

Appendix A – Drawings and Specifications

I – Re:Vision: Architectural A2.0, A2.1 (window)

II – Practical Energy Solutions: HVAC CS, M-1.0, M-2.0

III – SSM: Electrical E.0-01, EP.1-01

Appendix A.I - Re:Vision: Architectural A2.0, A2.1 (window)



GREEN ARCHITECTURE
SUSTAINABILITY
CONSULTING

FRANKFORD HIGH SCHOOL

SOLAR LAB
5000 OXFORD AVE
PHILADELPHIA, PA 19124

OWNER
PHILADELPHIA BOARD
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440 N BROAD ST
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RE:VISION ARCHITECTURE
133 GRAPE STREET
PHILADELPHIA, PA 19127
P: 215.482.1133

STATUS LINE:
ISSUED FOR BID

DATE FEBRUARY 9, 2021
SCALE 1/4" = 1'-0"
TITLE FLOOR PLANS

SHEET

A2.0

CONTRACTOR TO VERIFY ALL DIMENSIONS IN
FIELD AND INFORM ARCHITECT OF ANY
DISCREPANCIES BEFORE STARTING WORK.

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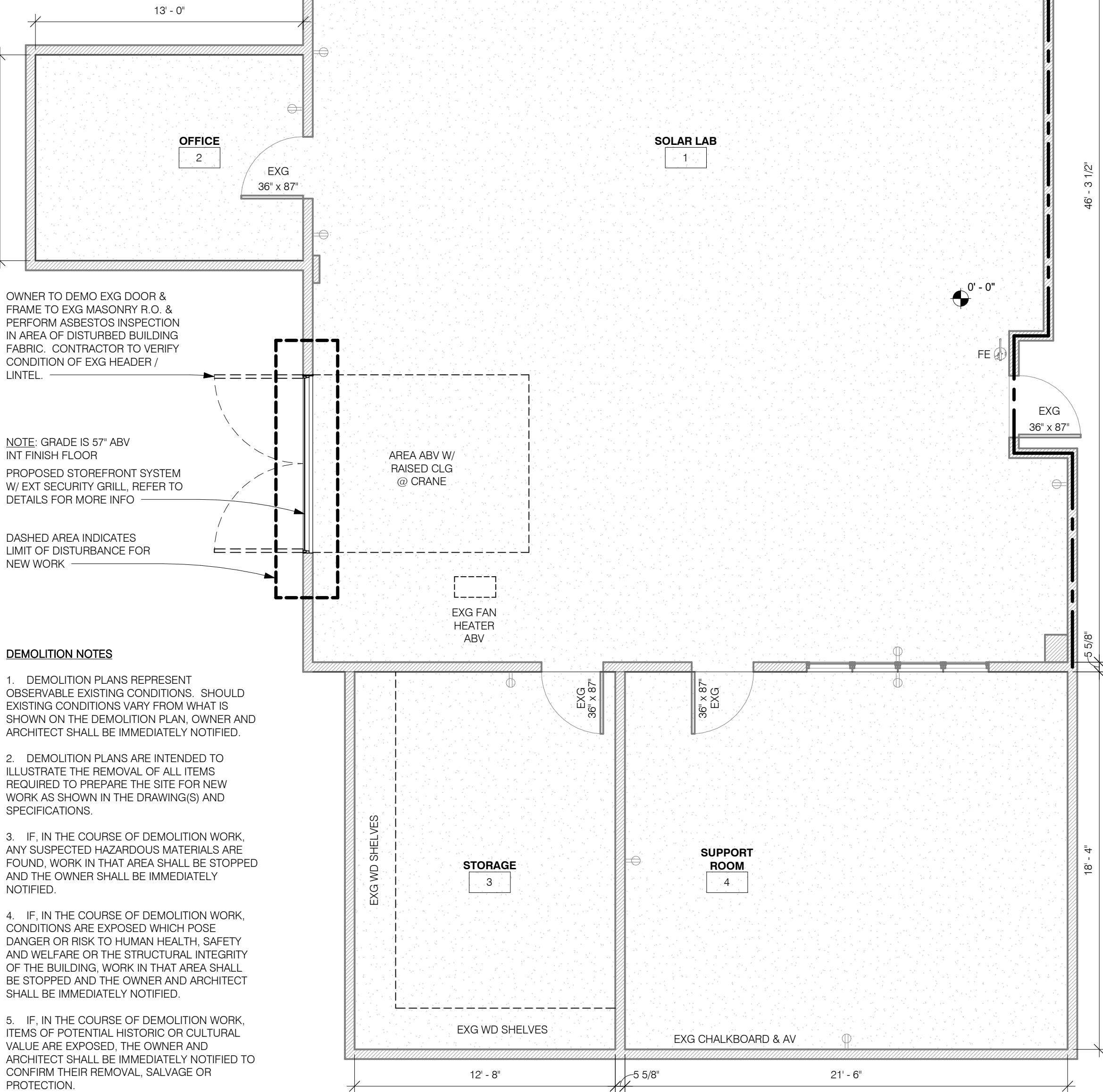
GENERAL NOTES:
1. REFER TO MEP DRAWINGS FOR MORE
INFORMATION.
2. POWER OUTLETS SHOWN ARE EXISTING.

PROJECT DESCRIPTION & NOTES TO PLAN REVIEWER

THE PROPOSED PROJECT IS TO ADD A SOLAR
LABORATORY SPACE IN CLASSROOM 10 THAT WILL
ACCOMMODATE A NEW CURRICULUM AT FRANKFORD
HIGH SCHOOL.
THERE ARE NO PROPOSED CHANGES TO THE USE,
OCCUPANCY, OR HAZARD IN THIS CLASSROOM.

THE ONLY PROPOSED ALTERATION TO THE CLASSROOM
INVOLVES THE REPLACEMENT OF AN EXISTING DOOR
WITH A NEW STOREFRONT WINDOW UNIT.

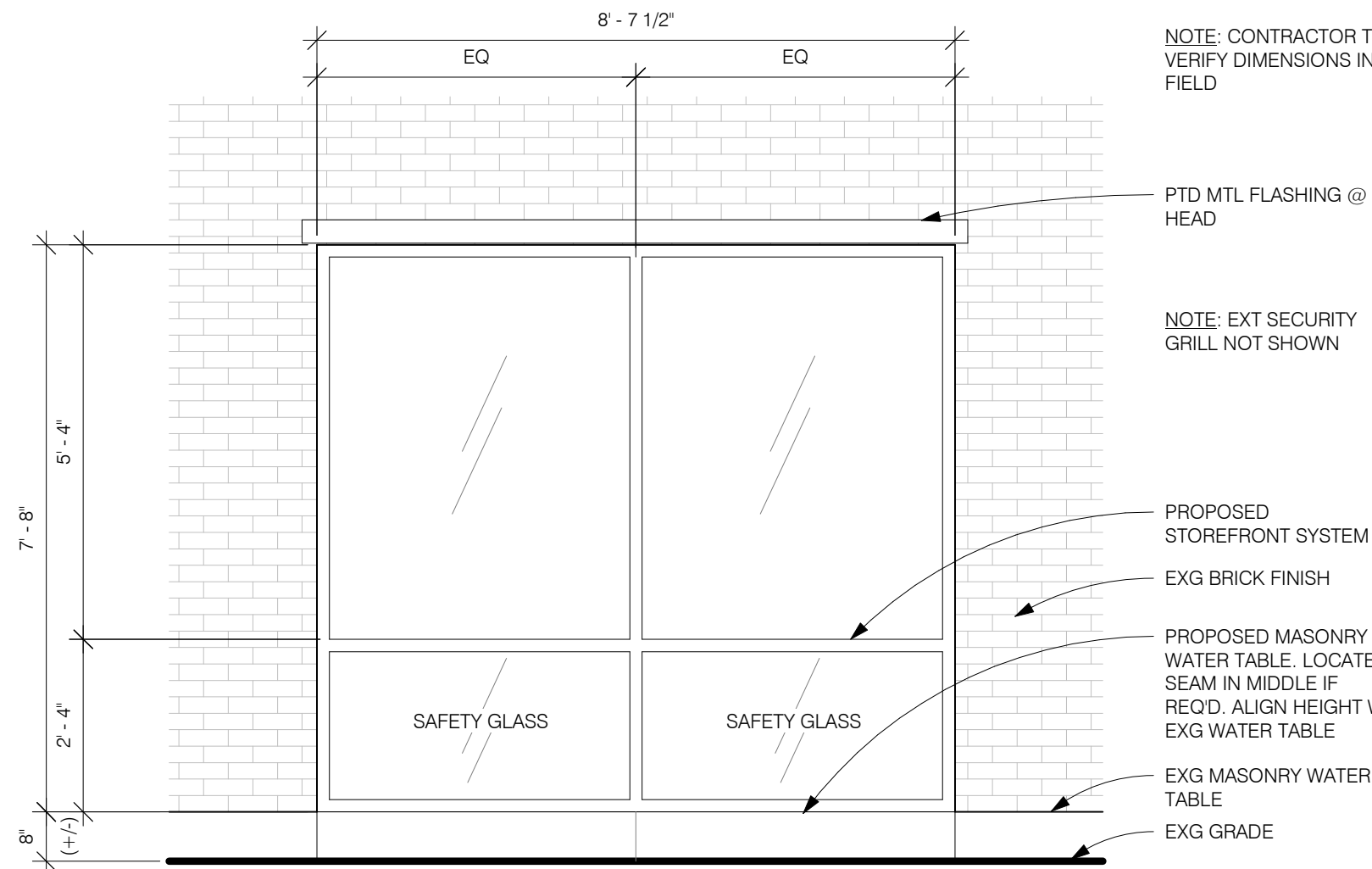
ADDITIONAL PERMITS FOR MEP WORK ARE BY OTHERS.



DEMOLITION NOTES

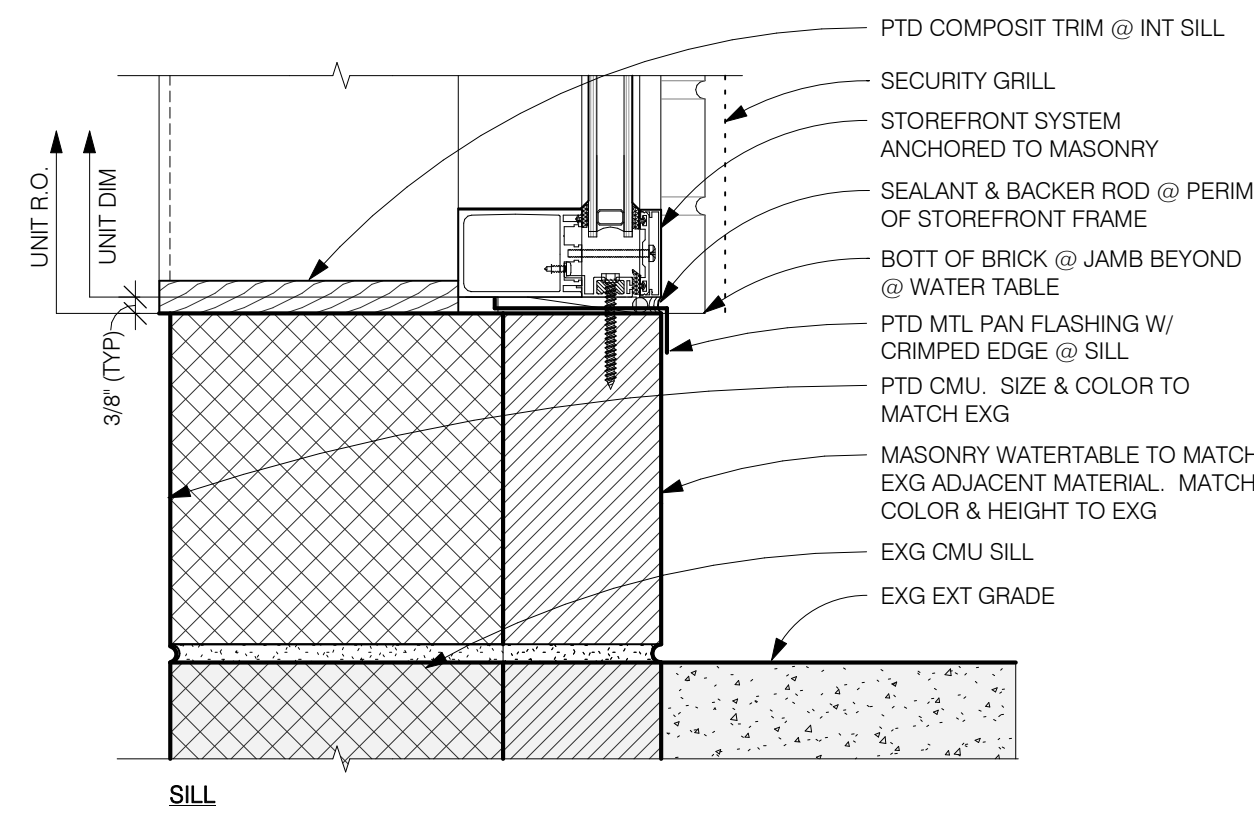
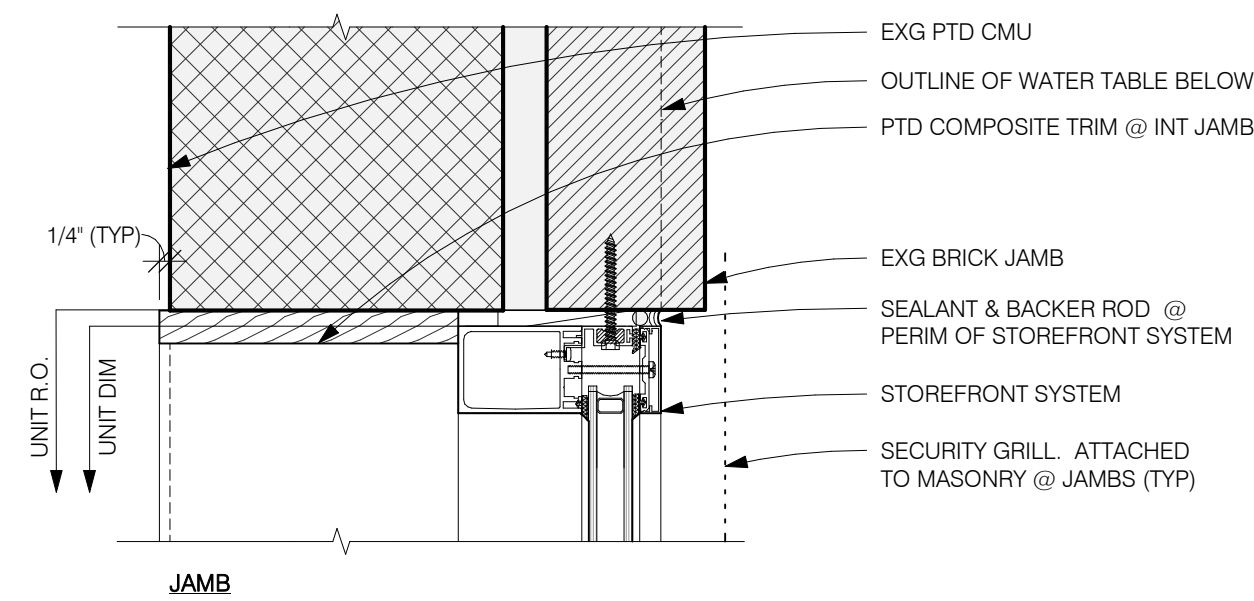
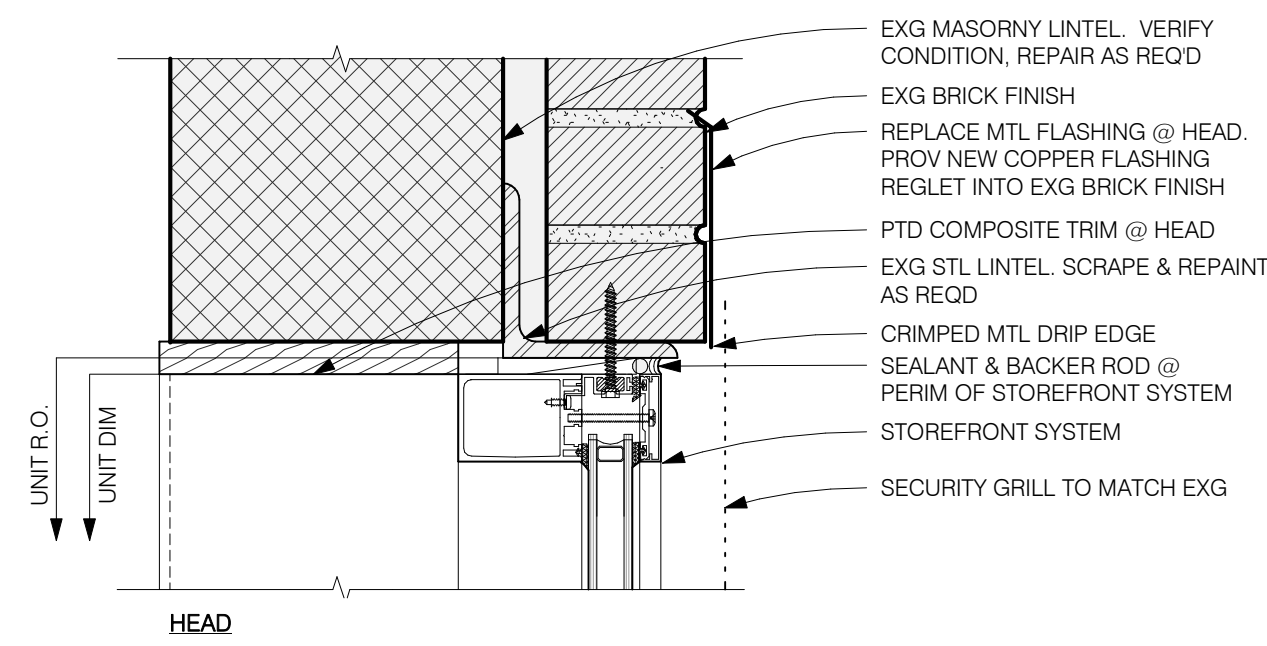
- DEMOLITION PLANS REPRESENT
OBSERVABLE EXISTING CONDITIONS. SHOULD
EXISTING CONDITIONS VARY FROM WHAT IS
SHOWN ON THE DEMOLITION PLAN, OWNER AND
ARCHITECT SHALL BE IMMEDIATELY NOTIFIED.
- DEMOLITION PLANS ARE INTENDED TO
ILLUSTRATE THE REMOVAL OF ALL ITEMS
REQUIRED TO PREPARE THE SITE FOR NEW
WORK AS SHOWN IN THE DRAWING(S) AND
SPECIFICATIONS.
- IF, IN THE COURSE OF DEMOLITION WORK,
ANY SUSPECTED HAZARDOUS MATERIALS ARE
FOUND, WORK IN THAT AREA SHALL BE STOPPED
AND THE OWNER SHALL BE IMMEDIATELY
NOTIFIED.
- IF, IN THE COURSE OF DEMOLITION WORK,
CONDITIONS ARE EXPOSED WHICH POSE
DANGER OR RISK TO HUMAN HEALTH, SAFETY
AND WELFARE OR THE STRUCTURAL INTEGRITY
OF THE BUILDING, WORK IN THAT AREA SHALL
BE STOPPED AND THE OWNER AND ARCHITECT
SHALL BE IMMEDIATELY NOTIFIED.
- IF, IN THE COURSE OF DEMOLITION WORK,
ITEMS OF POTENTIAL HISTORIC OR CULTURAL
VALUE ARE EXPOSED, THE OWNER AND
ARCHITECT SHALL BE IMMEDIATELY NOTIFIED TO
CONFIRM THEIR REMOVAL, SALVAGE OR
PROTECTION.
- ENSURE THE ADEQUATE PROTECTION OF
AREAS SURROUNDING DEMOLITION
SCOPE. DAMAGE INCURRED FROM DEMOLITION,
INCLUDING THE JOB SITE AND SURROUNDING
PROPERTY, SHALL BE REPAIRED OR REPLACED
IN KIND AT NO EXPENSE TO THE OWNER.
- MAINTAIN OPERATION OF LIFE SAFETY
SYSTEMS DURING PROPOSED ALTERATION
WORK.

1 FLOOR PLAN
1/4" = 1'-0"



② STOREFRONT ELEVATION
1/2" = 1'-0"

- 2018 INTERNATIONAL ENERGY CODE NOTES:
1. CLIMATE ZONE 4A
 2. GLAZING VALUES: (FOR DOUBLE GLAZED IGU IN THERMALLY BROKEN METAL FRAME)
A. U-VALUE: 0.65 MAX
B. SHGC: 0.7 MAX
C. VT: 0.6



① STOREFRONT DETAIL
3" = 1'-0"



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DATE FEBRUARY 9, 2021
SCALE As indicated
TITLE OPENING DETAILS

SHEET

A2.1

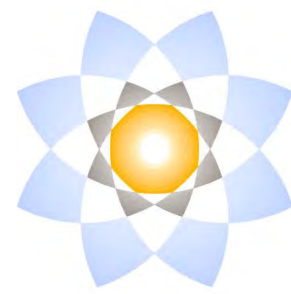
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Appendix A.II – Practical Energy Solutions: HVAC CS, M-1.0, M-2.0

FRANKFORD HIGH SCHOOL SOLAR LAB

HVAC RENOVATIONS



practical
energy
solutions

101 EAST EVANS ST.
SUITE 2
WEST CHESTER, PA 19380

www.practicalenergy.net

HVAC / PLUMBING SYMBOLS

— CWS —	CONDENSER WATER SUPPLY		MANUAL AIR VENT
— CWR —	CONDENSER WATER RETURN		AUTOMATIC AIR VENT
— CHWS —	CHILLED WATER SUPPLY		STRAINER WITH BLOWDOWN VALVE, HOSE END
— CHWR —	CHILLED WATER RETURN		PIPE UP
— DTS —	DUAL TEMPERATURE WATER SUPPLY		PIPE DOWN
— DTR —	DUAL TEMPERATURE WATER RETURN		REDUCER
— HWS —	HOT WATER SUPPLY (HEATING)		FLEXIBLE PIPE CONNECTOR
— HWR —	HOT WATER RETURN (HEATING)		FLOW SWITCH
— CW —	DOMESTIC COLD WATER		THERMOMETER
— HW —	DOMESTIC HOT WATER		GAUGE WITH GAUGE VALVE
— CD —	CONDENSATE LINE		REDUCED PRESSURE BACKFLOW PREVENTER W/ STRAINER AND QUARTER TURN VALVES
— CF —	CHEMICAL FEED		FLOOR DRAIN (SQUARE/ROUND)
— G —	NATURAL GAS		CLEANOUT
— SD —	STORM DRAIN		FLOOR CLEANOUT
— SAN —	SANITARY SEWER		MANHOLE
— V —	SANITARY VENT		DEMOLITION BREAK POINT
— IW —	INDIRECT WASTE		NEW TO EXISTING CONNECTION
	DIRECTION OF FLOW		SUPPLY DUCT
	SLOPE - FALL PER FOOT		RETURN AND/OR OUTSIDE AIR INTAKE/RELIEF
	GATE VALVE		EXHAUST DUCT (NOT INSULATED)
	BUTTERFLY VALVE		SUPPLY AIR DIFFUSER (PATTERN AS INDICATED)
	BALL VALVE		90° VANED ELBOW UP
	CHECK VALVE		90° VANED ELBOW DOWN
	GAS COCK		DROP IN DUCT IN DIRECTION OF AIRFLOW
	AUTOMATIC CONTROL VALVE (3 WAY)		RISE IN DUCT IN DIRECTION OF AIRFLOW
	AUTOMATIC CONTROL VALVE (2 WAY)		BRANCH DUCT TAKE-OFF
	PRESSURE REDUCING VALVE		VANED ELBOW
(E)	EXISTING TO REMAIN		FULL THROAT RADIUS ELBOW R=1.5W
(N)	NEW		FIRE DAMPER WITH ACCESS DOOR
(R)	ABANDON & REMOVE		HAND DAMPER
(S)	SALVAGE		ATC DAMPER
			SMOKE DETECTOR (DUCT MOUNTED)
			FIRE/SMOKE DAMPER WITH ACCESS DOOR
			THERMOSTAT/SENSOR
			THERMOSTAT/SENSOR (NIGHT)
			IAQ SENSOR
			HUMIDISTAT
			BACKFLOW PREVENTER
			TEMPERATURE SENSOR
			FLOW METER
			MOTORIZED DAMPER
			PNEUMATIC DAMPER

HVAC / PLUMBING ABBREVIATIONS

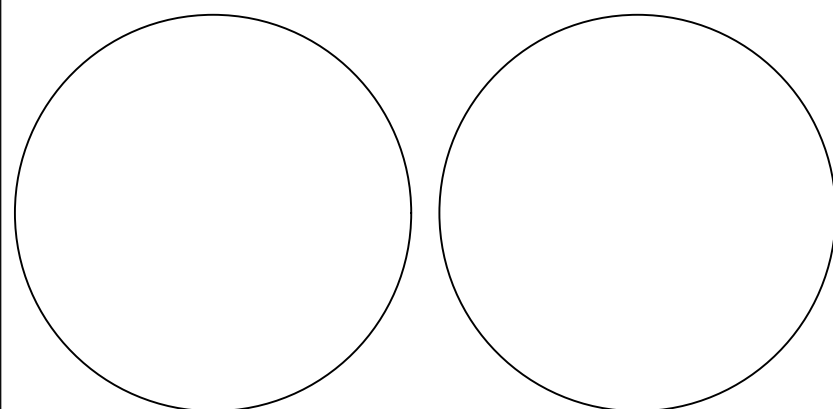
ABV.	ABOVE	HR	HOURL
AD	AIR DEVICE	HWR	HOT WATER RETURN
A/D	ACCESS DOOR (DUCT)	HW	HOT WATER
AF	AIRFOIL FAN	IN.	INCHES
A.F.F.	ABOVE FINISHED FLOOR	INT	INTERNAL
AHU	AIR HANDLING UNIT	KW	KILOWATTS
AP	ACCESS PANEL (WALL/CEILING)	LAT	LEAVING AIR TEMPERATURE
ATC	AUTOMATIC TEMPERATURE CONTROL	LWT	LEAVING WATER TEMPERATURE
B	BOILER	MAX	MAXIMUM
BDD	BACK DRAFT DAMPER	MIN	MINIMUM
BFP	BACK FLOW PREVENTER	M	MOTOR OPERATED DAMPER
BIF	BACKWARD INCLINED FAN	NC	NORMALLY CLOSED
BLDG	BUILDING	N.I.C.	NOT IN CONTRACT
B.O.S.	BOTTOM OF STEEL	NO	NORMALLY OPEN
BTU	BRITISH THERMAL UNITS	NTS	NOT TO SCALE
BTU/H	BRITISH THERMAL UNITS PER HOUR	OA	OUTSIDE AIR
CH	CHILLER	PD	PRESSURE DROP
CFM	CUBIC FEET PER MINUTE	PRV	PRESSURE REDUCING VALVE
CLG.	CEILING	PSI	POUNDS PER SQUARE INCH
CONT.	CONTINUED/CONTINUATION	PVC	POLYVINYL CHLORIDE
CT	COOLING TOWER	QTY	QUANTITY
CUH	CABINET UNIT HEATER	RLA	RATED LOAD AMPS
CW	DOMESTIC COLD WATER	RA	RETURN AIR
DOM	DOMESTIC	RECIR	RECIRCULATED
DDC	DIRECT DIGITAL CONTROL	RM	ROOM
DN	DOWN	RPM	REVOLUTIONS PER MINUTE
DX	DIRECT EXPANSION	SAN	SANITARY
DW	DOUBLE WALL	SA	SUPPLY AIR
DWG	DRAWING	SD	STORM DRAIN
EAT	ENTERING AIR TEMPERATURE	SP	STATIC PRESSURE
EB	ELECTRIC BASEBOARD	SPEC	SPECIFICATIONS
E.C.	ELECTRICAL CONTRACTOR	S.F.	SQUARE FEET
EER	ENERGY EFFICIENCY RATING	SR	SUPPLY RISER
EL	ELEVATION	TEMP	TEMPERATURE
ENT	ENTERING	T-STAT	THERMOSTAT
ER	EXHAUST RISER	TYP	TYPICAL
EXH	EXHAUST AIR	UH	UNIT HEATER
EXT	EXTERNAL	V.	VENT
EUH	ELECTRIC UNIT HEATER	VD	VOLUME DAMPER
EWT	ENTERING WATER TEMPERATURE	W.	WASTE
F	FAN	W/	WITH
F.A.I.	FRESH AIR INLET	WH	WALL HEATER
FC	FLEXIBLE CONNECTION	WG	WATER GAUGE
FCU	FAN COIL UNIT	W/O	WITHOUT
FD	FIRE DAMPER OR FLOOR DRAIN	#	POUNDS OR NUMBER
FLA	FULL LOAD AMPS	°F	DEGREES FAHRENHEIT
FP	FIRE PROTECTION	°wb	DEGREES FAHRENHEIT WET BULB
FPM	FEET PER MINUTE	°db	DEGREES FAHRENHEIT DRY BULB
FT	FEET		
G	GAS		
GAL	GALLON		
GPM	GALLONS PER MINUTE		
GPH	GALLONS PER HOUR		
HP	HORSEPOWER		

NOTE:

NOT ALL SYMBOLS AND ABBREVIATIONS
INDICATED APPEAR ON THESE DOCUMENTS.

GENERAL PROJECT NOTES:

- SCOPE OF WORK**
 - THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK, MATERIALS, AND LABOR TO SATISFY A COMPLETE WORKING SYSTEM WHETHER SPECIFIED OR IMPLIED.
 - ALL WORK IS TO BE PERFORMED IN STRICT COMPLIANCE WITH THE CURRENT INTERNATIONAL MECHANICAL CODE, ALL LOCAL CODES, AND ALL OTHER REGULATION GOVERNING WORK OF THIS NATURE.
 - THE CONTRACTOR SHALL, BEFORE SUBMITTING ANY PROPOSAL, EXAMINE THE PROPOSED SITE AND SHALL DETERMINE FOR HIMSELF THE CONDITIONS THAT MAY EFFECT THE WORK. NO ALLOWANCE SHALL BE MADE IF THE CONTRACTOR FAILS TO MAKE SUCH EXAMINATIONS.
 - ALL EQUIPMENT AND MATERIALS SHALL BE AS SPECIFIED OR 'APPROVED EQUAL' BY THE ENGINEER OR ARCHITECT.
- PERMITS**
 - THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ANY AND ALL FEES.
- SHOP DRAWINGS**
 - SUBMIT MATERIAL LIST AND SHOP DRAWINGS FOR MAJOR EQUIPMENT TO THE ARCHITECT/ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL SUBMIT DRAWINGS ELECTRONICALLY.
- DUCTWORK**
 - THE DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE 'SMACNA' APPLICABLE MANUALS. ALL DUCTWORK SHALL BE THE LOW VELOCITY TYPE, UNLESS SPECIFIED OTHERWISE. ALL DUCT SHALL BE INSTALLED WITH CLASS 'A' SEALS AND INSULATION.
 - CONTRACTOR SHALL PROVIDE AND INSTALL APPROVED FIRE DAMPERS AND ACCESS PANELS IN ANY AND ALL DUCTWORK WHICH PENETRATES A HORIZONTAL OR VERTICAL FIRE PARTITION, OR AS OTHERWISE SHOWN ON DRAWINGS.
 - ALL BRANCH DUCTS TO HAVE VOLUME DAMPERS.
 - SMOOTH TURN RADIUS DUCTWORK OR TURNING VANES SHALL BE USED THROUGHOUT WHERE FLOW EXCEEDS 150 CFM.
 - ALL DUCT JOINTS TO BE SEALED IN ACCORDANCE WITH 'SMACNA' STANDARDS AND ACCEPTED GOOD PRACTICE.
 - ALL DUCT DIMENSIONS SHOWN ARE NET INSIDE VALUES. DIMENSIONS MAY BE CHANGED SO LONG AS THE NET FREE FACE AREA IS MAINTAINED.
 - ALL NEW AND EXISTING SA, RA, AND OA DUCTWORK SHALL BE INSULATED WITH 1-1/2" FIBERGLASS INSULATING BLANKET WITH ALUMINUM FOIL FACING. REPLACE OLD OR DAMAGED INSULATION AS NECESSARY. BASIS-OF-DESIGN MANUFACTURERS INCLUDE TITUS, PRICE, AND KRUEGER, OR APPROVED EQUAL.
- DRAINAGE PIPING (CONDENSATE)**
 - SHALL BE TYPE 'K' COPPER PIPE OR PVC. REFER TO MANUFACTURERS DIRECTIONS. PITCH HORIZONTAL LINES 1" IN 10'-0". CONDENSATE DRAINS SHALL BE ROUTED TO FLOOR DRAIN, INDIRECT WASTE DRAIN, OR OUTSIDE.
- HVAC CONTROLS**
 - EMS VENDOR TO SUPPLY AND INSTALL ALL CONTROL WIRING AND THERMOSTATS AS REQUIRED.
- ELECTRICAL**
 - CONTRACTOR TO COORDINATE WITH ELECTRICAL CONTRACTOR FOR LOCATION OF WIRING FOR EACH HVAC UNIT.
- GAS PIPING (IF APPLICABLE)**
 - SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH MALLEABLE IRON FITTINGS. WHERE GAS PIPE CONNECTS TO EQUIPMENT, IT SHALL BE PROVIDED WITH A DRIP LEG THE FULL SIZE OF THE RUNOUT. A 100% SHUT-OFF VALVE AND A UNION. GAS PIPING CONTAINING PRESSURE GREATER THAN 9" W.G. SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH WELDED JOINTS.
- MISCELLANEOUS**
 - ALL EXTERIOR/INTERIOR OPENINGS TO BE PROPERLY CAULKED AND SEALED WITH A SEALANT OF HIGH QUALITY AND LONG LIFE, TO PREVENT INFILTRATION OF OUTSIDE AIR INTO CONDITIONED SPACE.
 - COORDINATE INSTALLATION OF ALL ROOF FLASHING AT ROOF PENETRATION (IF APPLICABLE).
 - DO NOT SCALE THIS DRAWING FOR EXACT DIMENSIONS. VERIFY ALL FIGURES, CONDITIONS, AND DIMENSIONS AT THE JOB SITE.
 - THE MECHANICAL PLANS ARE INTENDED TO BE DIAGRAMMATIC AND ARE BASED ON ONE MANUFACTURER'S EQUIPMENT. THEY ARE NOT INTENDED TO SHOW EVERY ITEM IN ITS EXACT LOCATION, THE EXACT DIMENSIONS, OR ALL THE DETAILS OF THE EQUIPMENT. THE CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS OF THE EQUIPMENT PROPOSED TO ENSURE THAT THE EQUIPMENT WILL FIT IN THE AVAILABLE SPACE.
 - A CERTIFIED BALANCING CONTRACTOR SHALL VERIFY THAT THE CORRECT TEMPERATURES AND AIRFLOWS ARE DELIVERED BY EACH FAN-COIL UNIT AND DIFFUSER AND MAKE ADJUSTMENTS AS NECESSARY. THE CONTRACTOR SHALL BE CERTIFIED BY AABC AND/OR NEBB TO PERFORM THIS TYPE OF WORK.
- GUARANTEE**
 - MATERIALS, EQUIPMENT AND INSTALLATION SHALL BE GUARANTEED FOR A PERIOD OF ONE(1) YEAR FROM DATE OF ACCEPTANCE. DEFECTS WHICH APPEAR DURING THAT PERIOD SHALL BE CORRECTED AT THIS CONTRACTOR'S EXPENSE.
 - FOR THE SAME PERIOD, THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO PREMISES CAUSED BY DEFECTS IN WORKMANSHIP OR IN THE WORK OR EQUIPMENT FURNISHED AND/OR INSTALLED BY HIM.
- WHERE USED, THE TERM 'PROVIDE' SHALL MEAN 'FURNISH AND INSTALL'.
- FIRE STOP ALL PENETRATIONS.



FRANKFORD HIGH SCHOOL SOLAR LAB

5000 OXFORD AVE
PHILADELPHIA, PA 19124

HVAC RENOVATION

REV	DATE	DESCRIPTION
--	06-25-20	BID ISSUE REVIEW SET
--	06-26-20	BID ISSUE SET
01	07-27-20	BID ISSUE SET
02	08-11-20	BID ISSUE SET
03	02-09-21	BID ISSUE SET

PROJECT: FRANKFORD HS SOLAR LAB
OWNER: PHILADELPHIA BOARD OF EDUCATION
ENGINEER: PRACTICAL ENERGY SOLUTIONS
DRAWN BY: BP
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SHEET TITLE

COVER SHEET

CS

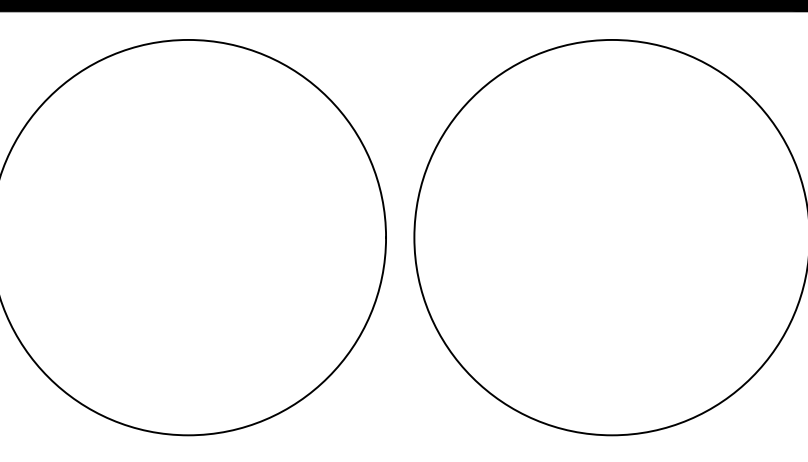
DRAWING LIST

CS	●●●●●	COVER SHEET
M-1.0	●●●●●	MECHANICAL DEMOLITION AND NEW WORK PLANS
M-2.0	●●●●●	MECHANICAL SCHEDULES



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HVAC
RENOVATION

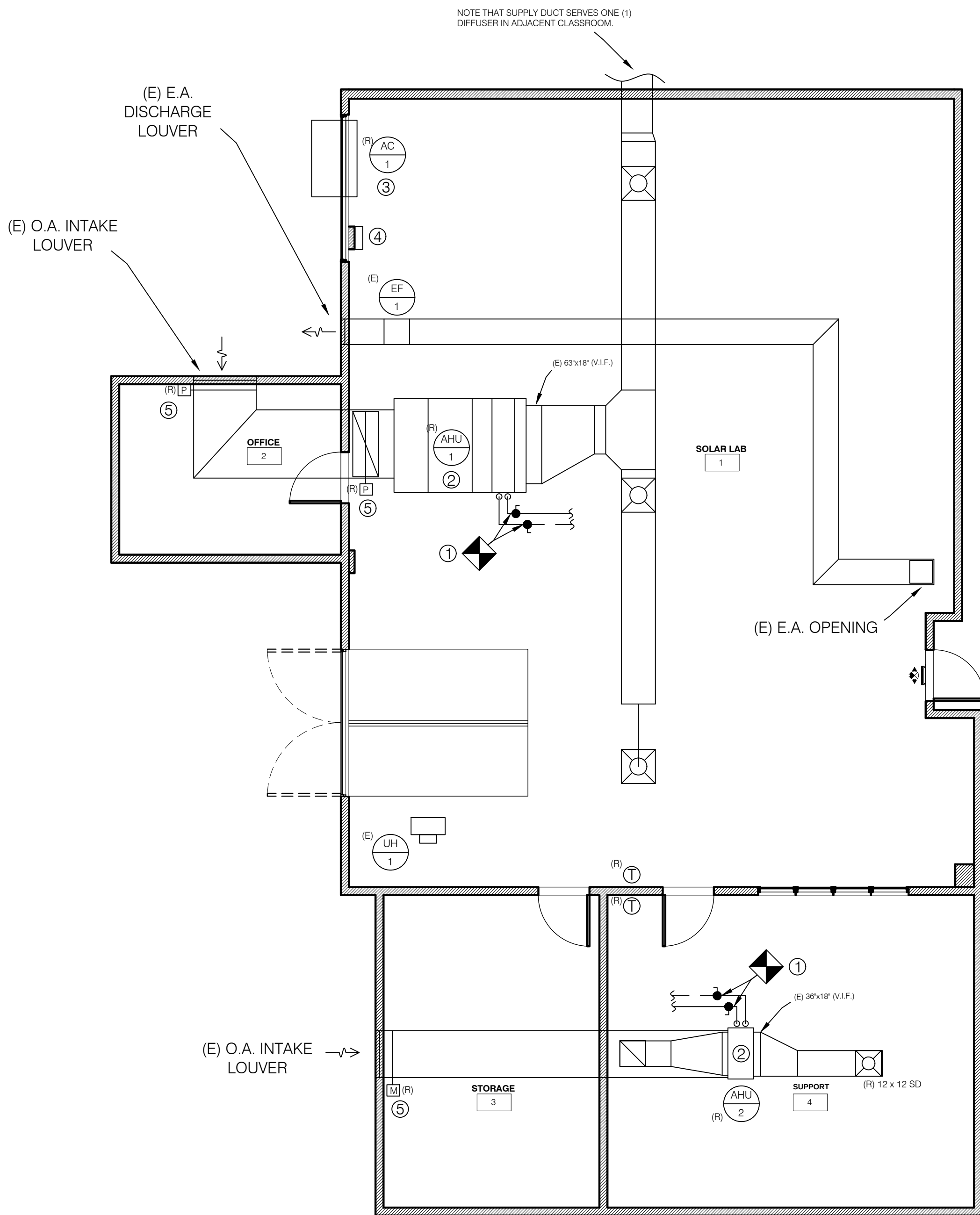
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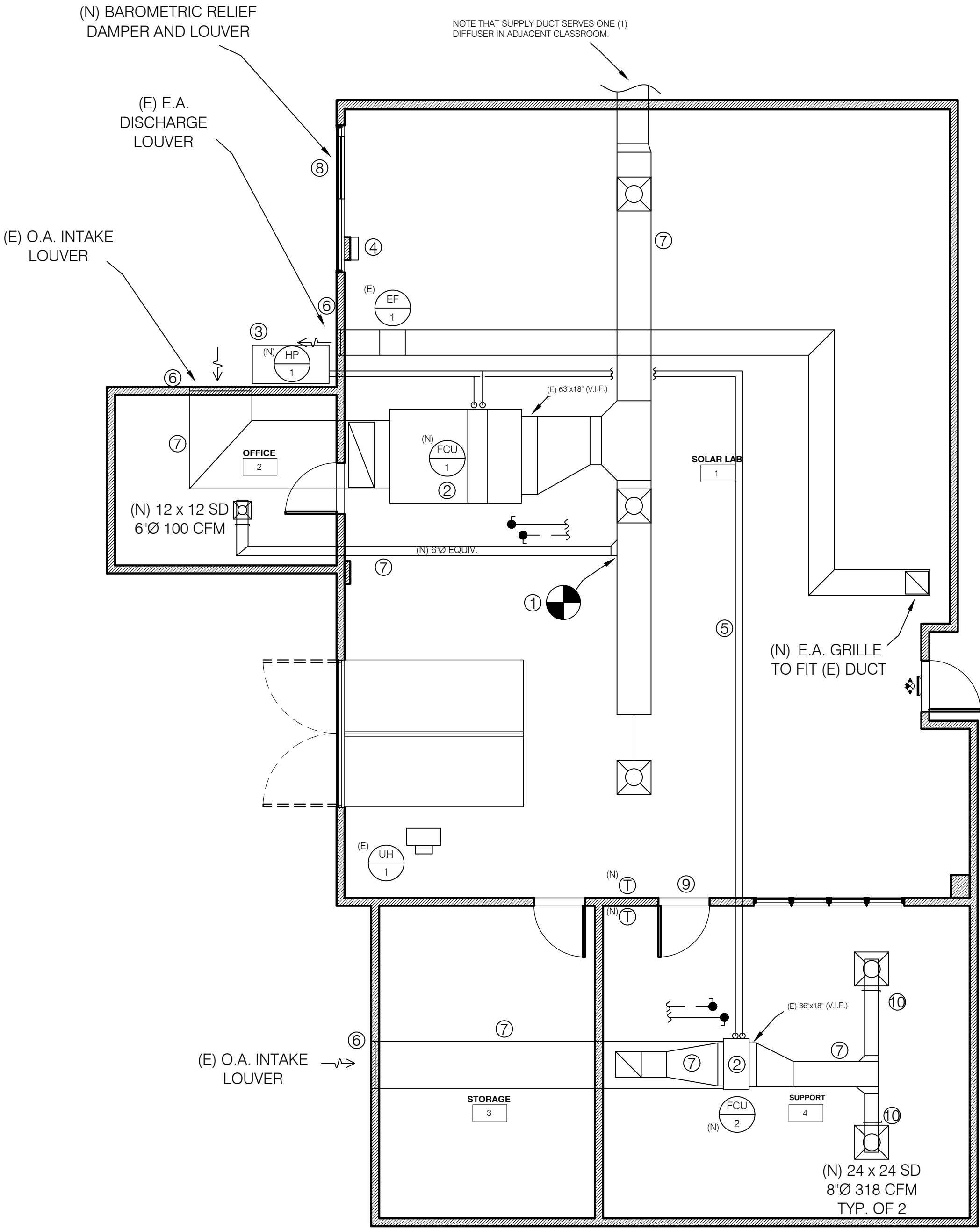
MECHANICAL
DEMOLITION AND
NEW WORK PLANS

M-1.0



- DEMOLITION NOTES:
1. CUT-AND-CARRY HOT WATER PIPING BACK TO SERVICE VALVES.
 2. REMOVE AHU IN ITS ENTIRETY.
 3. REMOVE WINDOW AIR CONDITIONER IN ITS ENTIRETY.
 4. COORDINATE REMOVAL OF PIPE COVERING AND REPLACEMENT WITH SUITABLE BASEBOARD COVERING TO IMPROVE APPEARANCE AND SAFETY.
 5. REMOVE DAMPER AND ACTUATOR.

M-1.0 SOLAR LAB MECHANICAL DEMO PLAN
1 NOT TO SCALE



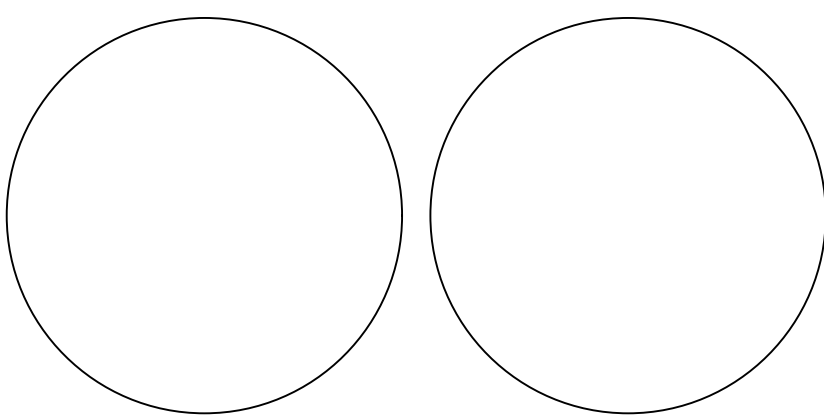
- NEW WORK NOTES:
1. PROVIDE NEW #10 ROUND OR EQUIV. RECTANGULAR METAL DUCT TO SERVE OFFICE. PROVIDE NEW SUPPLY DIFFUSER AND VOLUME DAMPER TO DELIVER 100 CFM. DIFFUSER BASIS OF DESIGN: TITUS TOC-AA.
 2. PROVIDE NEW FAN-COOL UNIT, CONTROLS, ECONOMIZER MODULE AND CONDENSATE DRAIN LINE ACCORDING TO MECHANICAL SCHEDULE AND MANUFACTURER'S DIRECTIONS. CONNECT TO EXISTING DUCTWORK. VERIFY ALL DIMENSIONS IN THE FIELD.
 3. PROVIDE NEW VRF HEAT PUMP CONDENSING UNIT IN LIGHT COURT. OUTSIDE CLASSROOM WALL ACCORDING TO MECHANICAL SCHEDULE AND MANUFACTURER'S DIRECTIONS.
 4. COORDINATE REMOVAL OF PIPE COVERING AND REPLACEMENT WITH SUITABLE BASEBOARD COVERING TO IMPROVE APPEARANCE AND SAFETY.
 5. ROUTE AND PROVIDE REFRIGERANT PIPING TO BOTH FAN-COOL UNITS ACCORDING TO MANUFACTURER'S DIRECTIONS, INCLUDING ALL REQUIRED FITTINGS AND ACCESSORIES. REFRIGERANT PIPING SHOWN ON DRAWINGS IS FOR ILLUSTRATIVE PURPOSES ONLY.
 6. UNSEAL AND REPAIR EXISTING OUTSIDE AIR LOUVER OR REPLACE LOUVER AND PROVIDE INSECT SCREEN AS NECESSARY.
 7. ALL NEW AND EXISTING SUPPLY, RETURN, AND OUTSIDE AIR DUCTWORK SHALL BE INSULATED WITH 1-1/2\"/>
 8. PROVIDE NEW BAROMETRIC RELIEF DAMPER AND LOUVER IN PLACE OF EXISTING WINDOW. DAMPER SHALL BE SIZED FOR ECONOMIZER MODE WITH 1.765 CFM OF OUTSIDE AIR AT 500 FPM OR 3.5 SF OF DAMPER FACE AREA, BASE OF DESIGN: DAYTON DKLS.
 9. COORDINATE NEW LOUVER IN DOOR FOR RELIEF DURING ECONOMIZER MODE. MINIMUM FREE AREA 1.25 SF. BASIS OF DESIGN: DAYTON DKLS.
 10. PROVIDE NEW #10 ROUND OR EQUIV. RECTANGULAR METAL DUCT TO SERVE CLASSROOM. PROVIDE NEW SUPPLY DIFFUSER AND VOLUME DAMPER TO DELIVER 116 CFM. DIFFUSER BASIS OF DESIGN: TITUS TOC-AA.

M-1.0 SOLAR LAB MECHANICAL NEW WORK PLAN
2 NOT TO SCALE



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ENGINEER: PRACTICAL ENERGY SOLUTIONS
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SHEET TITLE

MECHANICAL
SCHEDULES

M-2.0

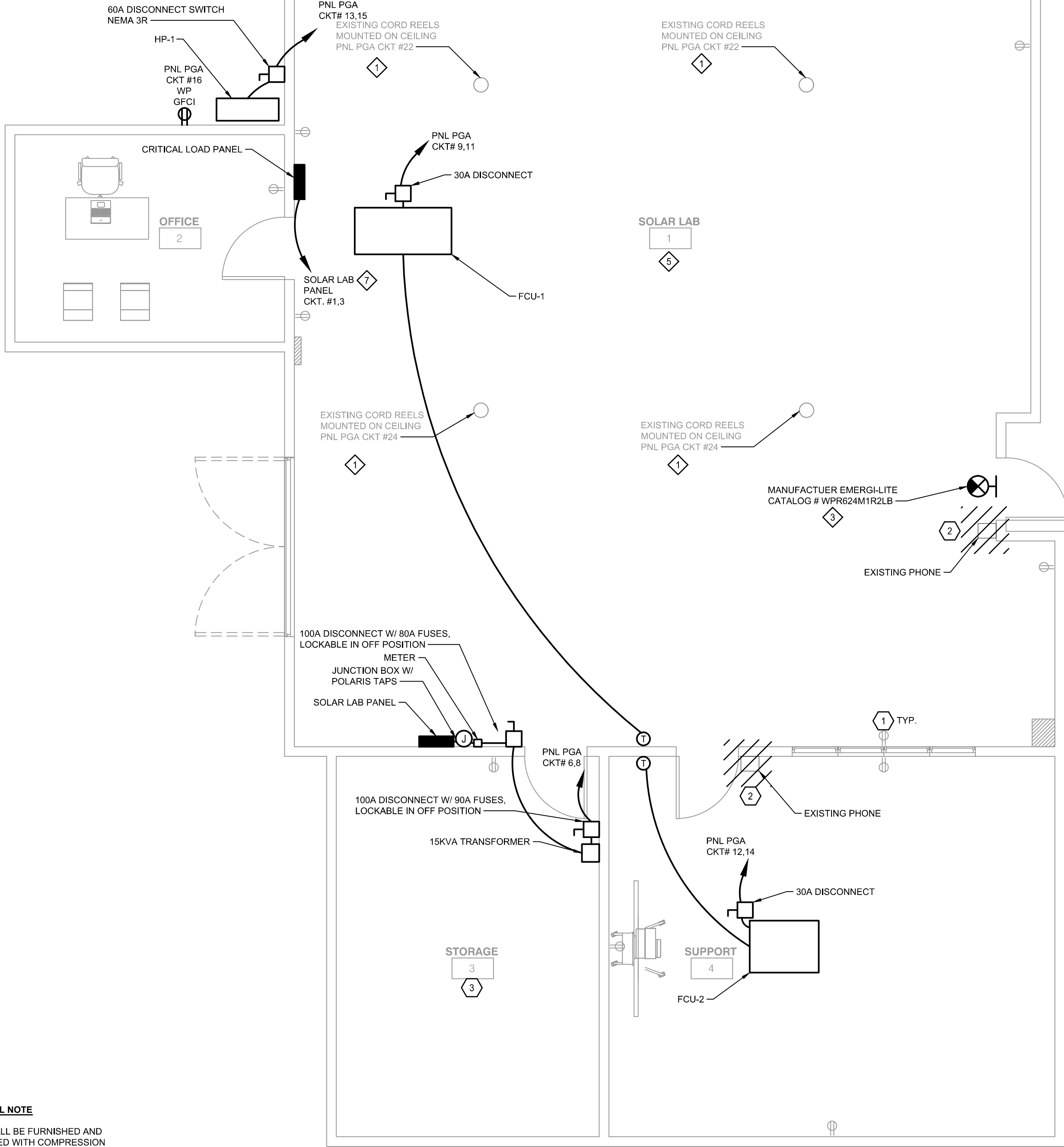
VARIABLE REFRIGERANT VOLUME (VRV) SCHEDULE - INDOOR UNITS																
TAG	ROOM	BOD MODEL #	NDM. TONS	OUTSIDE AIR	SUPPLY FAN	COOLING CAPACITY			HEATING CAPACITY		ELECTRICAL			DIMENSIONS	WEIGHT	OPTIONS AND ACCESSORIES
				CFM	CFM	TOTAL BTU/H	SENS BTU/H	EA DB/WB	TOTAL BTU/H	EA DB	V-PH-Hz	MCA	MDP	WxHxD	LBS	
FCU-1	SOLAR LAB	DAIKIN FXMQ36PBVJU	3.0	376	1,130	36,000	28,079	80 / 67	41,492	68	208-230V-1PH-60Hz	2.9	15.0	55.1x11.8x27.6	101.4	(1) BRC1E73, (1) ECONMQ48P-8-1K, (1) ECONMQP-ENTH
FCU-2	CLASSROOM	DAIKIN FXMQ18PBVJU	1.5	154	635	18,000	15,176	80 / 67	20,746	68	208-230V-1PH-60Hz	1.6	15.0	39.4x11.8x27.6	79.4	(1) BRC1E73, (1) ECONMQ48P-8-1K, (1) ECONMQP-ENTH

- VRV INDOOR UNIT SCHEDULE NOTES:
VRV INDOOR UNITS SHALL HAVE THE FOLLOWING FEATURES:
- EASY INSTALLATION WITH AUTO-ADJUSTING OF AIRFLOW BASED ON EXTERNAL STATIC PRESSURE.
 - EASY MAINTENANCE WITH SERVICE ACCESS FROM BELOW.
 - BUILT-IN CONDENSATE PUMP.
 - OPTIONAL MERV 8 AND 13 FILTERS.
 - OPTIONAL ENTHALPY ECONOMIZER KIT.
 - STANDARD LIMITED WARRANTY: 10-YEAR COMPRESSOR AND PARTS.
 - FCU THERMOSTATS MUST PROVIDE +/-1 DEGREE DEAD-BAND SET-POINT AND CONTROL CAPABILITY.

VARIABLE REFRIGERANT VOLUME (VRV) SCHEDULE - OUTDOOR UNIT																		
TAG	LOCATION	BOD MODEL #	NDM. TONS	COOLING CAPACITY		HEATING CAPACITY		REFRIG. CHARGE	CONNECTION RATIO	ELECTRICAL				DIMENSIONS	WEIGHT	EFFICIENCY		
				TOTAL BTU/H	OA DB	TOTAL BTU/H	OA DB	LBS		V-PH-Hz	MCA	MDP	RLA	WxHxD	LBS	EER	IEER	HSPF
HP-1	LIGHT COURT	DAIKIN RXTQ60TAVJUA	5.0	57,549	93	46,379	10	7.9	94.7%	208-230V-1PH-60Hz	29.1	35.0	23.2	35.4x53.0x12.6	224.9	9.2	16.0	10.5

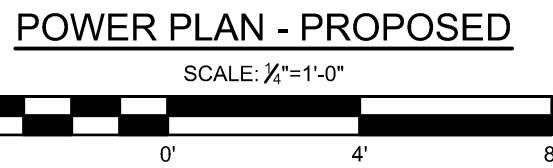
- VRV OUTDOOR UNIT SCHEDULE NOTES:
VRV OUTDOOR UNIT SHALL HAVE THE FOLLOWING FEATURES:
- MANUFACTURER MUST BE CERTIFIED, LISTED, AND LABELED PER AHRI 1230.
 - SYSTEM RATING DATA BASED ON DESIGN AMBIENT CONDITIONS FOR COOLING AND HEATING.
 - SUBMITTED PERFORMANCE DATA MUST BE FULLY DE-RATED FOR ALL COMPONENTS AND ACCESSORIES, INCLUDING BUT NOT LIMITED TO LINE LENGTH, VERTICAL SEPARATION, CONNECTION RATIO, DESIGN CONDITIONS, CONDENSER COIL COATING.
 - CONDENSING UNIT MUST HAVE FULLY MODULATING INVERTER COMPRESSORS.
 - CONDENSING UNIT MUST HAVE AUTO-CHANGEOVER FUNCTIONS.
 - DEMAND LIMITING RELAY CONTACT MUST BE PROVIDED.
 - EEV ACTUATORS MUST BE REMOVABLE FROM VALVE BODY WITHOUT DISTURBING THE REFRIGERANT SYSTEM.
 - MANUFACTURER'S SUBMITTAL MUST INCLUDE REFRIGERANT PIPING DIAGRAM WITH PIPE DIAMETERS, LENGTHS, AND REFRIGERANT VOLUME.
 - SUBSTITUTE MANUFACTURER SHALL BE RESPONSIBLE FOR ADDITIONAL PIPING AND REFRIGERANT DESIGN.
 - CONTRACTOR TO VERIFY PIPING DIMENSIONS.
 - INSTALLING CONTRACTOR MUST HAVE SUCCESSFULLY COMPLETED MANUFACTURER'S CERTIFIED INSTALLATION CLASS WITHIN THE PAST 36 MONTHS.
 - CONTRACTOR TO FURNISH AND INSTALL INSULATION ON REFRIGERANT PIPING.
 - MANUFACTURER'S REPRESENTATIVE MUST HAVE LOCAL STOCK OF PARTS AND A FACTORY-CERTIFIED TECHNICIAN ON STAFF.
 - MANUFACTURER'S REPRESENTATIVE SHALL PROVIDE PROOF OF ONGOING INSTALLATION TRAINING AT THEIR LOCAL FACILITY FOR AT LEAST THE PAST 5 YEARS.
 - MANUFACTURER'S REPRESENTATIVE SHALL PROVIDE PROOF OF CONTINUOUS SALES AND SUPPORT OF THEIR PRODUCTS FOR AT LEAST 15 YEARS.
 - MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DIRECT COSTS ASSOCIATED WITH DEVIATIONS RESULTING FROM CHANGES IN DESIGN.
 - MANUFACTURER MUST PROVIDE 10 YEARS PARTS WARRANTY ON ALL FCUS, CONDENSING UNITS, AND MODE CHANGEOVER DEVICES. WARRANTY CONDITIONS MUST BE CLARIFIED DURING SUBMITTAL PHASE.
 - CONDENSING UNITS MUST BE FURNISHED WITH PROTECTIVE COIL COATING TO WITHSTAND ASTM B117 SALT SPRAY TEST FOR A MINIMUM OF 1000 HOURS.
 - MANUFACTURER MUST CERTIFY AND SUBMIT SYSTEM PERFORMANCE AT EXTREME AMBIENT CONDITIONS OF 122 °FDB IN COOLING MODE AND -4 °FWB IN HEATING MODE.

Appendix A.III – SSM: Electrical E.0-01, EP.1-01



- GENERAL NOTE**
- EMT SHALL BE FURNISHED AND INSTALLED WITH COMPRESSION STEEL FITTINGS.
- INSTALLATION NOTES:**
- EXISTING WOODHEAD 35' CORD REEL, PART# 945-3, OR OWNER APPROVED EQUAL WITH UNISTRUT SUPPORT ABOVE CEILING FOR CORD REEL AND 20A 120V DUPLEX RECEPTACLE.
 - PANEL PGA IS LOCATED IN THE ADJACENT CLASSROOM, APPROXIMATELY 50' AWAY FROM THIS POINT.
 - CONNECT TO UNSWITCH LEG OF LIGHTING CIRCUIT.
 - PROVIDE CONDUIT, WIRE, AND SWITCH FOR NEW PV MODULE LED LIGHTS
 - EXISTING CEILING LIGHT LENS SHALL BE REPLACED.
 - ELECTRICAL CONTRACTOR SHALL VERIFY WITH MECHANICAL CONTRACTOR FINAL OVERCURRENT PROTECTION DEVICE BEFORE PURCHASE OF EQUIPMENT.
 - PROVIDE MANUAL TRANSFER SWITCH, RELIANCE CONTROLS CATALOG #A310C OR APPROVED EQUAL.

- REMOVAL NOTES:**
- DISCONNECT AND REPLACE EXISTING RECEPTACLE.
 - DISCONNECT AND REMOVE EXISTING PHONE. COIL WIRES ABOVE CEILING AND LEAVE. WIRE MOLD SHALL BE REMOVED. ALL WIRES ASSOCIATED WITH WIRE MOLD SHALL BE REMOVED.
 - WIRE MOLD SHALL BE REMOVED. ALL WIRES ASSOCIATED WITH WIRE MOLD SHALL BE REMOVED.
 - DISCONNECT AND REMOVE 20A-1P CIRCUIT BREAKERS. REPLACE WITH (3) 30A-2P & (1) 80A-2P CIRCUIT BREAKERS. NEW CIRCUIT BREAKERS SHALL MATCH EXISTING MANUFACTURER.

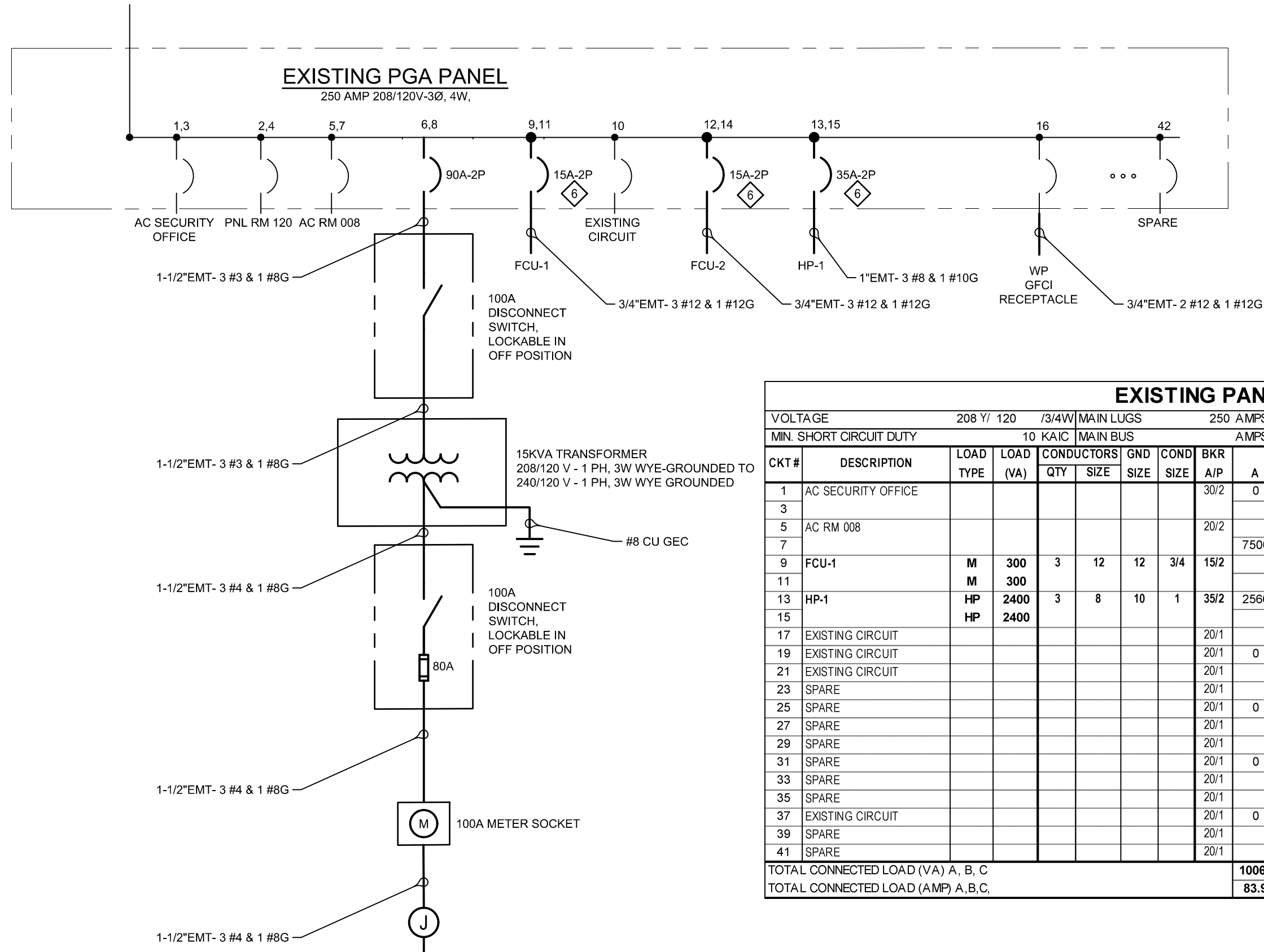
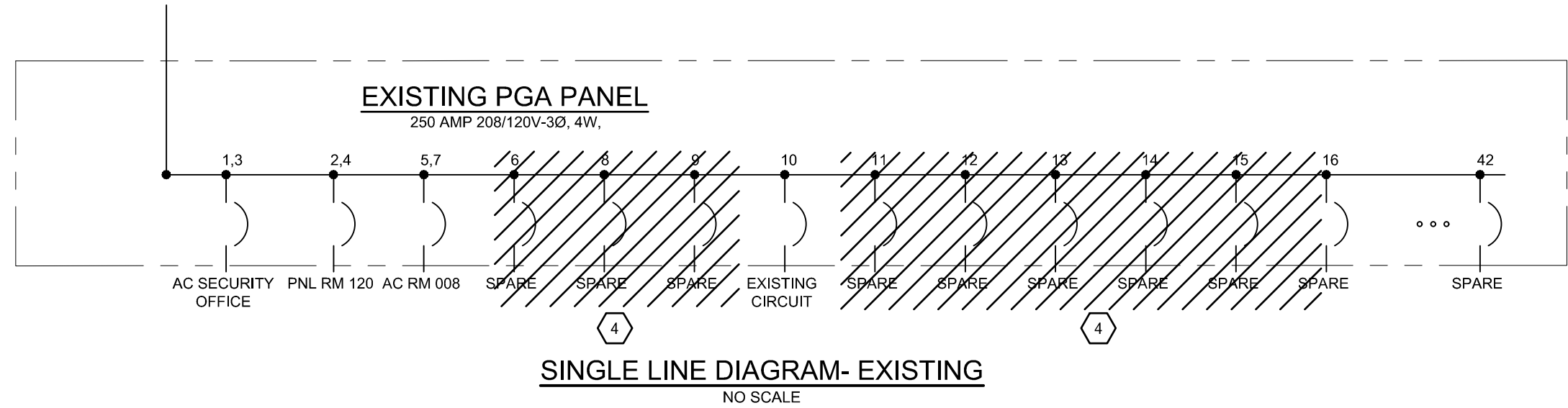


NEW PANEL 'SOLAR LAB' SCHEDULE																						
VOLTAGE		120 / 240		(1/3)W		MAIN LUGS		100 AMPS		MOUNTING		100 AMPS		OPTIONS								
SHORT CIRCUIT DUTY		10		KAIC		MAIN BUS		AMPS		MAIN C.B.		100 AMPS										
CKT. #	DESCRIPTION	LOAD TYPE	LOAD (VA)	QTY	SIZE	SIZE	SIZE	COND A/P	LEG L1	L2	BKR A/P	COND SIZE	COND SIZE	COND SIZE	COND SIZE	COND SIZE	COND SIZE	LOAD (VA)	LOAD TYPE	DESCRIPTION	CKT. #	
1	PV LED LIGHT	L	200	2	12	12	3/4	201	400		201	3/4	12	12	2	200	L		PV LED LIGHT	2		
3	PV LED LIGHT	L	200	2	12	12	3/4	201		200	201								SPARE	4		
5	SPARE							201	0		201								SPARE	6		
7	SPARE							201		0	201								SPARE	8		
9	SPARE							201	0		-1								SPARE	10		
11	SPACE							-1		0	-1								SPACE	12		
13	SPACE							-1	0		-1								SPACE	14		
15	SPACE							-1		0	-1								SPACE	16		
17	FEED TO CRITICAL LOAD	N	1000	3	10	10	1	302	1500		202	3/4	12	12	3	500	N		SOLAR LOAD SIDE	18		
19	PANEL	N	1000							1500							500	N	CONNECTION	20		
TOTAL CONNECT LOAD (VA) L1,L2									1900	1700	KVA WITH DIVERSITY APPLIED										3.6	KVA
TOTAL CONNECT LOAD (AMP) L1,L2									15.8	14.2	AMPS WITH DIVERSITY APPLIED										15.00	AMPS

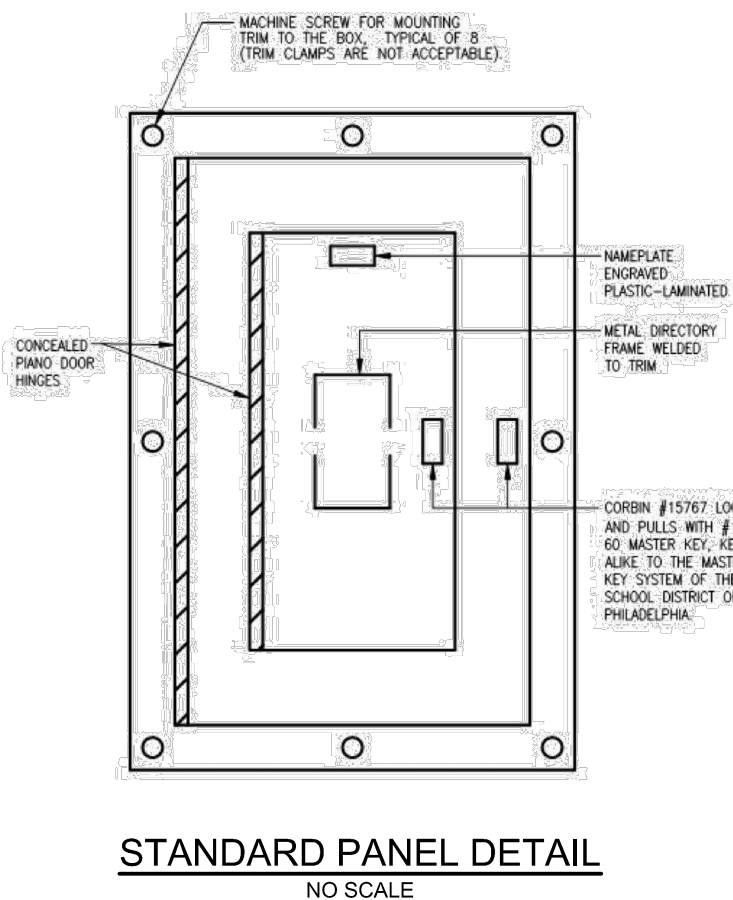
SINGLE LINE DIAGRAM- PROPOSED

NO SCALE

NEW PANEL 'CRITICAL LOAD' SCHEDULE																						
VOLTAGE		120 / 240		1/13W		MAIN LUGS		30 AMPS		MOUNTING				OPTIONS								
SHORT CIRCUIT DUTY		10 KAIC		MAIN BUS				AMPS		MAIN C.B.		AMPS										
CKT. #	DESCRIPTION	LOAD TYPE	LOAD (VA)	QTY	SIZE	SIZE	SIZE	BKR AIP	LEG L1	L2	BKR AIP	COND SIZE	COND SIZE	COND SIZE	COND SIZE	COND SIZE	COND SIZE	COND SIZE	COND SIZE	COND SIZE		
1	SPARE							201			201									2		
3	SPARE							201			201									4		
5	SPARE							201	0		201									6		
7	SPARE							201			201									8		
9	SPARE							201			201									10		
TOTAL CONNECT LOAD (VA) L1,L2									0		0		KVA WITH DIVERSITY APPLIED					0.0 KVA				
TOTAL CONNECT LOAD (AMP) L1,L2									0.0		0.0		AMPS WITH DIVERSITY APPLIED					0.00 AMPS				



EXISTING PANEL 'PGA' SCHEDULE																								
VOLTAGE		208 Y/ 120				3/4W MAIN LUGS				250 AMPS				MOUNTING				OPTIONS						
MIN. SHORT CIRCUIT DUTY		10 KAIC				MAIN BUS				AMPS				MAIN C.B.				AMPS						
CKT#	DESCRIPTION	LOAD TYPE	LOAD (VA)	QTY	SIZE	SIZE	COND SIZE	BKR AIP	PHASE B			BKR AIP	COND SIZE	COND SIZE	COND SIZE	COND SIZE	COND SIZE	COND SIZE	LOAD TYPE	LOAD TYPE	DESCRIPTION	CKT#		
1	AC SECURITY OFFICE							302	A	B	C		502								PNL RM 120	2		
3										0												4		
5	AC RM 008							202				7500	902	1-1/2	8	3	3	7500	N	N	SOLAR LAB PANEL	6		
7										7500								7500				8		
9	FCU-1	M	300	3	12	12	3/4	152		300			201								EXISTING CIRCUIT	10		
11		M	300									468	152	3/4	12	12	3	166	M		FCU-2	12		
13	HP-1	HP	2400	3	8	10	1	352	2568									166	M			14		
15		HP	2400							2580			201	3/4	12	12	2	180	R		WP GFCI RECEPTACLE	16		
17	EXISTING CIRCUIT							201			0		201								EXISTING CIRCUIT	18		
19	EXISTING CIRCUIT							201	0				201								EXISTING CIRCUIT	20		
21	EXISTING CIRCUIT							201		360			201	3/4	12	12	2	360	R		CORD REELS	22		
23	SPARE							201			360	201	3/4	12	12	2	360	R			CORD REELS	24		
25	SPARE							201	0			201									EXISTING CIRCUIT	26		
27	SPARE							201		0		201									SPARE	28		
29	SPARE							201				201									SPARE	30		
31	SPARE							201	0			201									SPARE	32		
33	SPARE							201		0		201									SPARE	34		
35	SPARE							201				201									SPARE	36		
37	EXISTING CIRCUIT							201	0			201									SPARE	38		
39	SPARE							201			0	201									SPARE	40		
41	SPARE							201				201									SPARE	42		
TOTAL CONNECTED LOAD (VA) A, B, C									10066	3240	8326	KVA WITH DIVERSITY APPLIED									19.1	KVA		
TOTAL CONNECTED LOAD (AMP) A,B,C									83.9	27.0	68.4	AMPS WITH DIVERSITY APPLIED									53.17	AMPS		



RELEASED FOR:

BID

NOT FOR CONSTRUCTION

PROJECT MANAGER: EVM

BASE BY: OTHERS

DRAWN BY: CJC

SSM

SPOTTS, STEVENS & MCCOY

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PRACTICAL ENERGY SOLUTIONS

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FRANKLIN HIGH SCHOOL - SOLAR LAB

ELECTRICAL - POWER

PLAN

DATE: 06/20/20

DIGITAL FILENAME

WORK ORDER NUMBER

EP-1-01

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DIGITAL FILENAME

WORK ORDER NUMBER

DRAWING NUMBER