


APPLICATION FOR SUBMITTAL OF POST-APPROVAL DOCUMENT

This application is for submittal of documents, after the initial approval of the project (post-approval documents), that require Division of the State Architect (DSA) review and approval. This form shall be completed by the Design Professional in General Responsible Charge of the project, in accordance with California Code of Regulations, Title 24, Part 1, Sections 4-317, 4-323 and 4-338 and in compliance with DSA IR A-6: Construction Change Document Submittal and Approval Process.

DSA documents referenced within this form are available on the [DSA Forms](#) or [DSA Publications](#) webpages.

1. SUBMITTAL TYPE: (Is this a resubmittal? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>)			
Deferred Submittal <input type="checkbox"/>	Addendum Number: 03	Revision Number:	CCD Number: Category A <input type="checkbox"/> or B <input type="checkbox"/>
2. PROJECT INFORMATION:			
School District/Owner: Fillmore Unified School District		DSA File Number: 56 H1	
Project Name/School: Fillmore High School Modernization		DSA Application Number 03 121233	
3. APPLICANT INFORMATION:			
Date Submitted: 09/08/23		Attached Pages? No <input type="checkbox"/> Yes <input checked="" type="checkbox"/> Number of pages? 19	
Firm Name: Westgroup Designs		Contact Name: Roy Frey	
Work Email: royf@westgroupdesigns.com		Work Phone: (949) 250-0880	
Firm Address: 19900 MacArthur Blvd. Suite 1000 92612		City: Irvine	State: CA Zip Code: 92612
4. REASON FOR SUBMITTAL: (Check applicable boxes)			
<input checked="" type="checkbox"/> For revision or addendum prior to construction.		<input type="checkbox"/> For a project currently under construction.	
<input type="checkbox"/> For a project that has a form DSA 301-N: Notification of Requirement for Certification, DSA 301-P: Posted Notification of Requirement for Certification or a 90-Day Letter issued.			
<input type="checkbox"/> To obtain DSA approval of an existing uncertified building or buildings.			
<input type="checkbox"/> For Category B CCD this is: <input type="checkbox"/> a voluntary submittal, <input type="checkbox"/> a DSA required submittal (attach DSA notice requiring submission).			
5. DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE:			
Name of the Design Professional In General Responsible Charge: David Jordan Smith			
Professional License Number: C20495		Discipline: Architect	
Design Professional in General Responsible Charge Statement: The attached post-approval documents have been examined by me for design intent and appear to meet the appropriate requirements of Title 24, California Code of Regulations and the project specifications. They are acceptable for incorporation into the construction of the project. Signature: 			
DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE			
6. CONFIRMATION, DESCRIPTION AND LISTING OF DOCUMENTS:			
For addenda, revisions, or CCDs: CHECK THIS BOX <input checked="" type="checkbox"/> to confirm that <i>all</i> post-approval documents have been stamped and signed by the Responsible Design Professional listed on form DSA 1: Application for Approval of Plans and Specifications for this project. (For Deferred Submittals, refer to IR A-18: Use of Construction Documents Prepared by Other Professionals, and IR A-19: Design Professional's Signature and Seal (Stamp) on Construction Documents, when applicable, for signature and seal requirements.)			
Provide a brief description of construction scope for this post-approval document (attach additional sheets if needed): Changed 3 AC models and related mechanical details/plans; modified electrical distribution system for buildings 8 & 9 and related plans/details. Please see attached narrative for more information.			
List of DSA-approved drawings affected by this post-approval document: M0-1.1, M0-1.2, MB1-1.2, MB2-1.2, E004, E100, ED101, E101, ED102, E102 and Specification Section 23 01 30			

DSA USE ONLY							
SSS ST Date 10/18/2023 <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved <input type="checkbox"/> Not Required Comments: _____ FLS ZM Date 10/23/2023 <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved <input type="checkbox"/> Not Required Comments: _____ ACS S. Luk Date 09/25/2023 <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved <input type="checkbox"/> Not Required Comments: _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="background-color: #f2f2f2;">Returned</th> </tr> <tr> <td>Date:</td> </tr> <tr> <td>By:</td> </tr> </table>	Returned	Date:	By:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="background-color: #f2f2f2;">DSA STAMP</th> </tr> <tr> <td style="text-align: center;"> <div style="border: 2px solid black; border-radius: 15px; padding: 10px; margin: 10px auto; width: 80%;"> <p>APPROVED DIV. OF THE STATE ARCHITECT APP: 03-121233 INC: 0 REVIEWED FOR SS <input checked="" type="checkbox"/> FLS <input checked="" type="checkbox"/> ACS <input checked="" type="checkbox"/> DATE: 10/23/2023</p> </div> </td> </tr> </table>	DSA STAMP	<div style="border: 2px solid black; border-radius: 15px; padding: 10px; margin: 10px auto; width: 80%;"> <p>APPROVED DIV. OF THE STATE ARCHITECT APP: 03-121233 INC: 0 REVIEWED FOR SS <input checked="" type="checkbox"/> FLS <input checked="" type="checkbox"/> ACS <input checked="" type="checkbox"/> DATE: 10/23/2023</p> </div>
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Project: Fillmore High School Modernization

Project Number: WGD 20624 DSA# 03-121233

Addendum 03 – Mechanical Unit Replacement

Date: September 8, 2023

Owner: Fillmore Unified School District

**Architect: Westgroup Designs
19900 MacArthur Blvd., Suite 1000
Irvine, CA 92612
(949) 250-0880
(949) 250-0882 Fax**

The clarifications, modifications, changes, additions, and/or deletions contained herein shall be incorporated within the construction documents for the project. Such information shall take precedence over that previously published. Responses shall be considered modifications to the contract hereby incorporated into the contract documents as established above.

CHANGES TO THE DRAWINGS - NARRATIVE:

Mechanical

M0-1.1 – Mechanical Schedules

- a. Revised AC-1, AC-2 and AC-3 model numbers and associated parameters on the “Heat Pump Schedule (Packaged).”
- b. Revised the “Existing Heat Pump and New Heat Pump Comparison Schedule.”

M0-1.2 – Mechanical Details

- a. Revised the operating weights on details #2 and #3.

MB1-1.2 – Library Mechanical Demolition Roof Plan

- a. Revised Plan Notes 1 and 4.

MB2-1.2 – Library Mechanical Improvement Roof Plan

- a. Revised “Library – Mechanical Roof Plan” Plan No. 1.
- b. Revised Plan Note 1.

Electrical

E004 – Single-Line Diagram

- a. Modify electrical distribution system feeding building 8 & 9.

E100 – Overall Electrical Site Plan

- a. Added General Notes 4-6.
- b. Tagged existing feeder with General Notes 2 & 3.

ED101 – Library Reflected Ceiling/ Floor Plan Demo. Bldg. 8

- a. Plan 1-Tag existing panel DP8 to be removed/replaced with new.
- b. Plan 2- Added General Notes 1 to plan.

E101 – Library Reflected Ceiling/ Floor Plan Bldg. 8

- a. Plan 1-Added circuitry to the building interior connecting new load.
- b. Plan 1-Noted to replace existing panel with panel LB.
- c. Plan 2- Revised power connection for AC-1, 2, &3.
- d. Eliminated panel schedule H8 and added panel schedule LL.
- e. Added Plan Notes 4.

ED102 – Cafeteria Reflected Ceiling/ Floor Plan Demo. Bldg. 9

- a. Plan 1-Tag existing transformer to be removed.
- b. Plan 2- Revised existing condition reflected ceiling plan.
- c. Added General Notes 1 & 2.

E102 – Cafeteria Reflected Ceiling/ Floor Plan Bldg. 9

- a. Plan 1-Added circuitry to the building interior connecting new load.
- b. Plan 1-Noted to replace transformer with new.
- c. Added panel schedule LK.
- d. Added Plan Notes 4.

CHANGES TO THE SPECIFICATIONS - NARRATIVE:

Mechanical

23 01 30 – HVAC Air Duct Cleaning

- a. New added specification section.

EXHAUST FAN SCHEDULE

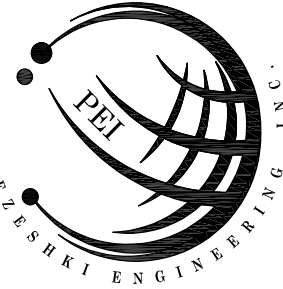
UNIT SYMBOL	EF-1	EF-2
LOCATION	ROOF LIBRARY BLDG.	ROOF LIBRARY BLDG.
SERVICE	GENERAL EXHAUST	GENERAL EXHAUST
TYPE	ROOF MOUNTED	ROOF MOUNTED
MANUFACTURER	COOK	COOK
FAN - CFM	60 ACEB	60 ACEB
EXTERNAL S.P. - "WG	0.25	0.25
DRIVE TYPE	BELT	BELT
FAN MOTOR - HP	1/6	1/6
FAN MOTOR - RPM	1101	1346
OUTLET VELOCITY - FPM	152	229
TIP SPEED - FPM	2882	3523
DISCHARGE LOCATION	DOWNBLAST	DOWNBLAST
WHEEL TYPE	BACKWARD INCLINED	BACKWARD INCLINED
VOLTAGE / PHASE	120 / 1	120 / 1
CURB TYPE	RCG	RCG
OPERATING WEIGHT - LBS	90	90
DETAIL REFERENCE	4/M0-1.3	4/M0-1.3
INTERLOCK	LIGHT SWITCH	LIGHT SWITCH
REMARKS	①②	①②
<div>○ REMARKS</div> <div>1- UNIT COMPLETE WITH BACKDRAFT DAMPER, BIRDSCREEN, AND MANUFACTURER'S PREFABRICATED GALVANIZED ROOF CURB. WHERE ROOF IS SLOPED, PROVIDE SLOPED ROOF CURB TO MATCH ROOF.</div> <div>3- INTERLOCK FAN OPERATION WITH SPACE LIGHTING. PROVIDE TIME DELAY SWITCH TO TURN OFF EXHAUST FAN 5 MINUTES AFTER SPACE LIGHTING TURNS OFF.</div>		

HEAT PUMP SCHEDULE (PACKAGED)

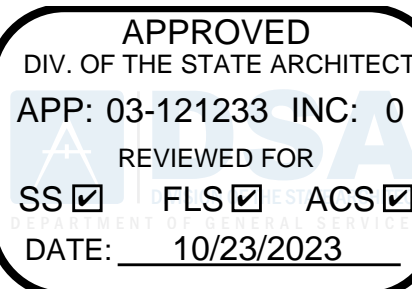
UNIT SYMBOL	AC-1	AC-2	AC-3
LOCATION	LIBRARY ROOF	LIBRARY ROOF	LIBRARY ROOF
SERVICE	LIBRARY BLDG	LIBRARY BLDG	LIBRARY BLDG
MANUFACTURER	RHEEM	RHEEM	RHEEM
MODEL	RHPXZR060AJT051AA	RHPXZR060AJT051AA	RHPXZR060AJT051AA
TYPE	HEAT PUMP/ SIDE DISCHARGE	HEAT PUMP/ DOWN DISCHARGE	HEAT PUMP/ DOWN DISCHARGE
SUPPLY FAN	INDOOR FAN - CFM	1900	1900
	OUTSIDE AIR - CFM	450	450
	EXTERNAL S.P. - "WG	0.75	0.75
	MOTOR HP / TYPE / RPM / SPEED	1.0 / DIRECT / 1050 / NEXT HIGHER	1.0 / DIRECT / 1050 / NEXT HIGHER
COOLING	EVAP. EAT - "F - DB	80.0	80.0
	EVAP. EAT - "F - WB	67.0	67.0
	CND. EAT - "F - DB	95.0	95.0
	ARI COOLING CAPACITY - MBH	57.0	57.0
	ARI COOLING CAPACITY SENSIBLE - MBH	41.6	41.6
	REFRIGERANT TYPE	R410A	R410A
	ARI EER2 / SEER2	10.6 / 13.40	10.6 / 13.40
	COMPRESSOR INPUT - KW	3.80	3.80
	INDOOR COIL EAT - "F - DB	70.0	70.0
	INDOOR COIL LAT - "F - DB	94.77	94.77
HEATING	OUTDOOR AMBIENT TEMP. - "F - DB	47.0	47.0
	HEATING INPUT - MBH	56.0	56.0
	HSPF2 / KW	6.7 / 4.8	6.7 / 4.8
	HEATING POWER INPUT - KW	5.0	5.0
	COMPRESSOR NO. / RLA (EA)	1 / 23.9	1 / 23.9
ELECTRICAL	OUTDOOR FAN MOTOR NO. / FLA (EA)	1 / 2.3	1 / 2.3
	INDOOR FAN MOTOR NO. / FLA (EA)	1 / 7.6	1 / 7.6
	COMBUSTION FAN MOTOR FLA (EA)	NA	NA
	MCA / MOCP	65 / 80	65 / 80
	VOLTAGE / PHASE	208-230 / 1	208-230 / 1
FILTER TYPE	MERV-13	MERV-13	MERV-13
CONDENSER COIL HAIL GUARD (LOUVERED)	N/A	N/A	N/A
FLUE DEFLECTOR	N/A	N/A	N/A
ECONOMIZER	INCLUDED	①	①
CURB MANUFACTURER / MODEL / HEIGHT	RHEEM / RXRE-11RXCAM3 / 14"	RHEEM / RXRE-11RXCAM3 / 14"	RHEEM / RXRE-11RXCAM3 / 14"
OPERATING WEIGHT INCLUDING ROOF CURB (LBS)	676	676	676
DIMENSIONS (L"xW"xH")	46 x 55 x 40	46 x 55 x 40	46 x 55 x 40
DETAIL REFERENCE	3/M0-1.2	2/M0-1.2	2/M0-1.2
REMARKS	②③④⑤	②③④⑤⑥	②③④⑤⑥
<div>○ REMARKS</div> <div>1- UNIT COMPLETE WITH FACTORY INSTALLED MODULATING ECONOMIZER WITH 100% OUTSIDE AIR INTAKE CAPABILITY AND BAROMETRIC RELIEF.</div> <div>2- UNIT COMPLETE WITH FACTORY INSTALLED LOW AMBIENT FREEZE STAT.</div> <div>3- OPERATING WEIGHT INCLUDES WEIGHT OF BASE UNIT, ACCESSORIES, AND ROOF CURB.</div> <div>4- PROVIDE VICONICS PROGRAMMABLE THERMOSTAT WITH CO2 SENSOR MODEL #VTB650.</div> <div>5- PROVIDE FACTORY MOUNTED AND TESTED UVC LIGHT AND BIPOLAR IONIZATION SYSTEM PER SPEC REQUIREMENTS. PROVIDE THE REQUIRED POWER TRANSFORMERS.</div> <div>6- INTERLOCK AC UNIT TO THE BUILDING SMOKE DETECTION SYSTEM FOR AUTOMATIC UNIT SHUTDOWN UPON SMOKE DETECTION. BUILDING IS SERVED BY TOTAL COVERAGE SMOKE-DETECTION SYSTEM. AUTOMATIC UNIT SHUT OFF CAN BE ACCOMPLISHED BY INTERCONNECTION TO SUCH SYSTEM. REFER TO FIRE ALARM DRAWINGS FOR ADDITIONAL INFORMATION.</div>			

EXISTING HEAT PUMP AND NEW HEAT PUMP COMPARISON SCHEDULE

MANUFACTURER	RHEEM MANUFACTURING COMPANY	
CONDITION	EXISTING	NEW
MODEL	RJNL-A060JK	RHPXZR060AJT051AA
DIMENSIONS (LxWxH) - IN	75 x 47 x 35	46 x 55 x 40
UNIT WEIGHT - LBS	565	676
CURB WEIGHT - LBS	120	①
TOTAL WEIGHT - LBS.	685	676
<div>○ REMARKS</div> <div>1- CURB WEIGHT IS INCLUDED IN TOTAL WEIGHT.</div>		



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FILLMORE HIGH
SCHOOL -
MODERNIZATION
FILLMORE
UNIFIED SCHOOL
DISTRICT
555 CENTRAL AVE.
FILLMORE, CA 93015

ISSUED FOR: 01/26/2021
DSA PLAN CHECK 04/23/2021
DSA BACK CHECK 04/23/2021
ADDENDUM 03 - MECHANICAL UNIT REPLACEMENT 08/25/2023

REVISIONS:

DEPARTMENT OF THE STATE ARCHITECT

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AC.....FLS.....SS.....
DATE:.....

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REGISTRATION/SIGNATURE:



SHEET TITLE:

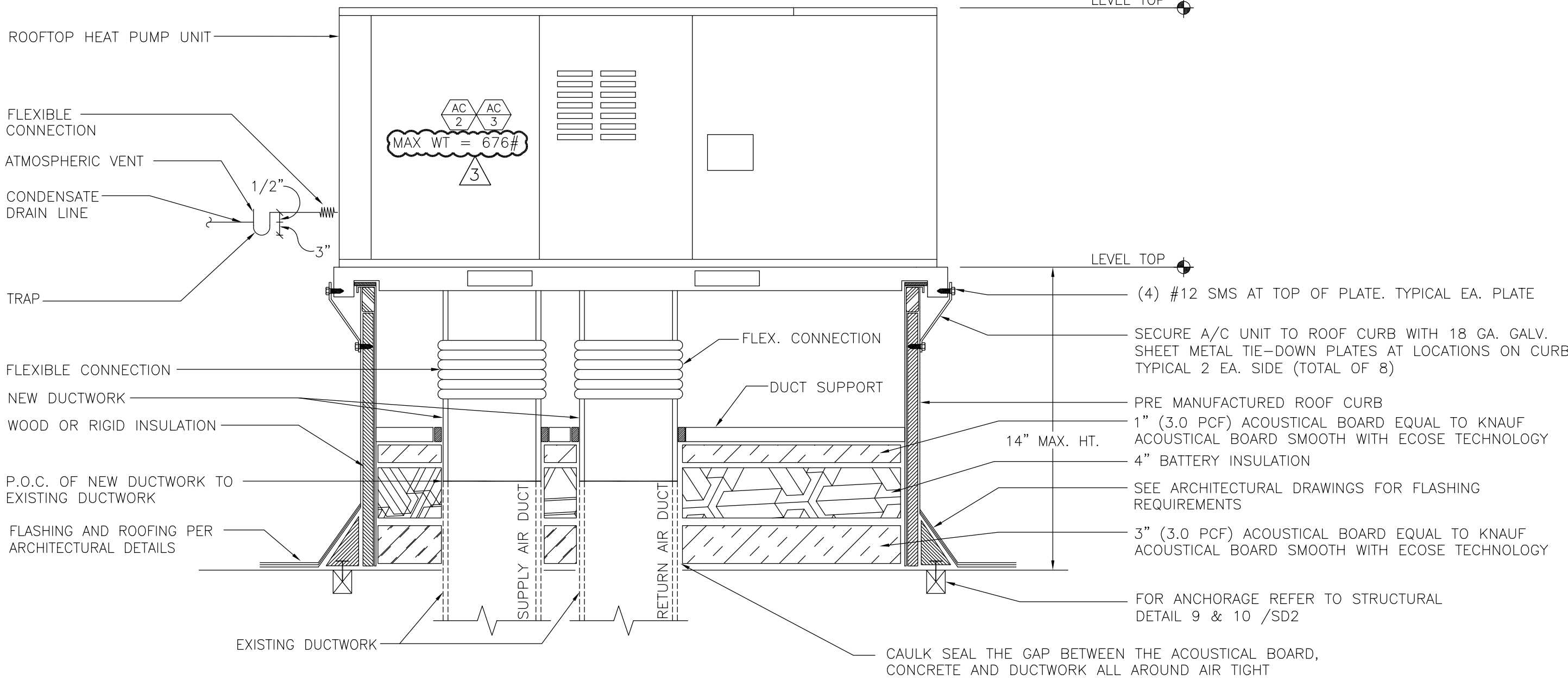
MECHANICAL
SCHEDULES

SHEET NUMBER:

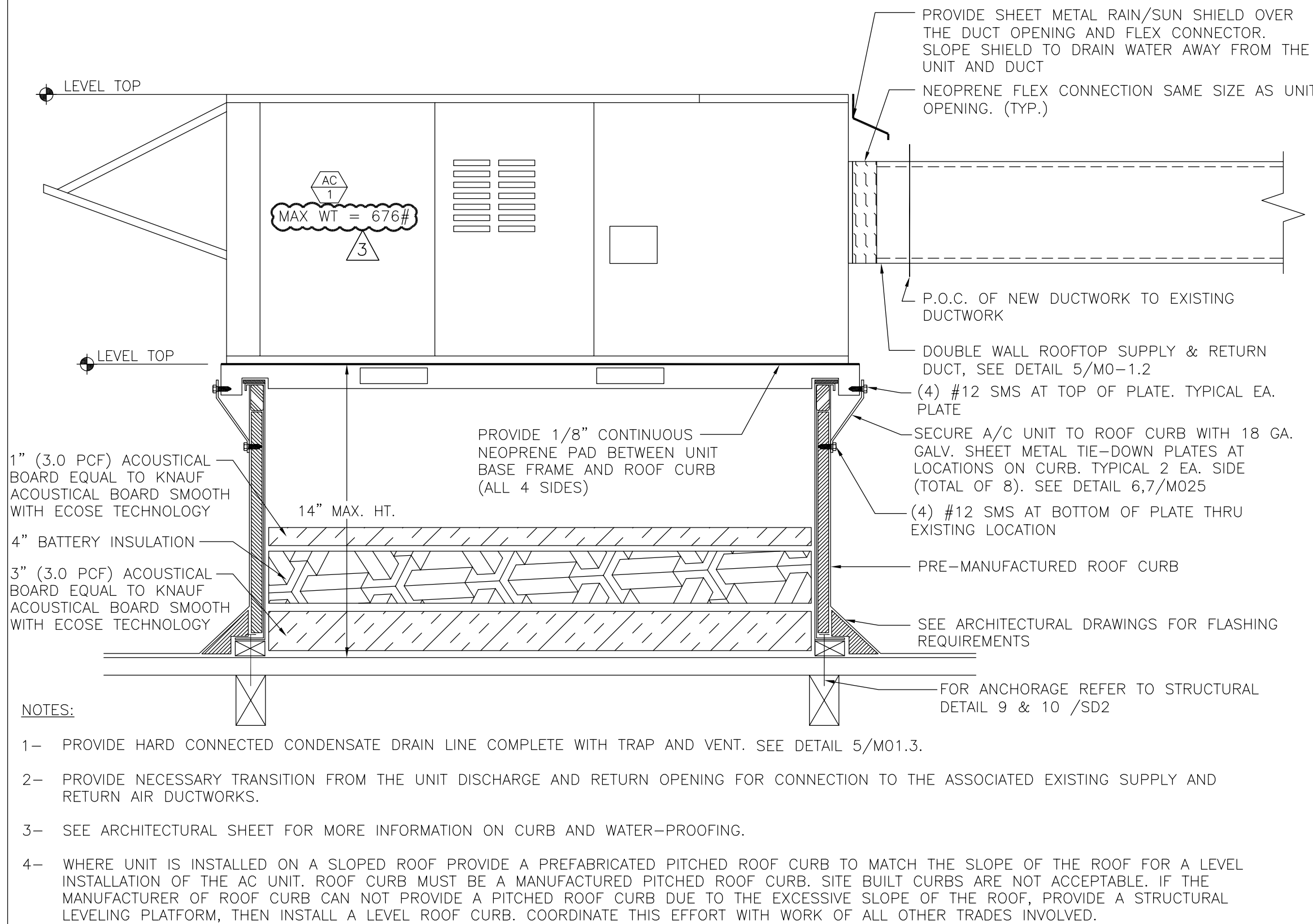
M0-1.1

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- NOTES:
- 1- PROVIDE FIRE MARSHAL APPROVED DUCT SMOKE DETECTOR FOR AIR MOVING SYSTEM SUPPLYING IN EXCESS OF 2000 CFM FOR AUTOMATIC SHUT OFF. IF BUILDING IS SERVED BY TOTAL COVERAGE SMOKE-DETECTION SYSTEM, AUTOMATIC UNIT SHUT OFF CAN BE ACCOMPLISH BY INTERCONNECTION TO SUCH SYSTEM. REFER TO FIRE ALARM DRAWINGS FOR ADDITIONAL INFORMATION.
 - 2- PROVIDE NECESSARY TRANSITION FROM THE UNIT DISCHARGE AND RETURN OPENING TO THE ASSOCIATED SUPPLY AND RETURN AIR DUCTWORKS.
 - 3- SEE ARCHITECTURAL SHEET FOR MORE INFORMATION ON CURB AND WATER-PROOFING.
 - 4- WHERE UNIT IS INSTALLED ON A SLOPED ROOF PROVIDE A PREFABRICATED PITCHED ROOF CURB TO MATCH THE SLOPE OF THE ROOF FOR A LEVEL INSTALLATION OF THE AC UNIT. ROOF CURB MUST BE A MANUFACTURED PITCHED ROOF CURB. SITE BUILT CURBS ARE NOT ACCEPTABLE. IF THE MANUFACTURER OF ROOF CURB CAN NOT PROVIDE A PITCHED ROOF CURB DUE TO THE EXCESSIVE SLOPE OF THE ROOF, PROVIDE A STRUCTURAL LEVELING PLATFORM, THEN INSTALL A LEVEL ROOF CURB. COORDINATE THIS EFFORT WITH WORK OF ALL OTHER TRADES INVOLVED.

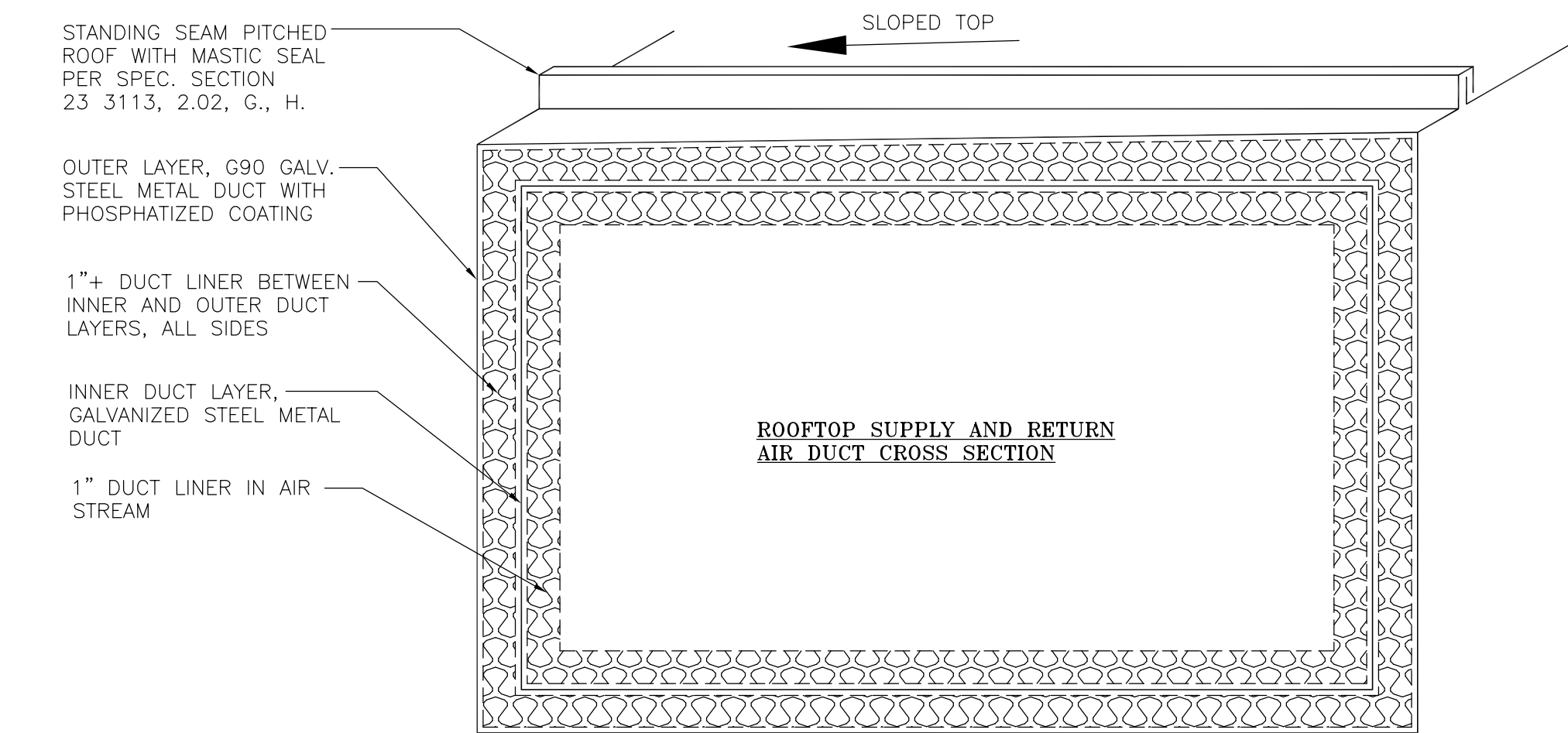


HEAT PUMP UNIT INSTALLATION DETAIL (DOWN DISCHARGE)

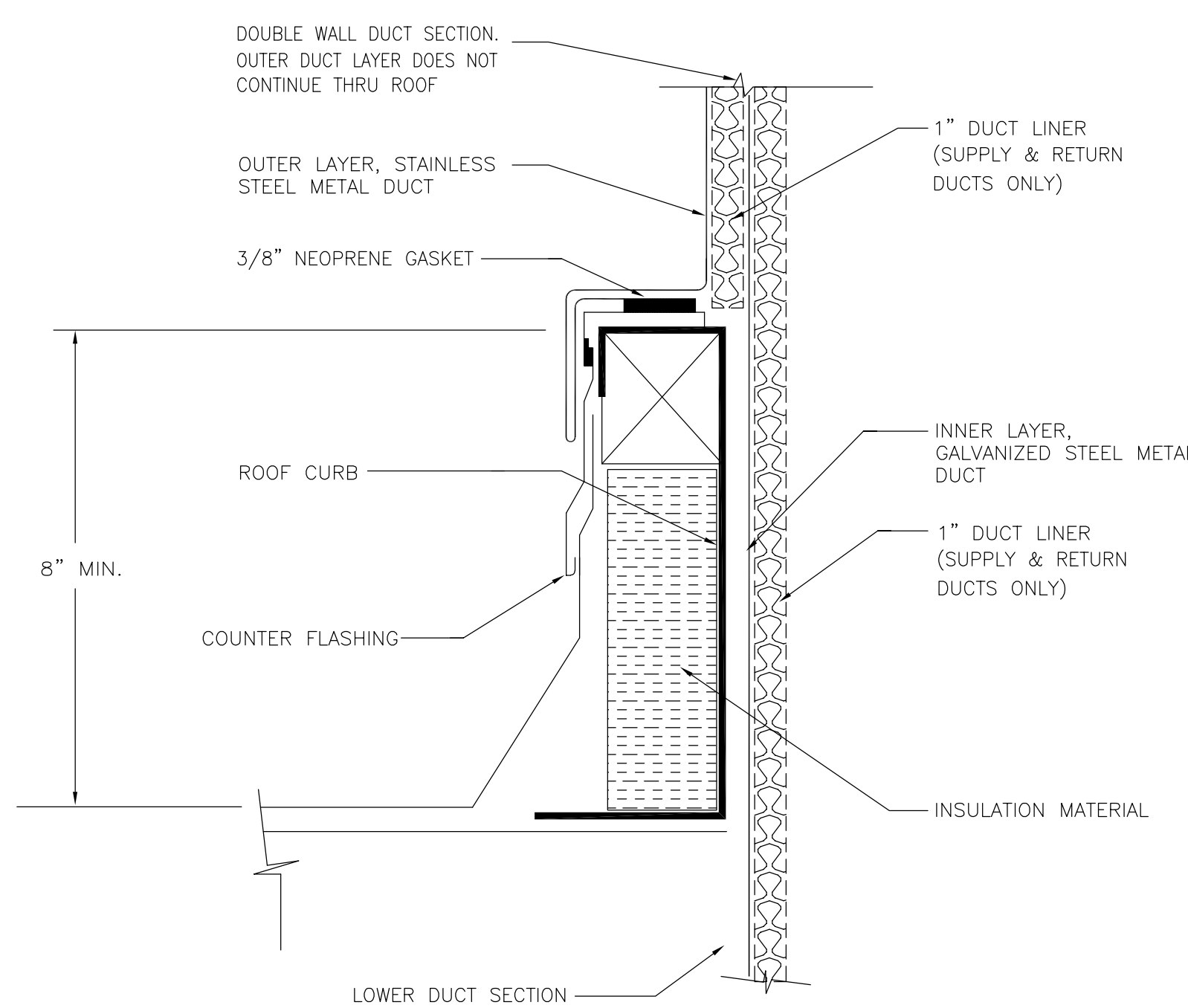
2
NOT TO SCALE

HEAT PUMP (SIDEWALL DISCHARGE) - ROOF MOUNTED DETAIL

3
NOT TO SCALE



- IMPORTANT NOTES:
- 1- ENTIRE RUN OF ROOFTOP SUPPLY AND RETURN AIR DUCTWORK SHALL BE DOUBLE WALL CONSTRUCTION AS SHOWN ON THIS DETAIL.
 - 2- SUPPLY AND RETURN AIR ROOFTOP DUCTWORK SHALL HAVE A STANDING SEAM ROOF SYSTEM AND PROVIDED WITH MASTIC MATERIAL TO PROVIDE SLOPE AND PROTECTION FROM STANDING WATER.
 - 3- COMBINED INSULATION R VALUE OF THE DUCT LINERS SHALL BE EQUAL TO OR EXCEED R 8.0.
 - 4- PROVIDE STANDING SEAM PITCHED ROOF OVER THE HORIZONTAL RUN OF THE ROOFTOP DUCTWORK. PITCHED POCKETS ARE NOT ALLOWED. CONSTRUCT DUCTWORK SUCH THAT POSITIVE DRAINAGE FROM THE TOP OF THE DUCTWORK IS PROVIDED AND THE DUCTWORK JOINTS DO NOT IMPEDE THE WATER RUN-OFF.
 - 5- AVOID WATER RUN-OFF FROM ONE DUCT TO TOP OF OTHER DUCTWORK OR EQUIPMENT.
 - 6- ALL DUCTWORK SHALL BE TESTED FOR AIR LEAKAGE BASED ON THE REQUIREMENTS NOTED IN SPECIFICATION.
 - 7- CONSTRUCT DOUBLE WALL DUCTWORK PER LATEST EDITION OF SMACNA "HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE" CHAPTER 8 "DOUBLE WALL DUCT CONSTRUCTION".
 - 8- DUCT SILENCER SHALL ALSO BE CONSTRUCTED AS DOUBLE WALL IN ORDER TO PROVIDE SMOOTH CONNECTION TO ADJOINING DUCTWORK, AND COMPLY WITH R-8 INSULATION REQUIREMENT.



- NOTE:
- SEE ARCHITECTURAL DRAWINGS FOR MORE INFORMATION ON CURB AND WATER-PROOFING.

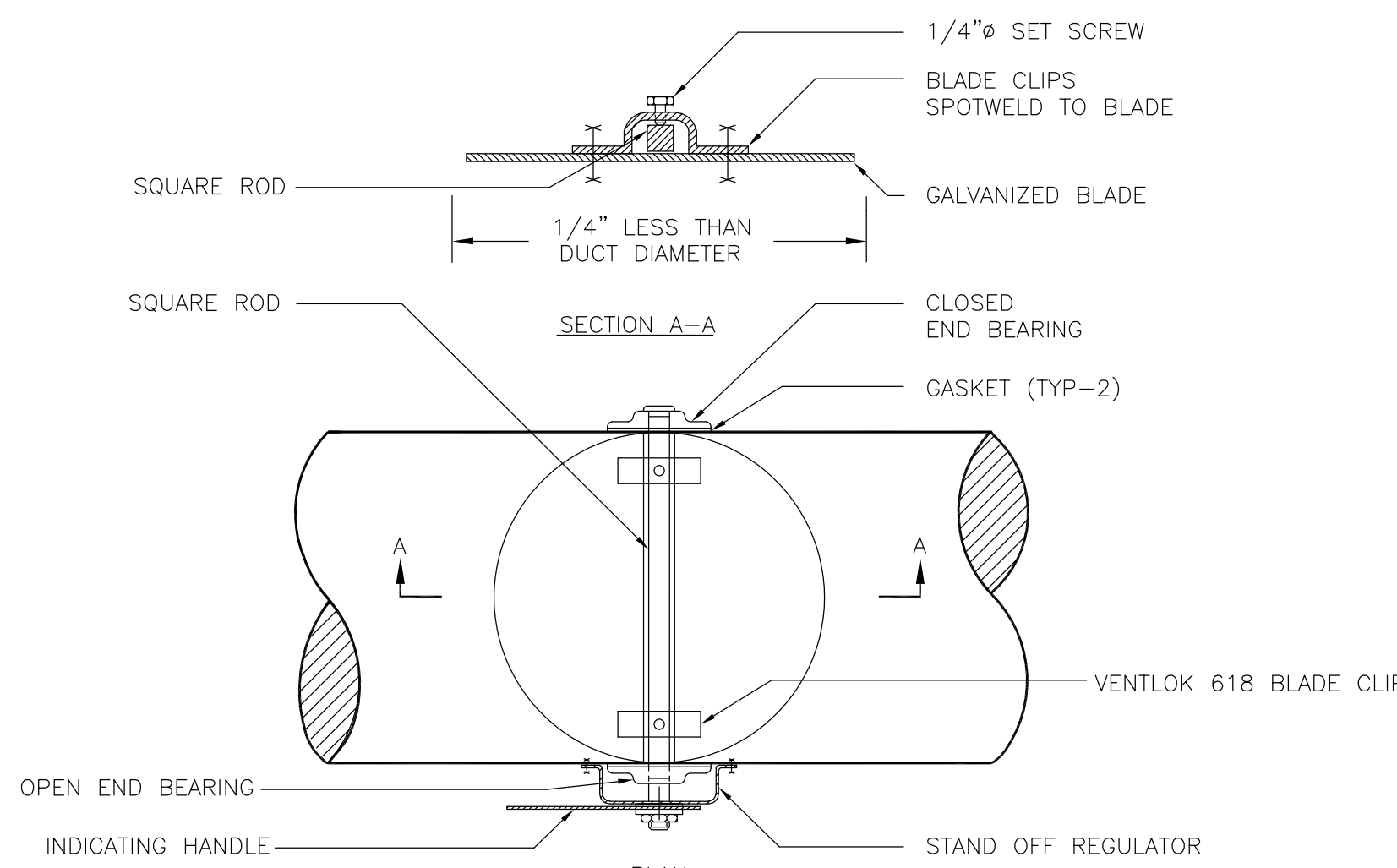
DOUBLE WALL ROOFTOP DUCT CONSTRUCTION AND ROOF PENETRATION DETAIL

5
NOT TO SCALE

CONCEALED RECTANGULAR DUCTWORK - UP TO 40" WIDE DETAIL

6
NOT TO SCALE

DIAMETER	4"-20"	22"-30"	32"-40"	
FRAME	20 GA.	20 GA.	20 GA.	GALV. STEEL
BLADES	16 GA.	16 GA.	10 GA.	GALV. STEEL
AXLES	3/8" Ø	1/2" Ø	3/4" Ø	FULL LENGTH PLATED STEEL AXLE
REGULATOR	VENTLOK 635	VENTLOK 555	VENTLOK 560	FOR NON-INSULATED DUCT
REGULATOR W/ INSUL.	VENTLOK 639	VENTLOK 555	VENTLOK 560	2" STANDOFF BRACKET
END BEARING	HIVEL 609	HIVEL 609	STEEL SLEEVE	CLOSED END
END BEARING	VENTLOK 607	VENTLOK 607	STEEL SLEEVE	OPEN END



- NOTE:
1. THE MORE RESTRICTIVE SPACING SHALL BE PROVIDED WHERE REQUIRED PER THE OPM BASIS OF DESIGN.

ROUND DUCTWORK - MAX. 24" DIA. DETAIL

7
NOT TO SCALE

RECTANGULAR TO ROUND BRANCH TAP DETAIL

8
NOT TO SCALE

ROUND VOLUME DAMPER DETAIL

9
NOT TO SCALE



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APP: 03-121233 INC: 0
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SS ☒ FLS ☒ ACS ☒
DATE: 10/23/2023

FILLMORE HIGH SCHOOL - MODERNIZATION
FILLMORE UNIFIED SCHOOL DISTRICT
555 CENTRAL AVE.
FILLMORE, CA 93015

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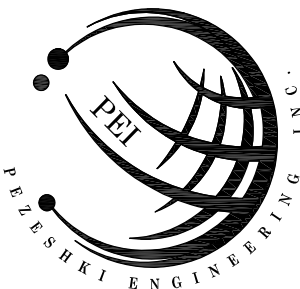
MECHANICAL DETAILS

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M0-1.2

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SHEET TITLE: **LIBRARY
MECHANICAL
DEMOLITION
ROOF PLAN**

SHEET NUMBER:

MB1-1.2

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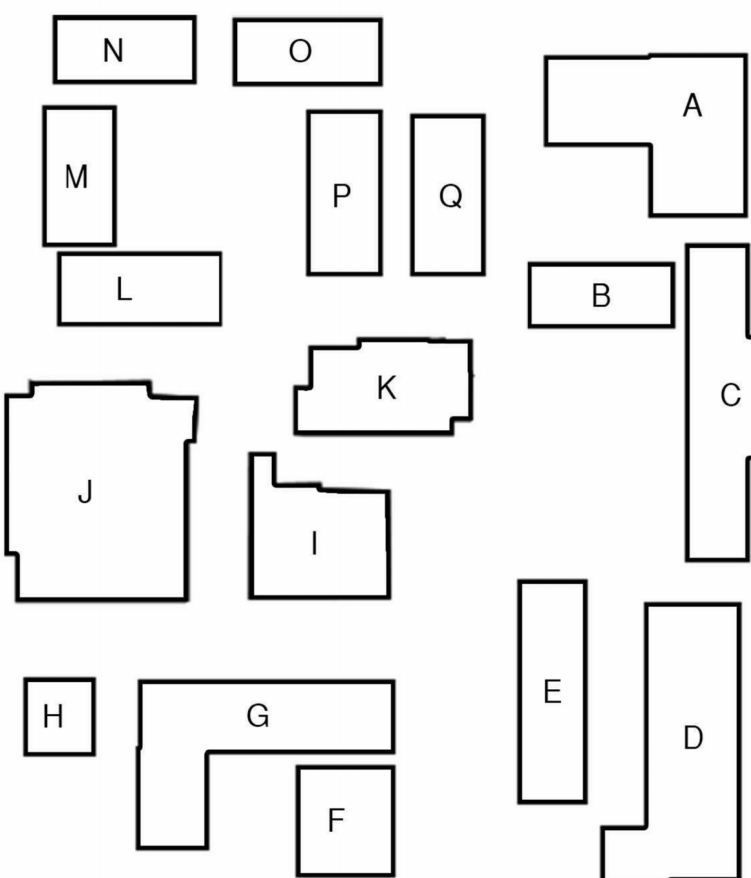
LIBRARY - MECHANICAL DEMOLITION ROOF PLAN

1
1/4" = 1'-0"

KEY PLAN

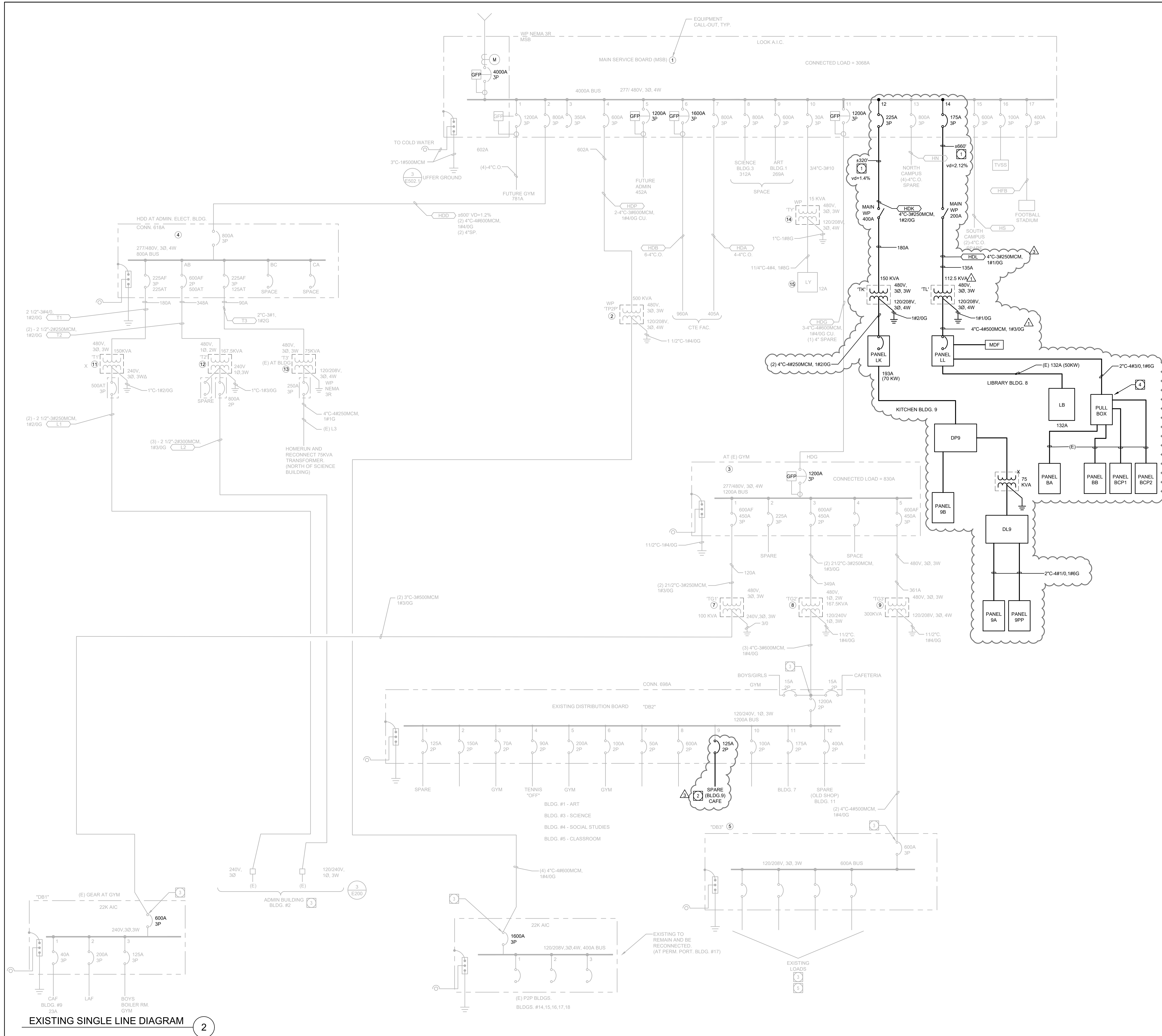
BUILDING DESIGNATION

A. ARTS
B. CLASSROOM
C. ADMINISTRATION
D. SCIENCE
E. SOCIAL STUDIES
F. METAL SHOP
G. PRINT AND DRAFTING
H. GIRLS SHOWER/LOCKER
I. CAFETERIA
J. GYMNASIUM
K. LIBRARY
L. CLASSROOM
M. CLASSROOM
N. CLASSROOM
O. CLASSROOM
P. CLASSROOM
Q. DRAMA AND MUSIC



DEMOLITION NOTES

- 1- REMOVE EXISTING ROOF MOUNTED PACKAGE HEAT PUMP, AND ASSOCIATED ROOF CURB IN ITS ENTIRETY. DISCONNECT ALL UTILITY CONNECTIONS AND DUCTWORK. MODIFY EXISTING DUCTWORK FOR INSTALLATION OF NEW HEAT PUMP. PREPARE AREA OF REMOVAL TO RECEIVE NEW UNIT. PROVIDE DUST CLEANING FOR EXISTING DUCTWORK. SEE RENOVATION ROOF PLAN FOR ADDITIONAL INFORMATION.
- 2- REMOVE EXISTING CONDENSATE DRAIN PIPING AND ASSOCIATED ROOF SUPPORTS IN ITS ENTIRETY. PREPARE AREA OF REMOVAL TO RECEIVE NEW PIPING. SEE RENOVATION ROOF PLAN FOR ADDITIONAL INFORMATION.
- 3- DISCONNECT EXISTING SUPPLY AND RETURN DUCTWORK FROM EXISTING UNIT. PROTECT DUCTWORK IN PLACE DURING CONSTRUCTION.
- 4- EXISTING ROOFTOP SUPPLY AND RETURN DUCTWORK TO REMAIN IN ITS ENTIRETY. PROTECT IN PLACE DURING CONSTRUCTION. PROVIDE DUST CLEANING FOR EXISTING DUCTWORK. PREPARE DUCTWORK TO CONNECT TO NEW PROPOSED HEAT PUMP UNIT. SEE RENOVATION ROOF PLAN FOR ADDITIONAL INFORMATION.
- 5- EXISTING ROOF RECEPTOR TO REMAIN. PROTECT IN PLACE DURING CONSTRUCTION.
- 6- REMOVE EXISTING EXHAUST FAN AND ASSOCIATED ROOF CURB IN ITS ENTIRETY. DISCONNECT ALL UTILITY CONNECTIONS AND DUCTWORK. PREPARE AREA OF REMOVAL AND MODIFY EXISTING DUCTWORK TO RECEIVE NEW UNIT. SEE RENOVATION ROOF PLAN FOR ADDITIONAL INFORMATION.



SINGLE LINE NOTES

- ALL EQUIPMENT TO BE SQUARE D OR EQUAL, BY SIEMENS, CUTLER-HAMMER, G.E., OR RSC-SIERRA.
- ALL ELECTRICAL EQUIPMENT SHALL BE PROVIDED WITH SPECIFIED AND APPROPRIATE UL LISTING BASED ON THE ENVIRONMENT IN WHICH THE EQUIPMENT IS TO BE MOUNTED.
- ALL ELECTRICAL EQUIPMENT SHALL BE PROVIDED WITH AND BRACED FOR REQUIRED FAULT CURRENT RINGS BASED ON THEIR VOLTAGE AND LOCATION WITHIN THE SYSTEM. SHOP DRAWINGS TO INCLUDE FAULT CURRENT RATINGS FOR ALL ELECTRICAL EQUIPMENT. NO SERIES RATING SHALL BE ALLOWED.
- ALL TERMINATIONS AND ENCLOSURES SHALL BE RATED FOR USE WITH 75 DEGREES CELSIUS CONDUCTORS.
- ALL SERVICE ENTRANCE EQUIPMENT/DISTRIBUTION BOARDS/SWITCHBOARDS RATED AT 600A OR GREATER SHALL BE PROVIDED WITH A SOLID STATE MAIN OVER-CURRENT PROTECTIVE DEVICE AND BISSING RATED AT 100% OPERATION.
- ALL SWITCH/DISTRIBUTION BOARDS SHALL BE PROVIDED WITH:
 - COPPER BUSSING WITH RECTANGULAR CROSS SECTION. HORIZONTAL AND VERTICAL BUSSING SHALL BE FULL LENGTH AND HAVE PROVISIONS FOR FUTURE EXTENSIONS. ALL BUSSING SHALL HAVE A MINIMUM WITHSTAND RATING EQUAL TO AVAILABLE FAULT CURRENT INDICATED ON THE AIC CALCULATION. ALL VERTICAL AND HORIZONTAL BUSSING SHALL BE RATED AT FULL CAPACITY IN ALL SWITCHBOARD AND DISTRIBUTION BOARD ASSEMBLIES. PROVIDE 100% NEUTRAL BUSSING MINIMUM - UNLESS OTHERWISE NOTED. PROVIDE FULL LENGTH GROUND BUSS, AND WHERE INDICATED ON PLANS, ISOLATED GROUND BUSSING. PROVIDE REAR WIRE WAY IN ALL SWITCHBOARD SECTIONS - UNLESS OTHERWISE NOTED OR REQUIRED.
 - LUSS SHALL BE SUITABLE FOR USE WITH BOTH COPPER AND ALUMINUM CONDUCTORS AND 75 DEGREE CELSIUS AMPACITY CONDUCTORS.
 - PERMANENT PLACARD(S) MARKED PER THE SPECIFICATIONS AND PER NEC (EC - WHERE ADOPTED SECTIONS 225.37, 230.2E), 690.56(B) & (C), 692.56, 700.8, 701.9, AND 702.8 DENOTING PRESENCE OF ADDITIONAL SERVICES, PHOTOVOLTAIC SYSTEMS, FUEL CELLS, EMERGENCY OR STAND-BY POWER SOURCES, ETC. AS APPLICABLE.
- CONTRACTOR SHALL PROVIDE SWITCHBOARD SHOP DRAWINGS TO SERVING UTILITY COMPANY PRIOR TO FABRICATION OF EQUIPMENT. CONTRACTOR SHALL SECURE CONFIRMATION PROPOSED SWITCHBOARD COMPLIES WITH ELECTRICAL UTILITY COMPANY REGULATIONS.
- ELECTRICAL EQUIPMENT SUBMITTALS SHALL BE ACCOMPANIED BY A 1/4" x 1/4" SCALED DRAWING WHICH REFERENCES ALL ELECTRICAL EQUIPMENT ROOMS AND EQUIPMENT. DRAWING SHALL CLEARLY IDENTIFY ADEQUATE SPACE IS PROVIDED IN ELECTRICAL ROOMS TO ACCOMMODATE THE INSTALLATION OF ELECTRICAL EQUIPMENT WHILE MAINTAINING ALL REQUIRED CODE CLEARANCES. ALL SUBMITTALS NOT ACCOMPANIED BY SCALED DRAWING WILL BE REJECTED AS INCOMPLETE.
- EC SHALL CONDUCT, WITH ASSISTANCE OF SWITCHGEAR MANUFACTURER, AN ELECTRICAL HAZARD ANALYSIS CONSISTING OF AN ARC FLASH, SHORT CIRCUIT, AND COORDINATION STUDY TO DETERMINE APPROPRIATE LEVELS OF PERSONNEL PROTECTIVE EQUIPMENT (PPE) AS REQUIRED BY NFPA 70E AND IEEE STD 1584, AND TO ENSURE PROPER COORDINATION (INCLUDING GROUND FAULT COORDINATION) EXISTS BETWEEN ALL OVER-CURRENT PROTECTIVE DEVICES SHOWN ON SINGLE-LINE DIAGRAM. ADDITIONALLY:
 - STUDY SHALL INCLUDE ALL PORTIONS OF ELECTRICAL SINGLE-LINE DIAGRAM, NORMAL SYSTEM CONNECTIONS AND THOSE THAT RESULT IN MAXIMUM FAULT CONDITION SHALL BE ADEQUATELY COVERED IN THE STUDY. PERFORM STUDY WITH THE AID OF A COMPUTER PROGRAM, SKM CAPTOR, OR EQUAL. STUDY SHALL IDENTIFY SELECTIVE COORDINATION SUCH THAT DEVICE CLOSEST TO FAULT WILL TRIP FIRST. GROUND FAULT PORTION OF THE STUDY SHALL DEMONSTRATE COORDINATION OF MAIN BREAKER AND ANY FEEDER GROUND FAULT DEVICES WITH DOWNSTREAM CIRCUIT BREAKERS 30A AND LESS.
 - EC SHALL BE RESPONSIBLE TO RECOMMEND SETTINGS OF ALL DEVICES AND TO INCLUDE GROUND FAULT SETTINGS NECESSARY TO ACHIEVE SYSTEM COORDINATION. CONTRACTOR SHALL FIELD ADJUST DEVICES ACCORDINGLY UTILIZING A QUALIFIED MANUFACTURERS REPRESENTATIVE.
 - DURING THE CONSTRUCTION PHASE OF THE PROJECT ALL GROUND FAULT RELAYS SHALL BE SET AT SHORTEST AVAILABLE TIME DELAY.
 - RESULT OF COORDINATION STUDY SHALL BE SUBMITTED AS PART OF OVERALL SWITCHGEAR SUBMITTAL AND SHALL INCLUDE PROTECTIVE DEVICE TIME VERSUS CURRENT COORDINATION CURVES, GROUPING APPROPRIATE DEVICES TOGETHER, TABULATIONS OF RELAY AND CIRCUIT BREAKER TRIP SETTINGS, FUSE SELECTION, AND COMMENTARY REGARDING SAME.
 - A GROUND FAULT SYSTEM TEST SHALL BE CONDUCTED BY AN INDEPENDENT TESTING AGENCY PER NEC (EC - WHERE ADOPTED) 230.95(C). GROUND FAULT SYSTEM TEST SHALL BE PERFORMED IN PRESENCE OF LOCAL AHI. VERIFICATION OF DEVICE SETTINGS PER THE COORDINATION STUDY SHALL BE PERFORMED BY SAME INDEPENDENT TESTING AGENCY. GROUND FAULT TEST RESULTS SHALL BE DELIVERED TO ENGINEER OF RECORD.
 - PERFORM ARC FLASH ANALYSIS TO DETERMINE FLASH BOUNDARY, FLASH HAZARD CATEGORY, PPE REQUIREMENTS, AND MINIMUM ARC RATING (CAL/SQUARE CM). ABOVE INFORMATION SHALL BE INDICATED AT EACH ARC FLASH SOURCE ON A NEC (EC WHERE ADOPTED) COMPLIANT ARC FLASH HAZARD LABEL(S) AS MANUFACTURED BY BRADY.
- GROUND ALL ELECTRICAL EQUIPMENT, BRANCH CIRCUITS, FEEDERS, PANEL AND DISTRIBUTION BOARDS, ELECTRICAL SERVICES, ETC. PER ADOPTED NEC ARTICLE 250.
- FEEDER SPECIFICATIONS ARE BASED ON USE OF COPPER CONDUCTORS AND SHALL BE PROVIDED WITH A CODE SIZED COPPER GROUNDING CONDUCTOR.
- ALL MAIN SWITCHBOARDS, PANELBOARDS, DISTRIBUTION BOARDS, ETC SHALL BE PROVIDED WITH A COPPER BUSS RATED AT SPECIFIED AMPACITY. ALL SWITCHBOARDS AND DISTRIBUTION BOARDS SHALL ALIGN IN FRONT. ALL PANELBOARDS SHALL BE PROVIDED WITH BOLT-ON BREAKERS, DEADFRONT COVERS WITH LOCKABLE DOORS, FACTORY INSTALLED MAIN CIRCUIT BREAKERS (IF APPLICABLE), AND PANEL DIRECTORY PER THESE DOCUMENTS.
- ALL ELECTRICAL EQUIPMENT (I.E. SWITCHGEAR, TRANSFORMERS, DISTRIBUTION BOARDS, PANELBOARDS, DISCONNECT SWITCHES, ETC.) SHALL BE PROVIDED WITH A PHENOLIC NAMEPLATE WITH ENGRAVED WHITE LETTERS REFERENCING FOLLOWING INFORMATION:

LINE 1 - "EQUIPMENT NAME"
LINE 2 - "FED FROM"
LINE 3 - "VOLTAGE, AMPACITY, PHASE"
LINE 4 - "DATE INSTALLED"

NAMEPLATES SHALL BE SIZED BASED ON FOLLOWING:

SWITCHBOARDS, DISTRIBUTION BOARDS, TRANSFORMERS:
* LINE 1 = 1/2" LETTERS, LINES 2, 3, & 4 = 1/4" LETTERS

PANELBOARDS, MOTOR CONTROL CENTERS, DISCONNECTS, STARTERS, ETC.:
* LINE 1 = 3/8" LETTERS, LINES 2, 3, & 4 = 1/4" LETTERSNAMEPLATE COLORS SHALL BE AS FOLLOWS:

BLACK = NORMAL POWER
RED = LIFE SAFETY/EMERGENCY POWER
BLUE = STANDBY POWER
GREEN = INVERTER POWER

ALL NAMEPLATES SHALL BE FASTENED WITH A MINIMUM OF TWO (2) MACHINE SCREWS. NO SELF-ADHESIVE NAMEPLATES ARE ALLOWED.
- ELECTRICAL DESIGN COMPUTES VOLTAGE DROP BASED ON FEEDER LENGTHS REFERENCED ON SINGLE-LINE DIAGRAM. EC TO NOTIFY ENGINEER OF RECORD IN EVENT FIELD CONDITIONS CAUSE A SUBSTANTIAL INCREASE IN OVERALL FEEDER LENGTH.
- ANY FLOOR-STANDING ELECTRICAL EQUIPMENT (I.E. INVERTERS, DISTRIBUTION BOARDS, SWITCHBOARDS, ATS SWITCHES, MOTOR CONTROL CENTERS, TRANSFORMERS ETC.) ARE TO BE MOUNTED ON A MINIMUM 4" HIGH HOUSEKEEPING PAD WHICH EXTENDS 4" BEYOND EQUIPMENT IN ALL DIRECTIONS.
- ALL MOTOR RELATED CIRCUITS ARE TO BE PROVIDED WITH PROTECTIVE RELAYS FOR PHASE FAILURE AND UNDER-VOLTAGE.
- ELECTRICAL CONTRACTOR TO INCLUDE IN BID ALL ASSOCIATED COSTS FOR THIRD PARTY TESTING OF ELECTRICAL EQUIPMENT, GROUND FAULT, CONDUCTORS, ETC..
- ALL FEEDER DISTANCES REFERENCED ON DRAWINGS ARE FOR DESIGN PURPOSES ONLY. LENGTHS AS INDICATED ARE NOT TO BE UTILIZED IN MATERIAL TAKE-OFFS.

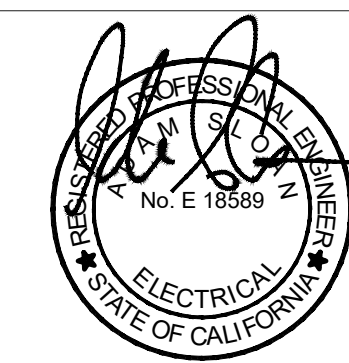
SINGLE LINE NOTES

- EXISTING MAIN SERVICE BOARD (MSB) LOCATED WEST OF GYMNASIUM. CONDUIT PATHWAYS ARE EXISTING OUTSIDE OF PROJECT LINE. DUCT BANK HOMERUN TO MSB. CONTRACTOR SHALL MANDEL AND SWAB CONDUITS AND PULL IN CONDUCTORS TO (MSB). MAIN CIRCUIT BREAKERS ARE EXISTING & LABELED IN MSB.
- EXISTING PANEL TO BE DISCONNECTED FROM OLD SYSTEM. LOAD TO BE RECONNECTED.
- EXISTING CIRCUIT BREAKER TO BE UTILIZED.
- PROVIDE 24" SQ. PULL BOX INTERCEPT SUB PANELS AND EXTEND/RECONNECT AS REQUIRED.

APPROVED
DIV. OF THE STATE ARCHITECT
APP: 03-121233 INC.: 0
REVIEWED FOR:
SS ☒ FLS ☒ ACS ☒
DATE: 10/23/2023



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DISTRICT
555 CENTRAL AVE.
FILLMORE, CA 93015

ISSUED FOR:
ADDENDUM 1 03/03/2023
ADDENDUM 03 08/25/2023

REVISIONS:

REGISTRATION/SIGNATURE:

SHEET TITLE:
SINGLE-LINE
DIAGRAM

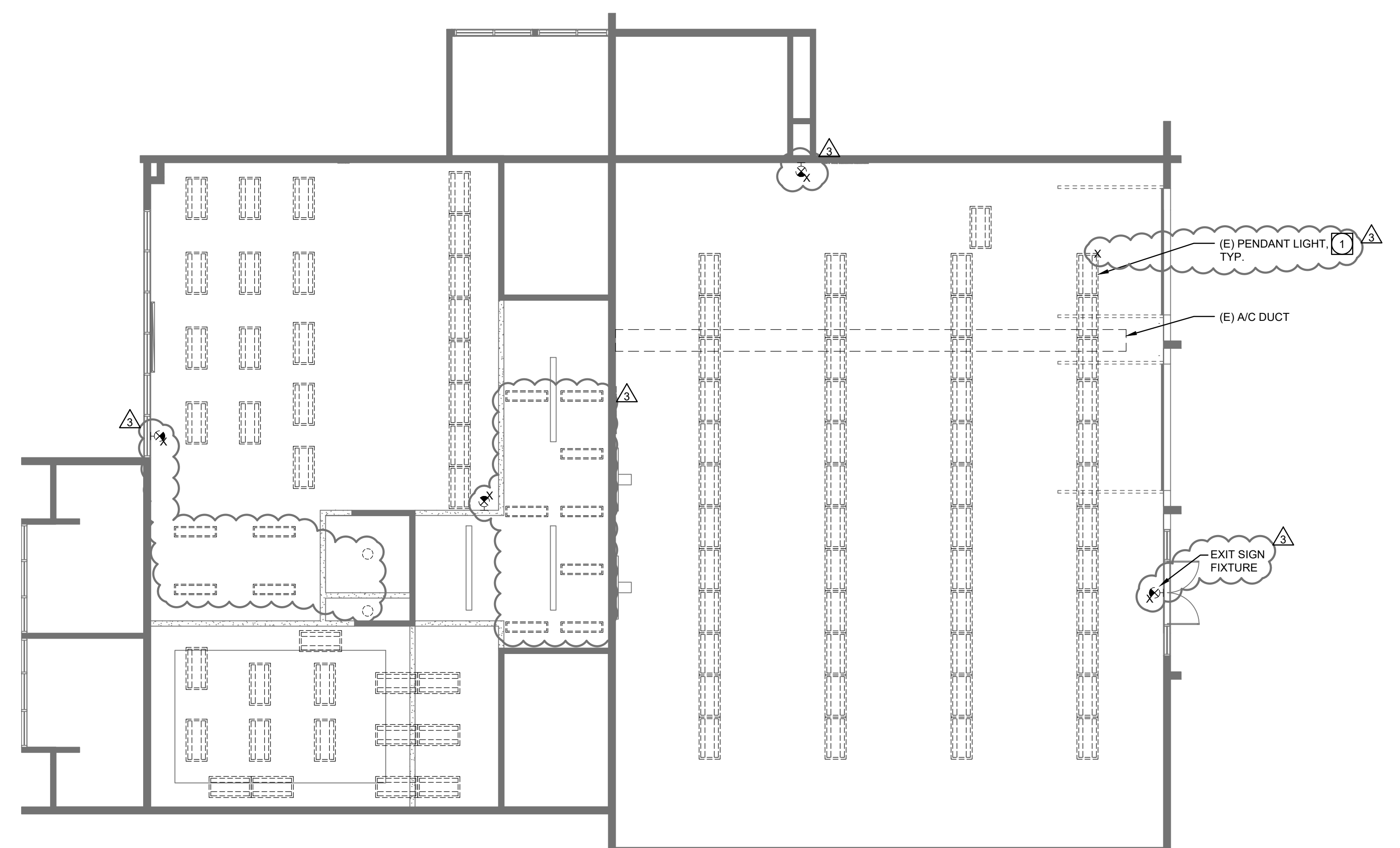
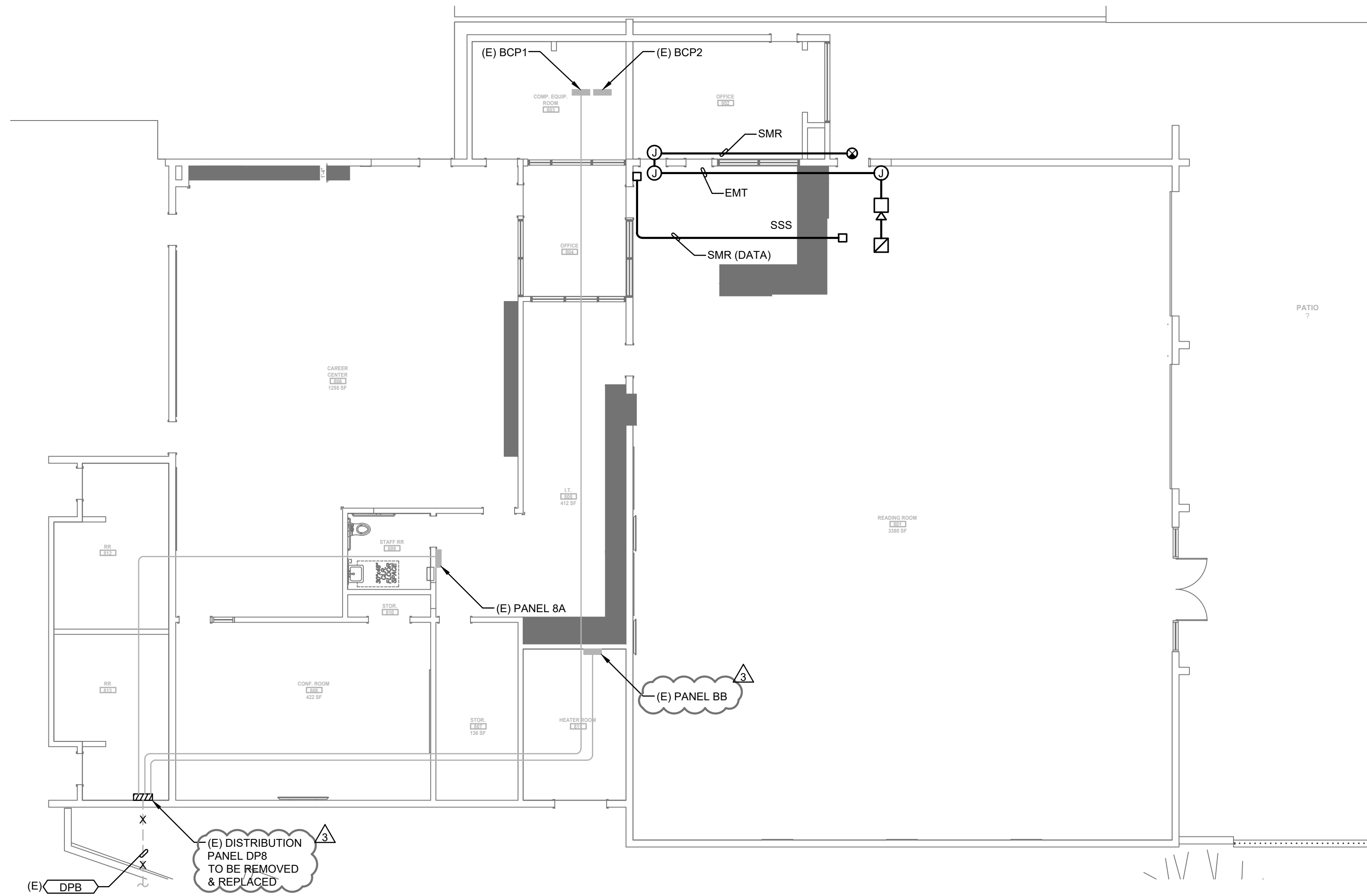
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E004

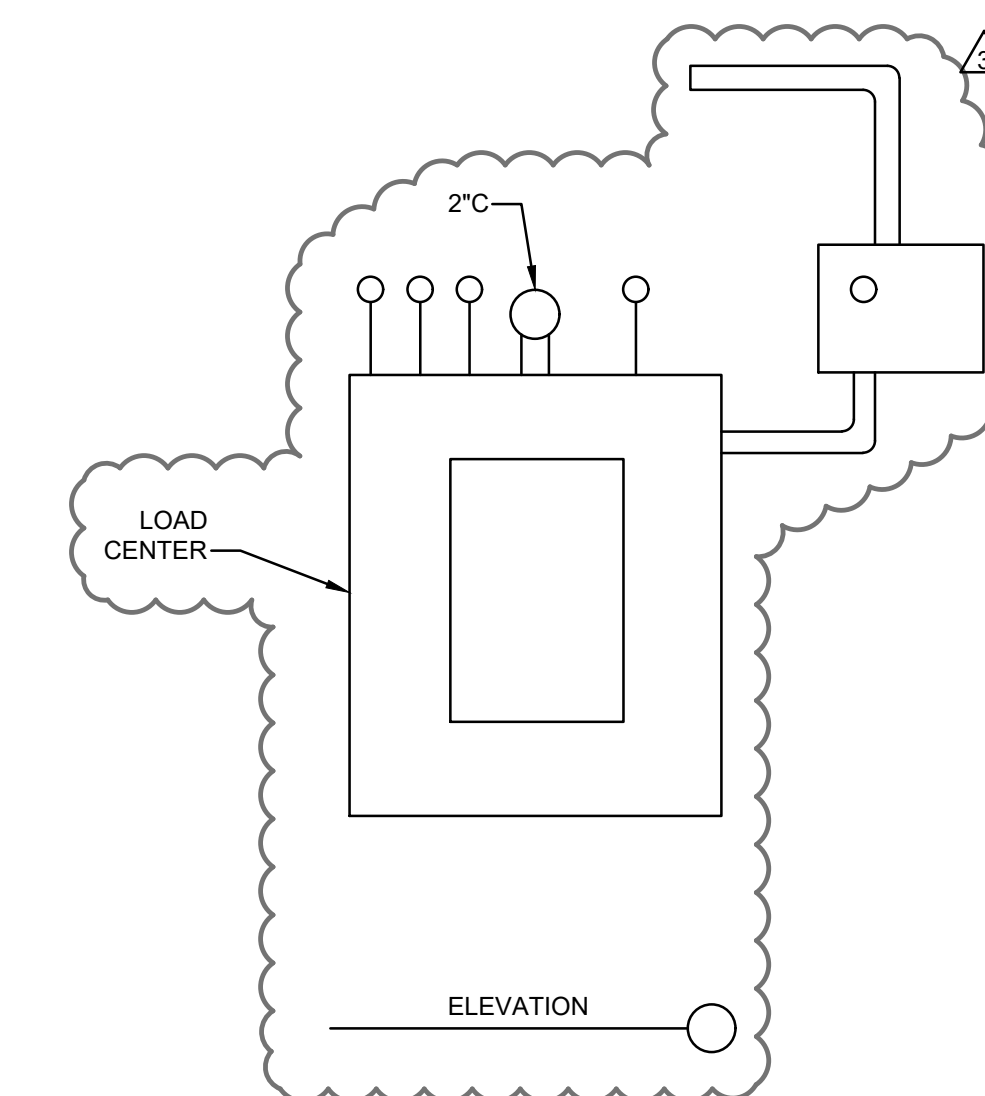
WD PROJ. # DRAWN BY: CHECKED: DATE

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SINGLE LINE DIAGRAM - MSB

1






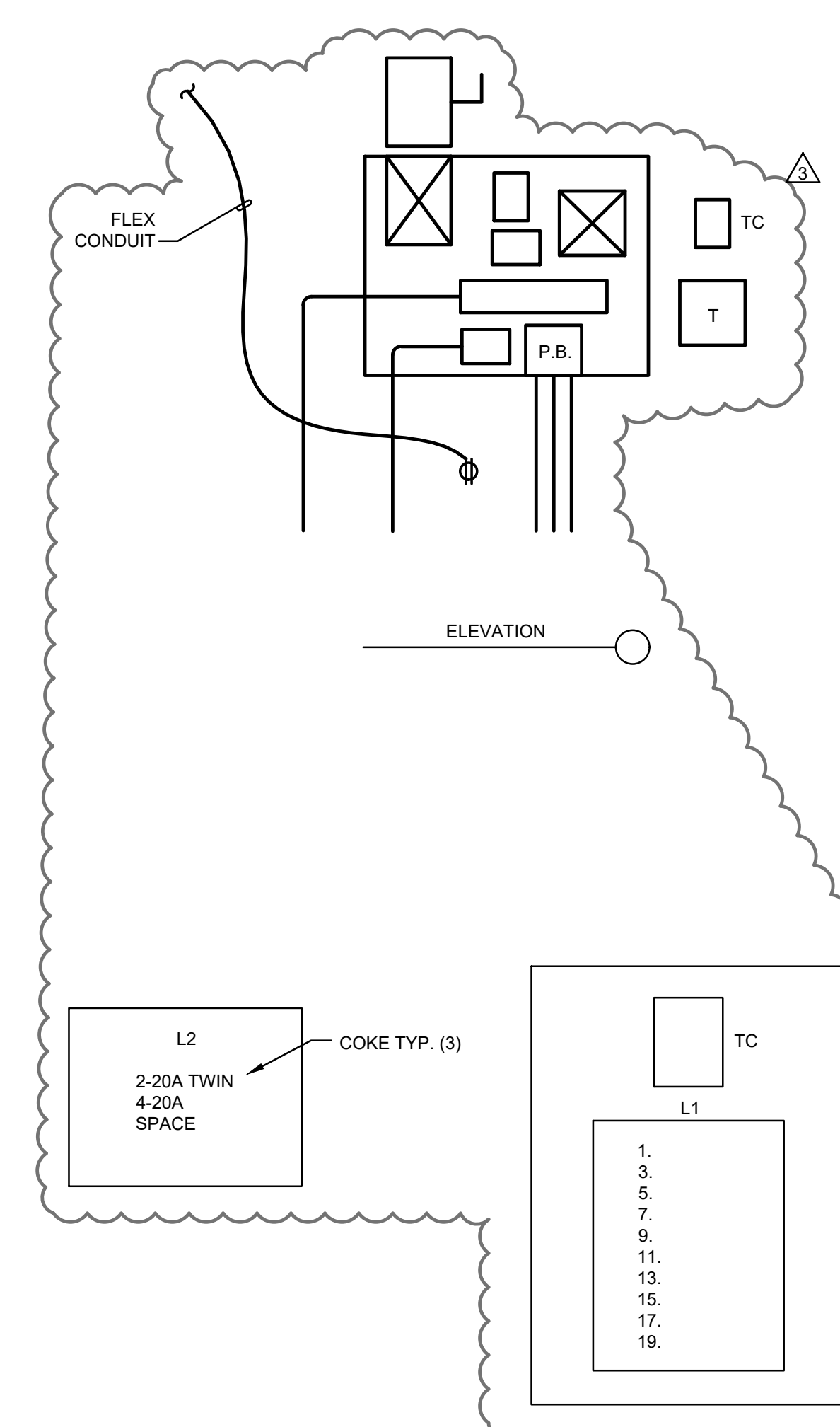
KEYNOTES

- | | |
|--------------------|-----------------------------|
| 1. COMPUTER OUTLET | 2. UPS |
| 3. | 4. COMPUTER IN MAIN LIBRARY |
| 5. | 6. |
| 7. WEST LIBRARY | 8. |
| 9. WEST LIBRARY | 10. |
| 11. WEST LIBRARY | 12. 2P COPIER |
| 13. CAREER CENT. | 14. |
| 15. COMPUTERS | 16. AC-(10) |
| 17. | 18. |
| 19. | 20. |
| 21. AC-1 (10) | 22. AC-3 (30) |
| 23. | 24. |
| 25. AC-2 (30) | 26. WIREMOLD |
| 27. | 28. WIREMOLD |
| 29. WIREMOLD | 30. |

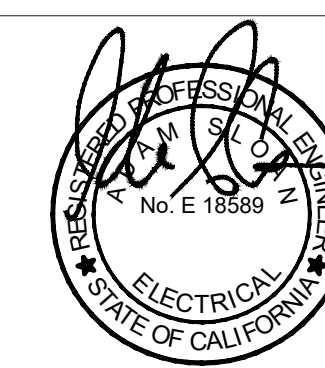
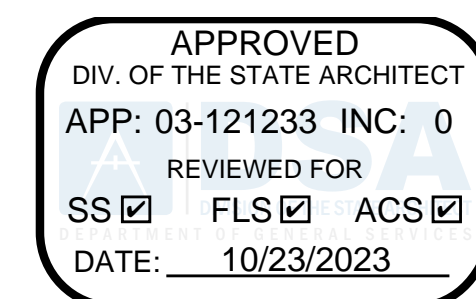
GENERAL NOTES

- 1 REMOVE, STORE & REINSTALL ALL CEILING MOUNTED DEVICE FOR NEW CEILING REPLACEMENT.
- 2 REMOVE COMPLETE, EXISTING LOADS TO BE RECONNECTED AS REQUIRED.

LEGEND



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION



**FILLMORE HIGH
SCHOOL -
MODERNIZATION
FILLMORE
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DISTRICT
555 CENTRAL AVE.
FILLMORE, CA 93015**

ISSUED FOR:	
DSA BACK CHECK	05/25/202

REVISIONS:

1	
2	
3	(E) ICE MAKER
4	09/07/202

REGISTRATION/SIGNATURE:

SHEET TITLE:
**(E) CONDITION CAFE
REFLECTED CEILING
FLOOR PLAN (BLDG 9**

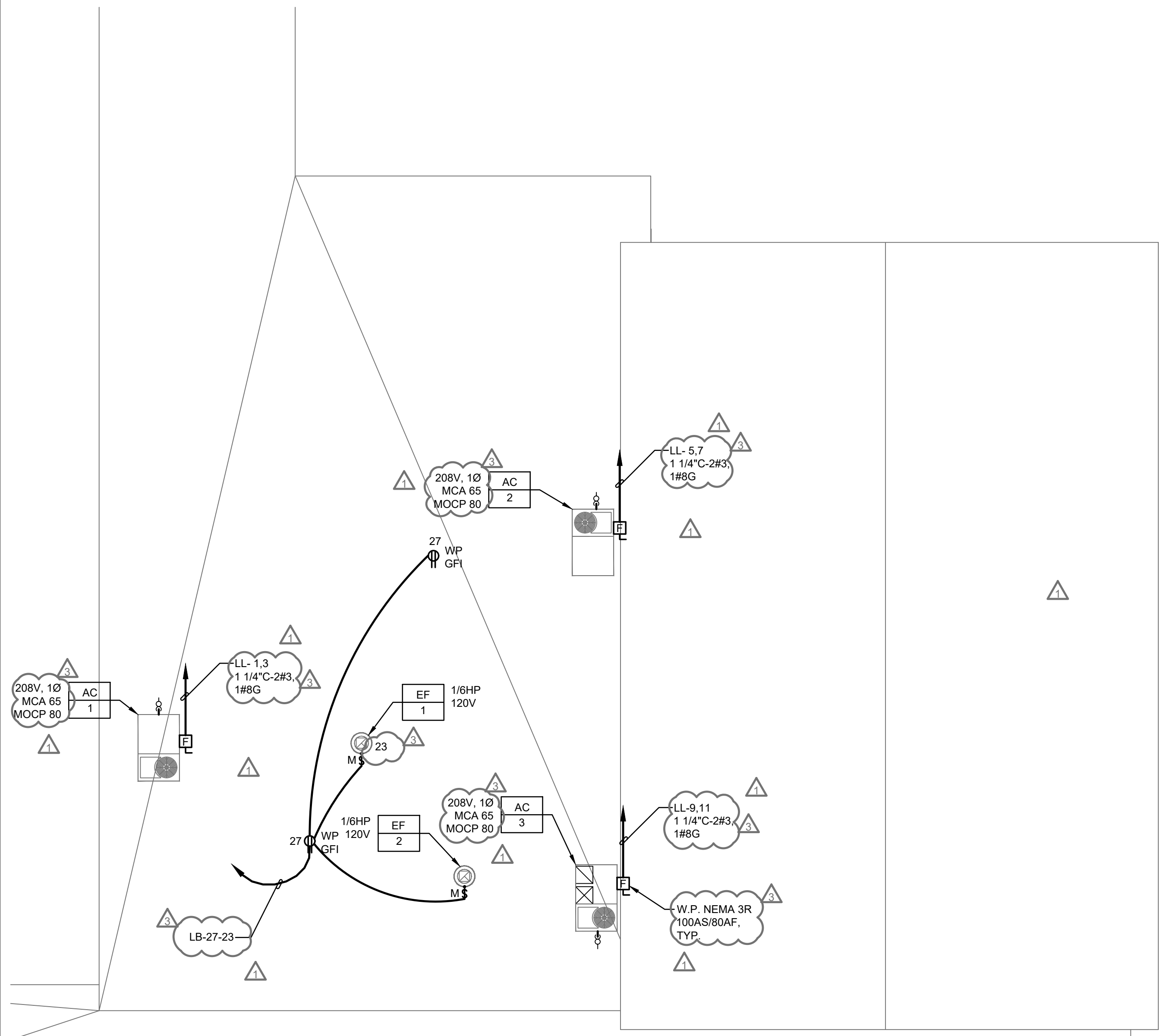
SHEET NUMBER:
ED102

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2023

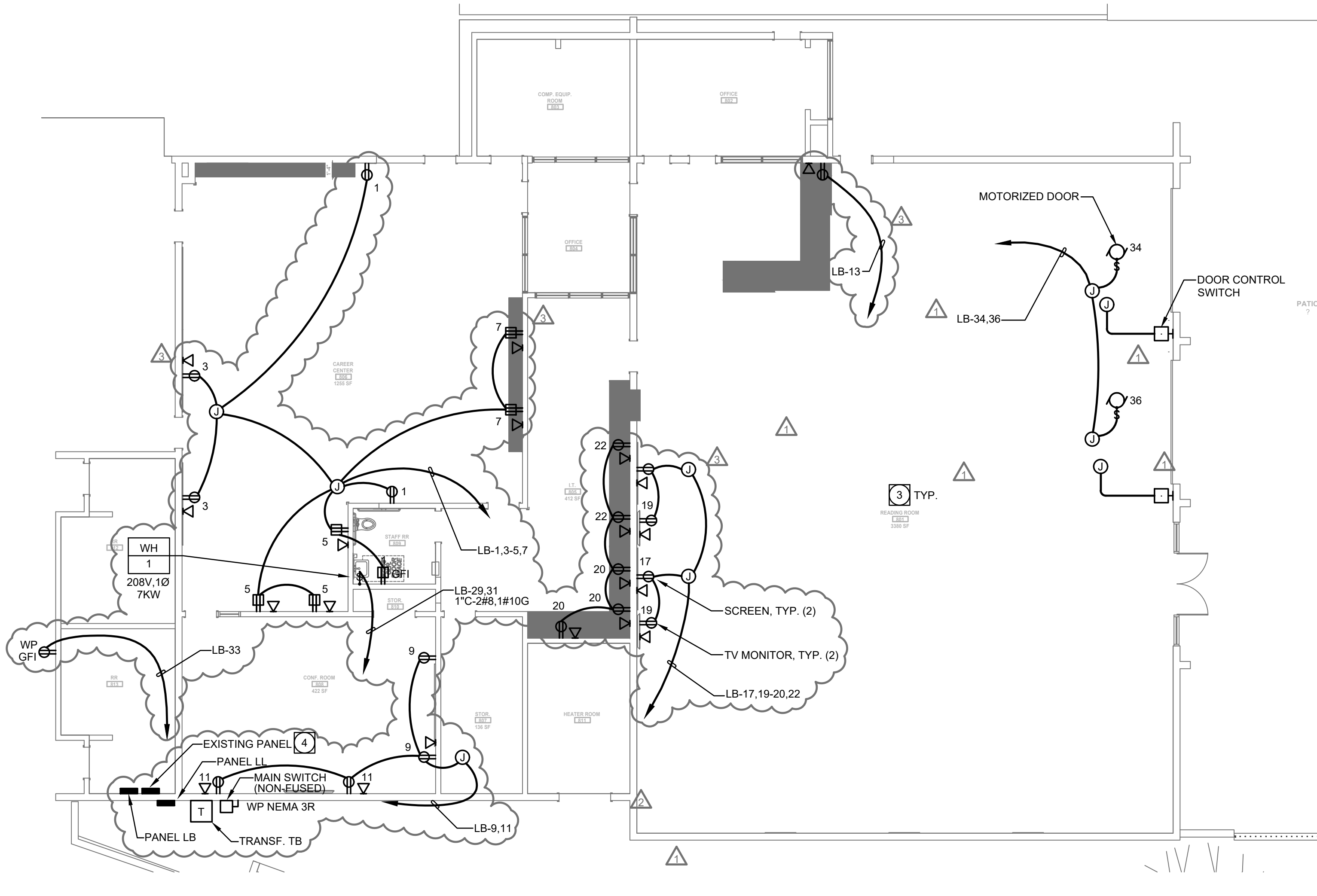
NOT FOR CONSTRUCTION



LIBRARY (BLDG. 8) ROOF PLAN

2

1/8" = 1'-0"



LIBRARY (BLDG. 8) FLOOR PLAN

1

1/8" = 1'-0"



KEYNOTES

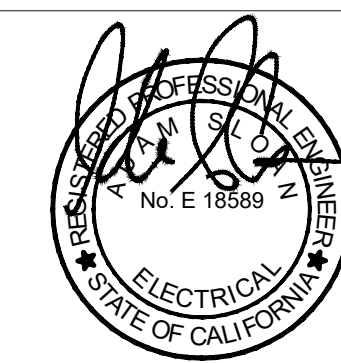
- EXISTING HVAC UNIT TO BE REPLACED.
- MOUNT RECEPTACLE FOR PROJECTOR POWER.
- REMOVE, STORE & REINSTALL ALL CEILING MOUNTED DEVICES FOR NEW CEILING REPLACEMENT.
- EXISTING PANEL TO BE REMOVED, REPLACED WITH PANEL LB. RECONNECT EXISTING LOADS AS REQUIRED.

GENERAL NOTES

LEGEND

APPROVED
DIV. OF THE STATE ARCHITECT
APP: 03-121233 INC: 0
REVIEWED FOR
SS ☒ FLS ☒ ACS ☒
DATE: 10/23/2023

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FILLMORE, CA 93015

ISSUED FOR:

REVISIONS:		
ADDENDUM 1	03/03/2023	
ADDENDUM 03	08/25/2023	

REGISTRATION/SIGNATURE:

SHEET TITLE:

LIBRARY REFLECTED
CEILING/FLOOR PLAN
BLDG. 8

SHEET NUMBER:

E101

WD PROJ. # DRAWN BY: CHECKED DATE

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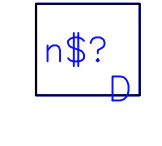
LC1.0 (E101)
Project: FUSD FILLMORE HS MODERNIZATION



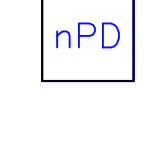
NCM PDT 10
Low Voltage Ceiling Mount Sensor, Passive
Dual Technology, Large Motion / Extended
Range 360° Lens



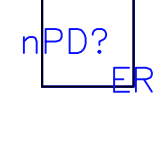
NCM PDT 9
Low Voltage Ceiling Mount Sensor, Passive
Dual Technology, Small Motion / Standard
Range 360° Lens



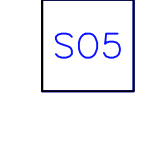
NP0DMA DX XX
nLight Wired Aesthetic Wallpod,
Raise/Lower Dimming Without Wires



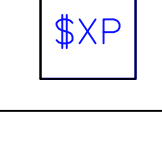
NPP16 D EFP
Power/Relay Pack, Occupancy Controlled
Dimming, External Fault Protection



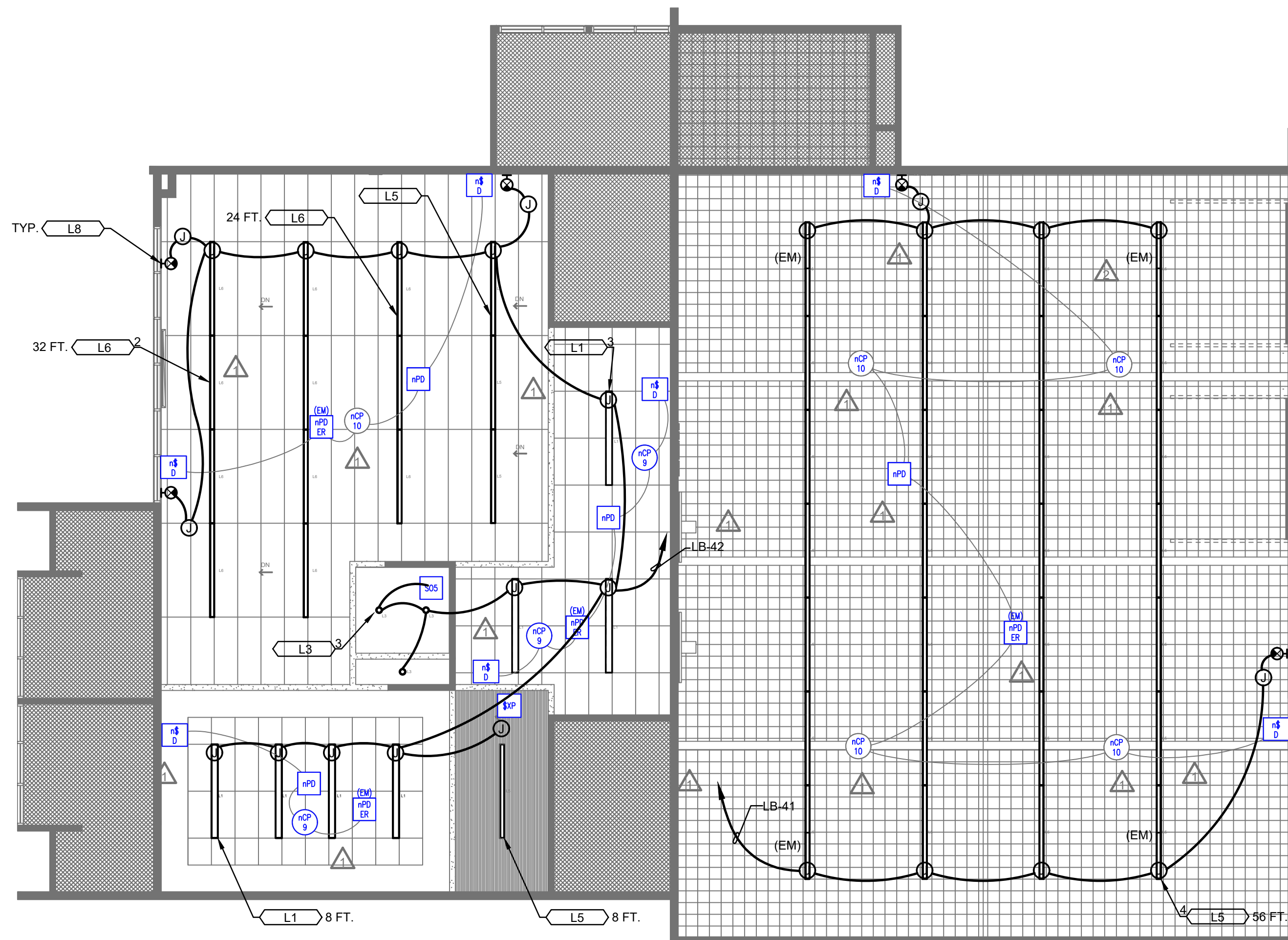
NPP16 D ER EFP
Power/Relay Pack, Occupancy Controlled
Dimming, UL924 Emergency Operation,
External Fault Protection



WSXA 2P FAN XX
Wall Switch Sensor, 2-Pole, Minimum Fan
Run Time



WSXA PDT XX
Dimming Wall Switch, Passive Dual
Technology



LIBRARY (BLDG. 8) REFLECTED CEILING PLAN

2

1/8" = 1'-0"



WP NEMA 3R

MOUNTING: SURFACE										PANEL LL										MAIN BUS	
208 / 120 VOLTS										A.I.C. RATING: 22,000										400A	
3 PHASE										4 WIRE										400A	
VOLT AMPS										VOLT AMPS										400A	
DESCRIPTION										DESCRIPTION										DESCRIPTION	
Ø A Ø B Ø C L L1 MISC Ø A Ø																					

SECTION 23 0130
HVAC AIR DUCT CLEANING

PART 1 - GENERAL

1.01 QUALIFICATION OF THE HVAC SYSTEM CLEANING CONTRACTOR

- A. Certification: The HVAC system cleaning contractor shall have a minimum of one (1) Air System Cleaning Specialist (ASCS) certified by NADCA on a full time basis, or shall have staff certified by a nationally recognized certification program and organization dedicated to the cleaning of HVAC systems.
- B. Supervisor Qualifications: A person certified as an ASCS by NADCA, or maintaining an equivalent certification by a nationally recognized program and organization, shall be responsible for the total work herein specified.
- C. Experience: The HVAC system cleaning contractor shall submit records of experience (from previous jobs) in the field of HVAC system cleaning as requested by the Owner.
- D. Equipment, Materials and Labor: The HVAC system cleaning contractor shall possess and furnish all necessary equipment, materials and labor to adequately perform the specified services.
 - 1. The contractor shall assure that its employees have received safety equipment training, medical surveillance programs (fit testing record), individual health protection measures, and manufacturer's product and material safety data sheets (MSDS) as required for the work by the U.S. Occupational Safety and Health Administration, and as described by this specification.
 - 2. The contractor shall maintain a copy of all current MSDS documentation and safety certifications at the site at all times, as well as comply with all other site documentation requirements of applicable OSHA programs (such as ladder safety, fall protection, etc.) and this specification
 - 3. Contractor shall submit to the Owner all Material Safety Data Sheets (MSDS) for all chemical products proposed to be used in the cleaning process.
- E. Licensing: The HVAC system cleaning contractor shall provide proof of maintaining the proper license(s) (i.e. NADCA certified), if any, as required to do work in this state. Contractor shall comply with all Federal, state and local rules, regulations, and licensing requirements.

1.02 STANDARDS

- A. NADCA Standards: The HVAC system cleaning contractor shall perform the services specified here in accordance with the current published standards of the National Air Duct Cleaners Association (NADCA).
 - 1. All terms in this specification shall have their meaning defined as stated in the NADCA Standards.
 - 2. NADCA Standards must be followed with no modifications or deviations being allowed.

1.03 DESCRIPTION

- A. Mechanical Drawings: The Owner shall provide the HVAC system cleaning contractor with one copy of the following documents:
 - 1. Project drawings and specifications.
 - 2. Approved construction revisions pertaining to the HVAC system.
 - 3. Any existing indoor air quality (IAQ) assessments or environmental reports prepared for the facility.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 SCOPE OF WORK

- A. Scope: This section defines the minimum requirements necessary to render HVAC components clean, and to verify the cleanliness through inspection and/or testing in accordance with items specified herein and applicable NADCA Standards.
 - 1. The Contractor shall be responsible for the removal of visible surface contaminants and deposits from within the HVAC system in strict accordance with these specifications.
 - 2. Refer to the Specific Tasks in the Turn-key SOW for details.

3.02 HVAC SYSTEM COMPONENTS INSPECTIONS AND SITE PREPARATIONS

- A. HVAC System Component Inspections: Prior to the commencement of any cleaning work, the HVAC system cleaning contractor shall perform a visual inspection of the HVAC system to determine appropriate methods, tools, and equipment required to satisfactorily complete this project. The cleanliness inspection should include air handling units and representative areas of the HVAC system components and ductwork. In HVAC systems that include multiple air handling units, a representative sample of the units should be inspected.
 - 1. The cleanliness inspection shall be conducted without negatively impacting the indoor environment through excessive disruption of settled dust, microbial amplification or other debris. In cases where contamination is suspected, and/or in sensitive environments where even small amounts of contaminant may be of concern, environmental engineering control measures should be implemented.
 - 2. Damaged system components found during the inspection shall be documented and brought to the attention of the Owner.
- B. Site Evaluation and Preparations: Contractor shall conduct a site evaluation, and establish a specific, coordinated plan which details how each area of the building will be protected during the various phases of the project.
- C. Inspector Qualifications: Qualified personnel should perform the HVAC cleanliness inspection to determine the need for cleaning. At minimum, such personnel should have an understanding of HVAC system design, and experience in utilizing accepted indoor environmental sampling practices, current industry HVAC cleaning procedures, and applicable industry standards.

3.03 GENERAL HVAC SYSTEM CLEANING REQUIREMENTS

- A. Containment: Debris removed during cleaning shall be collected and precautions must be taken to ensure that Debris is not otherwise dispersed outside the HVAC system during the cleaning process.
- B. Particulate Collection: Where the Particulate Collection Equipment is exhausting inside the building, HEPA filtration with 99.97% collection efficiency for 0.3-micron size (or greater) particles shall be used. When the Particulate Collection Equipment is exhausting outside the building, Mechanical Cleaning operations shall be undertaken only with Particulate Collection Equipment in place, including adequate filtration to contain Debris removed from the HVAC system. When the Particulate Collection Equipment is exhausting outside the building, precautions shall be taken to locate the equipment down wind and away from all air intakes and other points of entry into the building.
- C. Controlling Odors: Measures shall be employed to control odors and/or mist vapors during the cleaning process.
- D. Component Cleaning: Cleaning methods shall be employed such that all HVAC system components must be Visibly Clean as defined in applicable standards (see NADCA Standards). Upon completion, all components must be returned to those settings recorded just prior to cleaning operations.

HVAC AIR DUCT CLEANING
23 01 30 - 3

- E. Air-Volume Control Devices: Dampers and any air-directional mechanical devices inside the HVAC system must have their position marked prior to cleaning and, upon completion, must be restored to their marked position.
- F. Service Openings: The contractor shall utilize service openings, as required for proper cleaning, at various points of the HVAC system for physical and mechanical entry, and inspection.
 - 1. Contractor shall utilize the existing service openings already installed in the HVAC system where possible.
 - 2. Other openings shall be created where needed and they must be created so they can be sealed in accordance with industry codes and standards, which include the NFPA.
 - 3. Closures must not significantly hinder, restrict, or alter the airflow within the system.
 - 4. Closures must be properly insulated to prevent heat loss/gain or condensation on surfaces within the system.
 - 5. Openings must not compromise the structural integrity of the system.
 - 6. Construction techniques used in the creation of openings should conform to requirements of applicable building and fire codes, and applicable NFPA, SMACNA and NADCA Standards.
 - 7. Cutting service openings into flexible duct is not permitted. Flexible duct shall be disconnected at the ends as needed for proper cleaning and inspection.
 - 8. All service openings capable of being re-opened for future inspection or remediation shall be clearly marked and shall have their location reported to the Owner in project report documents.
- G. Ceiling sections (tile): The contractor may remove and reinstall ceiling sections to gain access to HVAC systems during the cleaning process.
- H. Air distribution devices (registers, grilles & diffusers): The contractor shall clean all air distribution devices.
- I. Air handling units, terminal units (VAV, Dual duct boxes, etc.), blowers and exhaust fans: The contractor shall insure that supply, return, and exhaust fans and blowers are thoroughly cleaned. Areas to be cleaned include blowers, fan housings, plenums (except ceiling supply and return plenums), scrolls, blades, or vanes, shafts, baffles, dampers and drive assemblies. All visible surface contamination deposits shall be removed in accordance with NADCA Standards. Contractor shall:
 - 1. Clean all air handling units (AHU) internal surfaces, components and condensate collectors and drains.
 - 2. Assure that a suitable operative drainage system is in place prior to beginning wash down procedures.
 - 3. Clean all coils and related components, including evaporator fins.
- J. Duct Systems. Contractor shall:
 - 1. Create service openings in the system as necessary in order to accommodate cleaning of otherwise inaccessible areas.
 - 2. Mechanically clean all duct systems to remove all visible contaminants, such that the systems are capable of passing Cleaning Verification Tests (see NADCA Standards).

3.04 HEALTH AND SAFETY

- A. Safety Standards: Cleaning contractors shall comply with applicable federal, state, and local requirements for protecting the safety of the contractor's employees, building occupants, and the environment. In particular, all applicable standards of the Occupational Safety and Health Administration (OSHA) shall be followed when working in accordance with this specification.
- B. Occupant Safety: No processes or materials shall be employed in such a manner that they will introduce additional hazards into occupied spaces.
- C. Disposal of Debris: All Debris removed from the HVAC System shall be disposed of in accordance with applicable federal, state and local requirements.

3.05 MECHANICAL CLEANING METHODOLOGY

- A. Source Removal Cleaning Methods: The HVAC system shall be cleaned using Source Removal mechanical cleaning methods designed to extract contaminants from within the HVAC system and safely remove contaminants from the facility. It is the contractor's responsibility to select Source Removal methods that will render the HVAC system Visibly Clean and capable of passing cleaning verification methods (See applicable NADCA Standards) and other specified tests (such as Cleaning Verification Test), in accordance with all general requirements.

No cleaning method, or combination of methods, shall be used which could potentially damage components of the HVAC system or negatively alter the integrity of the system. Provide the building owner three (3) hardcopies and one electronic copy of the test report(s) either on a CD or email attachment to the VA representative.

1. All methods used shall incorporate the use of vacuum collection devices that are operated continuously during cleaning. A vacuum device shall be connected to the downstream end of the section being cleaned through a predetermined opening. The vacuum collection device must be of sufficient power to render all areas being cleaned under negative pressure, such that containment of debris and the protection of the indoor environment are assured.
 2. All vacuum devices exhausting air inside the building shall be equipped with HEPA filters (minimum efficiency), including hand-held vacuums and wet-vacuums.
 3. All vacuum devices exhausting air outside the facility shall be equipped with Particulate Collection including adequate filtration to contain Debris removed from the HVAC system. Such devices shall exhaust in a manner that will not allow contaminants to re-enter the facility. Release of debris outdoors must not violate any outdoor environmental standards, codes or regulations.
 4. All methods require mechanical agitation devices to dislodge debris adhered to interior HVAC system surfaces, such that debris may be safely conveyed to vacuum collection devices. Acceptable methods will include those, which will not potentially damage the integrity of the ductwork, nor damage porous surface materials such as liners inside the ductwork or system components.
- B. Methods of Cleaning Fibrous Glass Insulated Components
1. Fibrous glass thermal or acoustical insulation elements present in any equipment or ductwork shall be thoroughly cleaned with HEPA vacuuming equipment, while the HVAC system is under constant negative pressure, and not permitted to get wet in accordance with applicable NADCA and NAIMA standards and recommendations.
 2. Cleaning methods used shall not cause damage to fibrous glass components and will render the system capable of passing Cleaning Verification Tests (see NADCA Standards).
- C. Damaged Fibrous Glass Material
1. Evidence of damage: If there is any evidence of damage, deterioration, delaminating, friable material, mold or fungus growth, or moisture such that fibrous glass materials cannot be restored by cleaning or resurfacing with an acceptable insulation repair coating, they shall be identified for replacement.
 2. Replacement: When requested or specified, Contractor must be capable of remediating exposed damaged insulation in air handlers and/or ductwork requiring replacement.
 3. Replacement material: In the event fiber glass materials must be replaced, all materials shall conform to applicable codes and standards, including those of UL and SMACNA.
 4. Replacement of damaged insulation is not covered by this section.
- D. Cleaning of coils
1. Any cleaning method may be used which will render the Coil Visibly Clean and capable of passing Coil Cleaning Verification (see applicable NADCA Standards). Coil drain pans shall be subject to Non-Porous Surfaces Cleaning Verification. The drain for the condensate drain pan shall be operational. Cleaning methods shall not cause any appreciable damage to, displacement of, inhibit heat transfer, or erosion of the coil surface

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- or fins, and shall conform to coil manufacturer recommendations when available. Coils shall be thoroughly rinsed with clean water to remove any latent residues.
2. Notify Owner if fins are found to be damaged prior to cleaning of coils.
- E. Antimicrobial Agents and Coatings
1. EPA registered and FDA approved antimicrobial agents for hospital use shall be applied to prevent fungal growth.
 2. Application of any antimicrobial agents used to control the growth of fungal or bacteriological contaminants shall be performed after the removal of surface deposits and debris.
 3. When used, antimicrobial treatments and coatings shall be applied in strict accordance with the manufacturer's written recommendations and EPA registration listing.
 4. Antimicrobial coatings shall be applied according to the manufacturer's written instructions. Coatings shall be sprayed directly onto interior ductwork surfaces, rather than, "fogged" downstream onto surfaces.

3.06 CLEANLINESS VERIFICATION

- A. General: Verification of HVAC System cleanliness will be determined after mechanical cleaning and before the application of any treatment or introduction of any treatment-related substance to the HVAC system, including bio-cidal agents and coatings.
- B. Visual Inspection: The HVAC system shall be inspected visually to ensure that no visible contaminants are present.
1. If no contaminants are evident through visual inspection, the HVAC system shall be considered clean; however, the Owner reserves the right to further verify system cleanliness through Surface Comparison Testing or the NADCA vacuum test specified in the NADCA standards.
 2. If visible contaminants are evident through visual inspection, those portions of the system where contaminants are visible shall be re-cleaned and subjected to re-inspection for cleanliness.
 3. NADCA vacuum test analysis should be performed by a qualified third party experienced in testing of this nature. To be considered clean by the NADCA vacuum test, the net weight of the debris on the sample filter media collected on a non-porous surface shall not exceed 0.75 mg/100 cm².
 4. Representative post cleaning surface fungal sampling shall be conducted and results shall be in the range of none to rare fungal structures for the representative samples collected.
 5. Representative post cleaning lead wipe samples shall be collected on horizontal interior surfaces and results shall not exceed 40 micrograms of lead per square foot.
 6. Each portion of the HVAC system, which does not meet the cleanliness verification test criteria shall be thoroughly re-cleaned and then re-inspected. The process shall be repeated until the system passes the test. Additional inspection and testing will be at the expense of the Contractor.
- C. Verification of Coil Cleaning
1. Cleaning must restore the coil pressure drop to within 10 percent of the pressure drop measured when the coil was first installed. If the original pressure drop is not known, the coil will be considered clean only if the coil is free of foreign matter and chemical residue, based on a thorough visual inspection (see NADCA Standards).

3.07 PRE-EXISTING SYSTEM DAMAGE

- A. Contractor is not responsible for problems resulting from prior inappropriate or careless cleaning techniques of others.

3.08 POST-PROJECT REPORT

- A. At the conclusion of the project, the Contractor shall provide a report to the Owner indicating the following:

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1. Success of the cleaning project, as verified through visual inspection and/or gravimetric analysis.
2. Areas of the system found to be damaged and/or in need of repair.
3. Microbial test and lead wipe test results.
4. Provide before and after photographs of duct cleaning.

3.09 APPLICABLE STANDARDS AND PUBLICATIONS

- A. The following current standards and publications of the issues currently in effect form a part of this specification to the extent indicated by any reference thereto:
- B. National Air Duct Cleaners Association (NADCA): "Assessment, Cleaning & Restoration of HVAC Systems (ACR 2005)," 2004.
- C. National Air Duct Cleaners Association (NADCA): "Understanding Microbial Contamination in HVAC Systems," 1996.
- D. National Air Duct Cleaners Association (NADCA): "Introduction to HVAC System Cleaning Services," 2004.
- E. National Air Duct Cleaners Association (NADCA): Standard 05 "Requirements for the Installation of Service Openings in HVAC Systems," 2004.
- F. Underwriters' Laboratories (UL): UL Standard 181
- G. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE): Standard 62-89, "Ventilation for Acceptable Indoor Air Quality".
- H. Environmental Protection Agency (EPA): "Building Air Quality," December 1991.
- I. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA): "HVAC Duct Construction Standards - Metal and Flexible," 1985.
- J. North American Insulation Manufacturers Association (NAIMA): "Cleaning Fibrous Glass Insulated Air Duct Systems," 1993.

END OF SECTION