: <=54 kBtu/h cooling	Econor Contr		Designe	d per <u>§140.4(e)</u> and (m)	System Fan Type:	Variable Air Volume
01	02		03	04			05	06	07	08
Fan Name or				Maximum Design Supply	Airflow				Fan Power Pressure Drop	Adjustment - Table 140.4
Item Tag	Fan Functio	on	Qty (CFM)		Annow	HP	Unit <sup>2</sup>	Design HP	Device	Design Airflow throug Device (CFM)
SF Supply 1			0	<u> </u>	BHP 0		0	NA	NA	
Total System Design Supply Airflow (CFM):				0	Total System Design (B)HP:			0	Maximum System Fan Power (B)HP:	0

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STATE OF CALIFORNIA **Mechanical Systems** 

CALIFORNIA ENERGY COMMISSION

Variable Air Volume

Design Airflow through

Device (CFM)

Variable Air Volume

Design Airflow through

Device (CFM)

Variable Air Volume

Design Airflow through

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CALIFORNIA ENERGY COMMISSION

Variable Air Volume

Design Airflow through

Device (CFM)

Variable Air Volume

Design Airflow through

Device (CFM)

Variable Air Volume

Design Airflow through

Registration Provider: Energysoft

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CALIFORNIA ENERGY COMMISSION

Variable Air Volume

Design Airflow through

Device (CFM)

Variable Air Volume

Design Airflow through

Device (CFM)

Variable Air Volume

Design Airflow through

Device (CFM)

an Power Pressure Drop Adjustment - Table 140.4-B

n Power Pressure Drop Adjustment - Table 140.4-B

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Device (CFM)

Power Pressure Drop Adjustment - Table 140.4-B

an Power Pressure Drop Adjustment - Table 140.4-B

n Power Pressure Drop Adjustment - Table 140.4-8

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Device (CFM)

an Power Pressure Drop Adjustment - Table 140.4-8

n Power Pressure Drop Adjustment - Table 140.4-

n Power Pressure Drop Adjustment - Table 140.4-8

Device

Maximum System Fan

Power (B)HP:

System Fan Type:

Maximum System Fan

System Fan Type:

Maximum System Fan

Power (B)HP:

System Fan Type:

Maximum System Fan

System Fan Type:

Maximum System Fan

Power (B)HP:

System Fan Type:

Maximum System Fan

System Fan Type:

Device

Maximum System Fan

Power (B)HP:

System Fan Type:

Power (B)HP:

System Fan Type:

Maximum System Fan

Power (B)HP:

Power (B)HP:

Power (B)HP:

Power (B)HP:

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System Name:	AC-10A	Econor	nizer:1	NA: <=54 kBtu/h cooling	Econon Contro		Designe	d per <u>§140.4(e)</u> and (m)	System Fan Type:	Variable Air Volume
01	02		03	04			05	06	07	08
Fan Name or	eme or			Maximum Design Sunnly	Airflow				Fan Power Pressure Drop A	Adjustment - Table 140.4-
Item Tag	Fan Functio	n	Qty	(CFM)	Maximum Design Supply Airflow (CFM)			Design HP	Device	Design Airflow through Device (CFM)
SF	Supply		1	0		Е	ВНР	0	NA	NA
Total Syst	em Design Supply A	irflow (CF	M):	O Total			Design	0	Maximum System Fan Power (B)HP:	0
System Name:	AC-11A	Econor	nizer:1	Differential Temperature	Econon Contre		Designe	d per <u>§140.4(e)</u> and (m)	System Fan Type:	Variable Air Volume
01	02		03	04			05	06	07	08
Fan Name or	lama au			Maximum Design Supply	Airflow				Fan Power Pressure Drop A	Adjustment - Table 140.4-
Item Tag	Fan Functio	n	Qty	(CFM)	Airriow	HP Unit <sup>2</sup>		Design HP	Device	Design Airflow through Device (CFM)
SF	Supply		1	0		Е	ВНР	0	NA	NA
Total Syst	em Design Supply A	irflow (CF	M):	0		ystem ( (B)HP:	Design	0	Maximum System Fan Power (B)HP:	0
System Name:	AC-2A	Econor	nizer:1	Differential Temperature	Econon Contre		Designe	d per <u>§140.4(e)</u> and (m)	System Fan Type:	Variable Air Volume
01	02		03	04			05	06	07	08
Fan Name or				Maximum Design Supply	Airflow				Fan Power Pressure Drop A	Adjustment - Table 140.4-
Item Tag	Fan Functio	n	Qty	(CFM)		HP	Unit <sup>2</sup>	Design HP	Device	Design Airflow through Device (CFM)
SF	F Supply 1			0		В	BHP	0	NA	NA
Total Syst	em Design Supply A	irflow (CF	M):	O Total S			Design 0		Maximum System Fan Power (B)HP:	0

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Total System Design

(B)HP:

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Project Name:

Name:

Fan Name or

Item Tag

Item Tag

Fan Name or

Item Tag

Registration Number:

STATE OF CALIFORNIA

Project Name:

Fan Name or

Item Tag

Name:

Fan Name or

Item Tag

Fan Name o

Item Tag

Registration Number:

STATE OF CALIFORNIA

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Project Name:

Project Address:

Fan Name or

Item Tag

Fan Name or

Item Tag

Fan Name or

Item Tag

Mechanical Systems

CERTIFICATE OF COMPLIANCE

H. FAN SYSTEMS & AIR ECONOMIZERS

Fan Function

Total System Design Supply Airflow (CFM):

Total System Design Supply Airflow (CFM):

Total System Design Supply Airflow (CFM):

01

Project Address:

Mechanical Systems

CERTIFICATE OF COMPLIANCE

H. FAN SYSTEMS & AIR ECONOMIZERS

AC-6A

Total System Design Supply Airflow (CFM):

AC-1D

Fan Function

Fan Function

Supply

Fan Function

Supply

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Total System Design Supply Airflow (CFM):

Total System Design Supply Airflow (CFM):

AC-2D

03

Project Address:

Mechanical Systems

CERTIFICATE OF COMPLIANCE

H. FAN SYSTEMS & AIR ECONOMIZERS

Total System Design Supply Airflow (CFM):

Total System Design Supply Airflow (CFM):

Total System Design Supply Airflow (CFM):

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Maximum Design Supply Airflow

Maximum Design Supply Airflow

Maximum Design Supply Airflow

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NA: <=54 kBtu/h cooling

Maximum Design Supply Airflow

Maximum Design Supply Airflow

Maximum Design Supply Airflow

WOODBRIDGE ES HVAC REPLACEMENT Report Page:

Differential Temperature

Maximum Design Supply Airflow

Maximum Design Supply Airflow

Maximum Design Supply Airflow

(CFM)

Differential Temperature

NA: <=54 kBtu/h cooling

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Controls:

Economizer Designed per §140.4(e) and

Designed per §140.4(e) and

Design HP

BHP

BHP

BHP

Total System Design

(B)HP:

Total System Design

(B)HP:

Registration Date/Time:

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Economizer

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HP Unit<sup>2</sup>

HP Unit<sup>2</sup>

BHP

HP Unit<sup>2</sup>

BHP

Total System Design

(B)HP:

Registration Date/Time:

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Controls:

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Economizer Designed per §140.4(e) and

Economizer Designed per §140.4(e) and

Design HP

Design HP

HP Unit<sup>2</sup>

BHP

BHP

BHP

Total System Design

(B)HP:

Controls:

Total System Design

(B)HP:

Total System Design

(B)HP:

Total System Design

(B)HP:

Economizer

Controls:

Designed per §140.4(e) and

Design HP

Design HP

Design HP

Designed per §140.4(e) and

Total System Design

(B)HP:

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Registration Number:

(B)HP: Power (B)HP: Registration Date/Time: Registration Number: CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance Report Version: 2019.1.003 Schema Version: rev 20200601 STATE OF CALIFORNIA Mechanical Systems NRCC-MCH-E CERTIFICATE OF COMPLIANCE

STATE OF CALIFORNIA			
Mechanical Systems			
NRCC-MCH-E			CALIFORNIA ENERGY COMMISSION
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Q. MANDATORY MEASURES DOCUMENTATION LOCATION		
This table is used to indicate where mandatory measures are documented in th	ne plan set or construction documentation.	
01		02
Compliance with Mandatory Measures documented through MCH	Yes	Plan sheet or construction document location
Mandatory Measures Note Block		M-Sheets

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STATE OF CALIFORNIA	
Mechanical Systems	
NRCC-MCH-F	

Sacramento CA 95816

NRCC-MCH-E			CALIFORNIA ENERGY COMMISSION
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	•		

I certify that this Certificate of Compliance docume	n is accurate and complete.
Documentation Author Name: TIM FLAGG	Documentation Author Signature:
Company: Turley & Associates	Signature Date:
Address: 2431 Capitol Ave	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: Sacramento CA 95816	Phone: 916-325-1065

#### RESPONSIBLE PERSON'S DECLARATION STATEMENT I certify the following under penalty of perjury, under the laws of the State of California:

- 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 cesign identified on this Certificate of Compliance (responsible designer)
- 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. 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.
- 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 building rowner at occupancy. Responsible Designer Name: John W. Thompson Date Signed: 2021-03-19 Turley & Associates Address: 2431 Capitol Ave License: M-28557

Phone: 916-325-1065

Schema Version: rev 20200601

Registration Number:	Registration Date/Time:	Registration Provider: Energysoft
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#### STATE OF CALIFORNIA Mechanical Systems

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H. FAN SYSTEMS & AIR ECONOMIZERS										
System Name:	AC-2C	Econon	nizer:1	NA: <=54 kBtu/h cooling	Econon Contro		Designe	d per <u>§140.4(e)</u> and (m)	System Fan Type:	Variable Air Volume
01	02		03	04		05		06	07	08
Fan Name or				Maximum Design Supply	Airflow			Fan Power Pressure Drop Adjustment - Table 140.4-B		
Item Tag	Fan Functio	n	Qty	(CFM)	All llow	HP Unit <sup>2</sup>		HP Unit <sup>2</sup> Design HP	Device	Design Airflow through Device (CFM)
SF	Supply		1	0	ВНР		HP	0	NA	NA
Total Syst	tem Design Supply A	irflow (CF	M):	0	Total System (B)HP:		esign	0	Maximum System Fan Power (B)HP:	0
1 FOOTNOTES:	FOOTNOTES: Computer room economizers must meet requirements of §140.9(a) and will be documented on the NRCC-PRC-E document.									

FOOTNOTES: Computer room economizers must meet requirements of \$140.9(a) and will be documented on the NRCC-PRC-E document.
<sup>2</sup> The unit used for HP must be consistent for all fans within a system.
I. SYSTEM CONTROLS
This section does not apply to this project.
J. VENTILATION AND INDOOR AIR QUALITY
This section does not apply to this project.
K. TERMINAL BOX CONTROLS
This section does not apply to this project.
L. DISTRIBUTION (DUCTWORK and PIPING)
This section does not apply to this project.
M. COOLING TOWERS
This section does not apply to this project.

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	•	

N. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION					
Selections have been made based on information provided in previous tab					

 NRCA-MCH-10-A Hydronic System Variable Flow Controls NRCA-MCH-11-A Automatic Demand Shed Controls

Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E Additional Remarks.							
These documents must be provided to the building inspector during construction and can be found online at							
https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/							
Yes	No	Form/Title	Field Inspector				
163		To my nac	Pass	Fail			

D. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE									
These do	cuments r	en made based on information provided in previous tables of this document. If any selection needs nust be provided to the building inspector during construction and can be found online at gy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCA		litional Re	marks.				
Yes	No	No Form/Title	Systems To Be Field Verified	Field Inspector					
163	140		Systems to be field verified	Pass	Fail				
	•	NRCA-MCH-02-A - Outdoor Air must be submitted for all newly installed HVAC units. Note: MCH-02-A can be performed in conjunction with MCH-07-A Supply Fan VFD Acceptance (if applicable) since testing activities overlap.							
	•	NRCA-MCH-03-A - Constant Volume Single Zone HVAC NOTE: This form does not automatically move to "Yes'. If Constant Volume Single Zone HVAC Systems are included in the scope, permit applicant should move this form to "Yes".							
	•	NRCA-MCH-04-A - Air Distribution Duct Leakage							
	•	NRCA-MCH-05-A - Air Economizer Controls							

•	NRCA-MCH-02-A - Outdoor Air must be submitted for all newly installed HVAC units. Note: MCH-02-A can be performed in conjunction with MCH-07-A Supply Fan VFD Acceptance (if applicable) since testing activities overlap.			
•	NRCA-MCH-03-A - Constant Volume Single Zone HVAC NOTE: This form does not automatically move to "Yes'. If Constant Volume Single Zone HVAC Systems are included in the scope, permit applicant should move this form to "Yes".			
•	NRCA-MCH-04-A - Air Distribution Duct Leakage			
•	NRCA-MCH-05-A - Air Economizer Controls			
•	NRCA-MCH-06-A Demand Control Ventilation Systems must be submitted for all systems required to employ demand controlled ventilation (refer to \$120.1(c)3) can vary outside ventilation flow rates based on maintaining interior carbon dioxide (CO2) concentration setpoints.			
•	NRCA-MCH-07-A Supply Fan Variable Flow Controls			
•	NRCA-MCH-08-A Valve Leakage Test			
•	NRCA-MCH-09-A Supply Water Temperature Reset Controls			

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#### STATE OF CALIFORNIA **Mechanical Systems**

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. DECL	DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE								
	•	NRCA-MCH-12-A FDD for Packaged Direct Expansion Units							
	•	NRCA-MCH-13-A Automatic FDD for Air Handling Units and Zone Terminal Units Acceptance							
	•	NRCA-MCH-14-A Distributed Energy Storage DX AC Systems Acceptance NOTE: This form does not automatically move to "Yes". If Distributed Energy System DX AC Systems are included in teh scope permit applicant should move this form to 'Yes".							
0	•	NRCA-MCH-15-A Thermal Energy Storage (TES) System Acceptance NOTE: This form does not automatically move to "Yes". If Chilled water Storage, Ice-on-Coil Internal Melt, Ice-on-Coil External melt, Ice Harvester, Brine, Ice-Slurry, Eutecti Salt, Clathrate Hydrate Slurry (CHS), Cryogenic or Encapsulated (Ice Ball) Systems are included in the scope, permit applicant should move this form to 'Yes".							
	•	NRCA-MCH-16-A Supply Air Temperature Reset Controls							
	•	NRCA-MCH-17-A Condenser Water Temperature Reset Controls							
	•	NRCA-MCH-18-A Energy Management Control Systems							
	•	NRCA-MCH-19-A Occupancy Sensor Controls							
	•	NRCA-MCH-20 Multi-Family Ventilation							
	•	NRCA-MCH-21 Multi-Family Envelope Leakage							

		•	NRCA-	A-MCH-20 Multi-Family Ventilation								
		•	NRCA-	MCH-21 Multi-Family Envelope Leakage								
P. D	P. DECLARATION OF REQUIRED CERTIFICATES OF VERIFICATION											
	Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E Additional Remarks											
				completed by a HERS Rater and provided to the building inspector during construction. The	,	RS Provider's	registry, b					
draf	drafts can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCV/											
	Yes		lo	Form/Title			spector					
	103		No Torriy ride			Pass	Fail					
				NRCV-MCH-04-H Duct Leakaage Test NOTE: Must be completed by a HERS Rater								

NRCV-MCH-24 Enclosure Air Leakaage Worksheet NOTE: Must be completed by a HERS Rater

 NRCV-MCH-27 High-rise Resdential NOTE: Must be completed by a HERS Rater NRCV-MCH-32 Local Mechanical Exhaust NOTE: Must be completed by a HERS Rater

Registration Provider: Energysoft	Registration Date/Time:	Registration Number:
Report Generated: 2021-03-19 12:10:50	Report Version: 2019.1.003	CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance

Schema Version: rev 20200601

#### STATE OF CALIFORNIA Mechanical Systems

NRCC-MCH-E			CALIFORNIA ENERGY COMMISS
CERTIFICATE OF COMPLIANCE			NRCC-M
Project Name:	WOODBRIDGE ES HVAC REPLACEMENT	Report Page:	(Page 10 o
Project Address:	1290 LILAC STREET	Date Prepared:	3/19/

# H. FAN SYSTEMS & AIR ECONOMIZERS

	a 7 200.10											
System Name:	AC-9E	Econor	nizer:1	Differential Temperature		nomizer Designed per §140.4(e) ntrols: (m)			System Fan Type:	Variable Air Volume		
01	02		03	04			05	06	07	08		
Fan Nama ar				Maximum Dasign Supply	Airflow				Fan Power Pressure Drop A	Adjustment - Table 140.4-B		
Fan Name or Item Tag	Fan Functio	on	Qty	Maximum Design Supply (CFM)	Airnow	HP	Unit <sup>2</sup>	Design HP	Device	Design Airflow through Device (CFM)		
SF	Supply		1	0		В	BHP	0	NA	NA		
Total Sys	tem Design Supply A	Airflow (CF	M):	0	Total 5	ystem ( (B)HP:	Design	0	Maximum System Fan Power (B)HP:	0		
System Name:	AC-4E	Econor	nizer:1	Differential Temperature		Economizer Designed Controls:				ed per <u>§140.4(e)</u> and (m)	System Fan Type:	Variable Air Volume
01	02		03	04			05	06	07	08		
Fan Name or				Maximum Design Supply				Fan Power Pressure Drop A	Adjustment - Table 140.4-B			
Item Tag	Fan Functio	on	Qty	(CFM)	Airilow	HP	Unit <sup>2</sup> Design HP		Device	Design Airflow through Device (CFM)		
SF	Supply		1	0		В	BHP	0	NA	NA		
Total Sys	tem Design Supply A	Airflow (CF	M):	0	Total S	ystem ( (B)HP:	Design	0	Maximum System Fan Power (B)HP:	0		
System Name:	AC-5E   Fconomizer:   Differential lemperature			Designe	ed per <u>§140.4(e)</u> and (m)	System Fan Type:	Variable Air Volume					
01	02		03	04			05	06	07	08		
Fan Name or				Mavimum Docian Sunah	Airflow				Fan Power Pressure Drop A	Adjustment - Table 140.4-B		
Item Tag	Fan Functio	on	Qty	Maximum Design Supply (CFM)	Aillow	HP Unit <sup>2</sup>		Design HP	Device	Design Airflow through Device (CFM)		
SF	Supply		1	0		В	BHP	0	NA	NA		
Total System Design Supply Airflow (CFM):			M):	0	Total S	ystem ( (B)HP:	Design	0	Maximum System Fan Power (B)HP:	0		

Registration Number:	Registration Date/Time:	Registration Provider: Energys
CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance	Report Version: 2019.1.003 Schema Version: rev 20200601	Report Generated: 2021-03-19 12:10

#### STATE OF CALIFORNIA Mechanical Systems

NRCC-MCH-E			CALIFORNIA ENERGY COMMISSION
CERTIFICATE OF COMPLIANCE			NRCC-MCH-E
Project Name:	WOODBRIDGE ES HVAC REPLACEMENT	Report Page:	(Page 11 of 17)
Project Address:	1290 LILAC STREET	Date Prepared:	3/19/2021

System Name:	AC-6E	Econom	nizer:1	Differential Temperature	Econon Contro			d per <u>§140.4(e)</u> and (m)	System Fan Type:	Variable Air Volume
01	02		03	04		05		06	07	08
Fan Name or				Maximum Design Supply	Airflow				Fan Power Pressure Drop A	djustment - Table 140.4-
Item Tag	Fan Functio	n	Qty	(CFM)	HPIIn		Unit <sup>2</sup>	Design HP	Device	Design Airflow through Device (CFM)
SF	Supply		1	0	0		BHP	0	NA	NA
Total System Design Supply Airflow (CFM):				0	Total System Design (B)HP:		Design	0	Maximum System Fan Power (B)HP:	0
System Name:	AC-1B	Econom	izer:1	NA: <=54 kBtu/h cooling	Economizer Controls:		Designe	d per <u>§140.4(e)</u> and (m)	System Fan Type:	Variable Air Volume
01	02		03	04	05		05	06	07	08
Fan Name or	r Fan Function Qty		Maximum Daries Sunah Airflau					Fan Power Pressure Drop Adjustment - Table 140.4-B		
Item Tag			Qty	Maximum Design Supply Airflow (CFM)		HP Unit <sup>2</sup>		Design HP	Device	Design Airflow through Device (CFM)
SF	Supply 1		0		BHP		0	NA	NA	
Total System Design Supply Airflow (CFM):						tal System Design (B)HP:		0	Maximum System Fan Power (B)HP:	0
System Name:	AC-2B	Econom	izer:1	Differential Temperature	Econon Contro		Designe	d per <u>§140.4(e)</u> and (m)	System Fan Type:	Variable Air Volume
01	02		03	04			05	06	07	08
Fan Name or	Fan Function Qty			Maximum Docide Supely	Airflow			Fan Power Pressure Drop A	Adjustment - Table 140.4-	
Item Tag			Qty	Maximum Design Supply Airflow (CFM)		HP Unit <sup>2</sup>		Design HP	Device	Design Airflow through Device (CFM)
SF	Supply 1 0		BHP		BHP	0	NA	NA		
Total System Design Supply Airflow (CFM):				0	0 Total S		Design	0	Maximum System Fan Power (B)HP:	0

Registration Number:	Registration Date/Time:	Registration Provider: Energysof
CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance	Report Version: 2019.1.003 Schema Version: rev 20200601	Report Generated: 2021-03-19 12:10:50

# state of california Mechanical Syste

CERTIFICATE OF COMPLIANCE			NRCC-MCH-E
Project Name:	WOODBRIDGE ES HVAC REPLACEMENT	Report Page:	(Page 12 of 17)
Project Address:	1290 LILAC STREET	Date Prepared:	3/19/2021

System Name:	AC-3B	Econor	nizer:1	Differential Temperature	Econor Contr		(m)		System Fan Type:	Variable Air Volume
01	02		03	04	04		05	06	07	08
Fan Name or		Maximum Design Supply Airflow					Fan Power Pressure Drop A	Adjustment - Table 140.4-B		
Item Tag	Fan Function C		Qty	(CFM)		HP Unit <sup>2</sup>		Design HP	Device	Design Airflow through Device (CFM)
SF	Supply 1		1	0		В	BHP	0	NA	NA
Total System Design Supply Airflow (CFM):				0	Total System Design (B)HP:		Design	0	Maximum System Fan Power (B)HP:	0
System Name:	AC-4B	Econor	nizer:1	Differential Temperature		Economizer Design Controls:		d per <u>§140.4(e)</u> and (m)	System Fan Type:	Variable Air Volume
01	02		03	04		05		06	07	08
Fan Name or				Maximum Design Supply Airflow					Fan Power Pressure Drop Adjustment - Table 140.4-B	
Item Tag	Fan Functio	n	Qty	(CFM)	Annow	HP Unit <sup>2</sup>		Design HP	Device	Design Airflow through Device (CFM)
SF	Supply 1		0		BHP		0	NA	NA	
Total System Design Supply Airflow (CFM):				0 Total 5		System Design (B)HP:		0	Maximum System Fan Power (B)HP:	0
System Name:	AC-1C	Econor	nizer:1	Differential Temperature		nomizer De ntrols:		d per <u>§140.4(e)</u> and (m)	System Fan Type:	Variable Air Volume
01	02		03	04			05	06	07	08
Fan Name or	Fan Function			Qty Maximum Design Supply Airflow (CFM)		Airflow HP Unit <sup>2</sup>		Design HP	Fan Power Pressure Drop A	Adjustment - Table 140.4-B
Item Tag			Qty						Device	Design Airflow through Device (CFM)
SF	SF Supply 1		1	0		BHP		0	NA	NA
Total System Design Supply Airflow (CFM):				0	Total Syste (B)		Design	0	Maximum System Fan Power (B)HP:	0

Registration Date/Time: CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance

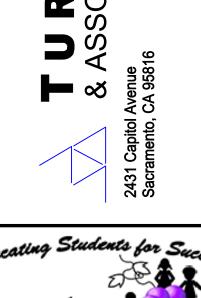
Report Version: 2019.1.003 Schema Version: rev 20200601

Registration Provider: Energysoft Report Generated: 2021-03-19 12:10:50

IDENTIFICATION STAMP DIV. OF THE STATE ARCHITECT APP: 02-118996 INC: REVIEWED FOR SS 🗹 FLS 🗹 ACS 🗹

DSA 02-118996

AGENCY APPROVAL:







SHEET TITLE:

T-24.2

		FIRE ALARM CABLE LEG	SEND	
SYMBOL	MODEL	DESCRIPTION	MANUFACTURER	USE
А	60975B	#18/2 SOLID TWISTED/SHIELED FPLP CABLE	WEST PENN OR EQUAL	INITIATING DEVICES

EXAMPLE:

NEW, EXISTING, REMOVE, ETC.

QUANTITY OF CABLES

WIRE TYPE (SEE LEGEND SYMBOL)

(N) 2A

# FIRE ALARM SCOPE OF WORK

CONTRACTOR SHALL PROVIDE FIRE ALARM SHOP DRAWINGS FOR DEFERRED APPROVAL PRIOR TO START OF CONSTRUCTION. FIRE ALARM SCOPE AS FOLLOWS:

PROVIDE CARBON MONOXIDE DETECTION IN CLASSROOMS WITHIN THE BUILDINGS CONTAINING FUEL-BURNING EQUIPMENT BEING MODIFIED AS REQUIRED BY CODE. NEW CARBON MONOXIDE DETECTORS SHALL BE CONNECTED TO EXISTING FIRE ALARM SYSTEM.

PROVIDE HVAC FAN SHUTDOWN CONTROL UPON AREA SMOKE DETECTOR AND DUCT DETECTOR ALARM.

EXISTING FIRE ALARM DEVICES AND EQUIPMENT ARE NOT BEING MODIFIED OR UPGRADED IN THIS SCOPE OF THE WORK.

	FIRE ALARM	I ABBREVIA	ATIONS
Α	AMPERE	LFMC	LIQUIDTIGHT FLEXIBLE METAL CONDUIT
AC	ALTERNATING CURRENT	LT	LIGHT
A/C	AIR CONDITIONER	LV	LOW VOLTAGE
AFF	ABOVE FINISHED FLOOR	MAX	MAXIMUM
AHJ	AUTHORITY HAVING JURISDICTION	MECH	MECHANICAL
AHU	AIR HANDLING UNIT	MFR	MANUFACTURER
AL	ALUMINUM	MIN	MINIMUM
AUX	AUXILIARY	MISC	MISCELLANEOUS
AWG	AMERICAN WIRE GAUGE	MLO	MAIN LUGS ONLY
ВС	BARE COPPER	MT	EMPTY CONDUIT W/ PULL LINE
BLDG	BUILDING	MTD	MOUNTED
С	CONDUIT	MTG	MOUNTING
CAB	CABINET	(N)	NEW
CEC	CALIFORNIA ELECTRICAL CODE	N/A	NOT APPLICABLE
CKT	CIRCUIT	NC	NORMALLY CLOSED
CLG	CEILING	NEC	NATIONAL ELECTRICAL CODE
CO	CONDUIT ONLY	NEMA	NATIONAL ELECTRICAL MANUFACTURER
CU	COPPER		ASSOCIATION
DC	DIRECT CURRENT	NIC	NOT IN CONTRACT
DIA	DIAMETER	NIES	NOT INCLUDED IN ELECTRICAL SCOPE
DN	DOWN	NO	NORMALLY OPEN
(E)	EXISTING	NTS	NOT TO SCALE
EA	EACH	OC	ON CENTER
EC	ELECTRICAL CONTRACTOR	OFCI	OWNER FURNISHED CONTRACTER INSTALLED
ELEC	ELECTRICAL	OFOI	OWNER FURNISHED OWNER INSTALLED
EM	EMERGENCY	P	POLE
EMT	ELECTRICAL METALLIC TUBING END OF LINE	PB	PULLBOX
EOL EQUIP	EQUIPMENT	PH PNL	PHASE PANEL
FA	FIRE ALARM	PVC	POLYVINYL CHLORIDE
FACP	FIRE ALARM CONTROL PANEL	(R)	REMOVE
FATC	FIRE ALARM TERMINAL CABINET	RCPT	RECEPTACLE
FBO	FURNISHED BY OTHERS	(RE)	RELOCATE EXISTING
FLA	FULL LOAD AMPERES	RM	ROOM
FLEX	FLEXIBLE	RMC	RIGID METAL CONDUIT
FLR	FLOOR	SM	SHEET METAL
FMC	FLEXIBLE METAL CONDUIT	SMS	SHEET METAL SCREW
FS	FLOW SWITCH	SP	SPARE
FSD	FIRE SMOKE DAMPER	SPKR	SPEAKER
FT	FOOT OR FEET	STD	STANDARD
G	GROUND	TEL	TELEPHONE
GA	GAUGE	TS	TAMPER SWITCH
GALV	GALVANIZED	TYP	TYPICAL
GC	GENERAL CONTRACTOR	UF	UNDERFLOOR
HP	HORSEPOWER	UG	UNDERGROUND
HZ	HERTZ	UL	UNDERWRITERS LAB
IMC	INTERMEDIATE METAL CONDUIT	UON	UNLESS OTHERWISE NOTED
JB	JUNCTION BOX	V	VOLT
КО	KNOCK-OUT	VA	VOLT-AMPERE
KVA	KILOVOLT AMPERE	W	WATT
KW	KILOWATT	W/	WITH
KWH	KILOWATT HOUR	WP	WEATHERPROOF

# EXISTING FIRE ALARM SYSTEM NOTES

- 1. EXISTING FIRE ALARM CONTROL PANEL IS NOT BEING UPGRADED OR REPLACED. BATTERY LOADS AND RUNTIME IS NOT BEING MODIFIED.
- 2. EXISTING FIRE ALARM NOTIFICATION DEVICES AND CIRCUITS IS NOT BEING MODIFIED. CIRCUIT VOLTAGE DROPS IS NOT CHANGING FROM EXISTING.

### APPLICABLE CODES AND STANDARDS

ALL WORK PERFORMED UNDER THIS CONTRACT IS TO CONFORM TO THE FOLLOWING CODES AND REGULATIONS:

### CALIFORNIA CODE OF REGULATIONS (CCR):

TITLE 19 - PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS
TITLE 24 - CALIFORNIA BUILDING STANDARDS CODE (CBSC)
2019 CALIFORNIA ADMINISTRATIVE CODE (CAC)

PART 1, TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR)

2019 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24, CCR

BASED ON THE 2018 INTERNATIONAL BUILDING CODE (IBC)
2019 CALIFORNIA BUILDING CODE (CBC), PART 3, TITLE 24, CCR

BASED ON THE 2018 INTERNATIONAL BUILDING CODE (IBC)
2019 CALIFORNIA ELECTRICAL CODE (CEC), PART 3, TITLE 24, CCR

BASED ON THE 2017 NATIONAL ELECTRICAL CODE (NEC)

2019 CALIFORNIA ENERGY CODE (CEnC), PART 6, TITLE 24, CCR

2019 CALIFORNIA FIRE CODE (CFC), PART 9, TITLE 24, CCR BASED ON THE 2018 INTERNATIONAL FIRE CODE (IFC)

### NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARDS:

NFPA 72 - NATIONAL FIRE ALARM AND SIGNALING CODE
NFPA 720 - STANDARD FOR THE INSTALLATION OF CARBON MONOXIDE(CO) DETECTION AND WARNING EQUIPMENT

### DISTRICT OF THE STATE ARCHITECT (DSA) INTERPRETATION OF REGULATIONS (IR)

OCCUPATIONAL SAFETY HEALTH ACT (OSHA)

LOCAL REGULATIONS AND STANDARDS

### FIRE ALARM GENERAL NOTES

- INSTALLATION OF NEW FIRE ALARM DEVICES SHALL BE PERFORMED BY A CERTIFIED TECHNICIAN ONLY.
- 2. PROVIDE NEW INITIATING FIRE ALARM DEVICES AT LOCATION INDICATED ON PLANS. CONNECT NEW FIRE ALARM DEVICES TO EXISTING ADDRESSABLE FIRE ALARM CONTROL PANEL AS INDICATED ON FIRE ALARM RISER DIAGRAM.
- 3. ALL NEW FIRE ALARM WIRING SHALL BE INSTALLED IN 3/4" MINIMUM CONDUIT.
- 4. EXISTING DEVICES ARE SHOWN BASED UPON OWNER PROVIDED AS-BUILT DRAWINGS. FIELD VERIFY EXISTING CONDITIONS PRIOR TO START OF WORK.
- . RACEWAYS AND CONDUITS SHOWN ON PLANS ARE DIAGRAMMATIC. CONTRACTOR SHALL DETERMINE ROUTING IN FIELD TO BEST SUITE EXISTING CONDITIONS.
- 6. NEW INITIATING FIRE ALARM CIRCUITS ARE CLASS B.

FIRE ALARM SYSTEM

MATRIX

(E) MANUAL PULL STATION

(E) HEAT DETECTORS

AC POWER LOSS

SINGLE GROUND

SINGLE OPEN

(E) AREA SMOKE DETECTORS

(E) DUCT SMOKE DETECTORS

WIRE-TO-WIRE SHORT (IDC)

WIRE-TO-WIRE SHORT (SLC)

WIRE-TO-WIRE SHORT (NAC)

(NEW) CARBON MONOXIDE DETECTOR

SEQUENCE OF OPERATIONS

- ALL DEVICES IN ALARM SYSTEM SHALL BE COMPATIBLE AND INSTALLED PER MANUFACTURERS SPECIFICATIONS.
- 8. ALL CIRCUITS SHALL BE SUPERVISED AGAINST OPENS, SHORTS, AND GROUNDS.
- 9. CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS IDENTIFYING
- 10. NEW ADDRESSABLE DEVICES SHALL BE ASSIGNED AN AVAILABLE ADDRESS AND RECORDED.
- 11. NOTIFY LOCAL FIRE AUTHORITY AND CENTRAL MONITORING STATION AT LEAST 48 HOURS IN ADVANCE OF ANY SHUTDOWN OF EXISTING FIRE ALARM SYSTEM.
- 12. ALL FIRE ALARM DEVICES INSTALLED SHALL BE APPROVED AND LISTED BY THE STATE FIRE MARSHALL.
- 13. IN ACCORDANCE WITH <u>CCR TITLE 24, PART 1, SECTION 7-125(c)</u>. CHANGES TO THE DRAWINGS AND SPECIFICATIONS MADE AFTER THE FIRST SUBMISSION FOR APPROVAL (OTHER THAN CHANGES MADE IN COMPLIANCE WITH <u>DSA</u> COMMENTS) MUST BE BROUGHT TO THE ATTENTION OF THE OFFICE IN WRITING OR BY SUBMISSION OF REVISED DRAWINGS IDENTIFYING THOSE CHANGES. FAILURE TO DO SO VOIDS ANY SUBSEQUENT APPROVALS GIVEN TO THE DRAWINGS AND SPECIFICATIONS.
- 14. WIRING SHALL NOT BE LOOPED THROUGH DEVICES. WIRE MUST BE CUT IN AND OUT.
- 15. T-TAPPING OR PARALLEL BRANCHING OF ADDRESSABLE INITIATING DEVICE CIRCUITS IS PERMITTED ONLY ON CLASS B CIRCUITS ONLY.
- 16. RATED ASSEMBLIES SHALL ONLY BE PENETRATED WITH A UL LISTED SYSTEM WITH A "T" RATING EQUAL TO THE RATING OF THE ASSEMBLY BEING PENETRATED.
- 17. NON-RATED PENETRATIONS SHALL BE SEALED WITH WATERTIGHT CAULKING.
- 18. UPON COMPLETION OF INSTALLATION OF NEW FIRE ALARM DEVICES A SATISFACTORY TEST OF THE ENTIRE SYSTEM SHALL BE MADE IN THE PRESENCE OF THE LOCAL AHJ.
- 19. INSTALLER SHALL PREPARE AND PROVIDE A CERTIFICATE OF COMPLIANCE TO THE LOCAL FIRE MARSHAL UPON COMPLETION OF THE INSTALLATION.
- 20. CARBON MONOXIDE ALARM SHALL SOUND A TEMPORAL FOUR PULSE PATTERN (NFPA 720, 5.8.6.5.1)
- 21. AUTOMATIC FIRE ALARM SYSTEMS SHALL BE MONITORED AND SHALL TRANSMIT THE ALARM, SUPERVISORY, AND TROUBLE SIGNALS TO AN APPROVED SUPERVISING STATION IN ACCORDANCE WITH NFPA 72. (NFPA 907.6.6.3)

# SHEET INDEX

E0.01	ELECTRICAL AND FIRE ALARM COVER SHEET	E3.06	FIRE ALARM FLOOR PLAN BUILDING E
E2.01	ELECTRICAL ROOF PLAN BUILDING A	E4.01	ONE-LINE DIAGRAM, MECHANICAL EQUIPMENT
E2.02	ELECTRICAL ROOF PLAN BUILDING A		REPLACEMENT SCHEDULE, AND PANEL
E2.03	ELECTRICAL ROOF PLAN BUILDING B		SCHEDULES
E2.04	ELECTRICAL ROOF PLAN BUILDING C	E4.02	PARTIAL ONE-LINE DIAGRAM AND PANEL
E2.05	ELECTRICAL ROOF PLAN BUILDING D		SCHEDULES - PORTABLES
E2.06	ELECTRICAL ROOF PLAN BUILDING E	E5.01	FIRE ALARM CUTSHEETS AND CSFM LISTINGS
E2.07	ELECTRICAL FLOOR PLAN PORTABLES	E5.02	FIRE ALARM CUTSHEETS AND CSFM LISTINGS
E3.01	FIRE ALARM FLOOR PLAN BUILDING A	E5.03	FIRE ALARM CUTSHEETS AND CSFM LISTINGS
E3.02	FIRE ALARM FLOOR PLAN BUILDING A	E6.01	ELECTRICAL SPECIFICATIONS, DETAILS, AND
E3.03	FIRE ALARM FLOOR PLAN BUILDING B		ANCHORAGE AND BRACING NOTES
E3.04	FIRE ALARM FLOOR PLAN BUILDING C		
E3.05	FIRE ALARM FLOOR PLAN BUILDING D		

### **ELECTRICAL SYMBOLS LIST**

- □ DUPLEX RECEPTACLE, NEMA 5-20R, MOUNT AT +18" AFF UON.
- DUPLEX RECEPTACLE, GFCI TYPE, NEMA 5-20R, MOUNT AT+18" AFF UON.
  - RECEPTACLE AND OUTLET SUBSCRIPTS:
    WP WEATHER PROOF
  - 1,2,3... NUMBER DENOTES CIRCUIT
- ① ①- JUNCTION BOX, SIZE AS INDICATED OR REQUIRED PER CODE
- ▼ SINGLE DATA OUTLET, 4-11/16" SQUARE X 2-1/8" DEEP BOX WITH 2-DEVICE RING AND PLATE. MOUNT AT +18" AFF UON. RE-USE EXISTING CABLE PATHWAY.
- FUSED DISCONNECT SWITCH, HEAVY DUTY, EXTERNALLY OPERATED. PROVIDE FUSES SIZED AS INDICATED OR PER MANUFACTURER REQUIREMENTS
- ELECTRICAL PANELBOARD SURFACE MOUNTED. SEE PANEL SCHEDULE.
- ELECTRICAL PANELBOARD FLUSH MOUNTED. SEE PANEL SCHEDULE.
- SWITCHBOARD

SHEET NO. DESCRIPTION

- BRANCH CIRCUIT WITHOUT CROSS HATCHES INDICATES 3/4" CONDUIT WITH 2 #12 AWG AND 1 #12 AWG GROUND, UON.
- BRANCH CIRCUIT WITH STRAIGHT CROSS HATCHES INDICATE NUMBER OF #12 AWG CONDUCTORS. CURVED HATCH INDICATES NUMBER OF #12 AWG GROUNDING ELECTRODE. 3/4" CONDUIT, UON.
- BRANCH CIRCUIT HOMERUN TO PANELBOARD INDICATED.
- EXISTING CONDUIT RUN. FIELD VERIFY ROUTING.
- (1) NUMBERED SHEET NOTE TAG
- MECHANICAL EQUIPMENT TAG. SEE MECH EQUIPMENT SCHEDULE AND DRAWINGS.
- PLAN OR DETAIL REFERENCE TAG. TOP VALUE DENOTES DETAIL NUMBER. BOTTOM VALUE DENOTES SHEET.

### **ELECTRICAL GENERAL NOTES**

- 1. WHERE PROVIDED, THROUGH-PENETRATION FIRESTOP SYSTEM AND MEMBRANE PENETRATION DETAILS ARE FOR REFERENCE ONLY. THROUGH-PENETRATIONS AND MEMBRANE PENETRATIONS SHALL BE PROTECTED BY AN APPROVED PENETRATION FIRESTOP SYSTEM OR MEMBRANE PENETRATION FIRESTOP SYSTEM INSTALLED AS TESTED IN ACCORDANCE WITH ASTM E 814 OR UL 1479, WITH A MINIMUM POSITIVE PRESSURE DIFFERENTIAL OF 0.01 INCH (2.49 Pa) OF WATER OR AS OTHERWISE PERMITTED IN CBC, SECTION 714. LISTED THROUGH-PENETRATION FIRESTOP SYSTEMS AND MEMBRANE PENETRATIONS SHALL BE INSTALLED IN ACCCORDANCE WITH THE INSTALLATION DETAILS FOR THE LISTED SYSTEMS. LISTED THROUGH-PENETRATION FIRESTOP SYSTEMS, MEMBRANE PENETRATION PROTECTION SHALL BE SUBMITTED FOR OSHPD FDD REVIEW AND APPROVAL PRIOR TO INSTALLATION.
- 2. WHEN INSTALLING DRILLED-IN ANCHORS AND/OR POWDER DRIVEN PINS IN EXISTING NON-PRESTRESSED REINFORCED CONCRETE, USE CARE AND CAUTION TO AVOID CUTTING OR DAMAGING THE EXISTING REINFORCING BARS. WHEN INSTALLING THEM INTO EXISTING PRE-STRESSED CONCRETE (PRE- OR POST-TENSIONED) LOCATE THE PRE-STRESSED TENDONS BY USING A NON-DESTRUCTIVE METHOD PRIOR TO INSTALLATION. EXERCISE EXTREME CARE AND CAUTION TO AVOID CUTTING OR DAMAGING THE TENDONS DURING INSTALLATION. MAINTAIN A MINIMUM CLEARANCE OF ONE INCH BETWEEN THE REINFORCEMENT AND THE DRILLED-IN ANCHOR AND/OR PIN.

FIRE ALARM CONTROL PANEL REMOTE ANNUNCIATOR STATION NOTIFICATION FIRE SAFETY FUNCTIONS





ELECTRICAL AND
FIRE ALARM COVER
SHEET

SHEET TITLE:

AGENCY APPROVAL:

DSA 02-118996

IDENTIFICATION STAMP DIV. OF THE STATE ARCHITE

REVIEWED FOR

SS 🗹 FLS 🗹 ACS 🗹

HANICAL INEERIN( UP, INC. 16) 325-1069 16) 325-1079 18) 325-1079

EC. NGI RO-(91

Unified School District

No. M-028557 Exp. 6/30/2021

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APP: 02-118996 INC:

DATE: 06/16/2021

NO. REVISIONS DATE

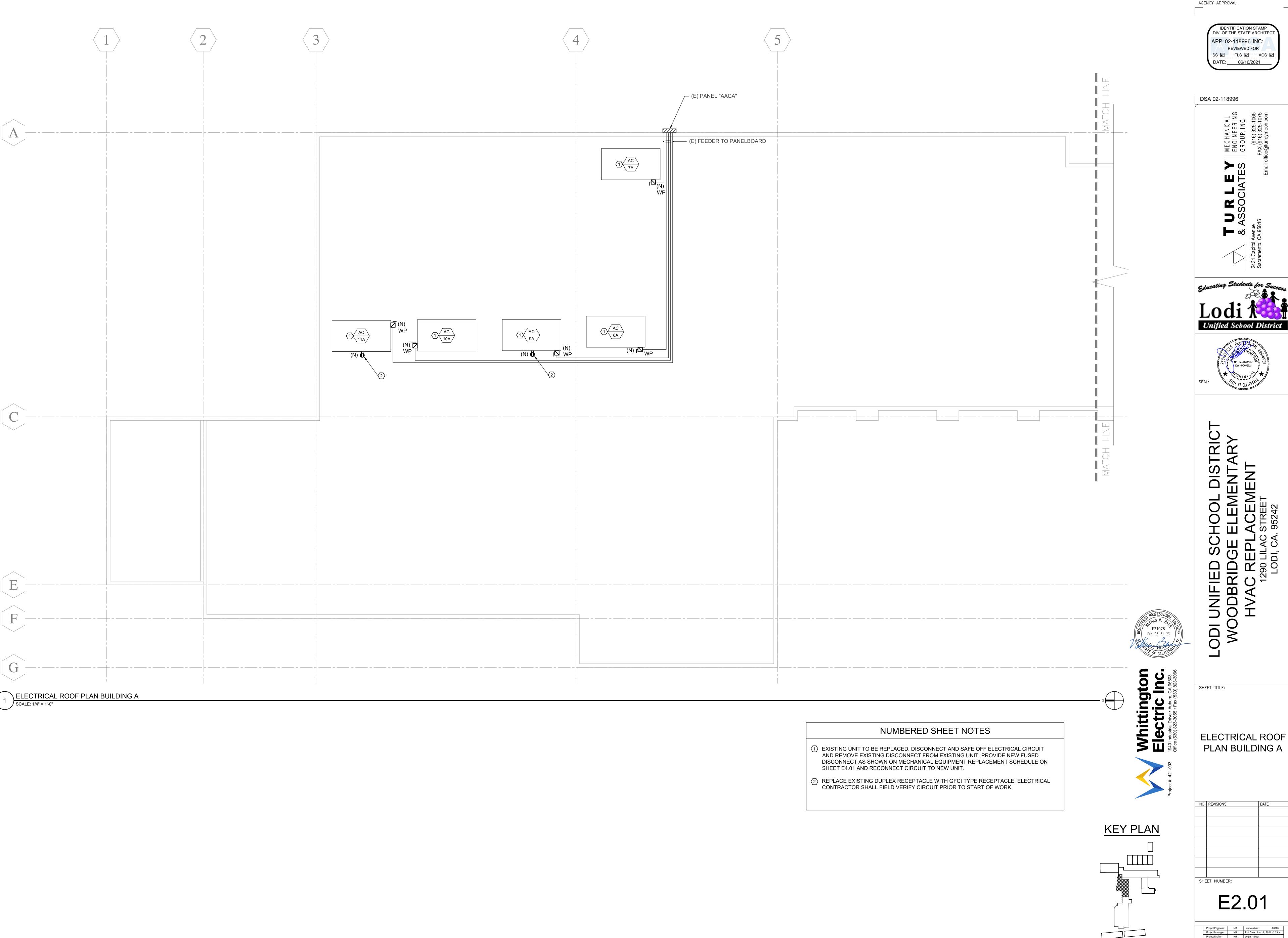
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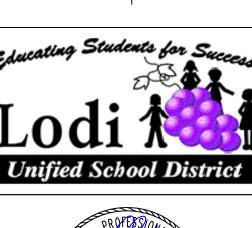
E0.01

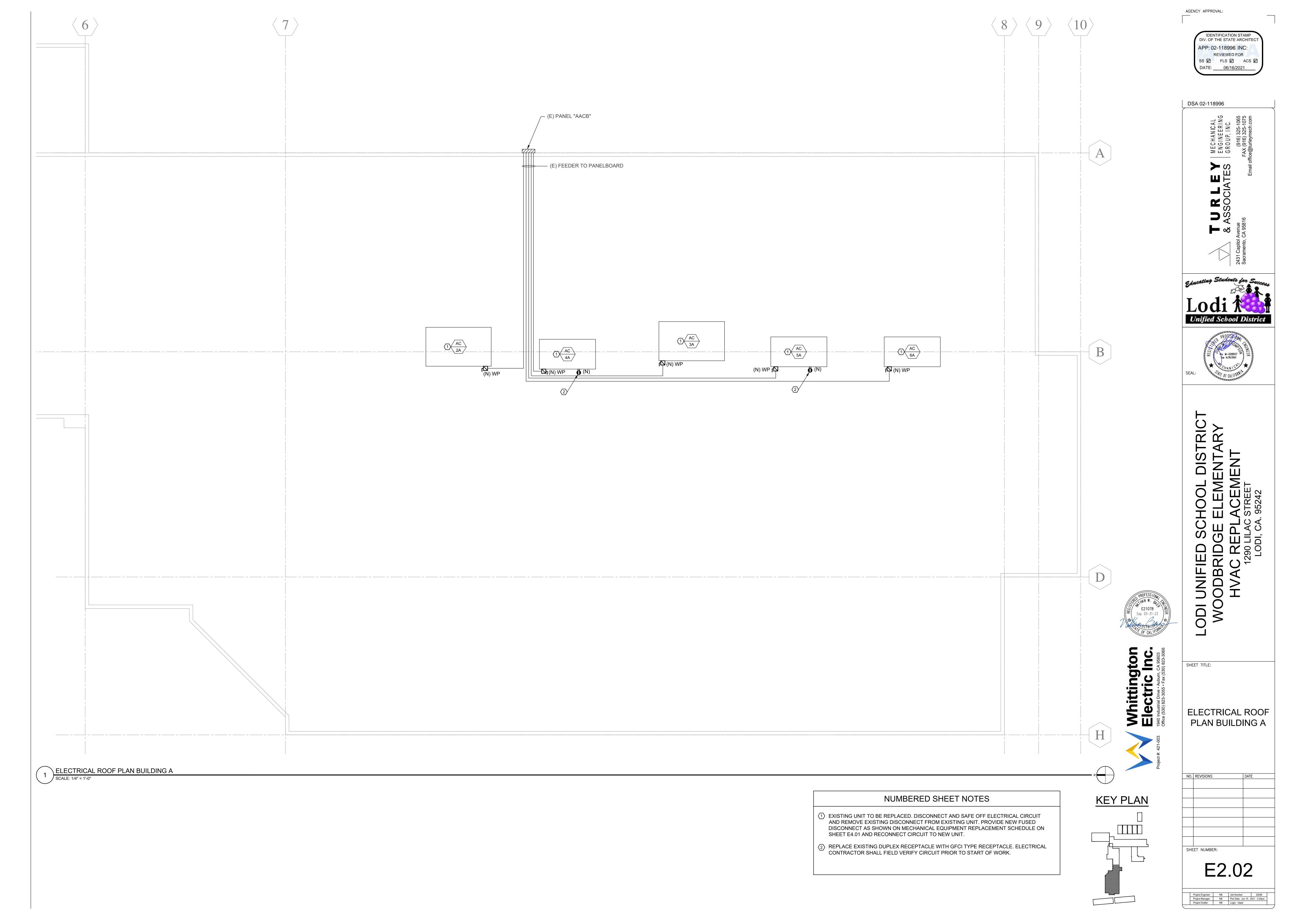
 Project Engineer:
 NB
 Job Number:
 20290

 Project Manager:
 NB
 Plot Date: Jun 15, 2021 - 2:23pm

 Project Drafter:
 NB
 Login: nbaer







# (E) AC 3B LOWER ROOF UPPER ROOF (E) PANEL "B" (E) FEEDER TO PANELBOARD LOWER ROOF LOWER ROOF

ELECTRICAL ROOF PLAN BUILDING B
SCALE: 1/8" = 1'-0"

# NUMBERED SHEET NOTES

- (1) EXISTING UNIT TO BE REPLACED. DISCONNECT AND SAFE OFF ELECTRICAL CIRCUIT AND REMOVE EXISTING DISCONNECT FROM EXISTING UNIT. PROVIDE NEW FUSED DISCONNECT AS SHOWN ON MECHANICAL EQUIPMENT REPLACEMENT SCHEDULE ON SHEET E4.01 AND RECONNECT CIRCUIT TO NEW UNIT.
- (2) REPLACE EXISTING DUPLEX RECEPTACLE WITH GFCI TYPE RECEPTACLE. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY CIRCUIT PRIOR TO START OF WORK.

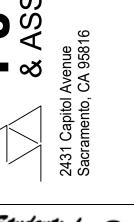
APP: 02-118996 INC:

IDENTIFICATION STAMP DIV. OF THE STATE ARCHITECT REVIEWED FOR SS 🗹 FLS 🗹 ACS 🗹 DATE: 06/16/2021

DSA 02-118996

AGENCY APPROVAL:

MECHANICAL ENGINEERING GROUP, INC. (916) 325-1065 =AX (916) 325-1075 \_\_\_\_

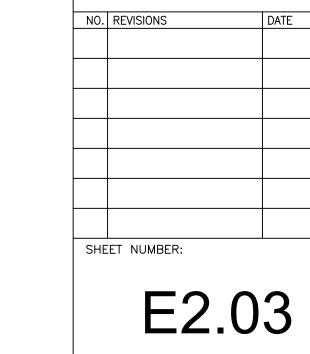






SHEET TITLE:

ELECTRICAL ROOF PLAN BUILDING B



Whittington
Electric Inc.
1940 Industrial Drive · Auburn, CA 95603
Office (530) 823-3055 · Fax (530) 823-3066

KEY PLAN

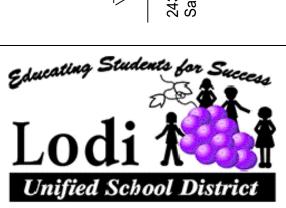
- (1) EXISTING UNIT TO BE REPLACED. DISCONNECT AND SAFE OFF ELECTRICAL CIRCUIT AND REMOVE EXISTING DISCONNECT FROM EXISTING UNIT. PROVIDE NEW FUSED DISCONNECT AS SHOWN ON MECHANICAL EQUIPMENT REPLACEMENT SCHEDULE ON SHEET E4.01 AND RECONNECT CIRCUIT TO NEW UNIT.
- (2) REPLACE EXISTING DUPLEX RECEPTACLE WITH GFCI TYPE RECEPTACLE. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY CIRCUIT PRIOR TO START OF WORK.

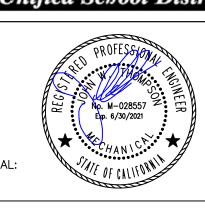
AGENCY APPROVAL:

IDENTIFICATION STAMP DIV. OF THE STATE ARCHITECT APP: 02-118996 INC: REVIEWED FOR SS 🗹 FLS 🗹 ACS 🗹 DATE: 06/16/2021

DSA 02-118996

MECHANICAL ENGINEERING GROUP, INC. (916) 325-1065 =AX (916) 325-1075 \_\_\_\_





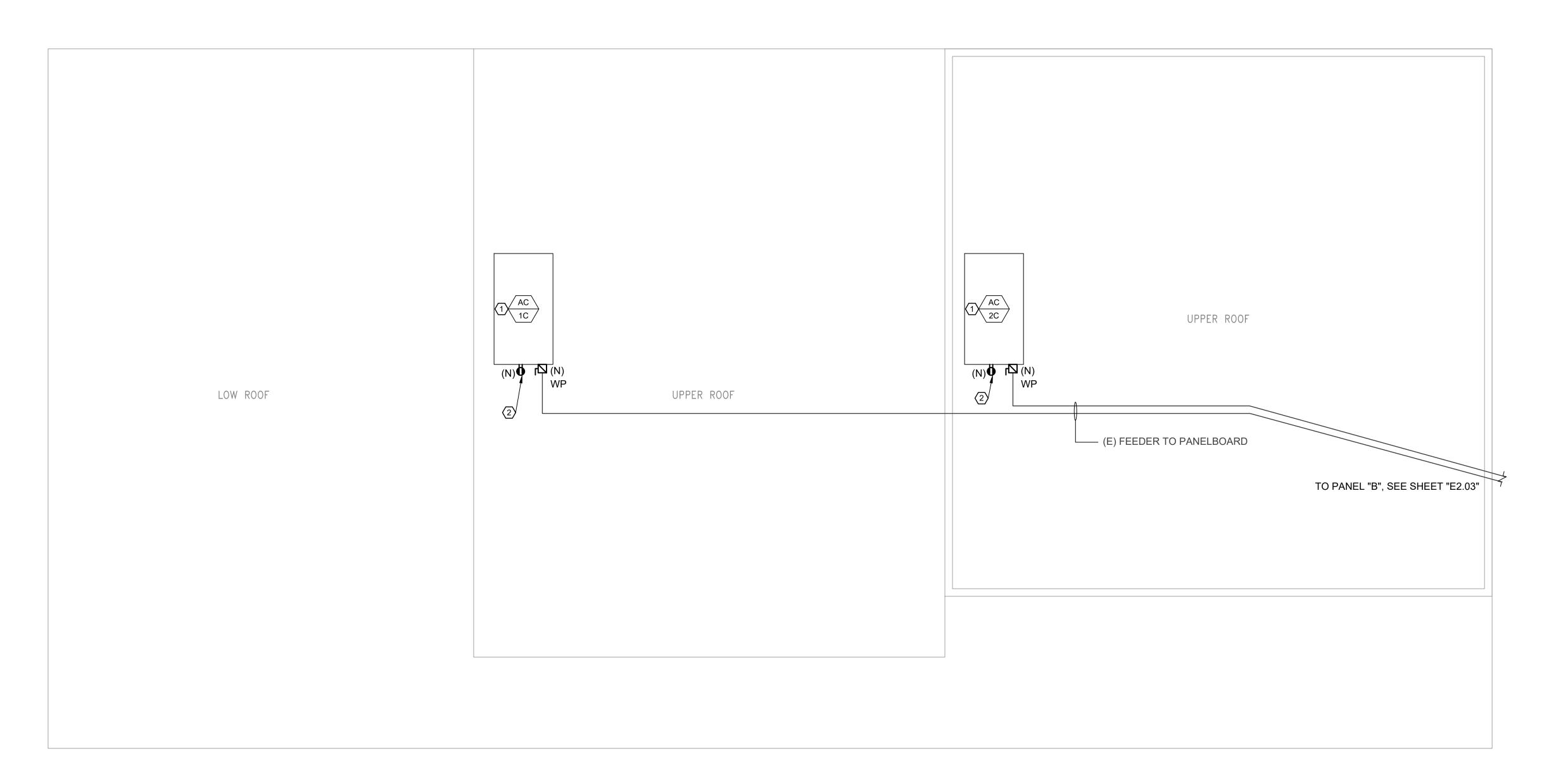
Whittington
Electric Inc.
1940 Industrial Drive · Auburn, CA 95603
Office (530) 823-3055 · Fax (530) 823-3066

KEY PLAN

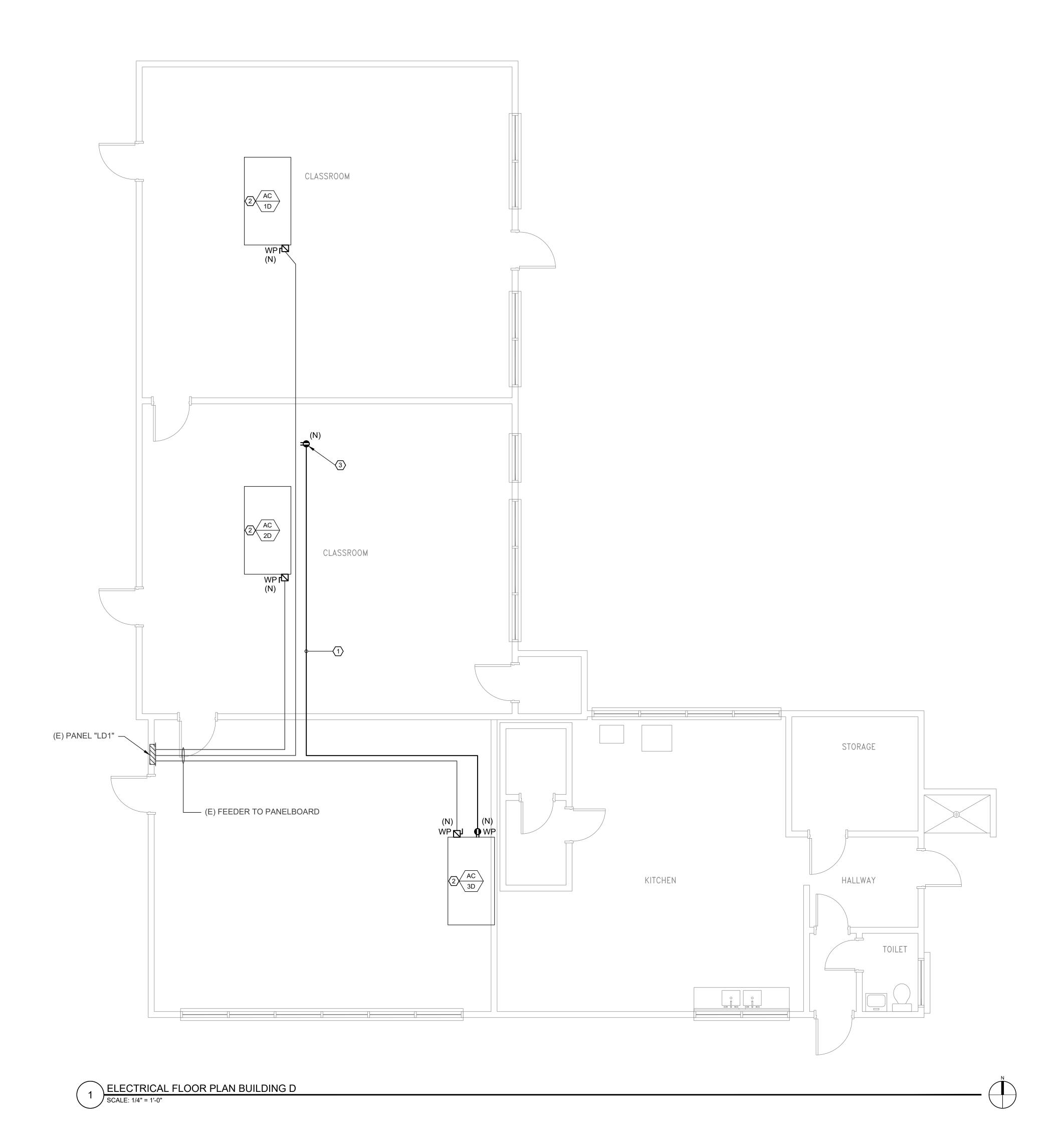
ELECTRICAL ROOF PLAN BUILDING C

NO. REVISIONS SHEET NUMBER:

E2.04



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



- 1 EXTEND CIRCUIT FROM EXISTING ROOFTOP GFCI RECEPTACLE AND CONNECT TO NEW GFCI RECEPTACLE WITH WHILE-IN-USE WEATHERPROOF COVER.
- (2) EXISTING UNIT TO BE REPLACED. DISCONNECT AND SAFE OFF ELECTRICAL CIRCUIT AND REMOVE EXISTING DISCONNECT FROM EXISTING UNIT. PROVIDE NEW FUSED DISCONNECT AS SHOWN ON MECHANICAL EQUIPMENT REPLACEMENT SCHEDULE ON SHEET E4.01 AND RECONNECT CIRCUIT TO NEW UNIT.
- (3) REPLACE EXISTING DUPLEX RECEPTACLE WITH GFCI TYPE RECEPTACLE. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY CIRCUIT PRIOR TO START OF WORK.

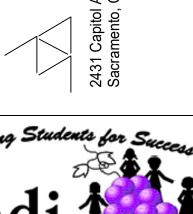
IDENTIFICATION STAMP DIV. OF THE STATE ARCHITECT APP: 02-118996 INC: REVIEWED FOR

SS 🗹 FLS 🗹 ACS 🗹 DATE: 06/16/2021

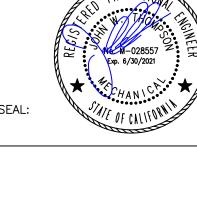
DSA 02-118996

AGENCY APPROVAL:

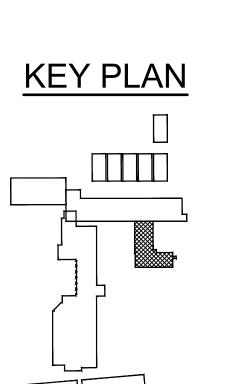
MECHANICAL ENGINEERING GROUP, INC. (916) 325-1065 FAX (916) 325-1075 \_\_\_\_







ELECTRICAL ROOF PLAN BUILDING D

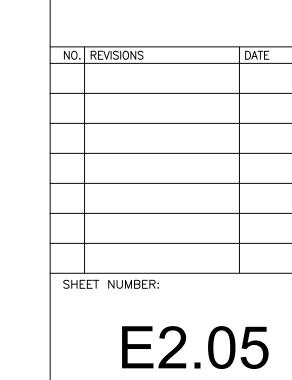


Whitington

Electric Inc.

1940 Industrial Drive • Auburn, CA 95603

Office 1530) 823-3055 • Fax (530) 823-3066



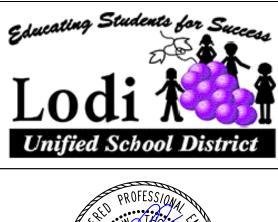
- (1) EXISTING UNIT TO BE REPLACED. DISCONNECT AND SAFE OFF ELECTRICAL CIRCUIT AND REMOVE EXISTING DISCONNECT FROM EXISTING UNIT. PROVIDE NEW FUSED DISCONNECT AS SHOWN ON MECHANICAL EQUIPMENT REPLACEMENT SCHEDULE ON SHEET E4.01 AND RECONNECT CIRCUIT TO NEW UNIT.
- (2) REPLACE EXISTING DUPLEX RECEPTACLE WITH GFCI TYPE RECEPTACLE. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY CIRCUIT PRIOR TO START OF WORK.

IDENTIFICATION STAMP DIV. OF THE STATE ARCHITECT APP: 02-118996 INC: REVIEWED FOR

AGENCY APPROVAL:

SS 🗹 FLS 🗹 ACS 🗹 DATE: 06/16/2021

DSA 02-118996 MECHANICAL ENGINEERING GROUP, INC. (916) 325-1065 FAX (916) 325-1075 \_\_\_\_



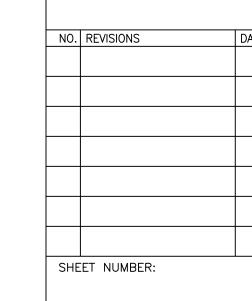


LODI UNIFIED SCHOOL DISTRICT
WOODBRIDGE ELEMENTARY
HVAC REPLACEMENT
1290 LILAC STREET
LODI, CA. 95242

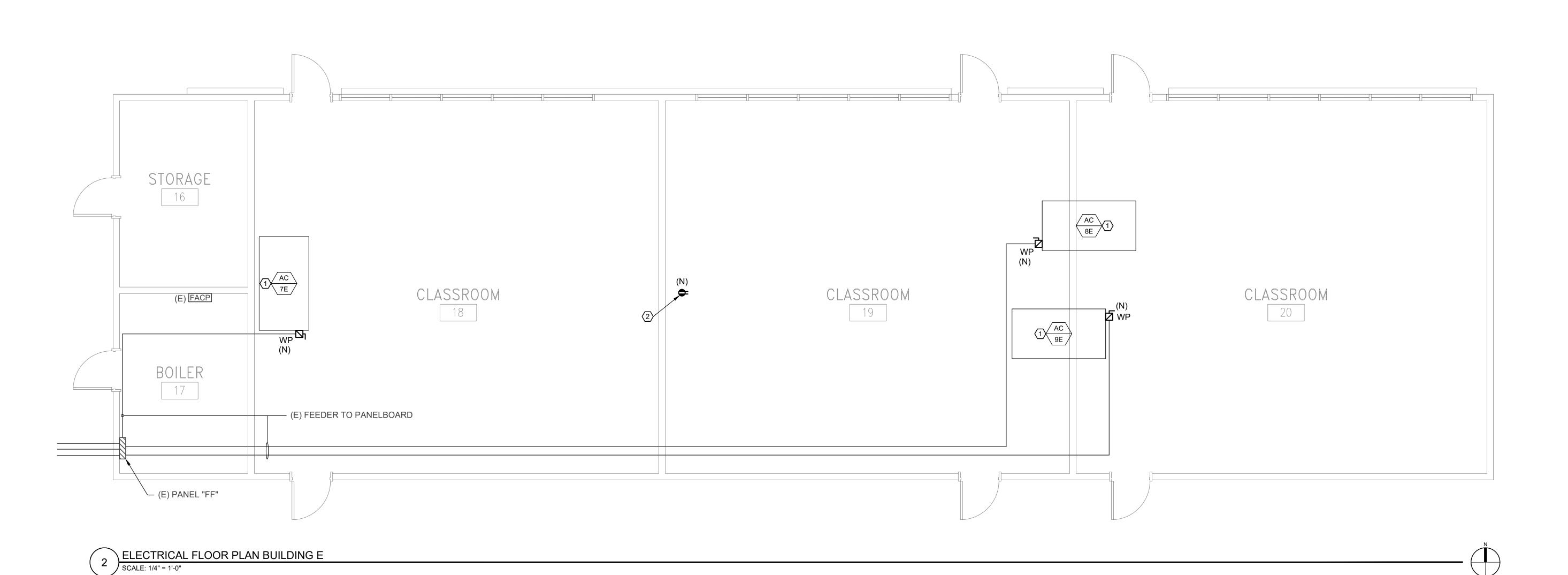
Whittington
Electric Inc.
1940 Industrial Drive · Auburn, CA 95603
Office (530) 823-3055 · Fax (530) 823-3066

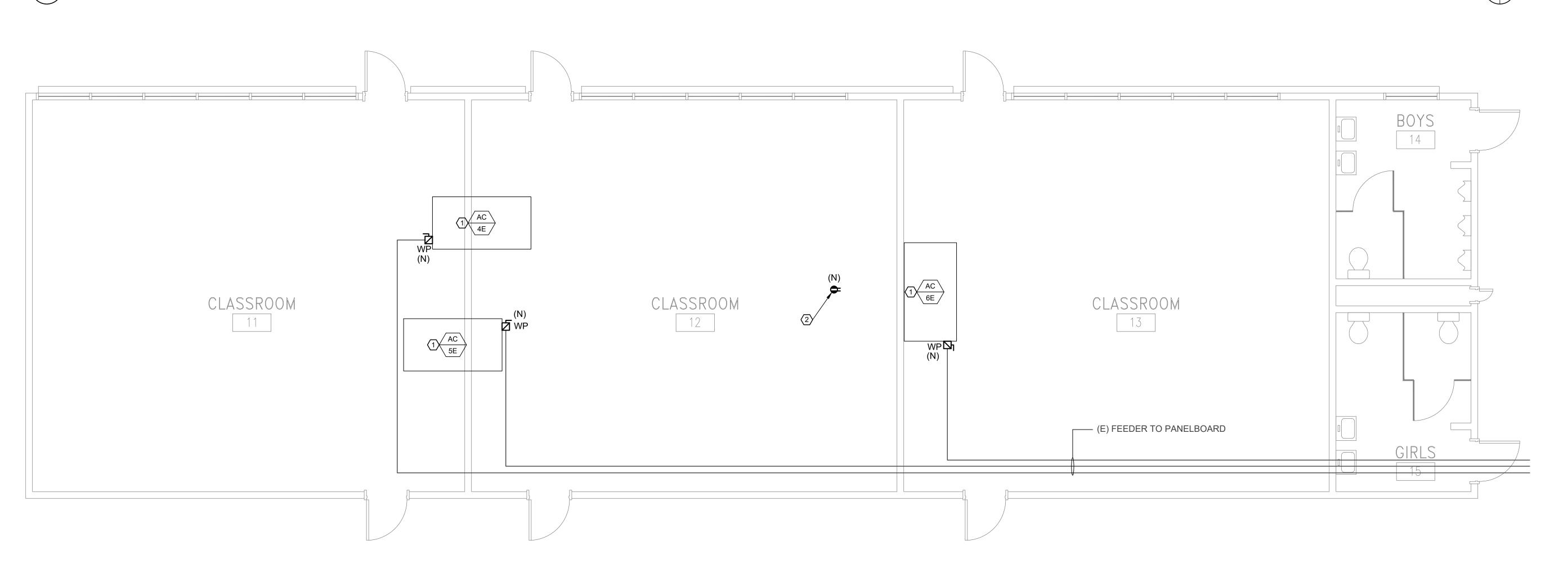
**KEY PLAN** 

ELECTRICAL ROOF PLAN BUILDING E



E2.06

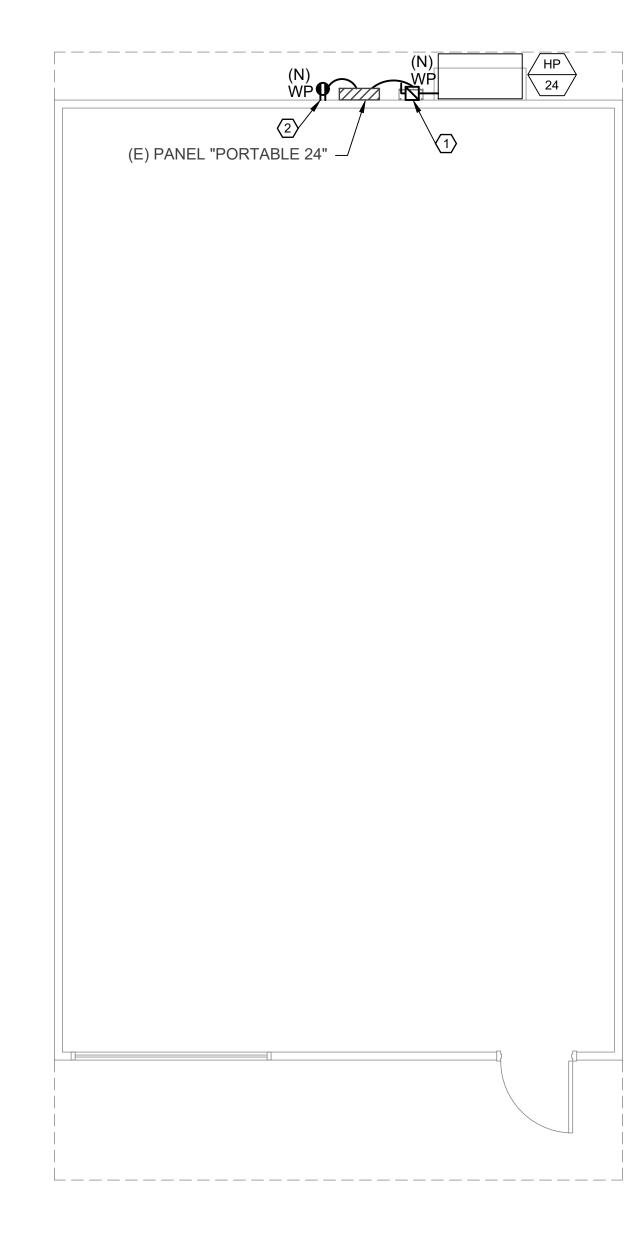


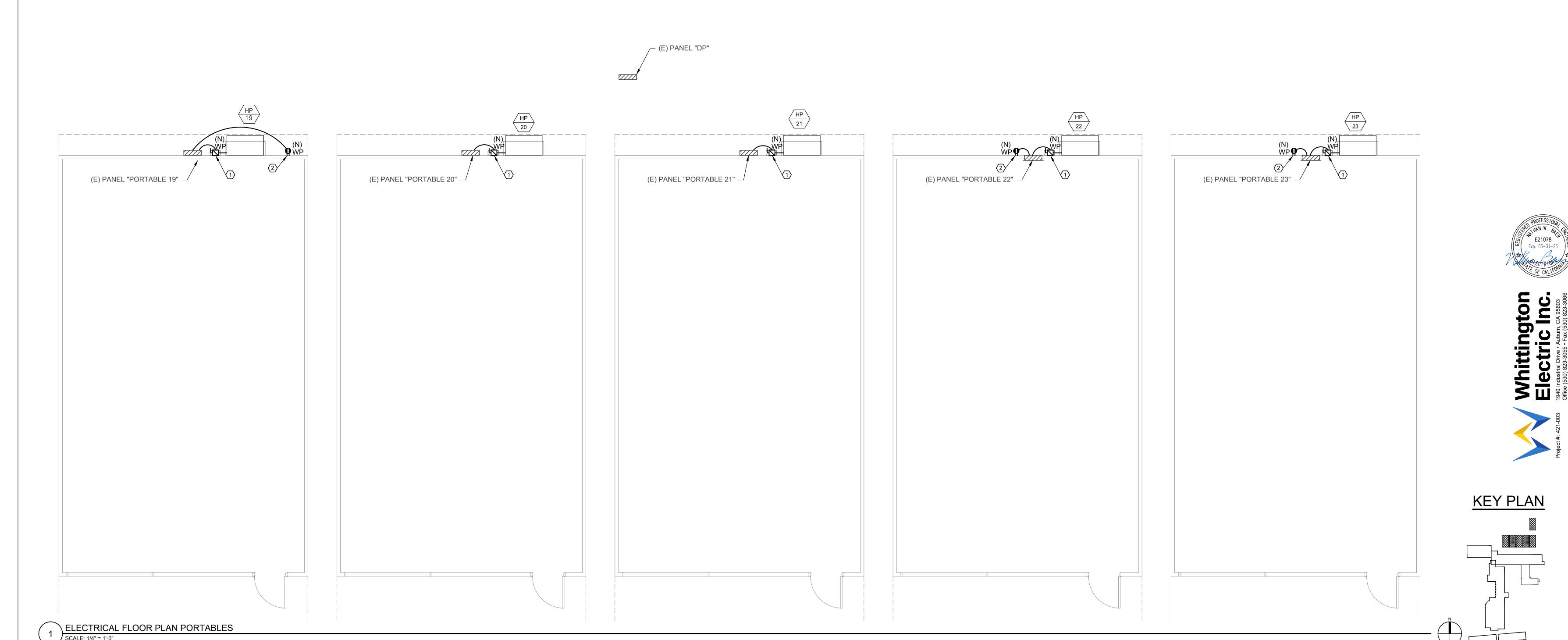


ELECTRICAL FLOOR PLAN BUILDING E

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

- (1) REPLACE EXISTING HVAC UNIT CIRCUIT. REPLACE HVAC CIRCUIT BREAKERS WITH ONE (1) NEW 90A/2P CIRCUIT BREAKER, SEE PANEL SCHEDULES, SHEET "E4.02". PROVIDE NEW FUSED DISCONNECT AND BRANCH CIRCUITING TO HVAC UNIT PER MECHANICAL EQUIPMENT CONNECTION SCHEDULE.
- 2 PROVIDE WEATHERPROOF GFCI RECEPTACLE AT +18" ABOVE GRADE WITH LOCKABLE COVER. PROVIDE AND CONNECT TO NEW 20A/1P CIRCUIT BREAKER IN PANELBOARD, SEE PANEL SCHEDULES, SHEET "E4.02".





IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT

APP: 02-118996 INC:

REVIEWED FOR
SS FLS ACS D

DATE: 06/16/2021

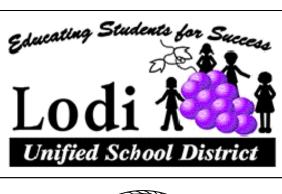
DSA 02-118996

AGENCY APPROVAL:

MECHANICAL ENGINEERING S GROUP, INC.
(916) 325-1065
FAX (916) 325-1075
ail office@turleymech.com

TURLEY & ASSOCIATES

A ASSC 2431 Capitol Avenue Sacramento, CA 95816





DISTRICT
ENTARY

ODI UNIFIED SCHOOL DIS WOODBRIDGE ELEMENT HVAC REPLACEMENT 1290 LILAC STREET

SHEET TITLE:

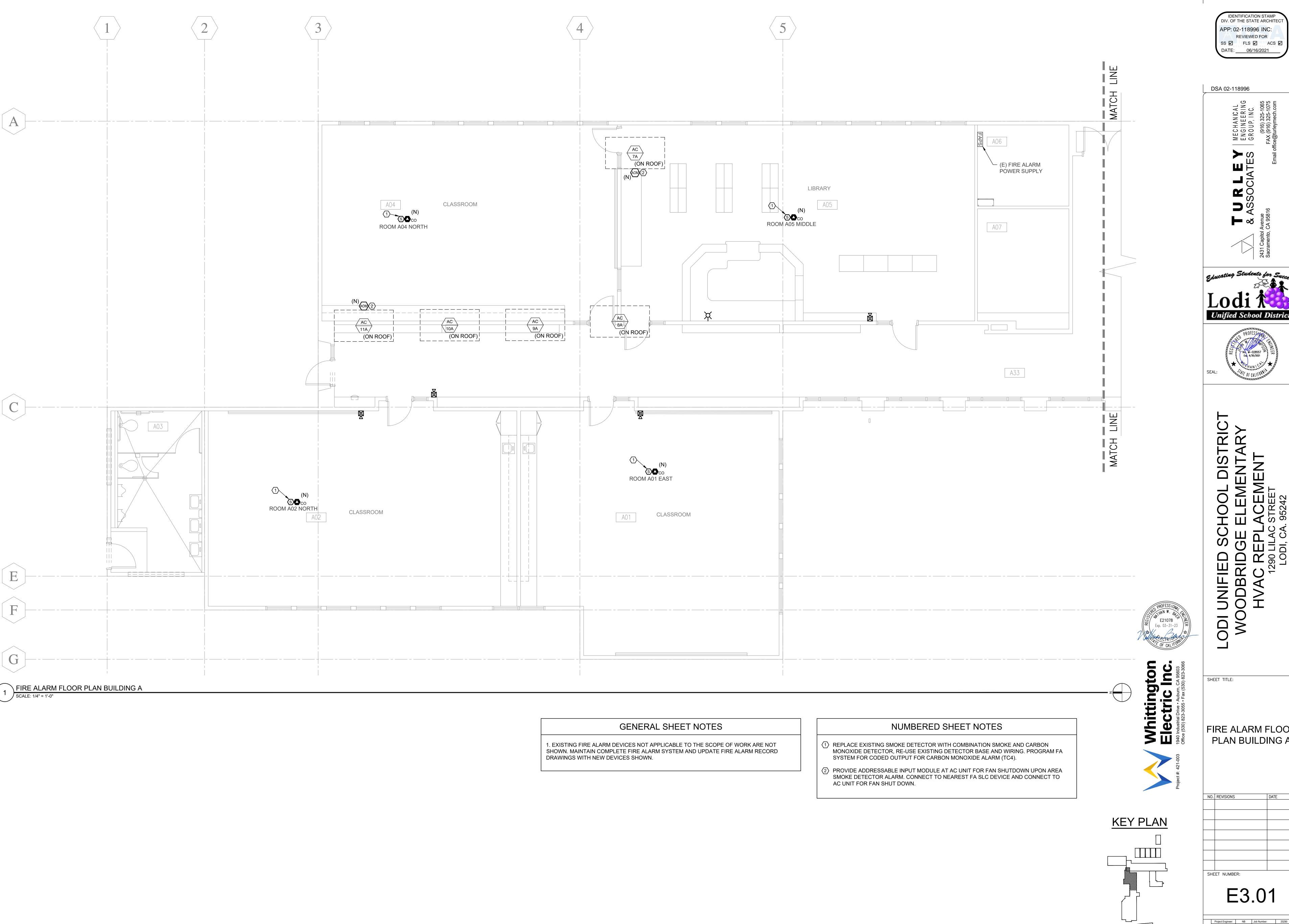
ELECTRICAL FLOOR PLAN PORTABLES

NO. REVISIONS DATE

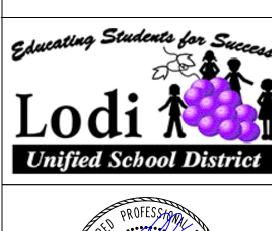
SHEET NUMBER:

E2.07

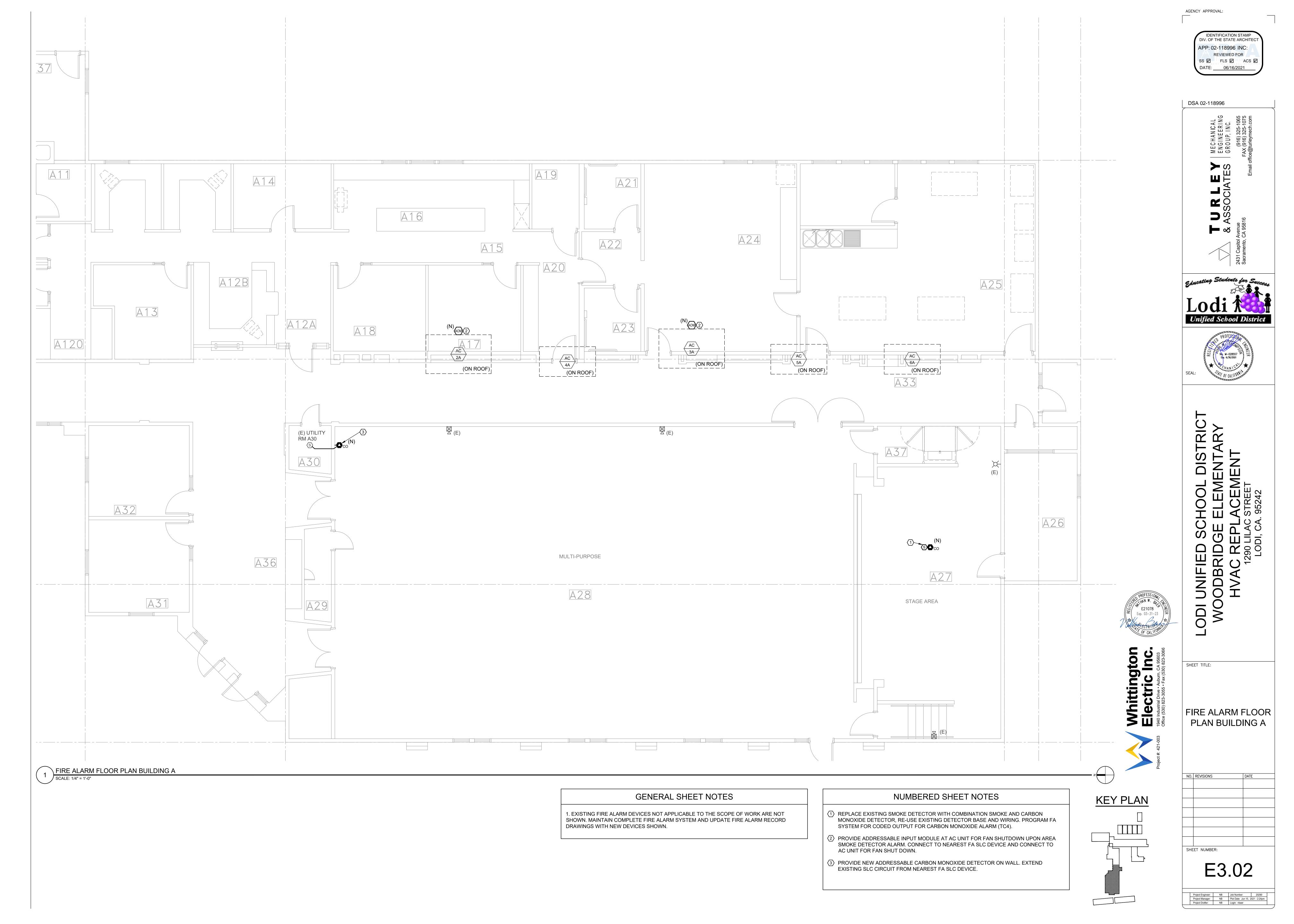
Project Engineer: NB Job Number: 20290
Project Manager: NB Plot Date: Jun 15, 2021 - 2:24pm
Project Drafter: NB Login: nbaer



AGENCY APPROVAL:



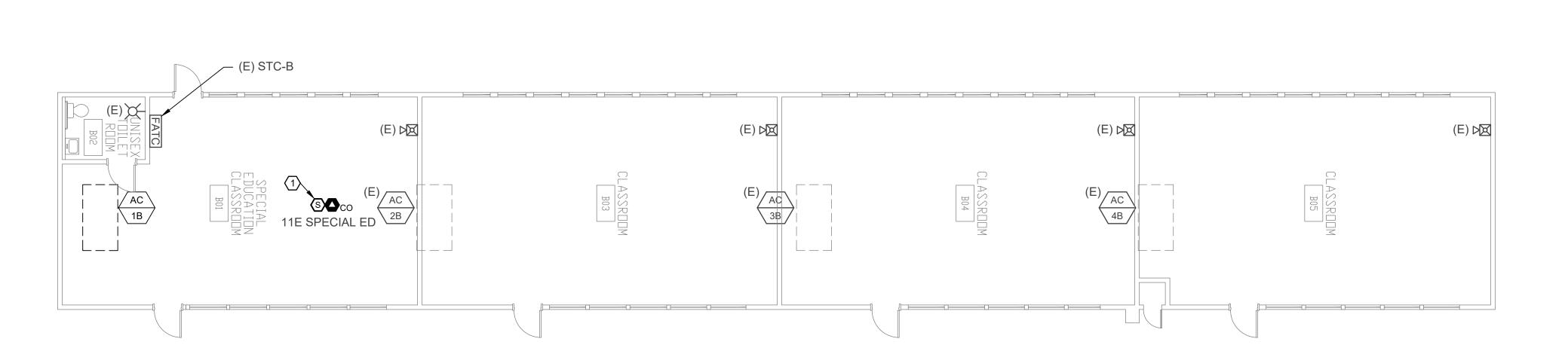
FIRE ALARM FLOOR PLAN BUILDING A



- 1 REPLACE EXISTING SMOKE DETECTOR WITH COMBINATION SMOKE AND CARBON MONOXIDE DETECTOR, RE-USE EXISTING DETECTOR BASE AND WIRING. PROGRAM FA SYSTEM FOR CODED OUTPUT FOR CARBON MONOXIDE ALARM (TC4).
- 2 PROVIDE ADDRESSABLE INPUT MODULE AT AC UNIT FOR FAN SHUTDOWN UPON AREA SMOKE DETECTOR ALARM. CONNECT TO NEAREST FA SLC DEVICE AND CONNECT TO AC UNIT FOR FAN SHUT DOWN.

### GENERAL SHEET NOTES

1. EXISTING FIRE ALARM DEVICES NOT APPLICABLE TO THE SCOPE OF WORK ARE NOT SHOWN. MAINTAIN COMPLETE FIRE ALARM SYSTEM AND UPDATE FIRE ALARM RECORD



FIRE ALARM FLOOR PLAN BUILDING B
SCALE: 1/8" = 1'-0"



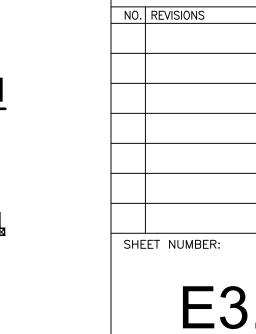


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FIRE ALARM FLOOR PLAN BUILDING B



E3.03

KEY PLAN

APP: 02-118996 INC: REVIEWED FOR SS 🗹 FLS 🗹 ACS 🗹 DATE: 06/16/2021 DSA 02-118996

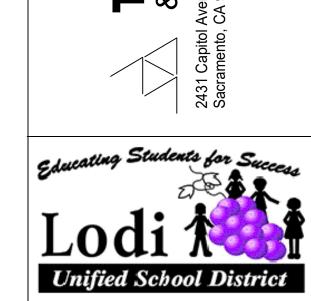
MECHANICAL ENGINEERING GROUP, INC. (916) 325-1065 FAX (916) 325-1075

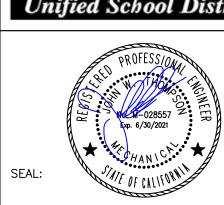
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IDENTIFICATION STAMP DIV. OF THE STATE ARCHITECT

AGENCY APPROVAL:

DRAWINGS WITH NEW DEVICES SHOWN.

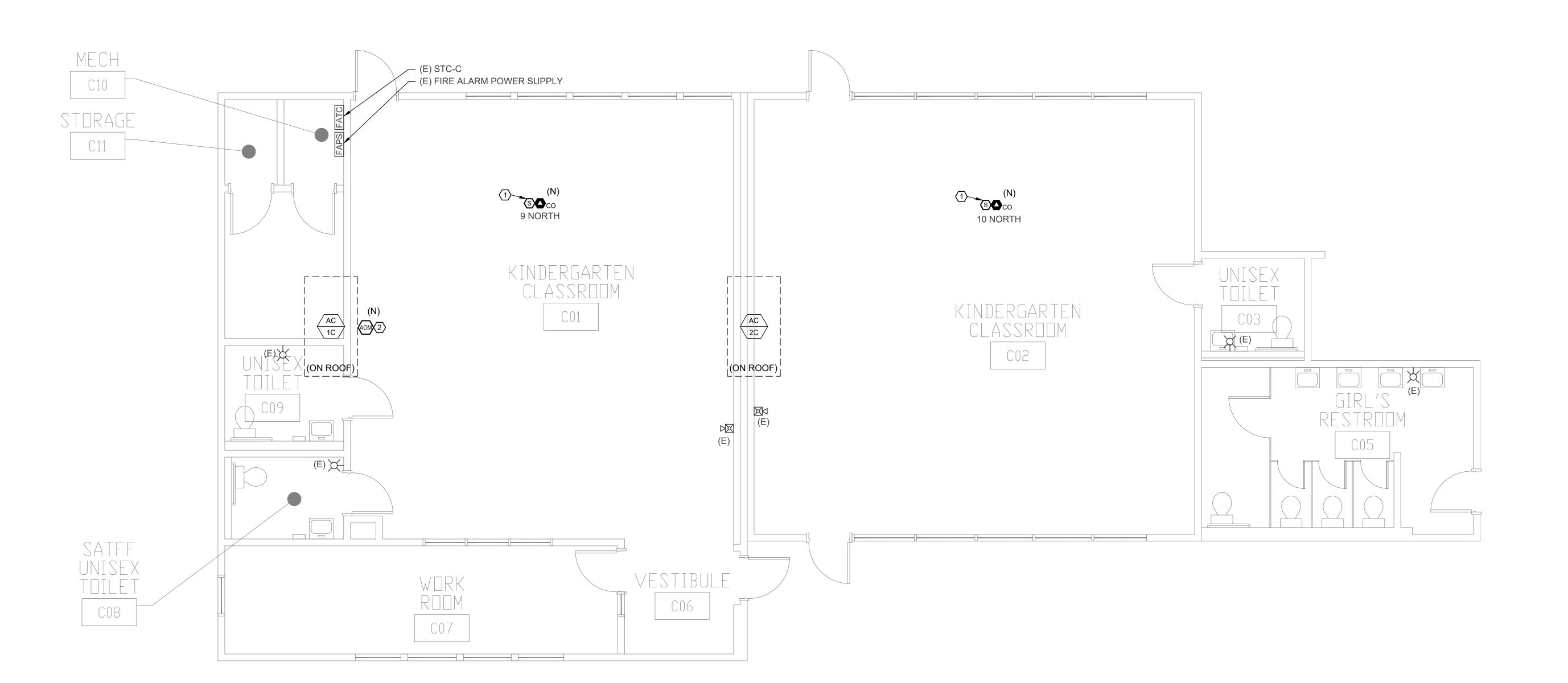




- (1) REPLACE EXISTING SMOKE DETECTOR WITH COMBINATION SMOKE AND CARBON MONOXIDE DETECTOR, RE-USE EXISTING DETECTOR BASE AND WIRING. PROGRAM FA SYSTEM FOR CODED OUTPUT FOR CARBON MONOXIDE ALARM (TC4).
- (2) PROVIDE ADDRESSABLE INPUT MODULE AT AC UNIT FOR FAN SHUTDOWN UPON AREA SMOKE DETECTOR ALARM. CONNECT TO NEAREST FA SLC DEVICE AND CONNECT TO AC UNIT FOR FAN SHUT DOWN.

# GENERAL SHEET NOTES

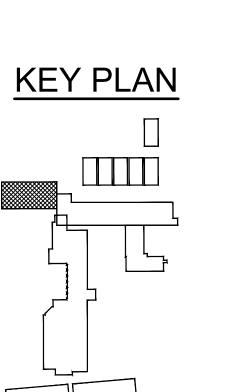
1. EXISTING FIRE ALARM DEVICES NOT APPLICABLE TO THE SCOPE OF WORK ARE NOT SHOWN. REFER TO FIRE ALARM RECORD DRAWINGS FOR COMPLETE SYSTEM. MAINTAIN COMPLETE FIRE ALARM SYSTEM AND UPDATE FIRE ALARM RECORD DRAWINGS WITH NEW DEVICES SHOWN.



FIRE ALARM FLOOR PLAN BUILDING C
SCALE: 1/4" = 1'-0"





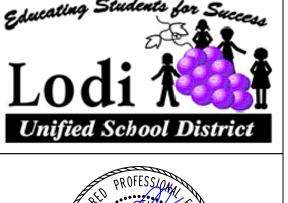


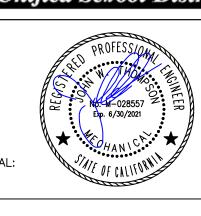
IDENTIFICATION STAMP DIV. OF THE STATE ARCHITECT APP: 02-118996 INC: REVIEWED FOR SS 🗹 FLS 🗹 ACS 🗹 DATE: 06/16/2021

DSA 02-118996

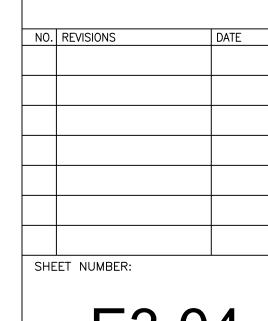
AGENCY APPROVAL:

MECHANICAL ENGINEERING GROUP, INC. (916) 325-1065 FAX (916) 325-1075 \_\_\_\_

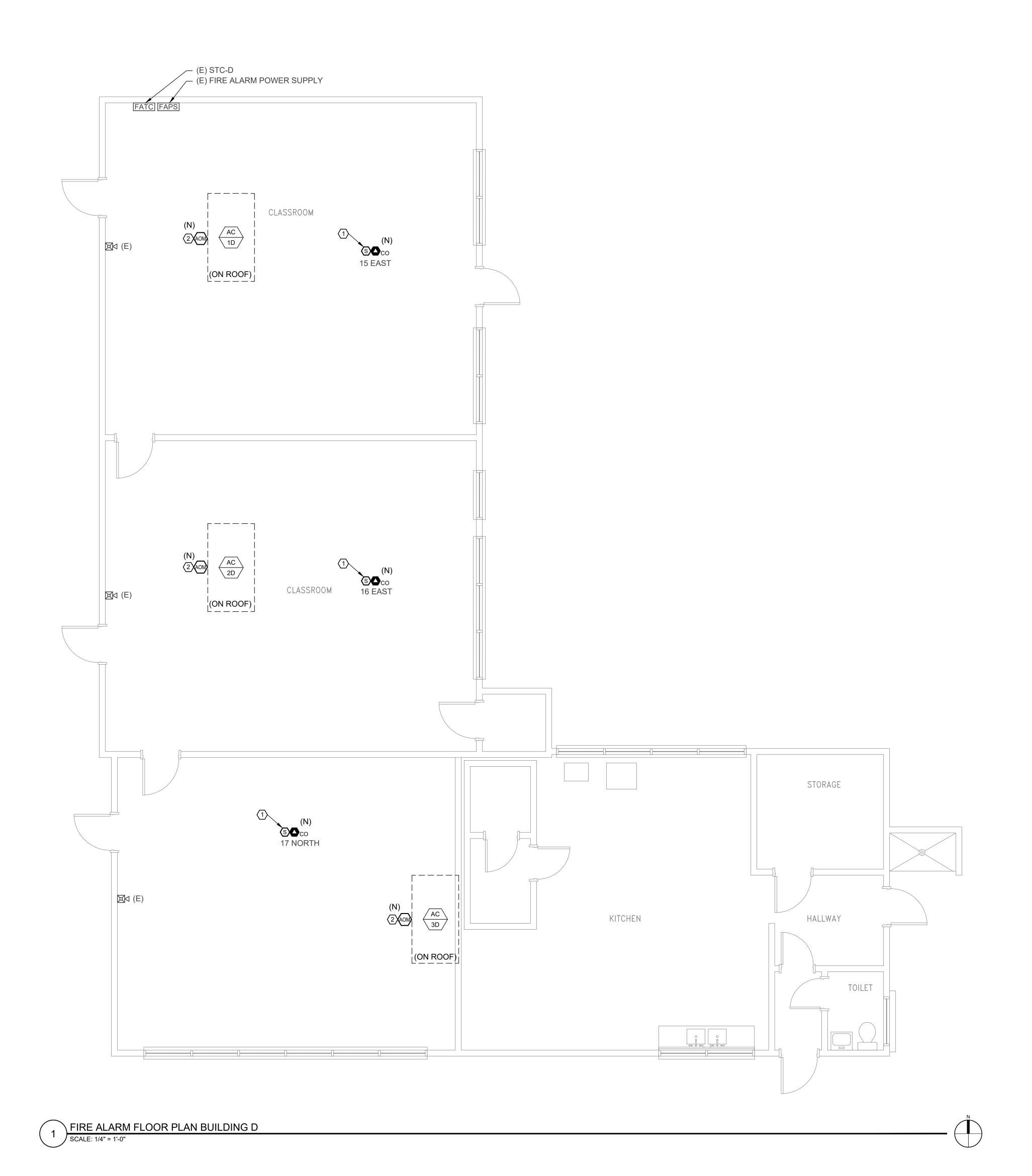




FIRE ALARM FLOOR PLAN BUILDING C



E3.04



- 1 REPLACE EXISTING SMOKE DETECTOR WITH COMBINATION SMOKE AND CARBON MONOXIDE DETECTOR, RE-USE EXISTING DETECTOR BASE AND WIRING. PROGRAM FA SYSTEM FOR CODED OUTPUT FOR CARBON MONOXIDE ALARM (TC4).
- (2) PROVIDE ADDRESSABLE INPUT MODULE AT AC UNIT FOR FAN SHUTDOWN UPON AREA SMOKE DETECTOR ALARM. CONNECT TO NEAREST FA SLC DEVICE AND CONNECT TO AC UNIT FOR FAN SHUT DOWN.

### **GENERAL SHEET NOTES**

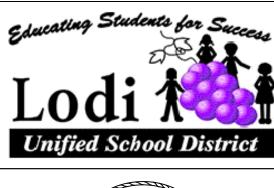
1. EXISTING FIRE ALARM DEVICES NOT APPLICABLE TO THE SCOPE OF WORK ARE NOT SHOWN. MAINTAIN COMPLETE FIRE ALARM SYSTEM AND UPDATE FIRE ALARM RECORD DRAWINGS WITH NEW DEVICES SHOWN.

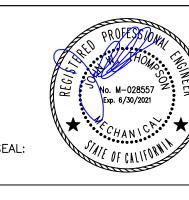
AGENCY APPROVAL:

IDENTIFICATION STAMP DIV. OF THE STATE ARCHITECT APP: 02-118996 INC: REVIEWED FOR SS 🗹 FLS 🗹 ACS 🗹 DATE: 06/16/2021

### DSA 02-118996

MECHANICAL ENGINEERING GROUP, INC. (916) 325-1065 FAX (916) 325-1075 \_\_\_\_

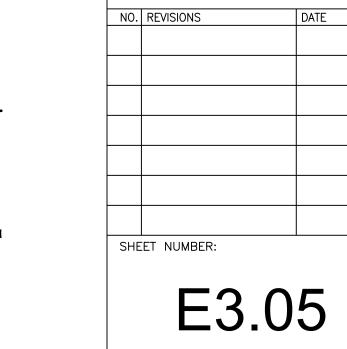












**KEY PLAN** 

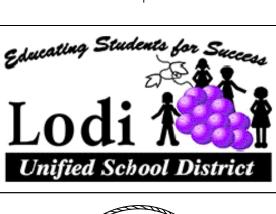
- (1) REPLACE EXISTING SMOKE DETECTOR WITH COMBINATION SMOKE AND CARBON MONOXIDE DETECTOR, RE-USE EXISTING DETECTOR BASE AND WIRING. PROGRAM FA SYSTEM FOR CODED OUTPUT FOR CARBON MONOXIDE ALARM (TC4).
- (2) PROVIDE ADDRESSABLE INPUT MODULE AT AC UNIT FOR FAN SHUTDOWN UPON AREA SMOKE DETECTOR ALARM. CONNECT TO NEAREST FA SLC DEVICE AND CONNECT TO AC UNIT FOR FAN SHUT DOWN.

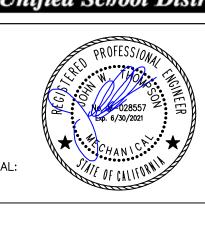
### IDENTIFICATION STAMP DIV. OF THE STATE ARCHITECT APP: 02-118996 INC: REVIEWED FOR SS 🗹 FLS 🗹 ACS 🗹 DATE: 06/16/2021

DSA 02-118996

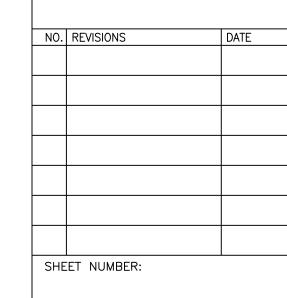
AGENCY APPROVAL:

MECHANICAL ENGINEERING GROUP, INC. (916) 325-1065 FAX (916) 325-1075 \_\_\_\_





FIRE ALARM FLOOR PLAN BUILDING E



**KEY PLAN** E3.06

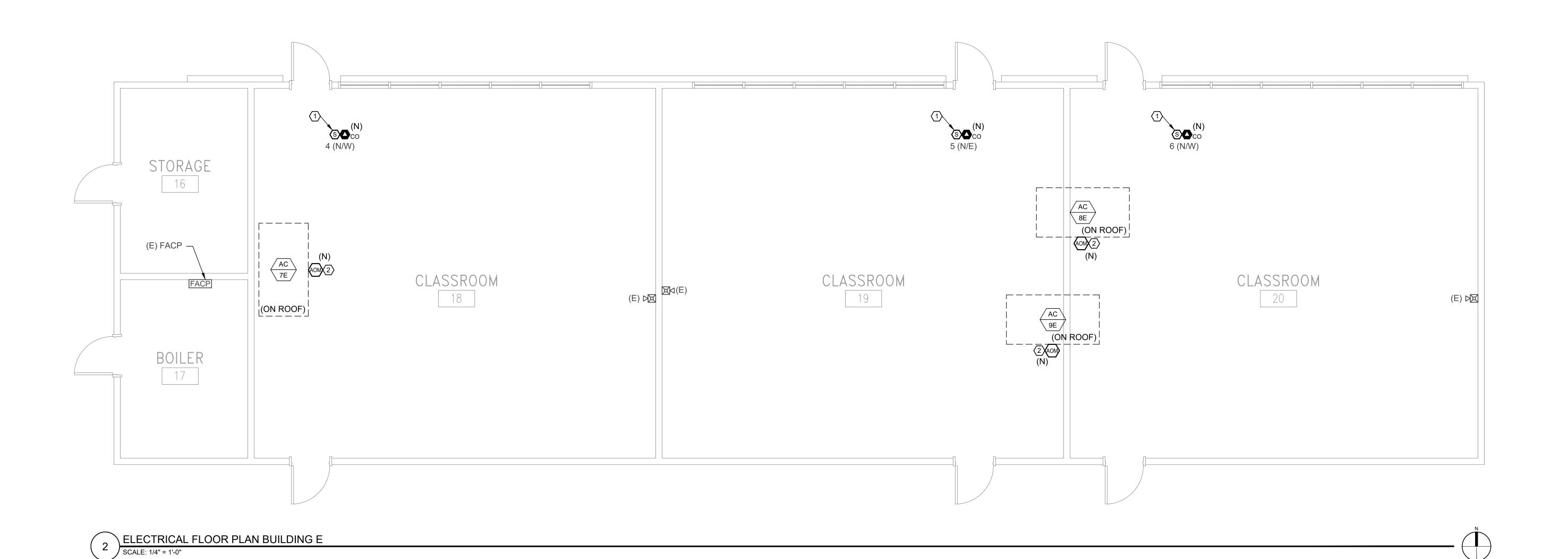
Whitington

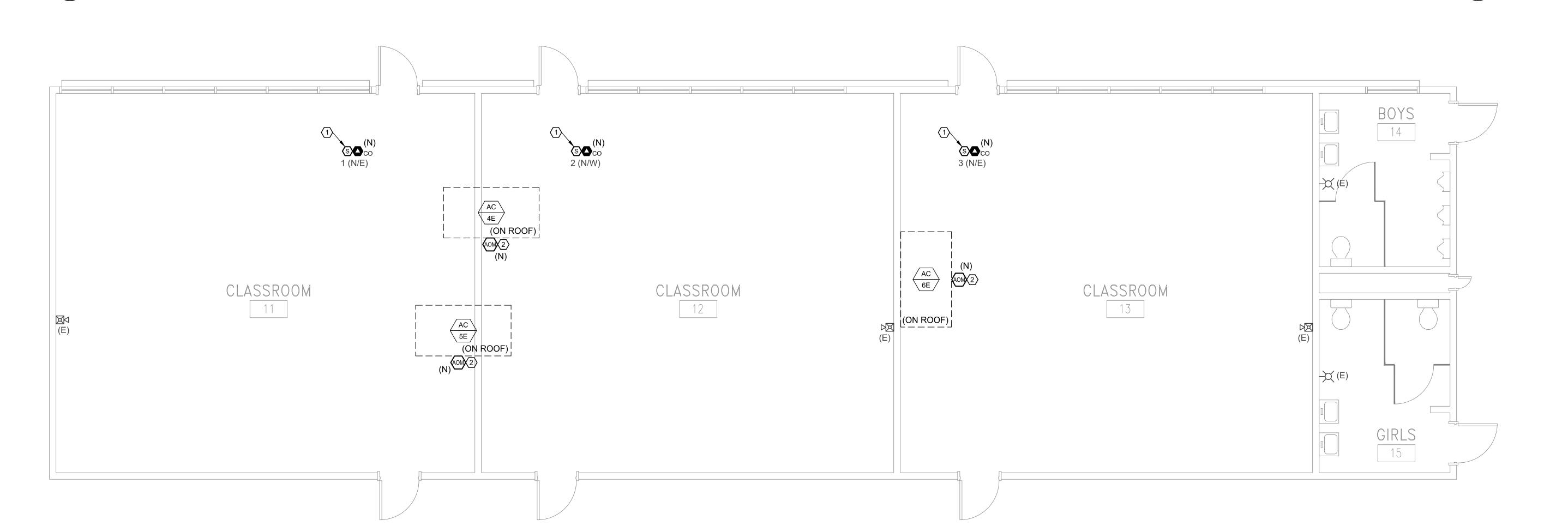
Electric Inc.

1940 Industrial Drive · Auburn, CA 95603
Office (530) 823-3055 · Fax (530) 823-3066

GENERAL SHEET NOTES

1. EXISTING FIRE ALARM DEVICES NOT APPLICABLE TO THE SCOPE OF WORK ARE NOT SHOWN. MAINTAIN COMPLETE FIRE ALARM SYSTEM AND UPDATE FIRE ALARM RECORD DRAWINGS WITH NEW DEVICES SHOWN.





FIRE ALARM FLOOR PLAN BUILDING E
SCALE: 1/4" = 1'-0"

								ME	SHAN	ICAL E	:QUIPMEI	NI REPL	ACEMEN	I SCF	IEDUL	.E						
					EXIS	TING UI	VIT								NEW	UNIT						
												CONDUC	TORS (MIN	SIZE)		MOTOR CONTRO	LLER		MO	OR DISCONN	IECT	
Equipment Designation	Panelboard	Circuit	Volts	Phase	FLA	MCA	MOCP	FLA	MCA	МОСР	CONDUIT	PHASE	NEUTRAL	GND	ТҮРЕ	STARRTER SIZE AB ABHSINANA	INSTALLED BY	ТҮРЕ	FUSE SIZE	FURNISHED BY	INSTALLED BY	NOTES
AC-2A	AACB	7,9,11	208	3	-	-		-	42.0	50.0	1 in	(3) #6	-	#10	-	- MFR	MFR	FD	50	EC	EC	1, 2, 3
AC-3A	AACB	13,15,17	208	3	-	-		-	42.0	50.0	1 in	(3) #6	-	#10	-	- MFR	MFR	FD	50	EC	EC	1, 2, 3
AC-4A	AACB	2,4,6	208	3	-	24.1	35.0	-	29.0	40.0	3/4 in	(3) #10	-	#10	-	- MFR	MFR	FD	40	EC	EC	1, 3
AC-5A	AACB	8,10,12	208	3	-	24.1	35.0	-	29.0	40.0	3/4 in	(3) #10	-	#10	-	- MFR	MFR	FD	40	EC	EC	1, 3
AC-6A	AACB	14,16,18	208	3	-	24.1	35.0	-	29.0	40.0	3/4 in	(3) #10	-	#10	-	- MFR	MFR	FD	40	EC	EC	1, 3
AC-7A	AACA	8,10,12	208	3	-	26.5	35.0	-	29.0	40.0	3/4 in	(3) #10	-	#10	-	- MFR	MFR	FD	40	EC	EC	1, 2, 3
AC-8A	AACA	7,9,11	208	3	-	24.1	35.0	-	29.0	40.0	3/4 in	(3) #10	-	#10	-	- MFR	MFR	FD	40	EC	EC	1, 3
AC-9A	AACA	13,15,17	208	3	-	24.1	35.0	-	29.0	40.0	3/4 in	(3) #10	-	#10	-	- MFR	MFR	FD	40	EC	EC	1, 3
AC-10A	AACA	19,21,23	208	3	-	24.1	35.0	-	29.0	40.0	3/4 in	(3) #10	-	#10	-	- MFR	MFR	FD	40	EC	EC	1, 3
AC-11A	AACA	14,16,18	208	3	-	26.5	35.0	-	29.0	40.0	3/4 in	(3) #10	-	#10	-	- MFR	MFR	FD	40	EC	EC	1, 2, 3
AC-1B	B	1,3,5	208	3	-	24.1	35.0	-	29.0	40.0	3/4 in	(3) #10	-	#10	-	- MFR	MFR	FD	40	EC	EC	1, 3
AC-2B	В	7,9,11	208	3	-	26.5	35.0															4
AC-3B AC-4B	D D	13,15,17 2,4,6	208 208	3 3	-	26.5 26.5	35.0 35.0															4
	Ь	<del>                                     </del>	208	3	-	26.5	35.0		29.0	40.0	3/4 in	(2) #10		#10		- MFR	MFR	FD	40	EC	EC	1 2 2
AC-1C AC-2C	D B	8,10,12 14,16,18	208	3	-	24.1	35.0	-	29.0	40.0	3/4 in	(3) #10 (3) #10	-	#10	-	MED	MFR	FD	40	EC	EC	1, 2, 3 1, 3
AC-20 AC-1D	LD1	31,33,35	208	3	<u>-</u>	26.5	35.0		29.0	40.0	3/4 in	(3) #10	-	#10	<u> </u>	- MFR	MFR	FD	40	EC	EC	1, 2, 3
AC-2D	LD1	25,27,29	208	3		26.5	35.0		29.0	40.0	3/4 in	(3) #10	_	#10	<u> </u>	- MFR	MFR	FD	40	EC	EC	1, 2, 3
AC-3D	LD1	32,34,36	208	3	_	26.5	35.0		29.0	40.0	3/4 in	(3) #10	_	#10	_	- MFR	MFR	FD	40	EC	EC	1, 2, 3
AC-4E	FF	1,3,5	208	3	_	26.5	35.0	_	29.0	40.0	3/4 in	(3) #10	_	#10	_	- MFR	MFR	FD	40	EC	EC	1, 2, 3
AC-5E	FF	2,4,6	208	3	_	26.5	35.0	_	29.0	40.0	3/4 in	(3) #10	_	#10	_	- MFR	MFR	FD	40	EC	EC	1, 2, 3
AC-6E	FF	7,9,11	208	3	_	26.5	35.0	-	29.0	40.0	3/4 in	(3) #10	_	#10	_	- MFR	MFR	FD	40	EC	EC	1, 2, 3
AC-7E	FF	8,10,12	208	3	_	26.5	35.0	-	29.0	40.0	3/4 in	(3) #10	_	#10	_	- MFR	MFR	FD	40	EC	EC	1, 2, 3
AC-8E	FF	13,15,17	208	3	-	26.5	35.0	-	29.0	40.0	3/4 in	(3) #10	_	#10	-	- MFR	MFR	FD	40	EC	EC	1, 2, 3
AC-9E	FF	14,16,18	208	3	-	26.5	35.0	-	29.0	40.0	3/4 in	(3) #10	-	#10	-	- MFR	MFR	FD	40	EC	EC	1, 2, 3
HP-19	PORTABLE	-	208	1	-	-		-	79.0	90.0	1 in	(3) #4	-	#8	-	- MFR	MFR	FD	90	EC	EC	
HP-20	PORTABLE	-	208	1	-	-		-	79.0	90.0	1 in	(3) #4	-	#8	-	- MFR	MFR	FD	90	EC	EC	
HP-21	PORTABLE	-	208	1	-	-		-	79.0	90.0	1 in	(3) #4	-	#8	-	- MFR	MFR	FD	90	EC	EC	
HP-22	PORTABLE	-	208	1	-	-		-	79.0	90.0	1 in	(3) #4	-	#8	-	- MFR	MFR	FD	90	EC	EC	
HP-23	PORTABLE	-	208	1	-	-		-	79.0	90.0	1 in	(3) #4	-	#8	-	- MFR	MFR	FD	90	EC	EC	
HP-24	PORTABLE	-	208	1 1	-	-		-	79.0	90.0	1 in	(3) #4	-	#8	-	- MFR	MFR	FD	90	EC	EC	
Numbered No																						
			-				entify circ	uit prior	to work.	Field ver	fiy branch circ	cuit sizing me	ets or exceed	ls sched	uled size	prior to start of work.						
	ddressable inp			•																		
	on Monoxide o				•	all classi	rooms ser	ved by ur	nit.													
-	ment removed	trom scope and	shall rei	main as ex	xisting.																	
General Notes		1 10 1	, ,																			
4. Coordinate	install with Med ng shall be by M	chanical Contrac	τor, refe	r to mech	ianical draw	ings.																

Existing Panel:	В												
Location:	Bldg B Roof				Volts:	1	L20/2	08Y			Mains:		MLO
Supply From:	MSB				Phases:	: 3	3				Bus Rat	ing:	225A
Mounting:	Surface				Wires:	4	ļ				AIC Rat	ing:	EXISTING
Load Description	Load (VA)	Load Type	Phase	Circuit Amp	Breaker Pole	Ckt #	Ckt #	Circuit	Breaker Poles	Phase	Load Type	Load (VA)	Load Description
(E) AC-3B	3180	5	A	50	3	1	2	50	3	Α	4	3180	(E) AC-4B
-	3180	5	В	-	_	3	4	-	_	В	4	3180	-
	3180	5	C	_	_	5	6	_	_	C	4	3180	_
(E) AC-2B	3180	4	A	50	3	7	8	50	3	A	4	3482	(N) AC-1C [1]
-	3180	4	В	-	-	9	10	-	_	В	4	3482	-
<u> </u>	3180	4	c	_	_	11	12	_	_	C	4	3482	-
(N) AC-1B [1]	3482	4	A	40	3	13	14	40	3	A	4	3482	(N) AC-2C [1]
-	3482	4	В	-	-	15	16	-	_	В	4	3482	-
-	3482	4	С	_	_	17	18	_	-	C	4	3482	-
(E) RCPT - ROOF	720	1	Α			20	20	1	Α	3	1920	(E) LOAD [2]	
(E) RCPT - ROOF	360	1	В	20	1	21	22	PFB	1	В			(E) SPACE
(E) SECURITY LIGHT	200	2	С	20	1	23	24	PFB	1	С			(E) SPACE
(E) SPACE			Α	PFB	1	25	26	PFB	1	Α			(E) SPACE
(E) SPACE			В	PFB	1	27	28	PFB	1	В			(E) SPACE
(E) SPACE			С	PFB	1	29	30	PFB	1	С			(E) SPACE
Load Type	Connected Load (kVA)		Dem	and Mu	ltiplier			Deman	d Load			С	onnected Load kVA/Phase
1 - Receptacles	1.08	x	(	CEC 220.	44	=		1.08	kVA			Phase A:	22.63 kVA
2 - Continuous (Lighting)	0.20	x		1.25		=		0.25	kVA			Phase B:	20.35 kVA
3 - Non-Continuous	1.92	x		1.00		=		1.92	kVA			Phase C:	20.19 kVA
4 - Motor	50.42	x		1.00		=		50.42	kVA				Total Demand Load
5 - Largest Motor	9.54	x		1.25		=		11.93	kVA				65.59 kVA
													182.05 Amps
Notes:													
1. Re-use existing circuit breaker.													
2. Unknown load calculated at max	imum 16 amp	s.											

Definitions:

EC - ELECTRICAL CONTRACTOR

OL - MOTOR RATED SWITCH WITH OVERLOAD

FVNR - FULL-VOLTAGE, NON-REVERSING STARTER WITH HAND-OFF-AUTO

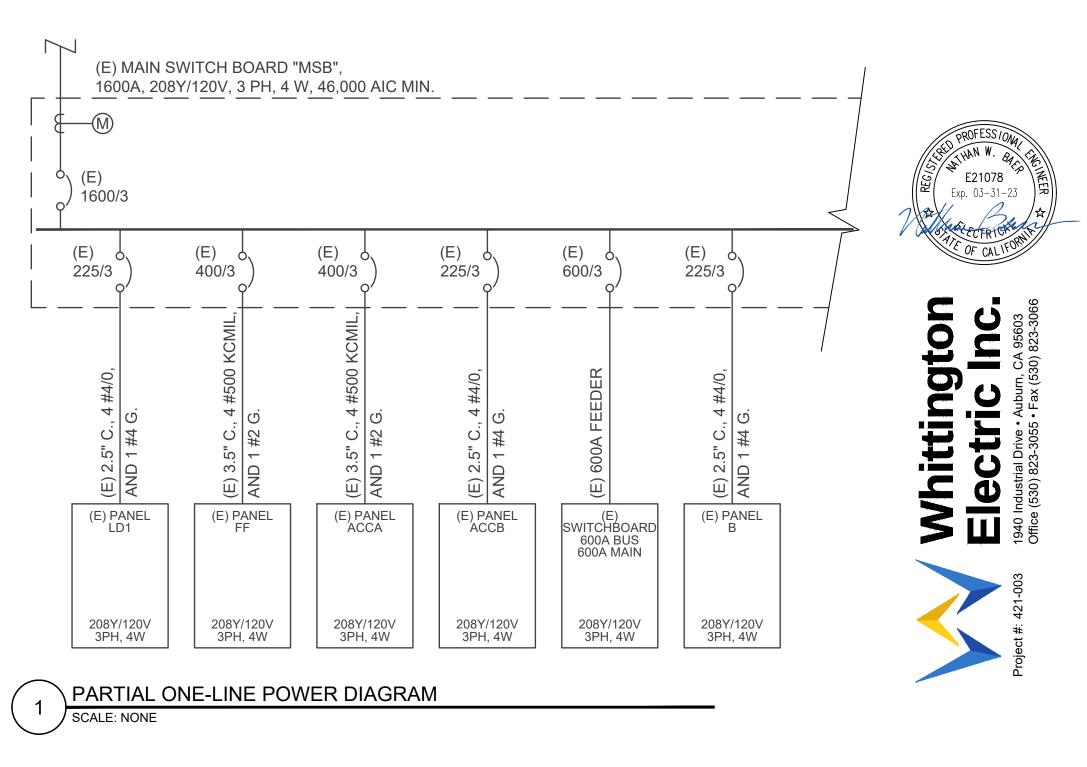
MFR - MANUFACTURER FD - FUSED DISCONNECT

Existing Panel:	LD-1												
Location:	Building D				Volts:		120/2	08Y			Mains:	l	225A
Supply From:	MSB				Phases:		3				Bus Rat	ing:	225A
Mounting:	Surface				Wires:		4				AIC Rat	ing:	EXISTING
Load Description	Load (VA)	Load Type	Phase	Circuit Amp	Breaker Pole	Ckt #	Ckt #	Circuit Amps	Breaker Poles	Phase	Load Type	Load (VA)	Load Description
(E) LIGHTING			Α	20	1	1	2	20	1	Α	,,,		(E) RECEPTACLES
(E) LIGHTING			В	20	1	3	4	20	1	В			(E) RECEPTACLES
(E) PROJECTOR			С	20	1	5	6	20	1	С			(E) RECEPTACLES
(E) INTRUSION			Α	20	1	7	8	20	1	Α			(E) RECEPTACLES
(E) RECEPTACLE			В	20	1	9	10	20	1	В			(E) RECEPTACLES
E) RECEPTACLE			С	20	1	11	12	20	1	С			(E) RECEPTACLES
E) SPARE			Α	20	1	13	14	20	1	Α			(E) RECEPTACLES
(E) SPARE			В	20	1	15	16	20	1	В			(E) SPARE
E) SPARE			С	20	1	17	18	30	1	С			(E) SPARE
(E) RECEPTACLE			Α	20	1	19	20	20	1	Α			(E) HOT SERVER
(E) SPARE			В	20	1	21	22	20	1	В			(E) COLD SERVER
(E) RCPT - ROOF			С	20	1	23	24	20	1	С			(E) LOAD
N) AC-3D [1]	3482		Α	50	3	25	26	20	1	Α			(E) LOAD
	3482		В	-	-	27	28	50	2	В			(E) KITCHEN
	3482		С	-	-	29	30	-	-	С			-
(N) AC-1D [1]	3482		Α	50	3	31	32	50	3	Α		3482	(N) AC-2D [1]
	3482		В	-	-	33	34	-	-	В		3482	-
·	3482		С	-	-	35	36	-	-	С		3482	-
(E) SPACE			Α			37	38	?	3	Α			(E) SPARE
E) SPACE			В			39	40	-	-	В			-
(E) SPACE			С			41	42	-	-	С			-
Notes:													
1. Re-use existing circuit breaker.													

Existing Panel:	FF												
Location:	Building F B	oiler R	m		Volts:		120/	<sup>208</sup>			Mains:		400A
Supply From:	MSB				Phases:		3				Bus Rat	ing:	400A
Mounting:	Surface				Wires:		4				AIC Rat	ing:	EXISTING
Load Description	Load (VA)	Load Type	Phase	Circuit Amp	Breaker Pole	Ckt #	CI #	kt Circuit # Amps		Phase	Load Type	Load (VA)	Load Description
(N) AC-4E [1]	3482	5	Α	50	3	1	2	2 50	3	Α	4	3482	(N) AC-5E [1]
-	3482	5	В	-	-	3	4	1 -	-	В	4	3482	-
-	3482	5	С	-	-	5	(	5 -	-	С	4	3482	-
(N) AC-6E [1]	3482	4	Α	50	3	7	8	3 50	3	Α	4	3482	(N) AC-7E [1]
-	3482	4	В	-	-	9	1	0 -	-	В	4	3482	-
-	3482	4	С	-	-	11	1	2 -	-	С	4	3482	-
(N) AC-8E [1]	3482	4	Α	50	3	13	1	4 50	3	Α	4	3482	(N) AC-9E [1]
-	3482	4	В	-	-	15	1	6 -	-	В	4	3482	-
-	3482	4	С	-	-	17	1	8 -	-	С	4	3482	-
(E) WATER HEATER			Α	30	2	19	2	0 PFB	1	Α			(E) SPACE
-			В	-	-	21	2	2 PFB	1	В			(E) SPACE
(E) SPACE			С	PFB	1	23	2	4 PFB	1	С			(E) SPACE
(E) SPACE			Α	PFB	1	25	2	6 PFB	1	Α			(E) SPACE
(E) SPACE			В	PFB	1	27	2	8 PFB	1	В			(E) SPACE
(E) SPACE			С	PFB	1	29	3	0 PFB	1	С			(E) SPACE
Notes:													
1. Re-use existing circuit breaker.													
2. Units replaced in kind. No net lo	ad addition to	panel											

<b>Existing Panel:</b>	AACA																
Location:	Building "A	' Exter	ior		Volts:		120	0/20	)8Y			Mains:	1	MLO (400A OCP)			
Supply From:					Phases:		3					Bus Rat	ing:	400A			
Mounting:	Surface				Wires:		4					AIC Rat	ing:	EXISTING			
Load Description	Load (VA)	Load Type	Phase		Breaker Pole	Ckt #		Ckt #	Circuit E	Breaker Poles	Phase	Load Type	Load (VA)	Load Description			
(E) SPARE		Type	A	Amp 20	1	1	-	2	Amps 20		Α	туре		(E) SPARE			
(E) SPARE			В	20	1	3		4	20	1 1	В			(E) SPARE			
(E) SPARE			С	20	1	5	-	6	20	1	С			(E) SPARE			
· ·	2894	4	A	40	3	7	-	8	50	3	A	5	3182	(N) AC-7A [2]			
(N) AC-8A [2]	2894		В			9	-	10	30	5	В	5	3182	(N) AC-7A [2]			
-		4	С	-	<u>-</u>		-	12	-	-	С	5	3182	-			
- (NI) AC OA [3]	2894		_	- 40	-	11	-	$\rightarrow$	-	-				(NI) A.C. 11 A. [2]			
(N) AC-9A [2]	2894	4	A	40	3	13	-	14	50	3	A	4	2894	(N) AC-11A [2]			
-	2894	4	В	-	-	15	-	16	-	-	В	4	2894	<del>-</del>			
- (21) 4.0 4.0 4.50	2894	4	C	-	-	17	-	18	-	-	С	4	2894	(5) 00 4 0 5			
(N) AC-10A [2]	2894	4	A	40	3	19	-	20	50	3	A			(E) SPARE			
-	2894	4	В	-	-	21	-	22	-	-	В			-			
-	2894	4	С	-	-	23	-	24	-	-	С			-			
(E) SPARE			Α	40	3	25	+ +	26	50	3	Α			(E) SPARE			
-			В	-	-	27	-	28	-	-	В			-			
-			С	-	-	29	-	30	-	-	С			-			
(E) SPARE			Α	40	3	31	+ +	32	PFB	1	Α			(E) SPACE [1]			
-			В	-	-	33		34	PFB	1	В			(E) SPACE [1]			
-			С	_	-	35		36	PFB	1	С			(E) SPACE [1]			
			Α	20	1	37	] [:	38	PFB	1	Α			(E) SPACE [1]			
(E) SPACE			В	PFB	1	39	4	40	PFB	1	В			(E) SPACE [1]			
(E) SPACE			С	PFB	1	41		42	PFB	1	С			(E) SPACE [1]			
Load Type	Connected Load (kVA)		Dem	and Mu	ltiplier				Demano	l Load			С	onnected Load kVA/Phase			
1 - Receptacles	0.00	x	(	CEC 220	.44	=			0.00	kVA			Phase A:	14.76 kVA			
2 - Continuous (Lighting)	0.00	x		1.25		=			0.00	kVA			Phase B:	14.76 kVA			
3 - Non-Continuous	0.00	x		1.00		=			0.00	kVA			Phase C:	14.76 kVA			
4 - Motor	34.73	x		1.00		=			34.73	kVA				Total Demand Load			
5 - Largest Motor	9.55	x		1.25		=			11.93	kVA				46.66 kVA			
														129.50 Amps			
Notes:																	
<ol> <li>Exposed bussing. Provide bre</li> </ol>	aker space cover																
2. Re-use existing circuit breake	r.																

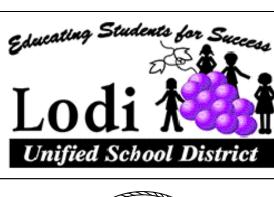
Existing Panel:	AACB												
Location:	Building "A	" Exter	ior		Volts:		120/2	208Y			Mains:		MLO (225A OCP)
Supply From:	MSB				Phases	:	3				Bus Rat	ing:	225A
Mounting:	Surface				Wires:		4				AIC Rat		EXISTING
	1 () ( )	Load		Circuit	Breaker	Ckt	Ckt	Circuit	Breaker		Load	1 () (1)	
Load Description	Load (VA)	Туре	Phase	Amp	Pole	#	#	Amps	Poles	Phase	Туре	Load (VA)	Load Description
(E) RCPT - ROOF	360	1	Α	20	1	1	2	40	3	Α	4	3482	(N) AC-4A [1]
(E) SPACE			В	PFB	1	3	4	-	-	В	4	3482	-
(E) RCPT - ROOF	360	1	С	20	1	5	6	-	_	С	4	3482	-
(N) AC-2A [1]	5044	5	Α	60	3	7	8	40	3	Α	4	3482	(N) AC-5A [1]
-	5044	5	В	-	-	9	10	-	-	В	4	3482	-
-	5044	5	С	-	-	11	12	-	-	С	4	3482	-
(N) AC-3A [1]	5044	4	Α	60	3	13	14	40	3	Α	4	3482	(N) AC-6A [1]
-	5044	4	В	-	-	15	16	-	-	В	4	3482	-
-	5044	4	С	-	-	17	18	-	-	С	4	3482	-
(E) SPACE			Α	PFB	1	19	20	PFB	1	Α			(E) SPACE
(E) SPACE			В	PFB	1	21	22	PFB	1	В			(E) SPACE
(E) SPACE			С	PFB	1	23	24	PFB	1	С			(E) SPACE
(E) SPACE			Α	PFB	1	25	26	50	3	Α			(E) SPARE
(E) SPACE			В	PFB	1	27	28	-	-	В			-
(E) SPACE			С	PFB	1	29	30	-	-	С			-
(E) SPACE			Α	PFB	1	31	32	50	3	Α			(E) SPARE
(E) SPACE			В	PFB	1	33	34	_	-	В			-
(E) SPACE			С	PFB	1	35	36	_	-	С			-
(E) SPACE			Α	PFB	1	37	-						UNUSABLE SPACE
(E) SPACE			В	PFB	1	39	-						UNUSABLE SPACE
(E) SPACE			С	PFB	1	41	-						UNUSABLE SPACE
Load Type	Connected Load (kVA)		Dem	and Mu	ltiplier			Deman	d Load			C	onnected Load kVA/Phase
1 - Receptacles	0.72	х	(	CEC 220	.44	=		0.72	kVA			Phase A:	20.89 kVA
2 - Continuous (Lighting)	0.00	х		1.25		=		0.00	kVA			Phase B:	20.53 kVA
3 - Non-Continuous	0.00	х		1.00		=		0.00	kVA			Phase C:	20.89 kVA
4 - Motor	46.47	х		1.00		=		46.47	kVA				Total Demand Load
5 - Largest Motor	15.13	х		1.25		=		18.92	kVA				66.11 kVA
													183.47 Amps
Notes:													
1. Re-use existing circuit breaker.													
										_			

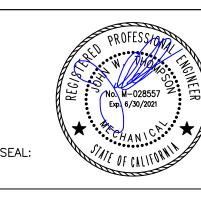


AGENCY APPROVAL: IDENTIFICATION STAMP

APP: 02-118996 INC: REVIEWED FOR SS 🗹 FLS 🗹 ACS 🗹

DSA 02-118996





LODI UNIFIED SCHOOL DISTRICT
WOODBRIDGE ELEMENTARY
HVAC REPLACEMENT
1290 LILAC STREET
LODI, CA. 95242

SHEET TITLE:

PARTIAL ONE-LINE POWER DIAGRAM, MECHANICAL EQUIPMENT REPLACEMENT SCHEDULE, AND PANEL SCHEDULES

NO. REVISIONS SHEET NUMBER:

E4.01

Existing Panel:	Portable	19												
Location:	Portable 19				Volts:		120,	/24	0			Mains:	ı	100A
Supply From:	Panel DP				Phases	:	1					Bus Rat	ing:	125A
Mounting:	Surface				Wires:		3					AIC Rat	ing:	10,000A
	1 1/2/42	Load		Circuit	Breaker	Ckt	С	kt	Circuit I	Breaker	D.I.	Load	1 () ( ) )	
Load Description	Load (VA)	Туре	Phase	Amp	Pole	#		#	Amps	Poles	Phase	Туре	Load (VA)	Load Description
(E) RCPT	1080	1	Α	20	1	1		2	90	2	Α	4	8544	(N) HP-19 [1]
(E) LTS	960	2	В	20	1	3	1   ,	4	-	-	В	4	8544	-
(E) LTS	1060	2	Α	20	1	7		8	60	2	Α		0	(R) BREAKER
(E) PROJECTOR	500	1	В	20	1	9	1	10	-	-	В		0	-
(N) RCPT - GFCI [2]	180	1	Α	A 20		13	1	14	PFB	1	Α			(E) SPACE
(E) SPACE			В	20	1	15	1	16	PFB	1	В			(E) SPACE
Load Type	Connected Load (kVA)		Dem	and Mu	ıltiplier			[	Deman	d Load			C	onnected Load kVA/Phase
1 - Receptacles	1.76	x	(	CEC 220	.44	=			1.76	kVA			Phase A:	10.86 kVA
2 - Continuous (Lighting)	2.02	x		1.25		=			2.53	kVA			Phase B:	10.00 kVA
3 - Non-Continuous	0.00	x		1.00		=			0.00	kVA				
4 - HVAC	17.09	x		1.00		=			17.09	kVA				Total Demand Load
														21.37 kVA
														89.05 Amps
Notes:														

Existing Panel:	Portable	20												
Location:	Portable 20	)			Volts:		120/	/240	<u>ט</u>			Mains:		100A
Supply From:	Panel DP				Phases:	:	1					Bus Rat	ing:	125A
Mounting:	Surface				Wires:		3					AIC Rat	ing:	10,000A
Load Description		Load	Phase	Circuit	Breaker	Ckt	CI	kt C	 Jircuit F	Breaker	Phase	Load	Load (VA)	Load Description
Load Description	Load (VA)	Туре	Pilase	Amp	Pole	#	<u> </u> #	# /	Amps	Poles	Pilase	Туре	Load (VA)	Load Description
(E) LTS	960	2	Α	20	1	1A	∐.	2	90	2	A	4	8544	(N) HP-20 [1]
(E) PROJECTOR	500	1	Α	20	1	1B						-	0344	(N) HF-20 [1]
(E) LTS	1060	2	В	20	1	1 3		4	-	-	В	4	8544	-
(E) CLOCK	360	1	Α	20	1	5A	Π,	6	125					/C) MANIAL DDEALED
(E) RCPT	720	1	Α	20	1	5B '		<u>э</u>	125	2	Α			(E) MAIN BREAKER
(E) RCPT	720	1	В	20	20	20 7A		8			В			
(E) RCPT	720	1	В	20	1	7B	°	3	-	_	В			-
Load Type	Connected Load (kVA)		Dem	nand Mu	ltiplier			D	Demand	d Load			С	onnected Load kVA/Phase
1 - Receptacles	3.02	x	(	CEC 220.	.44	=			3.02	kVA			Phase A:	11.08 kVA
2 - Continuous (Lighting)	2.02	x		1.25		=			2.53	kVA			Phase B:	11.04 kVA
3 - Non-Continuous	0.00	x		1.00		=			0.00	kVA				
4 - HVAC	17.09	x		1.00		=			17.09	kVA				Total Demand Load
														22.63 kVA
	94.30 Amps													
Notes:														
1. Remove existing circuit breaker	and provide r	iew ma	athcing	, existin	g hardw:	are w	/ith †	trip	ratings	shown	1.			

	<b>Existing Panel:</b>	Portable	21												
	Location:	Portable 21				Volts:		120	0/24	10			Mains:		100A
	Supply From:	Panel DP				Phases		1					Bus Rat	ting:	125A
	Mounting:	Surface				Wires:		3					AIC Rat	ting:	10,000A
ption	Load Description	Load (VA)	Load	IPhase		Breaker	1		H	Circuit E		Phase	Load	Load (VA)	Load Description
	(E) LTS	960	Type 2	A	Amp 20	Pole 1	1		2	Amps 90	Poles 2	A	Type 4	8544	(N) HP-21 [1]
	(E) LTS	1060	2	В	20	1	3		4	-	-	В	4	8544	-
	(E) RCPT	1080	1	А	20	1	5		6	125	2	А			(E) MAIN BREAKER
	(E) PROJECTOR	500	1	В	20	20	7A					_			
	(E) PROJECTOR	500	1	В	20	1	7B		8	-	-	В			-
hase	Load Type	Connected Load (kVA)		Dem	and Mu	ıltiplier				Demano	d Load			С	onnected Load kVA/Phase
/A	1 - Receptacles	2.08	х		CEC 220	.44	=			2.08	kVA			Phase A:	10.58 kVA
′A	2 - Continuous (Lighting)	2.02	х		1.25		-			2.53	kVA			Phase B:	10.60 kVA
	3 - Non-Continuous	0.00	x		1.00		=			0.00	kVA				
	4 - HVAC	17.09	x		1.00		=			17.09	kVA				Total Demand Load
															21.69 kVA
															90.39 Amps
	Notes:														
	1. Remove existing circuit break	ker and provide n	iew ma	athcing	existin	g hardwa	are w	vith	ı trip	p ratings	shown	•			

<b>Existing Panel:</b>	Portable	22											
Location:	Portable 22				Volts:		120/	208Y			Mains:		100A
Supply From:	Panel DP				Phases:		1				Bus Rat	ing:	125A
Mounting:	Surface				Wires:		3				AIC Rat	ing:	10,000A
Load Description	Load (VA)	Load Type	Phase	Circuit Amp	Breaker Pole	Ckt #	Ck #	t Circuit Amps	Breaker Poles	Phase	Load Type	Load (VA)	Load Description
(E) MAIN			Α	100	2	1	2		2	Α	4	8544	(N) HP-22 [1]
-			В	-	-	3	4	-	-	В	4	8544	-
(E) RCPT - WALL	1080	1	Α	20	1	5	6	20	1	Α	2	1060	(E) LIGHTS
(E) RCPT - CLOCK & TIMER	360	1	В	20	1	7	8	20	1	В	2	960	(E) LIGHTS
(N) RCPT - GFCI [2]	180	1	Α	20	1	9	10	20	1	Α	1	500	(E) RCPT - PROJECTOR
(E) SPACE			В	PFB	1	13	12	PFB	1	В			(E) SPACE
(E) SPACE			Α	PFB	1	15	14	PFB	1	Α			(E) SPACE
(E) SPACE			В	PFB	1	17	16	PFB	1	В			(E) SPACE
Load Type	Connected Load (kVA)		Dem	nand Mu	ltiplier			Deman	d Load			C	onnected Load kVA/Phase
1 - Receptacles	2.12	x		CEC 220.	.44	=		2.12	kVA			Phase A:	11.36 kVA
2 - Continuous (Lighting)	2.02	x		1.25		=		2.53	kVA			Phase B:	9.86 kVA
3 - Non-Continuous	0.00	x		1.00		=		0.00	kVA				
4 - HVAC	17.09	x		1.00		=		17.09	kVA				Total Demand Load
													21.73 kVA
													90.55 Amps
Notes:													
1. Remove existing circuit breal	ker and provide n	ew ma	thcing	existing	g hardwa	are v	/ith t	ip rating	s shown	١.			
2. Provide new circuit breaker v	vith trip rating sh	own m	atchin	g existir	ng hardv	vare.							

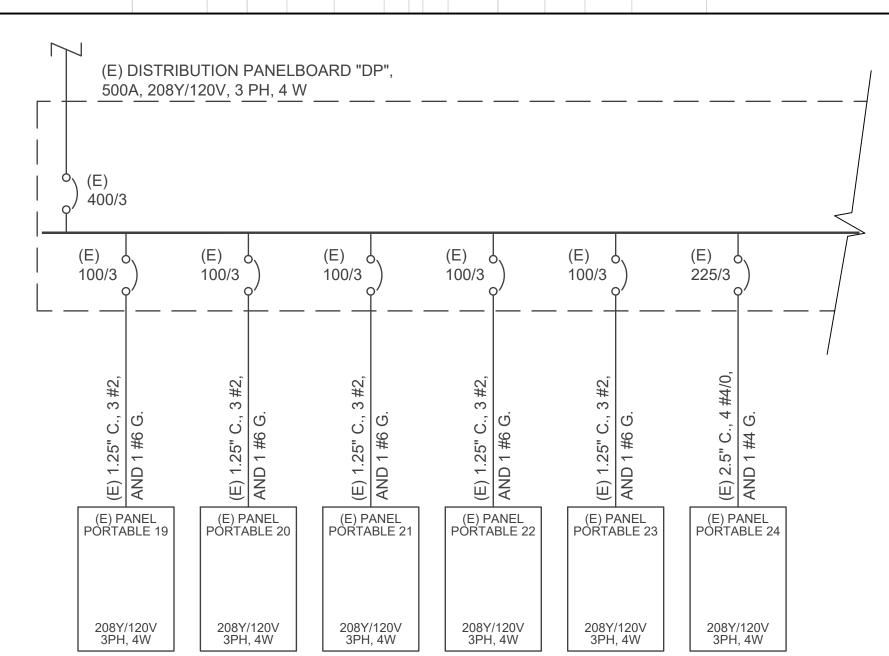
Existing Panel:	Portable	23											
Location:	Portable 23				Volts:		120/2	.08Y			Mains:	I	100A
Supply From:	Panel DP				Phases:		1				Bus Rat	ing:	125A
Mounting:	Surface				Wires:	:	3				AIC Rat	ing:	10,000A
Load Description	Load (VA)	Load Type	IPhase	Circuit Amp	Breaker Pole	Ckt #	Ckt #	Circuit I	Breaker Poles	Phase	Load Type	Load (VA)	Load Description
(E) MAIN			Α	100	2	1	2	90	2	Α	4	8544	(N) HP-23 [1]
-			В	-	-	3	4	-	-	В	4	8544	-
(E) RCPT - WALL	1080	1	Α	20	1	5	6	20	1	Α	2	1060	(E) LIGHTS
(E) RCPT - CLOCK & TIMER	360	1	В	20	1	7	8	20	1	В	2	960	(E) LIGHTS
(N) RCPT - GFCI [2]	180	1	Α	20	1	9	10	20	1	Α	1	500	(E) RCPT - PROJECTOR
(E) SPACE			В	PFB	1	13	12	PFB	1	В			(E) SPACE
(E) SPACE			Α	PFB	1	15	14	PFB	1	Α			(E) SPACE
(E) SPACE			В	PFB	1	17	16	PFB	1	В			(E) SPACE
Load Type	Connected Load (kVA)		Dem	and Mu	ltiplier			Demano	d Load			С	onnected Load kVA/Phase
1 - Receptacles	2.12	x	1	CEC 220	.44	=		2.12	kVA			Phase A:	11.36 kVA
2 - Continuous (Lighting)	2.02	x		1.25		=		2.53	kVA			Phase B:	9.86 kVA
3 - Non-Continuous	0.00	x		1.00		=		0.00	kVA				
4 - HVAC	17.09	x		1.00		=		17.09	kVA				Total Demand Load
													21.73 kVA
													90.55 Amps
Notes:													
1. Remove existing circuit break	ker and provide n	iew ma	thcing	existin	g hardwa	are w	ith tr	ip ratings	shown				
2. Provide new circuit breaker v	-		_		_								

Existing Panel:	Portable	24											
Location:	Portable 24				Volts:		120/2	208Y			Mains:		225A
Supply From:	Panel DP				Phases		3				Bus Rat	ing:	225A
Mounting:	Surface				Wires:		4				AIC Rat	ing:	10,000A
Load Description	Load (VA)	Load Type	IDhaca	Circuit Amp	Breaker Pole	Ckt #	Ck #	Circuit	Breaker Poles	Phase	Load Type	Load (VA)	Load Description
(E) RCPT - PANDUIT	1080	1	Α	20	1	1	2	20	1	Α	1	1080	(E) RCPT - PANDUIT
(E) RCPT - PANDUIT	1080	1	В	20	1	3	4	20	1	В	1	1080	(E) RCPT - PANDUIT
(E) IDF/TEACHERS DESK	1080	1	С	20	1	5	6	20	1	С	1	1080	(E) RCPT - PANDUIT
(E) RCPT - CENTER ROW	1080	1	Α	20	1	7	8	20	1	Α	1	840	(E) FACPS PANEL
(E) RCPT - CENTER ROW	1080	1	В	20	1	9	10	PFB	1	В			(E) SPACE
(E) SPACE			С	PFB	1	11	12	PFB	1	С			(E) SPACE
(N) RCPT - GFCI [2]	180	1	Α	20	1	13	14	PFB	1	Α			(E) SPACE
(E) SPACE			В	PFB	1	15	16	PFB	1	В			(E) SPACE
(E) SPACE			С	PFB	1	17	18	PFB	1	С			(E) SPACE
(E) SPACE			Α	PFB	1	19	20	PFB	1	Α			(E) SPACE
(N) HP-24 [1]	8544	4	В	90	2	21	22	PFB	1	В			(E) SPACE
-	8544	4	С	-	-	23	24	PFB	1	С			(E) SPACE
(E) SPACE			Α	PFB	1	25	26	PFB	1	Α			(E) SPACE
(E) SPACE			В	PFB	1	27	28	PFB	1	В			(E) SPACE
(E) SPACE			С	PFB	1	29	30	PFB	1	С			(E) SPACE
Load Type	Connected Load (kVA)		Dem	and Mu	ltiplier			Deman	d Load			С	onnected Load kVA/Phase
1 - Receptacles	9.66	x	(	CEC 220	.44	=		9.66	kVA			Phase A:	4.26 kVA
2 - Continuous (Lighting)	0.00	x		1.25		=		0.00	kVA			Phase B:	11.78 kVA
3 - Non-Continuous	0.00	x		1.00		=		0.00	kVA			Phase C:	10.70 kVA
4 - HVAC	17.09	x		1.00		=		17.09	kVA				Total Demand Load
													26.75 kVA
													74.25 Amps

1. Re-use existing circuit breaker for new heatpump.

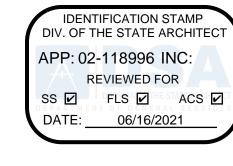
2. Provide new circuit breaker with trip rating shown matching existing hardware.

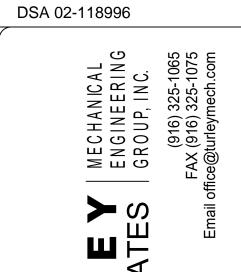
Existing Panel:	DP												
Location:	Freestandir	g near	near Portables				120/2	08Y			Mains:		400A
Supply From:					Phases	hases: 3				Bus Rat	ing:	400A	
Mounting:	Surface				Wires:		4				AIC Rat	ing:	10,000A
Load Description	Load (VA)	Load Type	Phase	Circuit Amp	Breaker Pole	Ckt #	Ckt #	Circuit	Breaker Poles	Phase	Load Type	Load (VA)	Load Description
(E) PORTABLE 19 [1]	10.9K	3	Α	100	2	1	2	100	2	Α	3	10.6K	(E) PORTABLE 21 [1]
	10.0K	3	В	-	-	3	4	-	-	В	3	10.6K	-
(E) PORTABLE 20 [1]	11.1K	3	С	100	2	5	6	100	2	С	3	11.4K	(E) PORTABLE 22 [1]
-	11.0K	3	Α	-	-	7	8	-	-	Α	3	9860	-
(E) SPARE	0		В	60	2	9	10	100	2	В	3	11.4K	(E) PORTABLE 23 [1]
-	0		С	-	-	11	12	-	-	С	3	9860	-
	0												
(E) PORTABLE 24	4260	3	Α	225	3								
-	11.8K	3	В	-	-	14							
-	10.7K	3	С	-	-								
(E) SPARE	0		Α	?	3								
	0		В	-	-	13							
	0		С	-	-								
(E) SPARE	0		Α	?	3								
	0		В	-	-	15							
	0		С	-	_								
Load Type	Connected Load (kVA)		Dem	and Mu	ltiplier			Deman	d Load			С	onnected Load kVA/Phase
1 - Receptacles	0.00	x	(	CEC 220	.44	=		0.00	kVA			Phase A:	46.60 kVA
2 - Continuous (Lighting)	0.00	x		1.25		=		0.00	kVA			Phase B:	43.74 kVA
3 - Non-Continuous	133.34	x		1.00		=		133.34	kVA			Phase C:	43.00 kVA
4 - HVAC	0.00	х		1.00		=		0.00	kVA				Total Demand Load
													133.34 kVA
													370.12 Amps
Notes:													
1. CIRCUITS UNLABELED. FIELD V	'ERIFY CIRCUIT PR	IOR TO	STAR <sup>-</sup>	r of wo	DRK.								

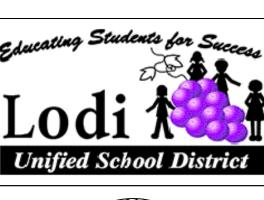


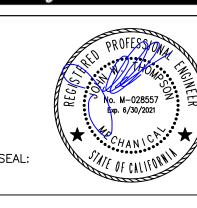


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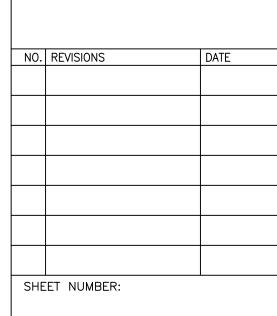




SHEET TITLE:

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1940 Industrial Drive · Auburn, CA 95603
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PARTIAL ONE-LINE POWER DIAGRAM AND PANEL SCHEDULES -PORTABLES



E4.02

EDWARDS® Catalog ► Intelligent Input/Output

# Control Relay Modules SIGA-CR, SIGA-MCR, SIGA-CRR, SIGA-MCRR



The Control Relay Module and the Polarity Reversal Relay Module

• Provides one no/nc contact (SIGA-CR/MCR) are part of the Signature Series system. They are intelligent analog addressable devices available in either plug-in (UIO) versions, or standard 1-gang mount versions.

The SIGA-CR/MCR Control Relay Module provides a Form "C" dry relay contact to control external appliances such as door closers, fans, dampers etc. This device does not provide supervision of the state of the relay contact. Instead, the on-board microprocessor ensures that the relay is in the proper ON/OFF state. Upon command from the loop controller, the SIGA-CR/MCR relay activates the normally open or normally-closed contact. The SIGA-CRR/MCRR Polarity Reversal Relay Module provides a Form "C" dry relay contact to power and activate a series of SIGA-AB4G Audible Sounder Bases. Upon command from the

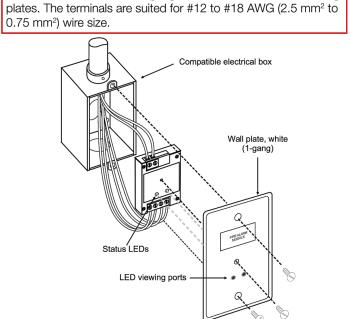
24 Vdc output, thus activating all Sounder Bases on the data loop. Standard-mount versions (SIGA-CR and SIGA-CRR) are installed to standard North American 1-gang electrical boxes, making them ideal for locations where only one module is required. Separate I/O and data loop connections are made to

each module. Plug-in UIO versions (SIGA-MCR and SIGA-MCRR) are part of the UIO family of plug-in Signature Series modules. They function identically to the standard mount versions, but take advantage of the modular flexibility and easy installation that characterizes all UIO modules. Two- and six-module UIO motherboards are available. All wiring connections are made to terminal blocks on the motherboard. UIO assemblies may be mounted in EDWARDS enclosures.

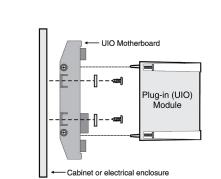
- Form "C" dry relay contact can be used to control external appliances such as door closers, fans, dampers etc.
- Allows group operation of sounder bases The SIGA-CRR/MCRR reverses the polarity of its 24 Vdc output, thus activating all Sounder Bases on the data loop. Plug-in (UIO) or standard 1-gang mount
- UIO versions allow quick installation where multiple modules are required. The 1-gang mount version is ideal for remote locations that require a single module. Automatic device mapping
- Signature modules transmit information to the loop controller regarding their circuit locations with respect to other Signature devices on the wire loop. Signature loop controller, the SIGA-CRR reverses the polarity of its • Electronic addressing
  - Programmable addresses are downloaded from the loop controller, a PC, or the SIGA-PRO Signature Program/Service Tool; there are no switches or dials to set.
  - Intelligent device with microprocessor All decisions are made at the module to allow lower communication speed with substantially improved control panel response time and less sensitivity to line noise and loop wiring properties; twisted or shielded wire is not required.

DATA SHEET **E85001-0239** Not to be used for installation purposes. Issue 1.

SIGA-CR and SIGA-CRR: modules mount to North American 2½ inch (64 mm) deep 1-gang boxes and 1½ inch (38 mm) deep their sub-type code or "Personality Code." 4 inch square boxes with 1-gang covers and SIGA-MP mounting



SIGA-MCR and SIGA-MCRR: mount the UIO motherboard inside a suitable EDWARDS enclosure with screws and washers provided. Plug the module into any available position on the motherboard and secure the module to the motherboard with the captive screws. Wiring connections are made to the terminals on the motherboard (see wiring diagram). UIO motherboard terminals are suited for #12 to #18 AWG (2.5 mm² to 0.75 mm²) wire size.



**Electronic Addressing** - The loop controller electronically addresses each module, saving valuable time during system commissioning. Setting complicated switches or dials is not required. Each module has its own unique serial number stored in its on-board memory. The loop controller identifies each device on the loop and assigns a "soft" address to each serial number. If desired, the modules can be addressed using the SIGA-PRO Signature Program/Service Tool.

EDWARDS recommends that this module be installed according to latest recognized edition of national and local fire alarm codes.

Application The operation of Signature Series control relays is determined by

Personality Code 8: CONTROL RELAY (SIGA-CR/MCR) - Dry Contact Output. This setting configures the module to provide one Form "C" DRY RELAY CONTACT to control Door Closers, Fans, Dampers, etc. Contact rating is 2.0 amp @ 24 Vdc; 0.5 amp @ 120 Vac (or 0.25A @ 220 Vac for non-UL applications). Personality Code 8 is assigned at the factory. No

user configuration is required. Personality Code 8: POLARITY REVERSAL RELAY MODULE (SIGA-CRR/MCRR). This setting configures the module to reverse the polarity of its 24 Vdc output. Contact rating is 2.0 amp @ 24 Vdc (pilot duty). Personality Code 8 is assigned at the factory. No user configuration is required.

### Compatibility

These modules are part of EDWARDS's Signature Series intelligent processing and control platform. They are compatible with EST3, EST3X and iO Series control panels.

### Warnings & Cautions

This module will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguards with your local fire protection specialist.

# Testing & Maintenance

The module's automatic self-diagnosis identifies when it is defective and causes a trouble message. The user-friendly maintenance program shows the current state of each module and other pertinent messages. Single modules may be turned off (deactivated) temporarily, from the control panel. Availability of maintenance features is dependent on the fire alarm system used. Scheduled maintenance (Regular or Selected) for proper system operation should be planned to meet the requirements of the Authority Having Jurisdiction (AHJ). Refer to current NFPA 72 and ULC CAN/ULC 536 standards.

DATA SHEET **E**85001-0239

DATA SHEET **E85001-0239** 

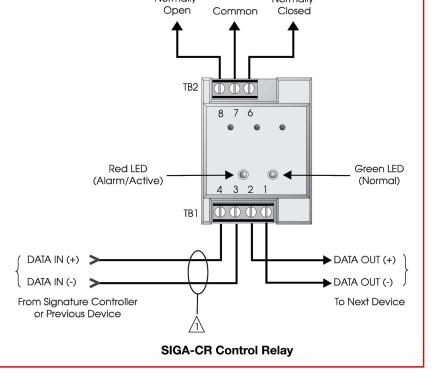
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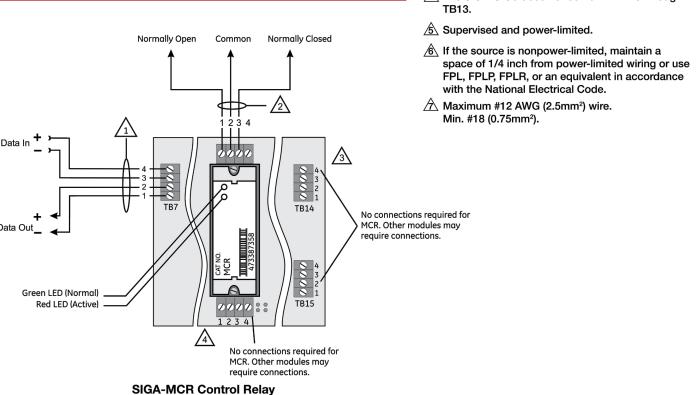
Not to be used for installation purposes. Issue 1.1

### Typical Wiring

sheet for detailed wiring requirement specifications.

Modules will accept #18 AWG (0.75mm²), #16 (1.0mm²), #14 AWG (1.50mm²) and #12 AWG (2.5mm²) wire sizes. Note: Sizes #16 AWG (1.0mm²) and #18 AWG (0.75mm²) are preferred for ease of installation. See Signature Loop Controller catalog





DATA SHEET **E**85001-0239 Not to be used for installation purposes. Issue 1.1

### Note: Sizes #16 AWG (1.0mm²) and #18 AWG (0.75mm²) are preferred for ease of installation. See Signature Loop Controller catalog sheet for detailed wiring requirement specifications. **Nominal Power** CT1 SIGA-CRR 0 0 for disabling/disconnecting sounder base SIGA-MCRR SIGA-CRR Schematic SIGA-MCRR Schematic Power In Power Out Refer to the Signature controller installation sheet for One Pair of Wires (24 Vdc power). One Pair of Wires (Signature Data). A Single Wire (24 Vdc power). ⚠ The SIGA-UIO6R and the SIGA-UIO2R do not come The SIGA-UIO6 does not come with TB8 through Supervised and power-limited. If the source is nonpower-limited, maintain a space of 1/4 inch from power-limited wiring or use FPL FPLP, FPLR, or an equivalent in accordance with the National Electrical Code. 9 Maximum #12 AWG (2.5 mm²) wire; Minimum #18 AWG (0.75 mm<sup>2</sup>). MCRR. Other modules may 10 End-of-Line Relay must monitor and report power supply trouble to control panel.

### Specifications

Catalog Number	SIGA-CR	SIGA-MCR	SIGA-CRR	SIGA-MCRR					
Description	Contro	l Relay	Polarity Rev	Polarity Reversal Relay					
Type Code	Personality Code	e 8 (Factory Set)	Personality Cod	Personality Code 8 (Factory Set)					
Address Requirements		Uses 1 Mod	dule Address						
Operating Current		Standby = 75 μA	Activated = 75 µA						
Operating Voltage		15.2 to 19.95 Vdc (19 Vdc nominal)							
Relay Type and Rating	Form C, 2 Amps @ 24 \	Form C, 2 Amps @ 24 Vdc (pilot duty), 0.5 Amps @ 120 Vac and 0.25 Amps @ 220 Vac (220 Vac is non-UL) Not rated for capacitive loads.							
Mounting	North American 2½ inch (64 mm) deep 1-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with 1-gang covers and SIGA- MP mounting plates	Plugs into UIO2R, UIO6R or UIO6 Motherboards	North American 2½ inch (64 mm) deep 1-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with 1-gang covers and SIGA- MP mounting plates	Plugs into UIO2R, UIO6R or UIO6 Motherboards					
Construction & Finish		High Impact Eng	gineering Polymer						
Storage and Operating Environment	Storage	Operating Temperature: 32°F to 120°F (0°C to 49°C) Storage Temperature: -4°F to 140°F (-20°C to 60°C) Humidity: 0 to 93% RH							
LED Operation	On-board Green	LED - Flashes when polled Or	n-board Red LED - Flashes whe	en in alarm/active					
Compatibility		Use With: Signatu	ure Loop Controller						
Agency Listings		UL, ULC, CSFM, MEA							

# Ordering Information

	maion	
Catalog Number	Description	Ship Weight (kg)
SIGA-CR	Control Relay Module (Standard Mount)	0.4 (0.15
SIGA-MCR	Control Relay Module (UIO Mount)	0.18 (0.0
SIGA-CRR	Polarity Reversal Relay Module (Standard Mount)	0.4 (0.15
SIGA-MCRR	Polarity Reversal Relay Module (UIO Mount)	0.18 (0.0
Related Equipment		
27193-11	Surface Mount Box - Red, 1-gang	1 (0.6)
27193-16	Surface Mount Box - White, 1-gang	1 (0.6)
SIGA-UIO2R	Universal Input-Output Module Board w/Riser Inputs - Two Module Positions	0.32 (0.1
SIGA-UIO6R	Universal Input-Output Module Board w/Riser Inputs - Six Module Positions	0.62 (0.2
SIGA-UIO6	Universal Input-Output Module Board - Six Module Positions	0.56 (0.2
SIGA-AB4G	Audible (Sounder) Detector Base	0.3 (0.15
Accessories		
MFC-A	Multifunction Fire Cabinet - Red, supports Signature Module Mounting Plates	7.0 (3.1)
SIGA-MB4	Transponder Mounting Bracket (allows for mounting two 1-gang modules in a 2-gang box)	0.4 (0.15
SIGA-MP1	Signature Module Mounting Plate, 1 footprint	1.5 (0.70
SIGA-MP2	Signature Module Mounting Plate, 1/2 footprint	0.5 (0.23
SIGA-MP2L	Signature Module Mounting Plate, 1/2 extended footprint	1.02 (0.4

DATA SHEET **E**85001-0239 Not to be used for installation purposes. Issue 1.1

# EDWARDS

LIFE SAFETY & INCIDENT MANAGEMENT Phone: 800-655-4497 (Option 4) Email: edwards.fire@carrier.com Website: edwardsfiresafety.com 8985 Town Center Pkwy Bradenton, FL 34202

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# Signature Series Overview

The Signature Series intelligent analog-addressable system from EDWARDS is an entire family of multi-sensor detectors and mounting bases, multiple-function input and output modules, network and non-network control panels, and user-friendly maintenance and service tools. Analog information from equipment connected to Signature devices is gathered and converted into digital signals. An onboard microprocessor in each Signature device measures and analyzes the signal and decides whether or not to input an alarm. The microprocessor in each Signature device provides four additional benefits – Selfdiagnostics and History Log, Automatic Device Mapping, and Fast, Stable Communication.

Self-diagnostics and History Log - Each Signature Series device constantly runs selfchecks to provide important maintenance information. The results of the self-check are automatically updated and permanently stored in its non-volatile memory. This information is accessible for review any time at the control panel, PC, or using the SIGA-PRO Signature Program/Service Tool. The information stored in device memory includes: Device serial number, address, and type

 Time and date of last alarm • Most recent trouble code logged by the detector — 32 possible trouble codes may be

used to diagnose faults. Automatic Device Mapping -The Signature Data Controller (SDC) learns where each device's serial number address is installed relative to other devices on the circuit. The SDC keeps a map of all Signature Series devices connected to it. The Signature Series Data Entry Program also uses the mapping feature. With interactive menus and graphic support, the wired circuits between each device can be examined. Layout or "as-built" drawing information showing branch wiring (T-taps), device types and their address are stored on disk for printing hard copy. This takes the mystery out of the installation. The preparation of as-built drawings is fast and efficient.

Device mapping allows the Signature Data Controller to discover: Unexpected additional device addresses

Missing device addresses

Changes to the wiring in the circuit.

Most Signature modules use a personality code selected by the installer to determine their actual function. Personality codes are downloaded from the SDC during system configuration and are indicated during device mapping.

### **CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION** OFFICE OF THE STATE FIRE MARSHAL FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM LISTING SERVICE



Sheet for wiring specifications.

7300-1657:0121 7300 -- FIRE ALARM CONTROL UNIT ACCESSORIES/MISC. DEVICES

LISTEE: EDWARDS, A Division of UTC Fire & Security Americas Corporation, Inc.8985 Town Center Parkway, Bradenton, FL 34202 United States Contact: Jewell Conover (941) 739-4358 Fax (941) 308-8123

Email: rhonda.micochero@carrier.com Models SIGA-CC1, SIGA-CC2, SIGA-CT1, SIGA-CT1HT, SIGA-CT2, SIGA-CR, SIGA-CRR,

SIGA-UM, SIGA-MM1, SIGA-WTM, SIGA-IM, \*SIGA-IM2, SIGA-MDM, SIGA-MAB, SIGA-MCT2, SIGA-MCC1, SIGA-MCC2, SIGA-MCR, and SIGA-MCRR Remote Transponders. Models SIGA-AA30 and SIGA-AA50 audio amplifiers. Models SIGA-APS and SIGA-APS-220 power supplies. Models SIGA-MB4, SIGA-MP1, SIGA-MP2 and SIGA-MP2L mounting plates. Models SIGA-UIO2R, SIGA-UIO6 and SIGA-UIO6R motherboards. Model CS-SIGA-CC1P releasing module. Models SIGA-CC1S and SIGA-MCC1S Auto-Sync Output Modules. Models MFC-A and MFC-AD Enclosures. Model SIGA-CR2 Control Relay Module. Model SIGA-CT1HT Signature Series High Temperature Single Input Module. SIGA-CRH

Refer to listee's data sheet for additional detailed product description and operational

consideration.

15.2 - 19.95 VDC RATING: INSTALLATION: In accordance with listee's printed installation instructions, applicable codes and ordinances, and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number, electrical rating, and UL label.

High Power Control Relay Module.

APPROVAL: Listed as control unit accessories for use with separately listed compatible fire alarm control units. Refer to listee's Installation Instruction Manual for details. Formerly 7300-1591:121 and 7300-1388:178

\*Revision 10-30-20 VWW

LISTING No.

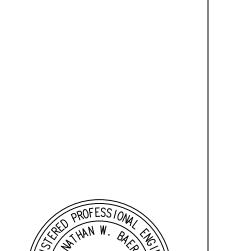
CATEGORY:

This listing is based upon technical data submitted by the applicant. CSFM Fire Engineering staff has reviewed the test results and/or other data but does not make an independent verification of any claims. This listing is not an endorsement or recommendation of the item listed. This listing should not be used to verify correct operational requirements or installation criteria. Refer to listee's data sheet, installation instructions and/or other

Date Issued: July 01, 2020 Authorized By: **DAVID CASTILLO,**, M.E., F.P.E.

Fire Engineering Division

Listing Expires June 30, 2021



Whittington Electric Inc. 1940 Industrial Drive • Auburn, CA 95603

SHEET TITLE:

AGENCY APPROVAL:

DSA 02-118996

IDENTIFICATION STAMP DIV. OF THE STATE ARCHITEC

REVIEWED FOR

SS 🗹 FLS 🗹 ACS 🗹

APP: 02-118996 INC:

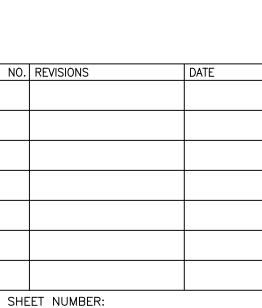
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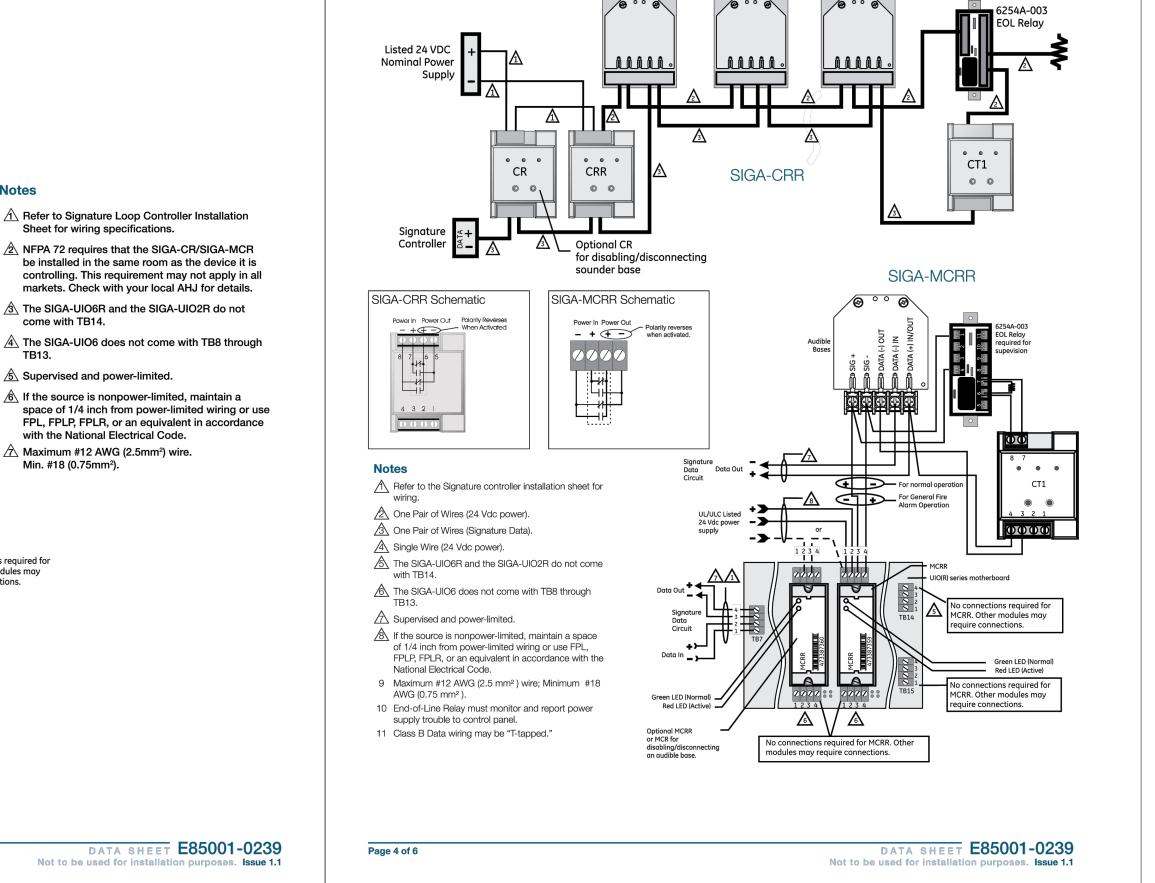
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Unified School District

FIRE ALARM **CSFM LISTINGS** 



E5.01



Modules will accept #18 AWG (0.75mm²), #16 (1.0mm²), #14 AWG (1.50mm²) and #12 AWG (2.50mm²) wire sizes.

Intelligent CO Detector

EDWARDS® Catalog ► Intelligent Initiating Devices

LIFE SAFETY & INCIDENT MANAGEMENT Phone: 800-655-4497 (Option 4) Email: edwards.fire@carrier.com Website: edwardsfiresafety.com 8985 Town Center Pkwy Bradenton, FL 34202 © 2020 Carrier All rights reserved.

The Signature Series SIGA-COD carbon monixide detector brings **Note:** Some features described here may not be supported by advanced sensing technology to a practical design that increases all control systems. Check your control panel's Installation and efficiency, saves installation time, cuts costs, and extends life safety capabilities. Continuous self-diagnostics ensures reliability over the long-haul, while advanced electrochemical CO sensing technology provides performance benefits that keep occupants safe from carbon monoxide, the "silent killer".

Like all Signature Series detectors, the SIGA-COD is an intelligent device that gathers analog information from its CO sensor, converting this data into digital signals. To make an alarm decision, the detector's on-board microprocessor measures and analyzes sensor readings over time. Digital filters remove signal patterns that are not typical of life safety events, thus virtually eliminating

unwanted alarms. The SIGA-COD includes an advanced carbon monoxide sensor. When the electrochemical cell reaches its end of life after approxi
• Automatic day/night sensitivity adjustment mately ten years, the detector signals a trouble condition to the control panel. Refer to the control panel documentation for specific end of life timing.

5278-1657:0335

15.2-19.95 Vdc

control units.

Date Issued: **July 01, 2020** 

Authorized By: **DAVID CASTILLO**,, M.E., F.P.E.

Fire Engineering Division

5278 -- CARBON MONOXIDE DETECTORS

Parkway, Bradenton, FL 34202 United States

Email: rhonda.micochero@carrier.com

Contact: Jewell Conover (941) 739-4358 Fax (941) 308-8123

detailed product description and operational considerations.

Listee's name, model number, electrical rating and UL label. \*Models SIGA-COD and SIGI-COD are under the Edwards brand.

\*Models KI-COD and KIR-COD are under the Kidde brand.

Listed as analog addressable CO detectors.

7165-1657:0186) fire alarm control unit.

7165-1657:0244) fire alarm control units.

INSTALLATION: In accordance with listee's printed installation instructions, NFPA 720, applicable codes and

ordinances, and in a manner acceptable to the authority having jurisdiction.

LISTING No.

CATEGORY:

RATING:

APPROVAL:

# Standard Features

- Advanced electrochemical carbon monoxide sensing
- Uses existing wiring
- Sensor Markings Provide Easy Testing Identification
- Up To 250 Total Signature Adresses Per Loop
- Electronic addressing

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION

OFFICE OF THE STATE FIRE MARSHAL

FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM

EDWARDS, A Division of UTC Fire & Security Americas Corporation, Inc.8985 Town Center

Models SIGA-COD, \*SIGI-COD, \*KI-COD and \*KIR-COD Analog Addressable Carbon

Monoxide Detectors. The carbon monoxide detector is designed to communicate an end-of-life signal to the control panel following ten years from the date of manufacture.

\*Model SIGI-COD is similar to Model SIGA-COD except for isolation circuitry. \*Model

KI-COD is identical to Model SIGA-COD except for trade name. \*Model KIR-COD is similar to Model SIGA-COD except for control panel compatibility. Refer to listee's data sheet for

\*Model SIGA-COD is for use with listee's Models EST3 (CSFM No. 7165-1657:0186); iO64

and iO1000 (CSFM No. 7165-1657:0244); EST3X (CSFM No. 7165-1657:0306) fire alarm

\*Model KIR-COD is for use with listee's Models FX-64, FX-254 and FX-1000 (CSFM No.

\*Model SIGA-COD is for use with listee's bases; Models SIGA-SB, -SB4, -RB, -RB4, -IB, -IB4 (CSFM No. 7300-1657:0120), SIGA-AB4GT (CSFM No. 7300-1657:0307) and

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the test results and/or other data but does not make an independent verification of any claims. This listing is not

an endorsement or recommendation of the item listed. This listing should not be used to verify correct

operational requirements or installation criteria. Refer to listee's data sheet, installation instructions and/or other

Listing Expires June 30, 2021

\*Models SIGI-COD and KI-COD are for use with listee's Model EST3 (CSFM No.

LISTING SERVICE

Standard, relay, fault isolator, and audible mounting bases

Next Generation CO Sensing Technology

- technology Automatic device mapping
- Non-volatile memory
- Bicolor (green/red) status LED

# DATA SHEET **E85001-0648**

Page 1 of 2

\*Rev 02-15-18 gt

EDWARDS

DATA SHEET **E85001-0648** Not to be used for installation purposes. Issue 1.2

0.4 (0.16)

Sensing and reporting technology

Fast, Stable Communication.

it has something new to report.

to a 4 inch square box only.

SIGA-AB4G/T/LF SIGA-SB

Accessories

The microprocessor in each detector provides additional benefits -

Self-diagnostics and History Log, Automatic Device Mapping, and

Self-diagnostics and History Log - Each Signature Series detec-

tor constantly runs self-checks to provide important maintenance

and permanently stored in the detector's non-volatile memory.

**Automatic Device Mapping** - The loop controller learns where

each device's serial number address is installed relative to other de-

vices on the circuit. The mapping feature provides supervision of each

device's installed location to prevent a detector from being reinstalled

Fast Stable Communication - On-board intelligence means less

detector only needs to communicate with the loop controller when

Detector mounting bases have wiring terminals that are acces-

box. The bases mount to North American 1-gang boxes and to

3½ inch or 4 inch octagon boxes, 1½ inches (38 mm) deep. They

also mount to European BESA and 1-gang boxes with 60.3 mm

boxes. They include the SIGA-TS4 Trim Skirt, which is used to

Remote LED SIGA-LED - The remote LED connects to the

SIGA-SB or SIGA-SB4 Standard Base only. It features a North

SIGA-TS4 Trim Skirt - Supplied with 4 inch bases, it can also

Sounder Bases - Signature Series sounder bases are designed

• SIGA-AB4GT bases provide sounder capability to the SIGA-

COD when used with a SIGA-TCDR Temporal Pattern Gen-

SIGA-AB4G-LF bases provide 520 Hz low frequency sound-

er capability to the SIGA-COD when used with a SIGA-TCDR

Temporal Pattern Generator to produce the appropriate CO

(TC4) tone pattern. The SIGA-AB4G-LF is suitable for applica-

erator to produce the appropriate CO (TC4) tone pattern.

be ordered separately to use with the other bases to help hide

surface imperfections not covered by the smaller bases.

tions requiring low frequency audible tones.

for use where localized or group alarm signaling is required.

American size 1-gang plastic faceplate with a white finish and red

cover the "mounting ears" on the base. The SIGA-AB4G mounts

SIGA-IB

fixing centers. The SIGA-SB4, SIGA-RB4, and SIGA-IB4 mount to

North American 4 inch sq. electrical boxes in addition to the above

sible from the "room-side" after mounting the base to the electrical

(after cleaning etc.) in a different location from where it was originally.

information needs to be sent between the detector and the loop

controller. Other than regular supervisory polling response, the

information. The results of the self-check are automatically updated



DATA SHEET **E**85001-0648

7300-1657:0120 LISTING No.

CATEGORY: 7300 -- FIRE ALARM CONTROL UNIT ACCESSORIES/MISC. DEVICES LISTEE:

EDWARDS, A Division of UTC Fire & Security Americas Corporation, Inc.8985 Town Center Parkway, Bradenton, FL 34202 United States Contact: Jewell Conover (941) 739-4358 Fax (941) 308-8123

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION

LISTING SERVICE

OFFICE OF THE STATE FIRE MARSHAL

Email: rhonda.micochero@carrier.com Detector Bases. Base models are as follow:

Models 5963B, 5964 B/BR, 6241B-002, 6249B-001, 6251, 6251B-001A, -001, -002, -003, -004, 6251B-100, -200, -R100, -R200 and 6251-2

Models 6251B-001, -002, -003 and -004 are suitable for releasing device service. Models P-847674-0022, -0024, -0042, -0043, -0044, -0045, -0046, -0047

Models SIGA-IB, -IB4, -RB, -RB4, -SB, -SB4 and -AB4.

**INSTALLATION:** In accordance with listee's printed installation instructions, applicable codes and ordinances

Listee's name, model number, electrical rating, and UL label. \*KI are under the Kidde Brand.

Listed as mounting bases for use with separately listed compatible detectors and fire alarm control units. Refer to listee's Installation Instruction Manual for details.

Formerly 7300-1591:120 and 7300-1388:170

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Listing Expires June 30, 2021 July 01, 2020

Typical Wiring The detector mounting bases accept #18 AWG (0.75mm²), #16 Audible Sounder Bases, Fire-plus-CO Mode (1.0mm²), #14 AWG (1.5mm²), and #12 AWG (2.5mm²) wire sizes. AB4GT and AB4G-LF sounder bases.

Sizes #16 AWG (1.0mm²) and #18 AWG (0.75mm²) are preferred for ease of installation. Standard Detector Base, SIGA-SB, SIGA-SB4 This is the basic mounting base for EDWARDS Signature Series detectors. The SIGA-LED Remote LED is supported by this

Not Used
DATA IN/OUT (+
Not Used
DATA IN (-)
Remote LED (-)
Remote LED (+)
Not Used
DATA OUT (-)

### Isolator Detector Base, SIGA-IB, SIGA-IB4

This base includes a built-in line fault isolator for use on Class A circuits. A detector must be installed for it to operate. The isolator base does not support the SIGA-LED Remote LED. The isolator operates as follows: - a short on the line causes all isolators to open within 23 msec - at 10 msec intervals, beginning on one side of the Class A circuit nearest the loop controller, the isolators close to provide the DATA IN (+) next isolator down the From Signature Controller line with power - when the isolator next

to the short closes, it reopens within 10 The process repeats beginning on the

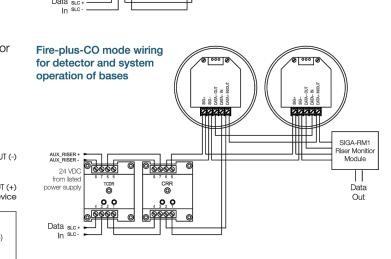
other side of the loop controller.

Relay Detector Base, SIGA-RB, SIGA-RB4

This base includes a relay. Normally Open or Normally Closed operation is selected during installation. The dry contact is rated for 1 amp (pilot duty) @ 30 Vdc.

The relay's position is supervised to avoid accidentally jarring it out of position. The SIGA-RB can be DATA IN (-) operated as a control relay if programmed to do so at the control DATA IN (+) panel. The relay base does not From Signature Controller or Previous Device support the SIGA-LED Remote \_

These configurations require a SIGA-TCDR Temporal Pattern Generator to produce the appropriate CO (TC4) tone pattern. Fire-plus-CO mode wiring for detector operation of bases



### Warnings & Cautions

 This detector is designed to protect individuals from the acute affects of CO exposure. It will not fully safeguard individuals with specific medical conditions. People with special medical problems should consider using specialized detection devices with less than 30 ppm (parts per million) alarming capabilities. If in doubt, consult a medical practitioner.

• If the detector is in trouble or at the end of its life, it may not sense CO and cannot be relied upon to monitor CO levels. Replace the detector every ten years from the date of manufacture or when the control panel indicates a sensor end-oflife condition, whichever comes first.

A detector installed outside a bedroom may not awaken a

Normal noise due to stereos, television, etc. may also prevent the detector from being heard if distance or closed or partly closed doors muffle the sounder. This unit is not designed for the hearing impaired.

CO detectors are not a substitute for life safety. Though these detectors will warn against increasing CO levels, we do not warrant or imply in any way that they will protect lives from CO poisoning. They should only be considered as an integral

part of a comprehensive safety program.

Not to be used for installation purposes. Issue 1.2

DATA SHEET **E**85001-0648

SIGA-AB4G-LF (CSFM No. 7300-1657:0322).

\*Model SIGI-COD is for use with listee's bases; Models SIGI-AB4GT (CSFM No.

7300-1657:0307) and KI-ABLT (CSFM No. 7300-1657:0322).

Authority having jurisdiction should be consulted prior to installation. Refer to listee's Installation Instruction Manual for details.

Listing No. 5278-1657:0335

Dimensions

CD

Specifications

Normal operating current

Compatible detector testers

Operating environment

Storage temperature

UL CO false alarm level

per UL 2034, CAN/CSA 6.19

per UL 2034, CAN/CSA 6.19

Ordering Information

UL CO alarm level

Operating voltage

Alarm current

Construction

→ SIGA-COD

SIGA-SB4

SIGA-RB

SIGA-RB4

SIGA-IB

SIGA-IB4

SIGA-LED

SIGA-TCDR

SIGA-AB4G-LF

SIGA-AB4GT

SIGA-TS4

SIGA-RTA

SIGA-SB

Vibration level

Compatible bases

15.20 to 19.95 VDC

See Ordering Information

-4 to 140°F (-20 to 60°C

70 ppm 60 to 240 minutes

150 ppm 10 to 50 minutes

400 ppm 4 to 15 minutes

Agency Listings, SIGA-COD UL 2075. Evaluated to the CO alarm sensitivity limits of UL 2034.

30 ppm 30 davs

Intelligent Carbon Monoxide Detector

SIGA-COD-CA Intelligent Carbon Monoxide Detector, Canadian Market

Detector Mounting Base - Standard

Detector Mounting Base w/Relay

4-inch Detector Mounting Base c/w Trim Skirt

Remote Alarm LED (not for EN54 applications)

Audible (Sounder) Base for CO and Fire Detectors

Detector Mounting Base w/Fault Isolator

Trim Skirt (supplied with 4-inch bases)

Detector Removal Tool

4-inch Detector Mounting Base w/Relay, c/w Trim Skirt

4-inch Detector Mounting Base w/ Fault Isolator, c/w Trim Skirt

Tone Generator for Detector Sounder Bases with CO mode

Low Frequency Audible (Sounder) Base for CO and Fire Detectors 0.3 (0.15)

Agency Listings, SIGA-COD-CA ULC Listed to CAN/CSA 6.19.

70 ppm 60 minutes

Testifire 1000, Testifire 2000

10 to 35 Hz, with an amplitude of 0.01 ir

High Impact Engineering Polymer, White

32 to 120°F (0 to 49°C), 0 to 90% RH, noncondensing

7300-1657:0307) and SIGI-AB4G-LF (CSFM No. 7300-1657:0322).

\*Models KI-COD and KIR-COD are for use with listee's bases; Models KI-ABDT (CSFM No.

\*Models KI-IB, -IB4, -RB, -RB4, -SB and -SB4. The -RB series are suitable for releasing device service. \*Model SIGI-SB and SIGI-SB4.

Model AB4G-SB surface mount back box for use with listee's SIGA series sounder bases. Refer to listee's data sheet for detailed product description and operational considerations.

and in a manner acceptable to the authority having jurisdiction.

SIGA\* and SIGI\* are under the Edwards Brand

Fire Engineering Division

Application

Concentration Symptoms

35PPM

150PPM

6,400 PPM

Compatibility

Loop Controller.

Installation

more information.

Signature Series detectors mount

to North American 1-gang boxes,

trical boxes 1-1/2 inches (38 mm)

BESA and 1-gang boxes with 60.3

Testing & Maintenance

720, and ULC CAN/ULC 536 standards.

boxes, and to 4 inch square elec-

deep. They mount to European

mm fixing centers. See mounting

base installation and wiring for

3-1/2 inch or 4 inch octagon

400PPM

CO detection has rapidly become a standard part of life safety strate-

gies everywhere. Monitored CO detection is mandated with increas-

ing frequency in all types of commercial applications, but particularly

care facilities, schools, hospitals, assisted living facilities, and nursing

homes. In fact, more than half of the U.S. population already lives in

states requiring the installation of CO detectors in some commercial

occupancies. This is because carbon monoxide is the leading cause

of accidental poisoning deaths in America. Known as the "Silent

lives, and results in more than 15,000 hospital visits annually.

Mild Headache

Headache/Nausea

12,800 PPM Immediately dangerous to life or health

Headache/nausea/dizziness/

Progressing to unconscious

Headache/nausea & dizziness

The SIGA-COD detector is compatible only with the Signature

The user-friendly maintenance program shows the current state

may be turned off temporarily from the control panel. Availability

of maintenance features is dependent on the fire alarm system

of each detector and other pertinent messages. Single detectors

used. When the CO sensor's electrochemical cell reaches its end

of life, the detector signals a Trouble condition to the control panel.

Scheduled maintenance (regular or selected) for proper detector

operation should be planned to meet the requirements of the Au-

thority Having Jurisdiction (AHJ). Refer to current NFPA 72, NFPA

The CO sensor has a 10-year life from the date of manufacture or

when the control panel indicates a sensor end-of-life condition,

whichever comes first. The detector signals a "COMMON TRBL

its end of life. Pressing the Details button on the control panel

ACT" condition on the control panel when the CO sensor reaches

displays "END OF LIFE ACT" providing verification that it is an end-

of-life trouble of the CO sensor. This trouble remains active until

the detector is replaced, even if the panel is reset.

Killer," CO is odorless, tasteless, and colorless. It claims nearly 500

<=8 hours

1 – 2 hours

45 min.

to 2 hours

1 - 2 min.

2 – 3 hours

in occupancies such as hotels, rooming houses, dormitories, day

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Date Issued: July 01, 2020 Authorized By: **DAVID CASTILLO,**, M.E., F.P.E.

Fire Engineering Division

Listing Expires June 30, 2021

\*Rev 02-15-18 gt

Date Issued: Authorized By: **DAVID CASTILLO,**, M.E., F.P.E. \*Rev 05-03-18 gt

Whittington
Electric Inc.
1940 Industrial Drive Aubum, CA 95603

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AGENCY APPROVAL:

DSA 02-118996

IDENTIFICATION STAMP DIV. OF THE STATE ARCHITEC

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APP: 02-118996 INC:

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Unified School District

FIRE ALARM **CUTSHEETS AND CSFM LISTINGS** 

NO. REVISIONS

E5.02

The Signature Series SIGA-PCD detector brings advanced multisensor technology to a practical design that increases efficiency, saves installation time, cuts costs, and extends life safety and property protection capabilities. Continuous self-diagnostics ensures reliability over the long-haul, while environmental compensation helps reduce maintenance costs.

The SIGA-PCD provides a combination of optical detection for the early detection of smoke, with the added element of carbon monoxide sensing. The result is a detector that pulls double duty: continually monitoring the environment for signs of fire — as well • Uses existing wiring as its invisible yet deadly companion: carbon monoxide.

Like all Signature Series detectors, the SIGA-PCD gathers analog information from its sensing elements and converts this data into digital signals. To make an alarm decision, the detector's on-board

• Up To 250 Total Signature Addresses Per Loop microprocessor measures and analyzes smoke sensor readings

• Two levels of environmental compensation and compares this information to historical data. Digital filters remove signal patterns that are not typical of fires, thus virtually eliminating unwanted alarms. The detector also analyzes the smoke sensor independently from the CO sensor to determine

whether to initiate a fire alarm, a life safety CO alarm, or both.

Standard Features

**Note:** Some features described here may not be supported by all control systems. Check your control panel's Installation and Operation Guide for details. Next Generation Detection Technology

 Integrates optical smoke with carbon monoxide detection • Wide 0.53 to 3.94 %/ft. (1.7 to 12.35 %/m) smoke obscuration

EDWARDS® Catalog ▶ Intelligent Initiating Devices

- Sensor Markings Provide Easy Testing Identification
- Automatic device mapping
- Ground fault detection by module
- Two levels of dirty detector warning
- Twenty pre-alarm settings
- Non-volatile memory

Five sensitivity settings

- Electronic addressing Environmental compensation
- Automatic day/night sensitivity adjustment
- Bicolor (green/red) status LED
- Standard, relay, fault isolator, and audible mounting bases

DATA SHEET **E85001-0651** 

Application Sensing and reporting technology

The microprocessor in each detector provides additional **Smoke detection** benefits - Self-diagnostics and History Log, Automatic The SIGA-PCD detects extremely small particles of combustion Device Mapping, and Fast, Stable Communication. and triggers an alarm at the first sign of smoke. Thanks to its high-performance forward-scattering reflective response Self-diagnostics and History Log - Each Signature Series technology, the photoelectric smoke sensor responds quickly detector constantly runs self-checks to provide important and reliably to a wide range of fire types, especially slow maintenance information. The results of the self-check are burning fires fuelled by combustibles typically found in modern automatically updated and permanently stored in the detector's

The SIGA-PCD detector is compatible only with the Signature

Scheduled maintenance (regular or selected) for proper detector

operation should be planned to meet the requirements of the

Authority Having Jurisdiction (AHJ). Refer to current NFPA 72,

The SIGA-PCD determines when its optical sensor is dirty or

defective and can transmit sensitivity data to the loop controller.

A sensitivity report can also be printed to satisfy NFPA sensitivity

measurements which must be conducted at the end of the first

year and every two years thereafter. The availability of maintenance

The CO sensor has a 10-year life from the date of manufacture or

whichever comes first. When the sensor reaches its end of life, the

detector signals a "COMMON TRBL ACT" condition on the control

when the control panel indicates a sensor end-of-life condition,

panel. Pressing the *Details* button on the control panel displays

trouble of the CO sensor. This trouble remains active until the

"END OF LIFE ACT" providing verification that it is an end-of-life

multi-use buildings.

Compatibility

Loop Controller.

Installation

information.

Signature Series detectors mount

to North American 1-gang boxes,

3-1/2 inch or 4 inch octagon

boxes, and to 4 inch square

electrical boxes 1-1/2 inches

(38 mm) deep. They mount to

European BESA and 1-gang

boxes with 60.3 mm fixing

centers. See mounting base

Smoke Sensor Sensitivity

CO Sensor Life

installation and wiring for more

Testing & Maintenance

NFPA 720, and ULC CAN/ULC 536 standards.

features depends on the fire alarm system used.

detector is replaced, even if the panel is reset.

**CO Detection** 

non-volatile memory. **Automatic Device Mapping** - The loop controller learns where Monitored CO detection, such as that provided by the SIGA-PCD, each device's serial number address is installed relative to other is becoming mandated with increasing frequency in all types of devices on the circuit. The mapping feature provides supervision commercial applications, but particularly in occupancies such as of each device's installed location to prevent a detector from being hotels, rooming houses, dormitories, day care facilities, schools, hospitals, assisted living facilities, and nursing homes. Known as the it was originally. "Silent Killer," CO is odorless, tasteless, and colorless. It claims nearly

reinstalled (after cleaning etc.) in a different location from where Fast Stable Communication - On-board intelligence means less information needs to be sent between the detector and the loop controller. Other than regular supervisory polling response,

500 lives, and results in more than 15,000 hospital visits annually. the detector only needs to communicate with the loop controller when it has something new to report.

Accessories

**Detector mounting bases** have wiring terminals that are accessible from the "room-side" after mounting the base to the electrical box. The bases mount to North American 1-gang boxes and to 3½ inch or 4 inch octagon boxes, 1½ inches (38 mm) deep. They also mount to European BESA and 1-gang boxes with 60.3 mm fixing centers. The SIGA-SB4, SIGA-RB4, and SIGA-IB4 mount to North American 4 inch sq. electrical boxes in addition to the above boxes. They include the SIGA-TS4 Trim Skirt, which is used to cover the "mounting ears" on the base. Sounder bases mount to a 4 inch square boxes only. **EXISTING** 



Remote LED SIGA-LED - The remote LED connects to the SIGA-SB or SIGA-SB4 Standard Base only. It features a North American size 1-gang plastic faceplate with a white finish and red alarm LED.

SIGA-TS4 Trim Skirt - Supplied with 4 inch bases, it can also be ordered separately to use with the other bases to help hide surface imperfections not covered by the smaller bases. Sounder Bases - Signature Series sounder bases are designed for use where localized or group alarm signaling is required.

Listing No. 7275-1657:0334

DATA SHEET **E85001-0651** 

• SIGA-AB4GT bases provide sounder capability to the SIGA-PCD when used with a SIGA-TCDR Temporal Pattern Generator to separate CO (TC4) and Fire (TC3) tone patterns. • SIGA-AB4G-LF bases provide 520 Hz low frequency sounder capability to the SIGA-PCD when used with a SIGA-TCDR Temporal Pattern Generator to separate CO (TC4) and Fire (TC3) tone patterns. The SIGA-AB4G-LF is suitable for applications requiring low frequency audible tones.

Not to be used for installation purposes. Issue 1.3

\*Model SIGI-PCD is for use with listee's bases; Models SIGI-AB4GT (CSFM No.

\*Models KI-PCD and KIR-PCD are for use with listee's bases; Models KI-ABDT (CSFM No.

The photoelectric type detectors are generally more effective at detecting slow, smoldering

include cigarettes burning in couches or bedding. The ionization type detectors are generally

more effective at detecting fast, flaming fires, which consume combustible materials rapidly

and spread quickly. Sources of these fires may include paper burning in a waste container

fires, which smolder for hours before bursting into flames. Sources of these fires may

Authority having jurisdiction should be consulted prior to installation. Refer to listee's

7300-1657:0307) and SIGI-AB4G-LF (CSFM No. 7300-1657:0322).

7300-1657:0307) and KI-ABLT (CSFM No. 7300-1657:0322).

Installation Instruction Manual for details.

(1.0mm²), #14 AWG (1.5mm²), and #12 AWG (2.5mm²) wire sizes. SIGA-AB4GT, SIGA-AB4G, SIGA-AB4G-LF: Volume Setting Default = High Cut/remove jumper for Fire plus CO → - 24 Vdc out

These configurations require a SIGA-TCDR Temporal Pattern

Generator to separate CO (TC4) and Fire (TC3) tone patterns.

**Audible Sounder Bases, Fire Mode** 

AB4GT, AB4G, AB4G-LF sounder bases

Isolator Detector Base, SIGA-IB, SIGA-IB4 This base includes a built-in line fault isolator for use on Class A **Audible Sounder Bases, Fire-plus-CO Mode** AB4GT and AB4G-LF sounder bases only.

Fire-plus-CO mode

operation of bases

wiring for detector

circuits. A detector must be installed for it to operate. The isolator base does not support the SIGA-LED Remote LED. The isolator operates as follows: - a short on the line causes all isolators to open within 23 msec - at 10 msec intervals, beginning on one side of the Class A circuit nearest the loop controller, the isolators close to provide the next isolator down To Next Device From Signature Controller the line with power - when the isolator next Term Description

Not Used

DATA IN/OUT (+)

A DATA IN (-)

Not Used

Not Used

DATA OUT (-)

Not Used to the short closes, it

CONTACT RATING 1.0 Amp @ 30 VDC (Pilot Duty)

The detector mounting bases accept #18 AWG (0.75mm²), #16

Sizes #16 AWG (1.0mm<sup>2</sup>) and #18 AWG (0.75mm<sup>2</sup>) are preferred

Standard Detector Base, SIGA-SB, SIGA-SB4

Relay Detector Base, SIGA-RB, SIGA-RB4

This base includes a relay. Normally Open or Normally Closed operation is selected during installation. The dry contact is rated for 1 amp (pilot duty) @ 30 Vdc. The relay's position is supervised to avoid accidentally jarring it out of position. The SIGA-RB can be operated as a control relay if programmed to do so at the control panel. The relay base does not support the SIGA-LED Remote LED.

reopens within 10 msec.

The process repeats beginning on

the other side of the loop controller.

Typical Wiring

for ease of installation.

This is the basic mounting

base for EDWARDS Signature

Remote LED is supported by

this Base.

Series detectors. The SIGA-LED

Term Description

Im Description

1 Not Used

2 DATA IN/OUT (-)

3 Not Used

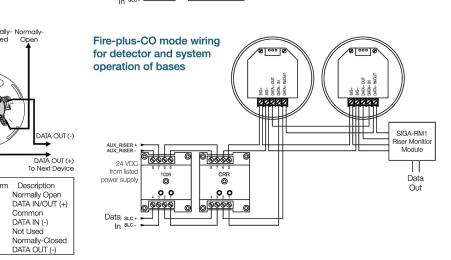
4 DATA IN (-)

4 Remote LED (-)

5 Remote LED (+)

6 Not Used

7 DATA OUT (-)



DATA SHEET **E85001-0651** Not to be used for installation purposes. Issue 1.3 EDWARDS LIFE SAFETY & INCIDENT MANAGEMENT Contact us Phone: 800-655-4497 (Option 4)

Email: edwards.fire@carrier.com

Warnings & Cautions

This detector does not sense

fires in areas where smoke

cannot reach the detector.

Smoke from fires in walls,

Photoelectric detectors have

a wide range of sensing

capabilities, and are best

the detector.

roofs, or on the opposite side

of closed doors may not reach

Website: edwardsfiresafety.com

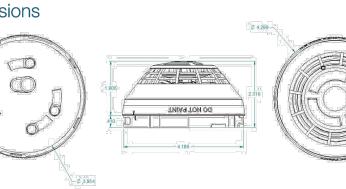
8985 Town Center Pkwy

Bradenton, FL 34202

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Dimensions



Specifications 15.20 to 19.95 VDC Operating voltage Normal operating current Smoke Sensitivity Range UL/ULC: 0.53 to 3.94 %/ft. (1.7 to 12.35 %/m) obscuration 10 to 35 Hz, with an amplitude of 0.01 in. Vibration level 12 in. (305 mm) max. from ceiling Wall mounting Compatible bases See Ordering Information Compatible detector testers Testifire 1000, Testifire 2000 32 to 120°F (0 to 49°C), 0 to 90% RH, noncondensing Operating environment High Impact Engineering Polymer, White -4 to 140°F (-20 to 60°C) Storage temperature Environmental compensation Automatic UL CO alarm level 70 ppm 60 to 240 minutes per UL 2034, CAN/CSA 6.19 150 ppm 10 to 50 minutes; 400 ppm 4 to 15 minutes UL CO false alarm level 30 ppm 30 days per UL 2034, CAN/CSA 6.19 70 ppm 60 minutes UL 268, UL 2075. Agency Listings, Evaluated to the CO alarm sensitivity limits of UL 2034. SIGA-PCD Agency Listings, ULC Listed to CAN/ULC-S529 and CAN/CSA 6.19. SIGA-PCD-CA CSFM, FM approved.

Ordering Information

Ship Wt. Multisensor Smoke and CO Detector SIGA-PCD SIGA-PCD-CA Multisensor Smoke and CO Detector, Canadian Market 0.4 (0.16) Detector Mounting Base - Standard 4-inch Detector Mounting Base c/w Trim Skirt Detector Mounting Base w/Relay 4-inch Detector Mounting Base w/Relay, c/w Trim Skirt SIGA-RB4 Detector Mounting Base w/Fault Isolator 4-inch Detector Mounting Base w/ Fault Isolator, c/w Trim Skirt

Remote Alarm LED (not for EN54 applications)

Trim Skirt (supplied with 4-inch bases)

Detector Removal Tool

Detector Cleaning Too

Audible (Sounder) Base for CO and Fire Detectors

suited for detecting slow, smoldering fires. Install per NFPA 72 National SIGA-LED Fire Alarm and Signaling Code, SIGA-AB4G-LF NFPA 720 Standard for the SIGA-AB4GT Installation of Carbon Monoxide SIGA-TCDR (CO) Detection and Warning SIGA-TS4 Equipment, and UL 2075 SIGA-RTA Standard for Gas and Vapor SIGA-VA Detectors and Sensors.

Tone Generator for Detector Sounder Bases with CO mode

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION OFFICE OF THE STATE FIRE MARSHAL FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM

LISTING SERVICE

7275 -- COMBINATION SMOKE/CO DETECTOR-PHOTOELECTRIC TYPE CATEGORY: EDWARDS, A Division of UTC Fire & Security Americas Corporation, Inc.8985 Town Center Parkway, Bradenton, FL 34202 United States Contact: Jewell Conover (941) 739-4358 Fax (941) 308-8123

Email: rhonda.micochero@carrier.com Models SIGA-PCD \*SIGI-PCD, \*KI-PCD and \*KIR-PCD Analog Addressable Photoelectric Smoke Detector with CO Sensors. The carbon monoxide detector is designed to communicate an end-of-life signal to the control panel following ten years from the date of manufacture. \*Model SIGI-PCD is similar to Model SIGA-PCD except for isolation circuitry.

\*Model KI-PCD is identical to Model SIGA-PCD except for trade name. \*Model KIR-PCD is similar to Model SIGA-PCD except for control panel compatibility. Refer to listee's data sheet for detailed product description and operational considerations.

7275-1657:0334

LISTING No.

RATING: 15.2-19.95 Vdc **INSTALLATION:** In accordance with listee's printed installation instructions, NFPA 72, NFPA 720, applicable codes and ordinances, and in a manner acceptable to the authority having jurisdiction.

Listee's name, model number, electrical rating and UL label. MARKING: \*Models SIGA-PCD and SIGI-PCD are under the Edwards brand. \*Models KI-PCD and KIR-PCD are under the Kidde brand.

Listed as analog addressable photoelectric smoke-CO detectors.

\*Model KI-PCD is for use with listee's Models VS1, VS2 and VS4 (CSFM No. 7165-1657:0244); VM-1 (CSFM No. 7165-1657:0309) fire alarm control units.

\*Models SIGA-PCD and SIGI-PCD are for use with listee's Models EST3 (CSFM No. 7165-1657:0186); iO64, iO500 and iO1000 (CSFM No. 7165-1657:0244); EST3X (CSFM No. 7165-1657:0306) fire alarm control units.

\*Model KIR-PCD is for use with listee's Models FX-64, FX-254 and FX-1000 (CSFM No. 7165-1657:0244) fire alarm control units.

\*Model SIGA-PCD is for use with listee's bases; Models SIGA-SB, -SB4, -RB, -RB4, -IB, -IB4 (CSFM No. 7300-1657:0120), SIGA-AB4GT (CSFM No. 7300-1657:0307) and SIGA-AB4G-LF (CSFM No. 7300-1657:0322).

\*Rev 02-15-18 gt

Listing Expires June 30, 2021

This listing is based upon technical data submitted by the applicant. CSFM Fire Engineering staff has reviewed the test results and/or other data but does not make an independent verification of any claims. This listing is not an endorsement or recommendation of the item listed. This listing should not be used to verify correct operational requirements or installation criteria. Refer to listee's data sheet, installation instructions and/or other

Date Issued: **July 01, 2020** Authorized By: **DAVID CASTILLO,**, M.E., F.P.E.

Fire Engineering Division

This listing is based upon technical data submitted by the applicant. CSFM Fire Engineering staff has reviewed the test results and/or other data but does not make an independent verification of any claims. This listing is not an endorsement or recommendation of the item listed. This listing should not be used to verify correct operational requirements or installation criteria. Refer to listee's data sheet, installation instructions and/or other

Date Issued: July 01, 2020 Authorized By: **DAVID CASTILLO,**, M.E., F.P.E. Listing Expires June 30, 2021

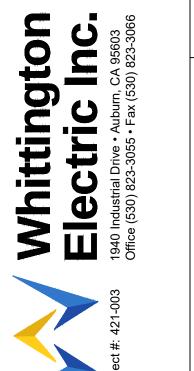
Fire Engineering Division

\*Rev 02-15-18 gt

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DATA SHEET **E85001-0651** Not to be used for installation purposes. Issue 1.3

Low Frequency Audible (Sounder) Base for CO and Fire Detectors 0.3 (0.15)



AGENCY APPROVAL:

DSA 02-118996

IDENTIFICATION STAMP DIV. OF THE STATE ARCHITEC

REVIEWED FOR

SS 🗹 FLS 🗹 ACS 🗹

APP: 02-118996 INC:

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Unified School District

FIRE ALARM **CUTSHEETS AND CSFM LISTINGS** 

NO. REVISIONS SHEET NUMBER:

E5.03

### PART 1 - GENERAL

- 1.01 SUMMARY
- A. The intent of Division 26, Specifications and Drawings is to provide a complete and workable facility with complete systems as shown, specified and required by applicable codes. Include all work specified in these Specifications and shown on the Drawings.
- B. The Division 26 Specifications and Drawings are complementary; what is called for by one is binding, as if called for by both. Items shown on the Drawings are not necessarily included in the Specifications and vice versa.
- C. Use the more stringent requirement when specified materials or methods exceed the applicable code
- D. The Drawings that accompany the Division 26 Specifications are diagrammatic. They do not show every offset, bend, conduit body, elbow or junction box that may be required to install work in the space provided and avoid conflicts. Follow the Drawing as closely as is practical and install additional bends, offsets and elbows where needed by local job site conditions. Provide necessary junction boxes to meet code regulations for the allowed number of conduit bends. The right is reserved to make minor field order changes within 12 inches in outlet location prior to pre-fabrication/roughing-in without additional cost to the owner.

### 1.02 APPLICABLE CODES

- A. Publications and standards listed below form a part of this specification to the extent referenced. The publications and standards are referred to in the text by basic designation only.
  - 1. 2019 California Building Code Part 2, Title 24, CCR
  - 2. 2019 California Electrical Code Part 3, Title 24, CCR
- 3. 2019 California Mechanical Code Part 4, Title 24, CCR
- 4. 2019 California Fire Code Part 9, Title 24, CCR
- 5. National Fire Protection Association (NFPA)
- 6. Occupational Health and Safety Act (OSHA).
- 7. Division of the State Architect (DSA) regulations. 7. All applicable State and Local codes and regulations.
- 1.03 QUALITY ASSURANCE
- A. Nothing in the Contract Documents shall be construed to permit Work not conforming to applicable codes, laws, ordinances, rules or regulations.
- B. Provide materials and apparatus that comply with NEC, NEMA and ANSI standards.
- C. Provide materials and apparatus that bear the UL label where such label is applicable or nationally recognized testing agency approved by the authority having jurisdiction.
- 1.04 SITE EXAMINATION
- A. Examine the site prior to bidding and become familiar with existing conditions and other factors which
- may affect the execution of work. Include all related costs in the initial bid proposal. 1.05 GUARANTEE
- A. Provide one year guarantee for installed project materials and equipment unless otherwise indicated in other Division 26 Sections. Guarantee period effective from time of work acceptance. a. Lamps excluded from one year guarantee.
- 1.06 RECORD DRAWINGS
- A. Provide record Drawings that fully represent installed conditions including actual location of outlets, true panel board connections following phase balancing routines, correct conduit and wire sizing as well as routing for feeder and branch homeruns, diagrammatic branch circuit wiring, revised fixture

schedule listing actual manufacturer and products installed, and revised panel board schedules.

- B. Maintain up to date record set of electrical prints during the course of construction. The prints re subject to monthly review by the owner's representative to ascertain that they are current. If not current, monthly payments may be withheld.
- 1.07 SUBSTITUTIONS
- A. Products or systems listed as "no substitutions": Provide as specified.
- B. Products or systems noted as "or equivalent": A product or system of equivalent design, construction and performance will be considered. Submit all pertinent data and product information for review. Provide the specified products or systems if proposed equivalent is found unacceptable. 1.08 EQUIPMENT SUPPORT
- A. Perform necessary equipment seismic anchorage in compliance with the California Building Code Title 24, Uniform Building Code and requirements of any local agency having jurisdiction. Support shall be per manufacturer's recommendation for Seismic zone 4.
- B. For instances where a pre-approved seismic support detail cannot be used because of field conditions, submit details and calculations signed and stamped by a registered structural engineer in the State of California for approval by the authority having jurisdiction.
- C. Once the exact location of all pipes have been established, detailed shop drawings showing the location of all seismic supports, braces, and anchors shall be submitted to the Structural Engineer of Record to verify adequacy of the supporting structure to ensure that the original design is still adequate.
- 1.09 COORDINATION OF WORK
- A. Conduct work in a manner to cooperate with all other trades for proper installation of all items of equipment. Consult the Drawings of all other trades or crafts to avoid conflicts with cabinets, counters, equipment, structural members, in general, the architectural drawings govern but resolve conflicts with the Architect prior to rough-in.
- B. Verify the physical dimension of each item of electrical equipment to fit the available space. The Contractor is responsible for coordinating electrical equipment space requirements with the allotted space provisions, and access routes through the construction area.
- C. Coordinate rough-in and wiring requirements for all equipment provided by other trades requiring electrical connections. Make installation in accordance with rough-in and wiring diagrams provided for Contractor's use.
- D. Coordinate underground work with other contractors working on the site. Perform coordination with contractors installing storm sewer, sanitary sewer, water and irrigation lines, to avoid conflicts. Common trenches may be used with other trades, providing clearances required by codes and ordinances are maintained. To the extent possible, locate electrical conduits and duct banks aside from plumbing and hydronic piping in common trench.
- 1.10 PROTECTION OF WORK
- A. Protect all electrical work and equipment installed under this Division against damage by other trades, weather conditions or any other causes. Equipment found damaged or in other than new condition will be rejected as defective.
- B. Keep, luminaires and all electrical equipment covered or closed to exclude dust, dirt and splashes of plaster cement or paint and shall be free of all such contamination before acceptance. Keep enclosures and trims in new condition, free of rust, scratches and other finish defects. If damaged, properly refinish and repaint in a manner acceptable to the Architect.
- 1.11 DEMOLTION
- A. Disconnect, remove or relocate electrical material, equipment and other work noted and required by removal or changes in existing construction.
- B. Provide new material and equipment required for relocated equipment.
- C. Disconnect load and line end of conductors feeding existing equipment
- D. Remove conductors from existing raceways to be rewired
- E. Remove conductors and cap outlets on raceways to be abandoned
- F. Cut and cap abandoned floor raceways flush with concrete floor or behind walls and ceilings.
- G. Remove conductors back to nearest power source; junction box or panel board. H. Provide new type written panel board directories.
- I. Dispose of removed raceways and wire.
- J. Turn over removed electrical equipment to Owner as directed. Dispose of unwanted equipment and accessories
- 1.12 INSTALLATION
- A. Provide a complete properly operating system for each item of equipment called for under this work. Installation in accordance to equipment manufacturer's instructions, the best industry practices and the contract documents.
- B. Make installation in a neat, finished and safe manner, according to the latest published NECA Standard of Installation under competent supervision.
- C. Verify all dimensions by field measurements.
- D. Coordinate the installation of required supporting devices and sleeves to be set in poured-in place concrete and other structural components as they are constructed.
- E. Install systems, materials, and equipment to comply with approved submittal data, including coordination drawings, to greatest extent possible. Comply with arrangements indicated by the Contract Documents, recognizing that portions of the work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements refer conflict to the
- F. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
- G. Coordinate electrical systems, equipment, and materials installations with other building components. H. Install new work and connect to existing work with minimum interference to existing facilities.
- I. Connect new work to existing work in neat and acceptable manner.

J. Restore existing disturbed work to original condition including maintenance of wiring and continuity as

### PART 2 - PRODUCTS

### 2.01 CONDUIT

- A. ELECTRICAL METALLIC TUBING (EMT):
- a. ANSI C80.3; rolled steel tubing.
- b. Fittings: ANSI/NEMA FB 1 steel set screw type, insulated throat connectors
- c. Maximum size 2".
- B. Liquid-tight flexible metal conduit:
- a. Interlocked steel construction with PVC jacket.
- b. Fittngs: ANSI/NEMA FB 1, all steel fittings. Provide insulated throat connectors. c. Maximum length 18 inches, allow slack to allow movement of connected equipment.
- C. RIGID METAL CONDUIT (RMC):
- a. ANSI C80.1; rolled steel tubing.
- b. Fittings: ANSI/NEMA FB 1; Threaded fittings, Galvanized. c. Conduit Bodies: ANSI/NEMA FB 1; steel or malleable iron.
- d. Minimum Size: 3/4".
- 2.02 SUPPORT DEVICES
- A. CONDUIT SUPPORTS: a. Dry Location: Galvanized steel straps and hangers, OZ/Gedney, T&B, Minerallac or equivalent
- C. ANCHORS:
- a. Solid Masonry: Zinc plated carbon steel expasion anchors, Hilti Kwik Bolt series or equivalent.
- b. Hollow Masonry: Plated steel screw expansion anchor, Molly Bolt or equivalent.
- c. Concrete surface: Self drilling anchors, or powder driven studs.
- d. Metal surface: Machine screws, bolts, or welded studs
- e. Wood surface: Wood screws, lag bolts.
- 2.03 WIRE AND CABLE
- A. Wire Color:
- a. 208Y/120V, 3 Phase, 4 wire system: 1. Phase A - Black
- 2. Phase B Red
- 3. Phase C Blue
- 4. Neutral White 5. Ground - Green
- B. Copper conductors rated for 600 Volt and 90 Degree Celcius.
- C. THWN-2 Insulation.
- 2.04 WIRE CONNECTIONS A. Binding post terminal: For #10 AWG and smaller conductors, compression type, nylon, self-insulated grip spade lugs, 3M, T&B, Panduit or equivalent.
- B. Wire Splices: For #10 AWG and smaller conductors, twist on solderless, insulated spring connectors, 3M, T&B, or equivalent.
- 2.05 BOXES
- A. Standard Outlet Box:
  - a. Galvanized, one-piece die formed or drawn steel, knock-out type of size and configuration best suited to the application or as per drawings.
  - b. For duplex receptacle, provide boxes not less than 4 inch square by 1-1/2 inch deep.
  - c. For quadplex receptacle, provide boxes not less than 4-11/16 inch square by 1-1/2 inch deep.

a. Heavy Duty, 600 VAC, UL 98 and NEMA KS 1, horsepower rated witch clips or bolt pads to

- d. Tellecommunication boxes: No less than 4-11/16 inch square by 2-1/8 inch deep. e. ANSI/NEMA OS 1.
- 2.06 DISCONNECT SWITCHES A. Fusable Switches
- accommodate specified fuses. Provide with lockable handle with capacity to accept three padlocks and defeatable interlock with cover in closed position.

b. 100% rated, quick make, quick break mechanism.

- c. Manufacturer's: Cutler Hammer, General Electric, Square D or equal. d. Dry locations: Nema 250, Type 1.
- e. Wet locations: Nema 250, Type 3R.
- f. Provide phenolic identifiation label matching Kaiser facility standards. 2.07 FUSES
- A. NEMA FU 1, current-limiting, time-delay, non-renewable cartridge fuses with voltage ratings consistent with circuit voltages and 200 kAIC.
- B. Up to 600 amps: Type RK-1.
- C. Over 600 amps: Type L.
- D. Coordinate fuse ratings with utilization equipment nameplate limitatins of maximum fuse size and with system short-circuit current levels.
- E. Manufacturers: Ferraz-Shawmut or equal.

# PART 3 - EXECUTION

- 3.01 CONDUIT A. Install all wiring in conduit. Coordinate location of conduit with other divisions
- B. ELECTRICAL METALLIC TUBING (EMT): a. Suitable in concealed dry areas or exposed areas above 8 feet only
- D. Liquid-tight flexible metal conduit:
- a. Suitable in damp and/or wet areas.
- E. RIGID METAL CONDUIT (RMC):
- a. Suitable for use in all above grade locations. Conduit supports:
- a. Support conduits at intervals not to exceed 10 feet
- b. Support individual conduits with conduit hangers or clamps. c. Spring steel fasteners may be used to fasten EMT to individual hanger wires, minimum #12 AWG, specifically used to hang conduit only.
- d. Support all electrical equipment located in the ceiling space in accordance with CBC Sections 1613A and 1614A.

e. Seal and fireproof all conduit penetrations in walls requiring protected openings. Use only fire stop

- 1. Firmly attach items weighing less than 20 pounds to main cross runners.
- material of a tested assembly approved by the California State Fire Marshal. G. Conduit Bends:
- a. No more than (3) 90-degree bends or cumulative amount of bends between boxes. b. Maximum of 400 feet between boxes minus 100 feet for every 90-degrees of cumulative bends.
- 3.02 WIRE AND CABLE A. Identify and color code wire under provisions of Section 2.03A(a). Indentify every conductor at each terminal and boxes with circuit number or other designation indicated.
- B. Take all precautions when pulling conductors to avoid damaging the conductors or insulation. C. Connections:
- a. Size lugs in accordance with manufacturer's recommendations terminating wire sizes. b. For splicing receptacle circuits #10 AWG or smaller use twist-on solderless connectors
- 3.03 BOXES A. Install wall mounted boxes at elevations to accommodate mounting heights as indicated on Drawings.
- C. Flush mounted boxes: Secure between studs with stamped steel adjustable bar type hangers. Fasten hanger to both studs and both sides of box.

B. Locate outlet boxes as close to that as indicated on Drawings. Coordinate with other equipment and

D. Support boxes independently of conduit.

E. Install blank wall plates on pull boxes.

- 3.05 GROUNDING
- A. For conduit carrying circuits at or over 100V provide ground wire bonded at each end to equipment. B. Permanently and effectively ground all raceways, boxes, supports, equipment and other utilization apparatus.
- 3.06 DISCONNECT SWITCHES
- A. Coordinate layout and installation with mechanical contractor and the equipment served. Maintain required workspace clearances.

- B. Provide with all mounting hardware and accessories.
- C. Install indicated fuses in fusible devices.
- D. Install at uniform height and comply with NFPA 70 and NECA 1 requirements.

### **END OF SECTION**

### DSA EQUIPMENT ANCHORAGE & BRACING NOTES

### M/E/P COMPONENT ANCHORAGE NOTES:

ALL MECHANICAL, PLUMBING, AND ELECTRICAL 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 2019 CBC SECTIONS 1617A.1.18 THROUGH 1617A.1.26 AND ASCE 7-16 CHAPTERS 13, 26, AND 30:

ALL PERMANENT EQUIPMENT AND COMPONENTS.

ACCORDANCE WITH THE ABOVE REQUIREMENTS.

- 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.

BY DSA. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN

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

### PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTES:

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7-16 SECTION 13.3 AS DEFINED IN ASCE 7-16 SECTIONS 13.6.5, 13.6.6, 13.6.7, 13.6.8; AND 2019 CBC, SECTIONS 1617A.1.24, 1617A.1.25 AND 1617A.1.26.

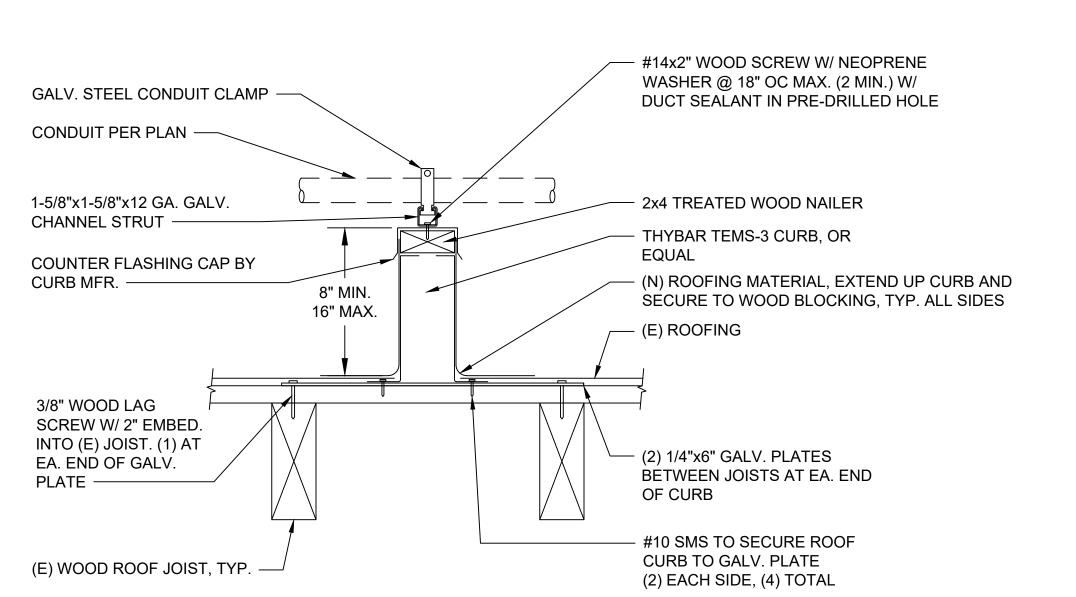
THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION

SYSTEM ARE AS NOTED BELOW. WHEN BRACING AND ATTACHMENTS ARE BASED ON A PREAPPROVED INSTALLATION GUIDE (E.G., OSHPD OPM FOR 2013 CBC OR LATER), 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

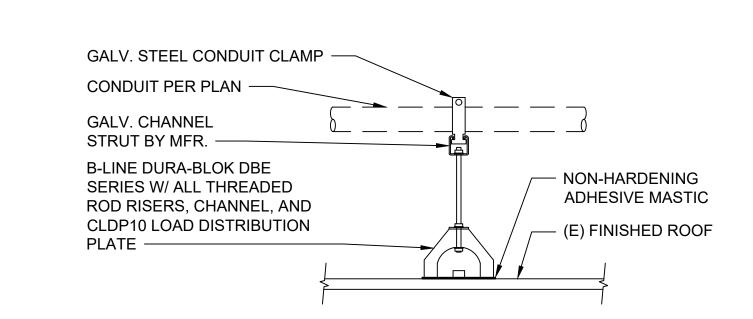
☐ MP ☐ MD ☐ PP ☒ E OPTION 1: DETAILED ON THE APPROVED DRAWINGS WITH PROJECT SPECIFIC NOTES

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):

AND DETAILS. ☐ MP ☐ MD ☐ PP ☐ E OPTION 2: SHALL COMPLY WITH THE APPLICABLE OSHPD PRE-APPROVAL (OPM #)



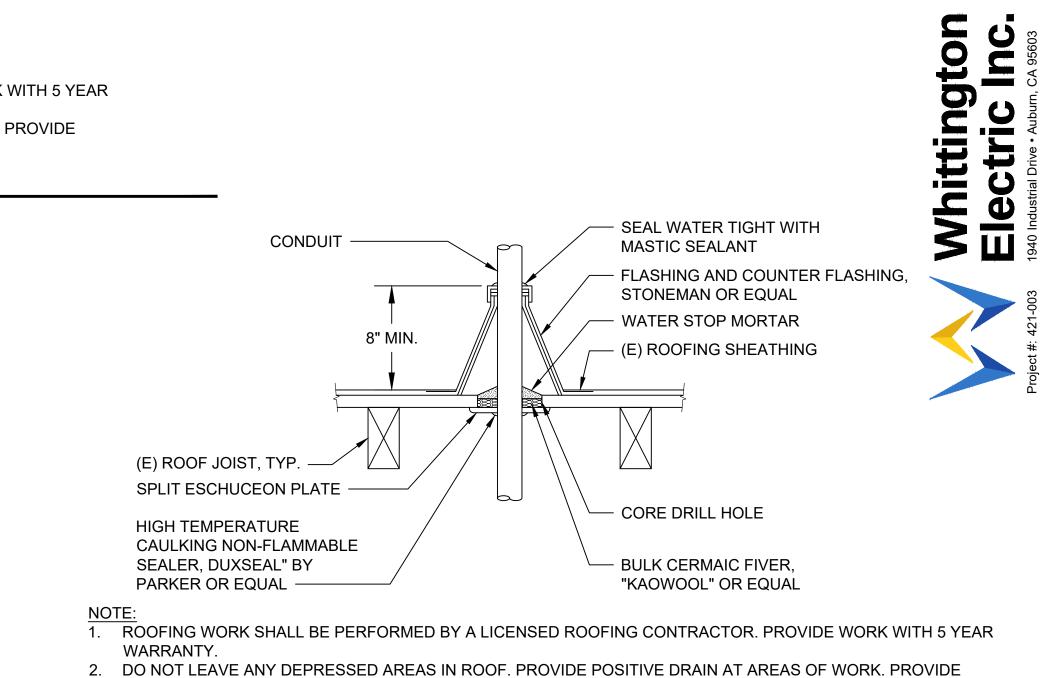
- 1. SECURE CONDUIT TO ROOF STRUCTURE @ 24'-0" OC MAXIMUM
- 2. REQUIRED FOR MULTIPLE CONDUIT RUNS AND CONDUITS 1-1/4" AND LARGER.
- 3. ROOFING WORK SHALL BE PERFORMED BY A LICENSED ROOFING CONTRACTOR. PROVIDE WORK WITH 5 YEAR 4. DO NOT LEAVE ANY DEPRESSED AREAS IN ROOF. PROVIDE POSITIVE DRAIN AT AREAS OF WORK. PROVIDE
- ADDITIONAL FIBERBOARD WHERE NEEDED. CONDUIT ROOF CURB SUPPORT - ANCHOR SCALE: NONE



# **NOTE**

SECURE CONDUIT TO ROOF STRUCTURE @ 24'-0" OC MAXIMUM. SEE DETAIL "1/E6.01". PROVIDE INTERMEDIATE ROOF CURB SUPPORT @ 8'-0" OC MAX. DO NOT PENETRATE OR CUT ROOF MEMBRANE.

CONDUIT ROOF CURB SUPPORT - INTERMEDIATE / SCALE: NONE



CONDUIT ROOF PENETRATION DETAIL SCALE: NONE

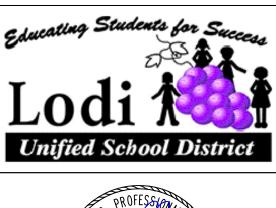
ADDITIONAL FIBERBOARD WHERE NEEDED.

IDENTIFICATION STAMP DIV. OF THE STATE ARCHITEC APP: 02-118996 INC: REVIEWED FOR SS 🗹 FLS 🗹 ACS 🗹 DATE: 06/16/2021

DSA 02-118996

AGENCY APPROVAL

HANICAL INEERIN( UP, INC. 16) 325-1069 16) 325-1079 leymech.com ပေဖဝ ≥шσ \_\_\_\_



S Ш

SHEET TITLE:

**ELECTRICAL** SPECIFICATIONS, DETAILS, AND **ANCHORAGE AND BRACING NOTES** 

NO. REVISIONS SHEET NUMBER:

E6.01

 Project Engineer:
 NB
 Job Number:
 20290

 Project Manager:
 NB
 Plot Date: Jun 15, 2021 - 2:26pm

 Project Drafter:
 NB
 Login: nbaer

### General

I. Interpretation of drawings & specifications

A) For convenience, specifications have been prepared for this project and are arranged in several sections, but such separation shall not be considered as the limits of the work required by any separate trade. The terms and conditions of such limitations are wholly between the contractor and his subcontractors.

B) In general, the working details will indicate dimensions, positions and kind of construction, and the specifications will indicate qualities and methods. Any work indicated on the working details mentioned but not in the specifications, or vice versa, shall be furnished as though fully set forth in both. Work not particularly detailed, marked, or specified, shall be the same as similar parts that are detailed, marked, or specified. If conflicts occur between drawings and specifications, the most expensive materials or methods will prevail. C) Should an error appear in the working details or specifications or in work done by others affecting this work, the contractor shall notify the architect at once and in writing. If the Contractor proceeds with the work so affected without having given such written notice and without receiving the necessary approval, decision or instruction in writing from the owner, then he shall have no valid claim against the owner, for the cost of so proceeding and shall make good any resulting damage or defect. No verba'l approval, decision, or Instruction shall be valid or be the basis for any claim against the owner, its officers, employees or agents. The foregoing includes typical errors in the specifications or notational errors in the working details where the interpretation is doubtful or where the error is sufficiently apparent as to place a reasonably prudent contractor on notice that, should he elect to

proceed, he is doing so at his own risk. Construction shall conform to all applicable codes and regulations.

3. Shop Drawing Note:

A) Shop drawings shall be submitted in the form of one reproducible and two copies of each sheet. B) The purpose of shop drawing submittals by the Contractor is to demonstrate to the Structural Engineer that he understands the design concept by indicating which materials he intends to furnish and install, and by detailing the fabrication and installation methods he intends to use.

C) Prior to fabrication, shop drawings shall be submitted for review to the Structural Engineer. Shop drawing submittals shall include, but are not necessarily limited to structural steel, reinforcing steel, glued laminated beams, and pre-fabricated wood roof framing items such as I-joists and trusses. D) Prior to submission the Contractor shall review all submittals for conformance with the contract documents and shall stamp submittals as being "Reviewed for Conformance".

E) Shop drawing submittals processed by the Structural Engineer are not change F) Any detail on the shop drawing that deviates from the contract documents

shall clearly be marked with the note "This is a Change". G) Shop drawings or calculations submitted for review that require resubmittal for re-review shall be billed hourly for such time to the General Contractor. Re-review will not proceed without written approval from the General Contractor for additional engineering review services.

4. Safety Note: A) It is the Contractors responsibility to comply with the pertinent sections, as they apply to this project, of the "Construction Safety Orders" issued by the State of California latest edition, and all OSHA requirements. B) The owner and the Structural Engineer do not accept any responsibility for the Contractor's failure to comply with these requirements.

C) The Contractor shall be responsible for adequate design and construction of

all forms and shoring required. 5. The Contractor shall notify the Architect and Structural Engineer where a conflict <u>or a discrepancy occurs between the structural drawings and any other portion of</u> the contract documents or existing field conditions. Such notification shall be given in due time so as not to affect the construction schedule. In case of a conflict between structural drawings and specifications, the more restrictive condition shall take precedence unless written approval has been given for the least restrictive. Contractor shall verify all dimensions with architectural and structural drawings prior to commencing any work.

6. Where no specific detail is shown, the construction shall be identical or similar to that indicated for like cases of construction on this project. Should there be any question, contact the Architect and Structural Engineer prior to proceeding. 7. When construction attaches to an existing building, a complete set of drawings of the existing building shall be kept on the job site. Contractor to obtain these

drawings from the owner. 8. Contractor shall provide an allowance equal to 2% of the bid for structural steel, misc. iron, light gauge framing, and reinforcing steel to be used at the discretion of the structural engineer. Unused amount to revert to the owner upon completion of

9. Any substitutions for structural members, hardware, or details shall be reviewed by the Architect and Structural Engineer. Such review will be billed on a time and materials basis to the General Contractor with no quarantee that the substitution

IO. Do not scale drawings. Contact the Architect or Structural Engineer for any dimensions not shown. II. These drawings are not complete until reviewed and accepted by the local building

official and signed by the owner and the Structural Engineer. 12. All drawings and written material appearing herein constitutes the original and unpublished work of the Structural Engineer and the same may not be duplicated,

used or disclosed without written consent of the Structural Engineer. 13. The structure shown on these drawings is structurally sound only in its completed form. The stability of this structure depends on the diaphragms and the bracing members shown. The Contractor is to provide for the design and construction of shoring for all earth, forms, concrete, steel, wood, and masonry to resist gravity, earth, wind, seismic, and construction loads. Shoring shall remain in place until all diaphragms and lateral resisting elements are in place in their entirety. Construction materials shall be spread out if placed on framed floors or roofs. Load shall not exceed the design live load per square foot.

# <u>Design Criteria</u>

I. Code: 2019 California Building Code (CBC) 2. Design Live Loads:

Lr = 20 psf3. Snow Design Parameters: 4. Wind Design Parameters: Basic Design Wind Speed (3-sec gust)

Nominal Design Wind speed (3-sec gust)

Risk Category Exposure Category Internal Pressure Coefficient Analysis Method 5. Earthquake Design Parameters: 5.1. Seismic Importance Factor 5.2. Risk Category

> 5.3. Soil Site Classification 5.4. Seismic Design Category 5.5. Mapped Spectral Response Accel A) Short period B) I-sec period

A) Short Period B) I-sec period 5.7 Seismic Force Resisting System 5.8 Seismic Base Shear 5.9 Seismic Response Coefficient 5.10 Component Amplification Factor

 $S_5 = 0.623q$ SI = 0.26g5.6 Design Spectral Response Accel Sps = 0.541q SDI = 0.329qN/A ap = 2.5 5.11 Component Response Modification Factor  $R_{p} = 6.0$ 5.12 Analysis Procedure Equivalent Lateral Force

Reducible per code

Directional Procedure

Ie = 1.25 (bldg)/1.0 (mech anchorage)

V = 100 mph

Vasd = 76 mph

# Demolition

A. It is the Contractor's responsibility to comply with the pertinent sections, as they apply to this project, of the "Construction Safety Orders" issued by the State of California, latest edition, and all OSHA requirements. B. The Structural Engineer and Owner do not accept any responsibility for the Contractor's failure to comply with these requirements.

2. Shore or brace trusses, beams columns, and walls as required to maintain the stable integrity of the existing structure prior to demolition. It is the Contractor's sole responsibility to design and provide competent shoring and bracing for all loads imposed during and after demolition through completion of new construction. 3. All dimensions given to and of the existing structure are approximate. Verify by field measurements the dimensions of the existing structure. Where actual

conditions deviate from the details shown on the drawings, notify the Structural Engineer for instructions prior to proceeding with work. 4. Demolition and removal of existing construction shall be made in such a manner as to avoid or minimize damage to adjacent construction.

5. Extent of demolition is to be as indicated on plans, sections and details Demolition is to include removal and disposal construction.

### Mood

I. All sawn lumber shall be Douglas Fir-Larch as graded by the West Coast Lumber Inspection Bureau (WCLIB) in accordance with Standard Grading Rules No. 17 typical unless noted otherwise. All members shall have a minimum grade of No. I except

2x4 and 2x6 wall studs, plates, and blocking may be No. 2. 2. All structural sheathing used for shearwalls and roof sheathing shall conform to the requirements for their type in DOC PSI, DOC PS2 or ANSI/APA PRP 210. Each panel or member shall be identified for grade, bond classification, and performance category by the trademarks of an approved testing and grading

3. Áll foundation plates or sills on concrete slabs which are in direct contact with earth, and plates or sills on concrete or masonry foundations, shall be pressure

4. All wood shall have a moisture content of not more than 19% when sheathing is

5. & minimum clearance shall be maintained at all exterior walls between finish grade and bottom of wood walls 6. Bearing and shearwalls shall have double top plates lapped at wall corners and

intersections and plates shall be internailed with 3-16d at such locations. For plate splice details, see drawings. 7. Śill plate anchor bolts shall be installed with plate washers 3x3x0.229 between nut

and plate. 8. Provide solid blocking between joists and rafters at all supports. 9. Provide blocking at all ceiling levels.

10. Joists under and parallel to partitions shall be doubled and nailed together. II. Holes for bolts in wood shall be bored with a bit of the same nominal diameter as the bolt plus 1/16". 12. Holes for lag screws shall be bored as follows:

a. The clearance hole for the shank shall have the same diameter as the shank, and the same depth of penetration as the length of unthreaded shank. b. The lead hole for the threaded portion shall have a diameter equal to 60% to 75% of the shank diameter and a length equal to at least the length of

the threaded portion. 13. Lag screws and wood screws shall be screwed and not driven into place. Soap may be used to lubricate the screws.

14. All bolts and lag screws shall be provided with metal washers under heads and nuts which bear on wood. Applies also to inserted expanding fasteners, Red Head,

Bolt Diameter	MI Washer	Steel Washer
5/ <sub>8</sub> "Φ	2¾"Φ×¾6"	3"x3"x¼"
<sup>3</sup> / <sub>4</sub> " $\phi$	3"Ф× 76"	3"x3"x¾6"
7/6"Φ	31/2"Φ×7/6"	3½"x3½"x¾"
Ι"Φ	4"Φ×½"	3¾"x3¾"x¾"

15. All bolts and lag screws shall be tightened at installation and retightened before closing in or at completion of job. 16. Lay all structural sheathing on roof and floors with face grain perpendicular to

support typical unless noted otherwise. Use ply-clips at unsupported sheathing 17. Connector hardware model number are those for Simpson Strong-Tie Company. All joist hangers shall be Simpson U series unless noted otherwise. Equivalent

connectors with ICC acceptance may be submitted for review as an alternate. 18. Notify Structural Engineer after wall, floor, and roof sheathing nailing has been completed and a minimum of 48 hours prior to concealing sheathing.

19. Fasteners, nuts, and washers in contact with SBX/DOT and zinc borate treated wood in interior dry conditions may be carbon steel. Fasteners in other preservative-treated wood (Anchor bolts, nails, screws) shall be approved silicon bronze or copper, stainless steel or hot-dipped zinc-coated steel per CBC 2304.10.5.1 v.n.o.

### Nailina Schedule

I. All nails for structural work shall be common wire nails conforming to the following minimum sizes:

8d O.131"Φx2½" O.148"Φx3" IOd shorts O.148"Φx15%" plus thickness of shtq 0.162"Φx3½

20d O.192"Фx4" 2. Provide nails at connections as indicated on the structural drawings. Where nails at connections are not indicated nail per nailing schedule in note 5.

3. Nailing not noted in schedule or on plans shall be a minimum of two nails at each contact. 8d nails for I" material and 16d nails for 2" material. 4. Holes shall be pre-drilled where necessary to prevent splitting.

Connection	Fastening	Location
l. Joist to sill or girder.	3-8d common (2½"x0.131") 3-3"x0.131" nails	toenail
2. Bridging to joist.	2-8d common (2½"x0.131") 2-3"x0.131" nails	toenail ea end
3. l"x6" subfloor or less	2-8d common (2½"x0.131")	face nail
4. Wider than I"x6" subfloor	3-8d common (2½"x0.131")	face nail
5. 2" subfloor to joist or girder	2-16d common (3½"x0.162")	blind # face nail
6. Sole plate to joist or blocking	16d (3½"x0.135") @ 16"cc  3"x0.131" nails @ 8"cc	typical face nail
Sole plate to joist or blocking at braced wall panel	3-16d (3½"x0.135") @ 16"cc 4-3"x0.131" nails @ 16"cc	braced wall panels
7. Top plate to stud.	2-16d common (3½"x0.162") 3-3"x0.131" nails	end nail
8. Stud to sole plate	4-8d common (2½"x0.131") 4-3"x0.131" nails	toenail
	2-16d common (3½"x0.162") 3-3"x0.131" nails	end nail
9. Double studs.	16d (3½"x0.135") @ 24"cc 3"x0.131" nail @ 8"cc	face nail
IO. Double top plates.	16d (3½"x0.135") @ 16"cc  3"x0.131" nail @ 12"cc	typical face nail
	8-16d common (3½"x0.162") 12-3"x0.131" nails	lap splice
II. Blocking between joists or rafters to top plate.	3-8d common (2½"x0.131") 3-3"x0.131" nails	toenail
12. Rim joist to top plate	8d (2½"x0.131" @ 6"cc 3"x0.131" nail @ 6"cc	toenail
13. Top plates, laps and intersections.	2-16d common (3½"x0.162") 3-3"x0.131" nails	face nail
14. Cont. header, two pieces.	16d common (3½"x0.162")	16"cc along edge
15. Ceiling joists to plate.	3-8d common (2½"x0.131") 5-3"x0.131" nails	toenail
16. Continuous header to stud.	4-8d common (2½"x0.131")	toenail
17. Ceiling joists, laps over partitions. (Section 2308.10.4.1, Table 2308.10.4.1)	3-16d common (3½"x0.162") min. Table 2308.10.4.1 4-3"x0.131" nails	face nail
18. Ceiling joists to parallel rafters. (Section 2308.10.4.1, Table 2308.10.4.1)	3-16d common (3½"x0.162") min. Table 2308.10.4.1 4-3"x0.131" nails	face nail
19. Rafter to plate. (Section 2308.10.1, Table 2308.10.1)	3-8d common (2½"x0.131") 3-3"x0.131" nails	toenail
20. I" diagonal brace to stud \$ plate.	2-8d common (2½"x0.131") 2-3"x0.131" nails	face nail
21. l"x8" ‡ wider sheathing to ea bearing.	3-8d common (2½"x0.131")	face nail
22. Built-up corner studs.	16d (3½"x0.162") @ 24"cc 3"x0.131" nail @ 16"cc	
22 Puilt up aindon & boams	20d common (4"x0.192") @ 32"cc	face nail at t\$b,
23. Built-up girder & beams.	3"x0.131" nail @ 24"cc	staggered on opposite sides

### Abbreviationa

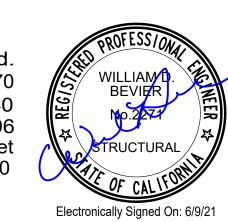
It. wt. .....Light weight

bre	<u>viations</u>		
	Additional Alternate	LLH	Long leg horizontal
100	And in the limbs of Charles and and in	LL Y	Long leg vertical
	American Institute of Steel Construction		Laminated Veneer Lumber
PA	American Plywood Association	MB	Machine bolt
	American Sóciety for	mfr	Manufacturer
		max	
MG	Testing and Materials American Welding Society		
MS	American Melaing Society	mecn	Mechanical
B	Anchor bolt	MI	Malleable iron
	And	min	Minimum
rch	Architect/Architectural		Miscellaneous
		mt/	
	Bottom of	Ŋ.I.C	Not in contract
η	Beam	(n)	New
	.Bearing		Not to scale
<u> </u>	Better		
	Between		Number or pounds
		0/	
Kg	Blocking	oc	
.5	Both sides	OWJ	Open web joist
ott	Bottom	opng	
	Boundary nail	opp	Opposite
	Ceilina	<i>Z</i> L	Opposite Hand
9	Ceiling Center to center	O.F1	Opposite Hand
	Center to center	o.a	Outside diameter
	Center line	<i>PP</i>	Partial penetration
'r	.Clear	pc	
ol		尼	'Plate
P	Complete Penetration	ply, plywd	Pluwood
· · · · · · · · · · · · · · · · · · ·	Consolo	pig, pigna	Parada a sa sulata Kaat
	Concrete	pct	Pounds per cubic foot
MU	Concrete masonry unit	psf	Pounds per square foot
onn	Connection	ˈɒsi	Pounds per square inch
	Construction Joint	'PAF	Powder 'Actuate'd Fasteners
	Continuous	PTDE	Praccura Traated Douglas Fin
		Γ I DI	Pressure Treated Douglas Fir
2K '	Countersink	r, rad	Raaius
	Control Joint	RDMD	
L	Dead Load	reinf	Reinforcing
et	Detail	req'd	Reavired
	Diagonal	rf	Roof
ia Ia	Diameter	P 0	Pough apaning
<i>a</i>	Ditto	A.O	Rough opening
<u></u>		Ψ	Round o'r diameter
.F	Douglas Fir	sched	.Schedule
bl	Double	S.A.D	See architectural drawings
η	Down	<i>S.E.D</i>	.See electrical drawings <sup>-</sup>
wa	Drawing	S.M.D	See mechanical drawinas
a	Each	SMS	Sheet Metal Screws
F	Each Face	SDS	Simpson Strona-Drive Screw
	.Embedment	SDSTS	Simpson Strong-Drive Screw Self drilling self
		JD J 1 J	tanning son
	Edge Nail	CC	tapping screw shear connector ¾"Ф v.n.o.) Sheathing
/γ	Each May	- let -	Shear connector 74 4 v.n.o.)
lev, el	.Elevation	sntg	.Sneathing
<i>q</i>	Eaval	sht"	.Sheet
ล้บin	.Equipment	SMS	Sheet metal screw
35,72	Existing	sim	
·/ ·······	Existing		
J	Expansion Joint		Slab on grade
C	Face of Concrete	#	square
B	.Face of Block	stagg	Staggered
Μ	.Face of Masonry	std	.Standard
0	Face of Plywood/Sheathing	st1	
<i></i>	Each of Glad	eetl	Stainless Steel
<i></i>	Face of Stud	0 + Fmm	Ctiff on on
າ		stfnr	
	.Finish floor	struct	
G	.Finish grade	SP	structural plywood
^	Floor	SPEN	structural plywood
			edge nailing
z,	Footing	alimm	Summatrical
	Foundation	9911111	Symmetrical Toe nail
o	Face of		
ma	.Framing	t&b	.Top # bottom
	.Galvanized	t.o.c	Top of concrete
a		$t \circ f$	Top of framing
۱۳	Glad lamin at a d la am	t 0 P	Top of plate
ις	Glved-laminated beam	L.O.IL	Top of plate
	Grid Line	1.0.5	Top of Steel
gr	Hanger	T.O.W	Top of Wall
dr	Header	t\$q	Tonque & Groove
		T5	Tubé Steel
SB	High strength halt	typ	
 בב	High strength bolt	υn Λ	Unless noted otherwice
	.Hōllow Stēel Section		Unless noted otherwise
<		vert	vertical
oriz	Horizontal	V.I.t	Verify in field
	.lnside diameter	W/	With
	Interior	w/in	Mithin
	Inverted	w/o	
t		IN D	Mood screw
	Joist hanger	/ Y. T	Working point
5	Lag screw		Welded headed studs
. wt	Light weight Live Load		<i>Melded wire fabric</i>
,	I Kie I and		West Coast Lumber

WCLIB ......West Coast Lumber

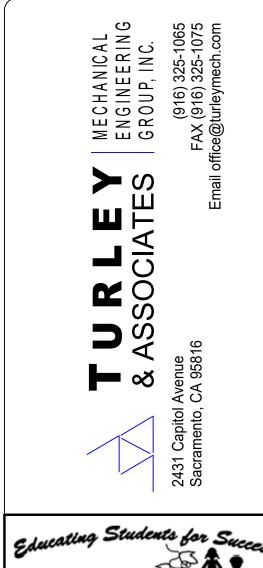
Inspection Bureau







DSA 02-118996



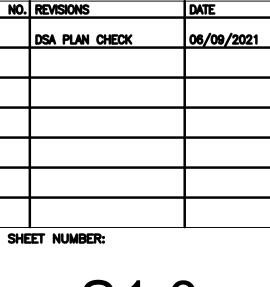




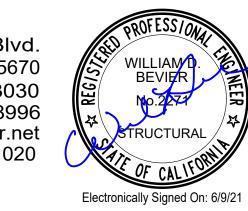
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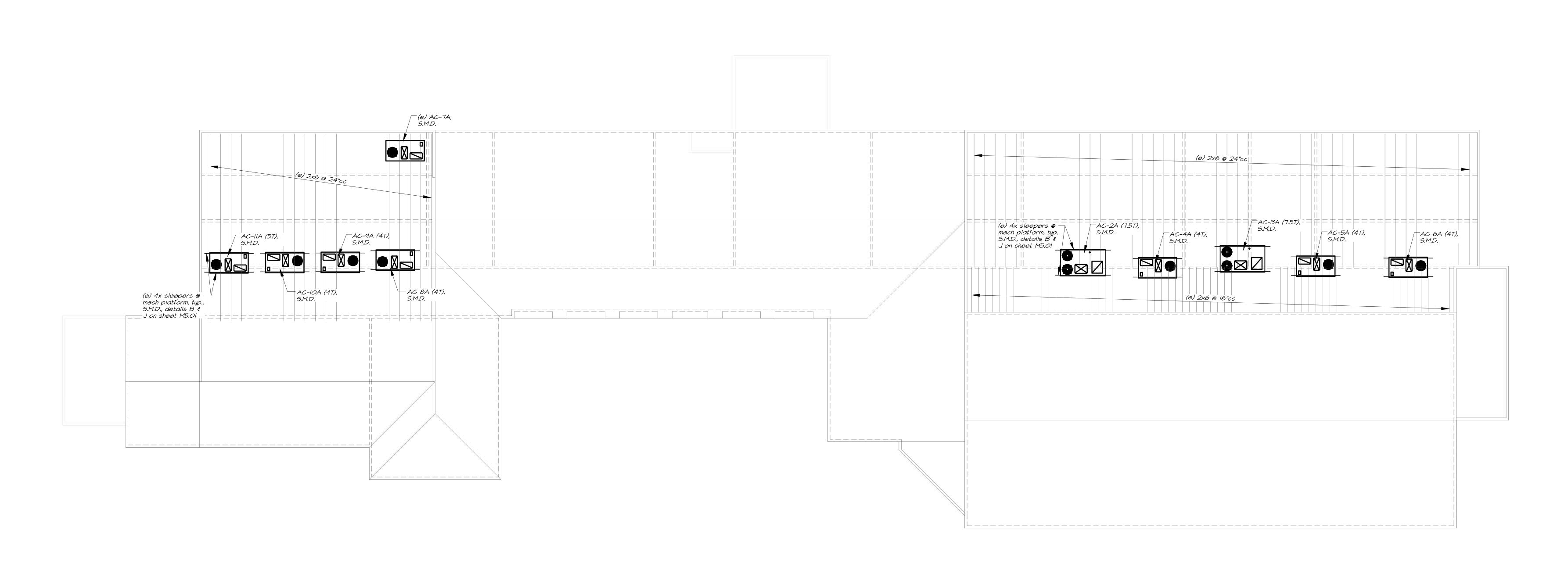
GENERAL NOTES

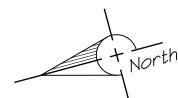


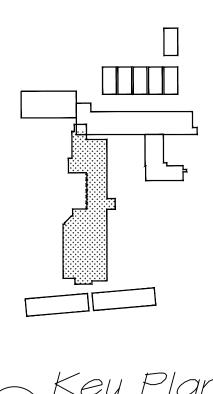




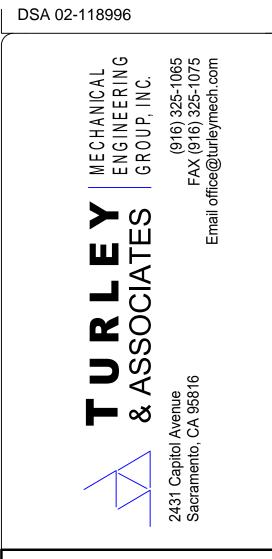


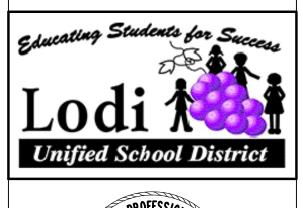






Key Plan







ODI UNIFIED SCHOOL DIST
WOODBRIDGE ELEMENT
HVAC REPLACEMENT
1290 LILAC STREET

PARTIAL (E) ROOF FRAMING PLAN (BLDG A)

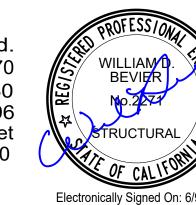
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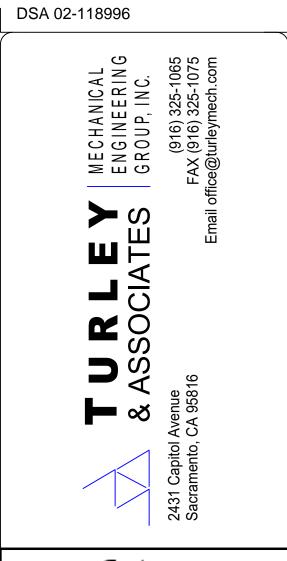
gineer: JT Job Number: 20290

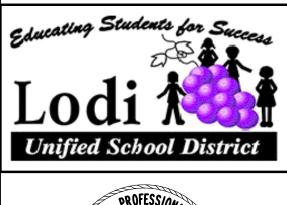
<u>Note:</u> Do not cut (e) roof framing.







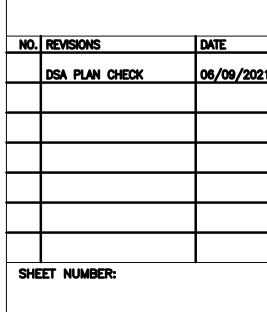






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PARTIAL (E) ROOF FRAMING PLAN (BLDG B)

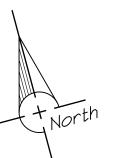


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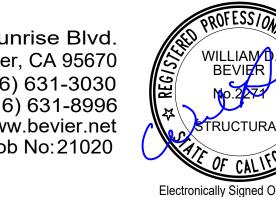
Key Plan





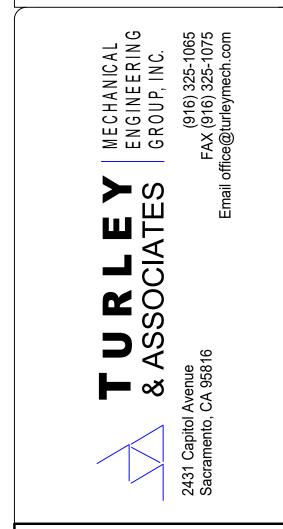


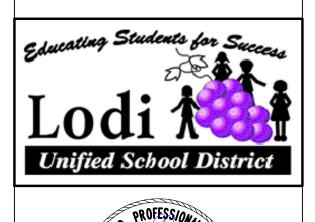


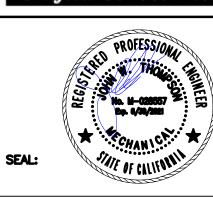




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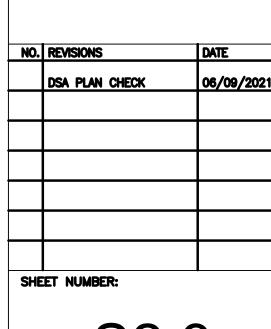
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WOODBRIDGE ELEMENT
HVAC REPLACEMEN

1290 LILAC STREET

SHEET TITLE:

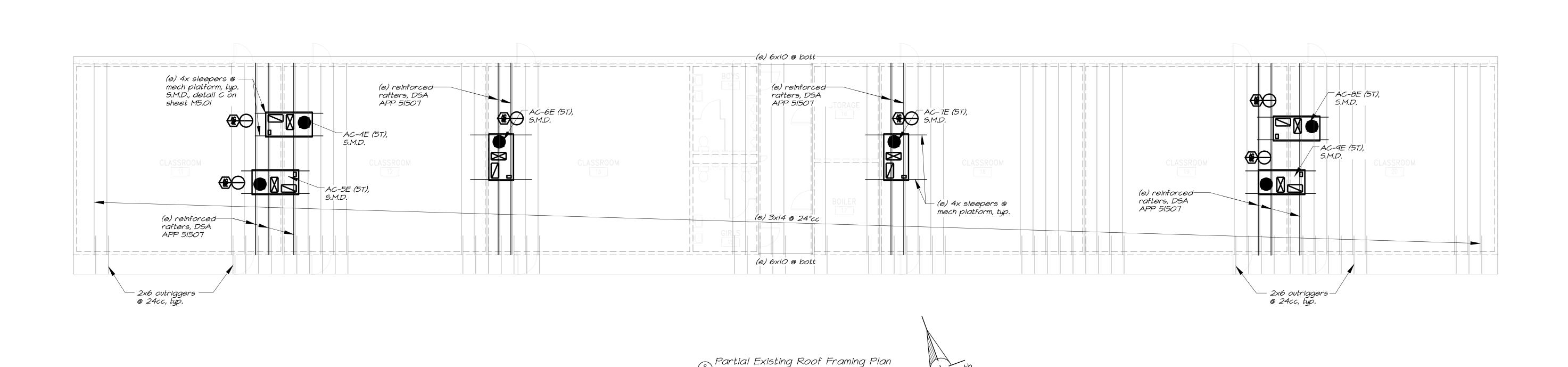
PARTIAL (E) ROOF FRAMING PLAN (BLDGs C, D & E)



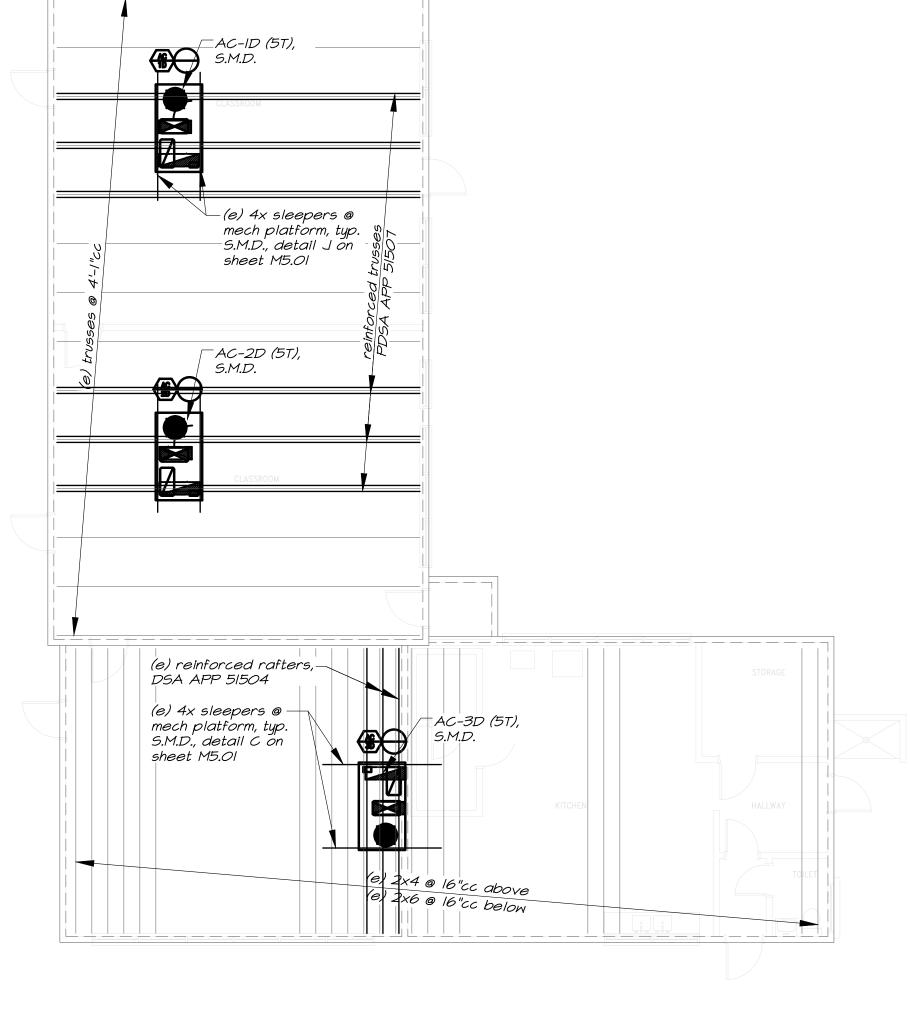
S2.3

Key Plan

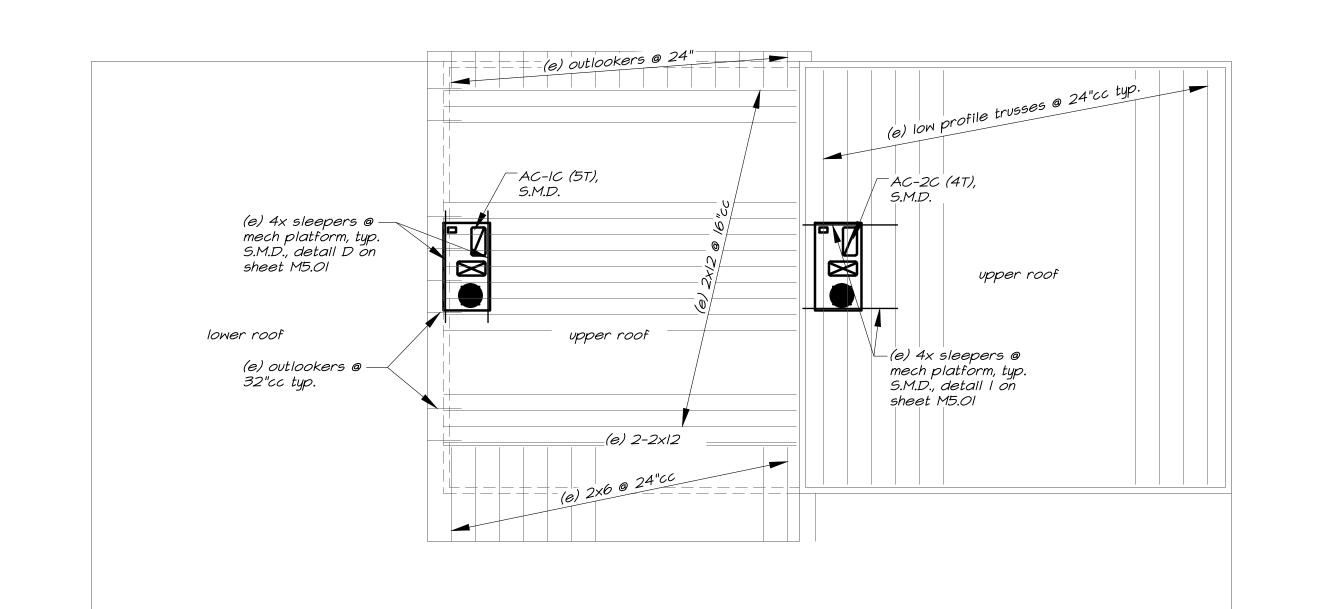
Project Engineer: JT Job Number: 20290
Project Manager: JT Plot Date: Jun 09, 2021 - 12:32pm
Project Drafter: ZH Login: Teri



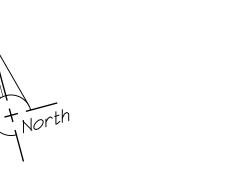


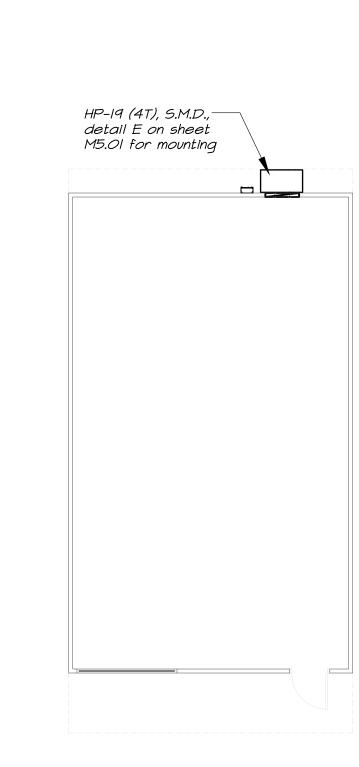


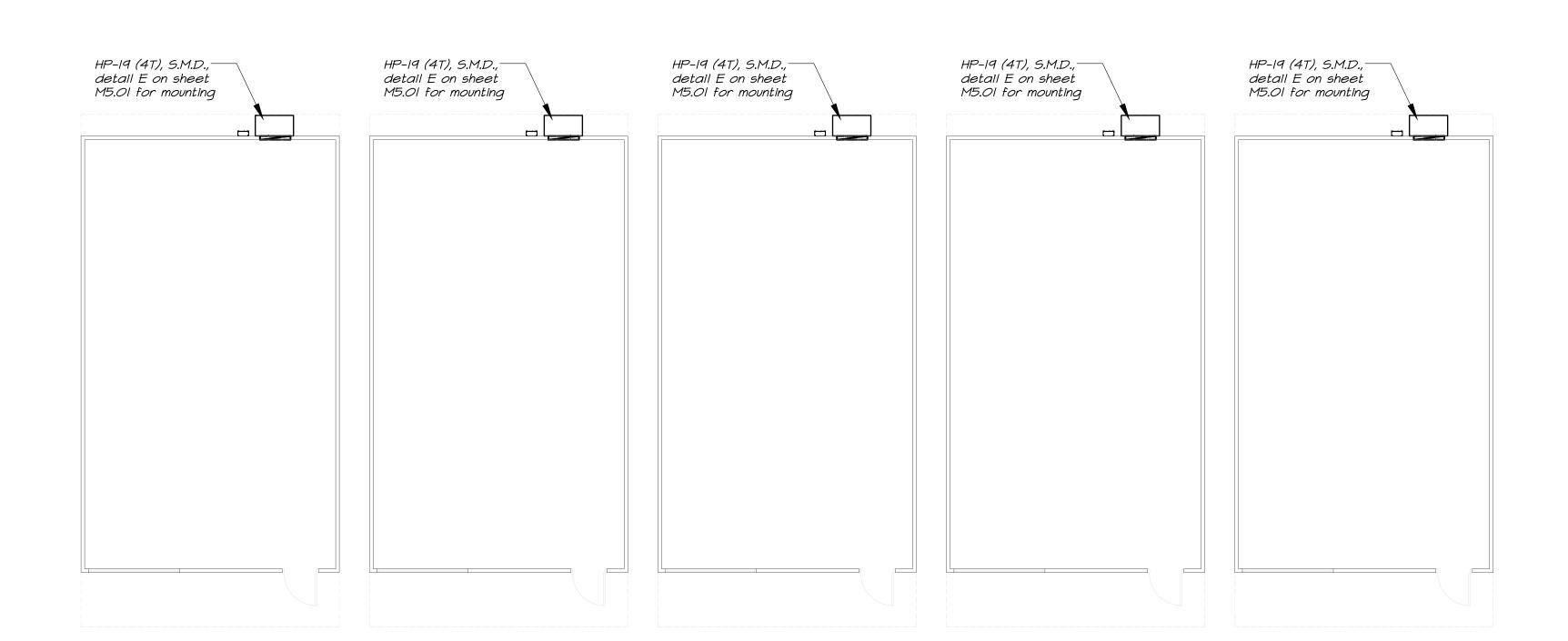




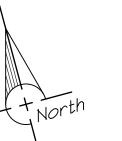




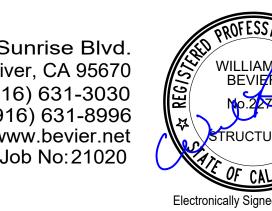




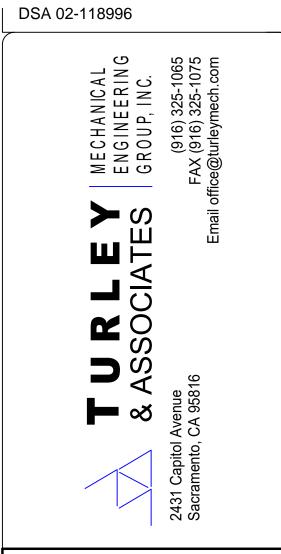
 $\underbrace{\text{Existing 24'x40' portable units}}_{\text{523}} \underbrace{\text{Existing 24'x40' portable units}}_{\text{523}}$ 

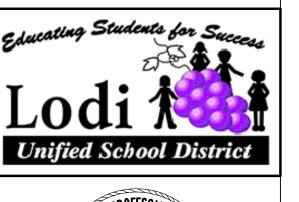




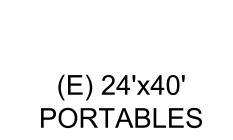


IDENTIFICATION STAMP DIV. OF THE STATE ARCHITECT APP: 02-118996 INC: REVIEWED FOR 

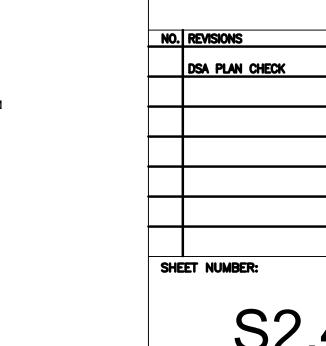








SHEET TITLE:



Key Plan S2.4