

PFLUGERVILLE ISD
PACE SCHOOL
SHOP BUILDING
HVAC RENOVATIONS
FOR CONSTRUCTION
DECEMBER 7, 2024

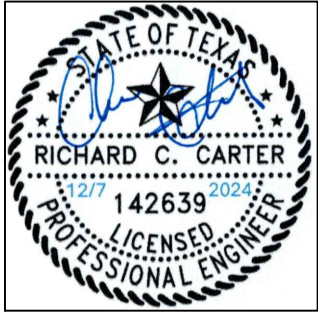


PACE School 1401B W Pecan Pflugerville, TX 78660
Shop Building

SHEET LIST

T-1	COVER SHEET AND SHEET LIST
MEP1	DEMOLITION FLOOR PLAN
MEP2	RENOVATION FLOOR PLAN
MEP3	ELEVATION & SECTION
MEP4	EQUIPMENT SCHEDULES AND CONTROLS

THIS DOCUMENT APPROVED
FOR CONSTRUCTION
BY CHRIS CARTER, P.E.
TEXAS PROFESSIONAL ENGINEER #142639
ON 12/7/2024



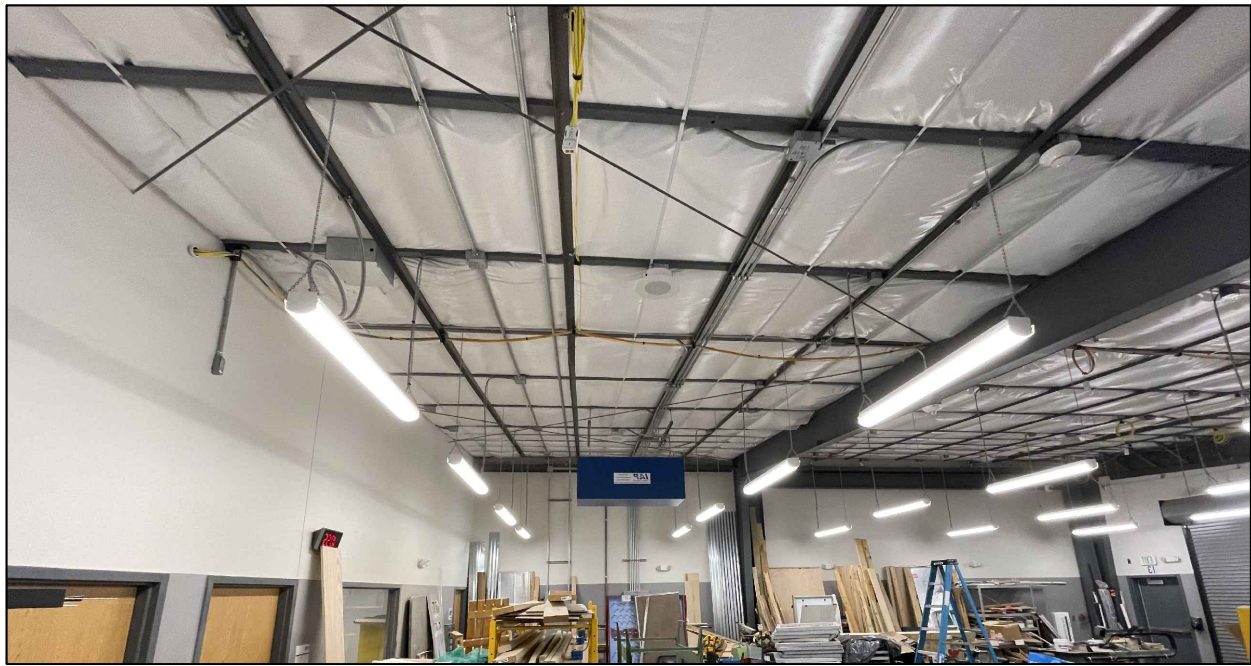
DATE
December 7, 2024

REVISIONS		
NO.	REV	DATE
DD	CC	12/7/2024

APPROXIMATE SCALE:
AS SHOWN

SHEET INFO.

T1



PICTURE: EXISTING CEILING AT SHOP BUILDING



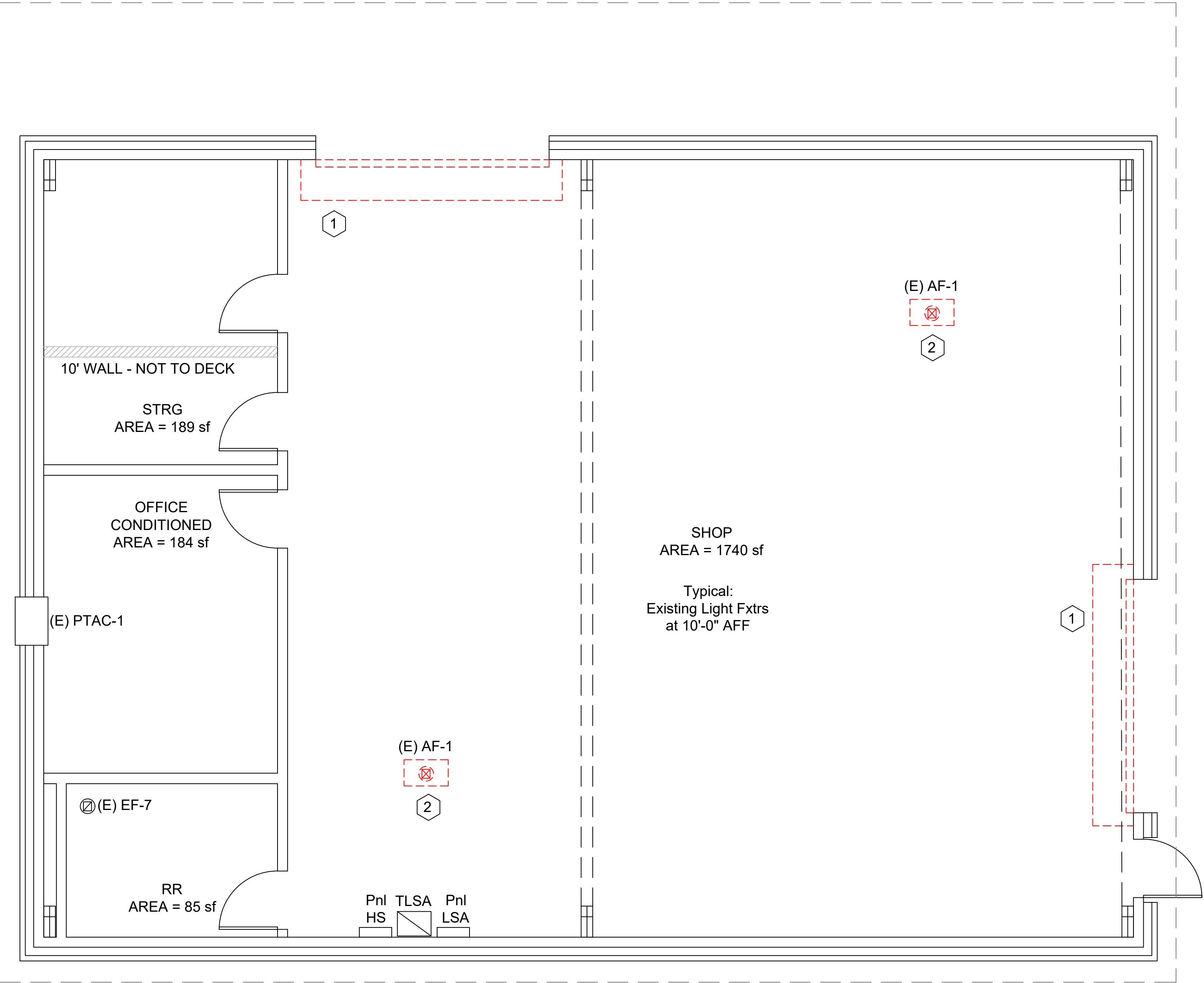
PICTURE: EXISTING SHOP BUILDING EXTERIOR

DEMOLITION PLAN KEYED NOTES:

- 1

CONTRACTOR TO REPLACE EXISTING ROLL-UP OVERHEAD DOOR WITH NEW INSULATED ROLL-UP OVER HEAD DOOR. DOOR TO BE THERMISER MAX 12x10 DOOR, OR ENGINEER APPROVED EQUAL. R-VALUE OF NEW DOOR TO BE MINIMUM R=8; U-VALUE TO 0.125 OR LOWER AS CALCULATED BY ASHRAE HANDBOOK OF FUNDAMENTALS. POWDER COAT COLOR TO BE DETERMINED BY OWNER. DOOR TO INCLUDE OPENER AND SAFETY DETECTION DEVICES. DOOR TO INCLUDE HIGH CYCLE SPRINGS. DOOR TO INCLUDE CONTACTOR THAT DE-ENERGIZES THE NEW PACKAGED HVAC UNIT WHEN THE DOORS ARE OPENED; CONTACTOR RE-ENERGIZES PACKAGED UNIT WHEN DOOR IS CLOSED.
- 2

CONTRACTOR TO REMOVE TWO EXISTING AF-1 UNITS. REMOVE ELECTRICAL CIRCUITS BACK TO THE PANEL. REMOVE SUSPENSION RODS FROM ROOF STRUCTURE.



PACE Shop Building New HVAC Schedule

Tag #	Model Number	Brand	Qty	Supply Air Blower					Cooling					Heating			Electrical				Alt. (ft)	Weight ²	Remarks					
				Airflow (cfm)		HP	ESP (IWG)	Blwr RPM	Temperature (°F)				Capacity MBH¹		EER	SEER /IEER	Refrigerant	Temp (°F)		MBH				Electric Heat kW	Voltage	MCA	Max Fuse	
				SA	OA				Ent. Air DB	WB	Lvg. Air DB	WB	OD Amb	Total				Sens.	Ent. DB									Lvg. DB
PU-Shop	DSH1204WXXXCXADXXEXXXXX	Daikin	1	4647	750	5.00	0.8	1725	79.7	66.1	60.0	57.9	95.0	116.77	97.87	11.4	15.2	R32	61.8	96.0	116.0	15 kW	460-3-60	53.2	60	700.0	1169	

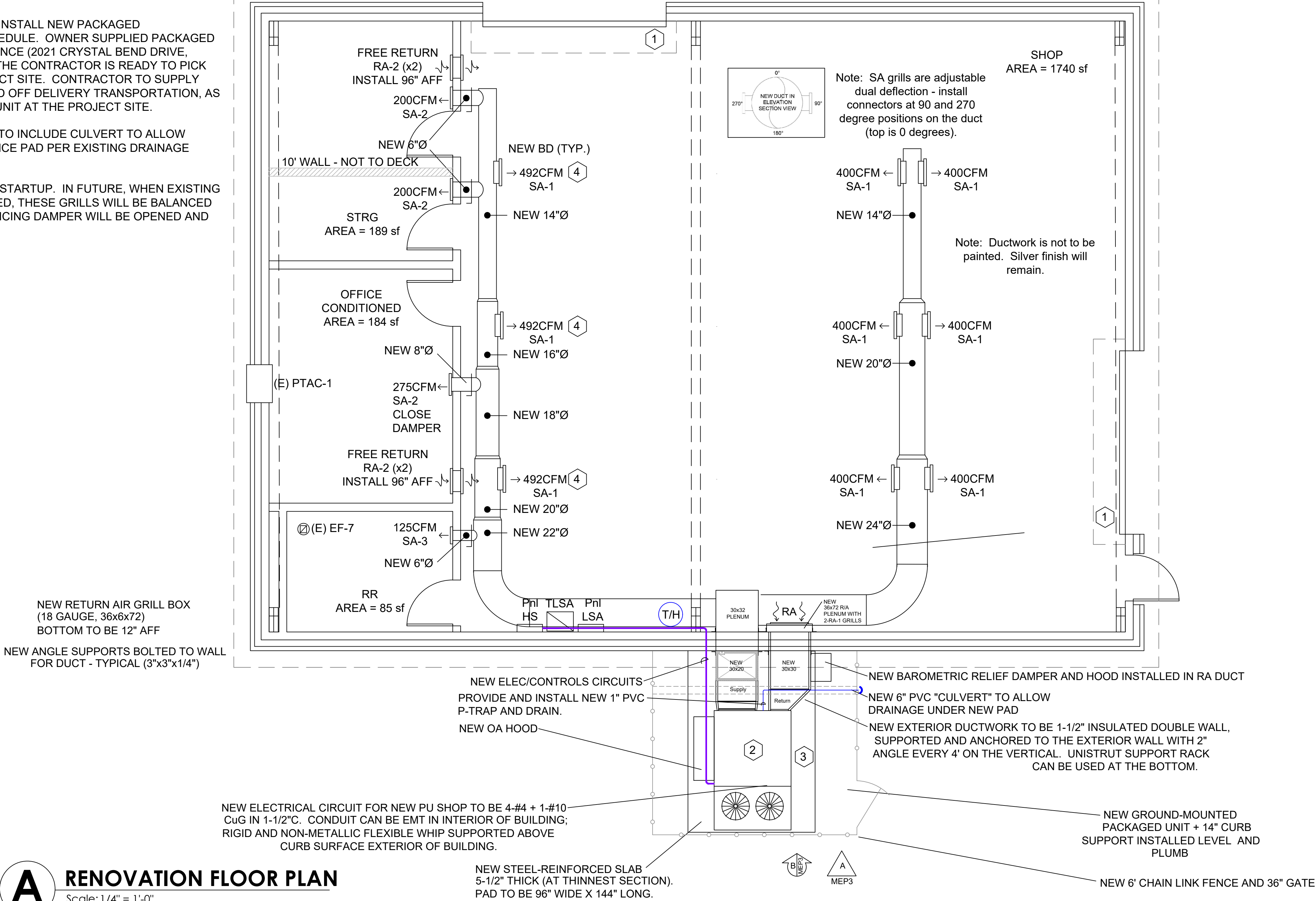
Include:

- Economizer with barometric relief.
- Disconnect switch and powered convenience outlet
- BACnet MSTP controls.
- Supply air smoke detector and Phase monitor.
- 2" MERV 8 Pleated Filters and Coil Guard.
- 15kW electric heat, single point electrical connection. Circuit = 60A CB with 4-#4 THHN + 1-#10 CuG in 1-1/2".
- Manufacturer Rep to supply 14" curb to mount unit on maintenance pad and allow sufficient space for the installation of P-trap and condensate drain piping.

NOTE: NEW UNIT AND ACCESSORIES LISTED IN THE SCHEDULE NOTES WILL BE SUPPLIED BY OWNER - SCHEDULE SUPPLIED FOR INFORMATION PURPOSES ONLY. CONTRACTOR IS NOT TO ORDER THE PACKAGED UNIT.

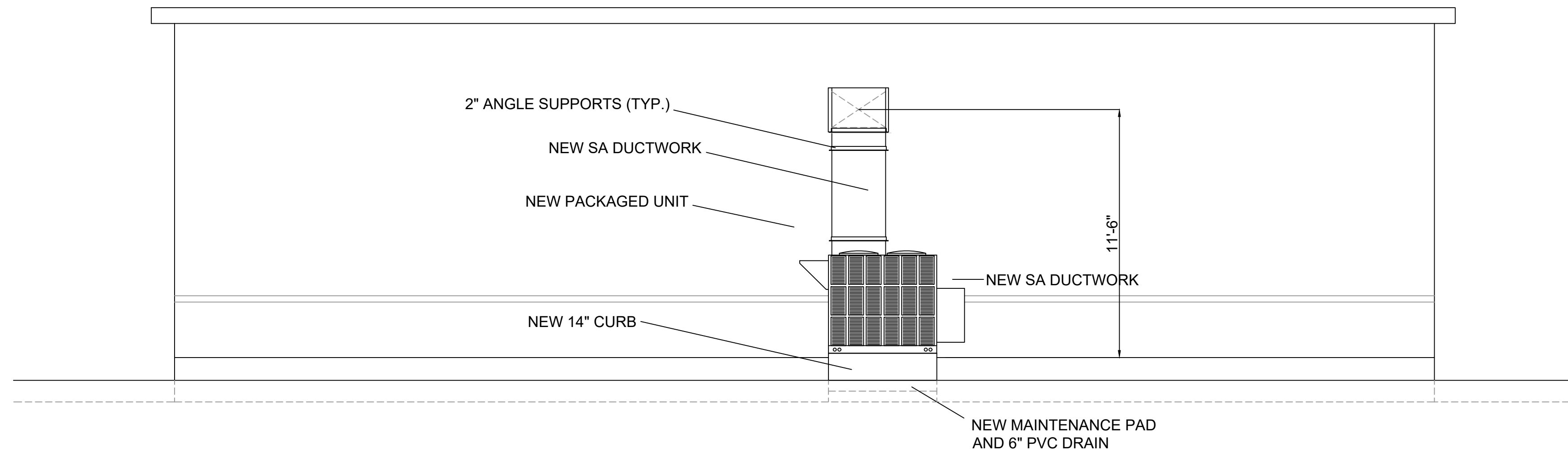
RENOVATION PLAN KEYED NOTES:

- 1
- NEW INSULATED ROLL-UP OVERHEAD DOOR - SEE DEMOLITION PLAN KEYED NOTES.
- 2
- OWNER WILL SUPPLY** ; CONTRACTOR TO INSTALL NEW PACKAGED GROUND-MOUNTED HEAT PUMP PER SCHEDULE. OWNER SUPPLIED PACKAGED UNIT WILL BE STORED AT PflsD MAINTENANCE (2021 CRYSTAL BEND DRIVE, PFLUGERVILLE, TX) UNTIL SUCH TIME AS THE CONTRACTOR IS READY TO PICK UP THE UNIT AND DELIVER TO THE PROJECT SITE. CONTRACTOR TO SUPPLY EQUIPMENT TO LIFT AND SET UNIT ON AND OFF DELIVERY TRANSPORTATION, AS WELL AS LOWER THE UNIT AND SET THE UNIT AT THE PROJECT SITE.
- 3
- NEW MAINTENANCE PAD (APPROX. 8'x12') TO INCLUDE CULVERT TO ALLOW WATER TO DRAIN UNDER THE MAINTENANCE PAD PER EXISTING DRAINAGE PATHWAYS.
- 4
- BALANCE THESE GRILLS TO 492 CFM FOR STARTUP. IN FUTURE, WHEN EXISTING PTAC OFFICE UNIT NEEDS TO BE REPLACED, THESE GRILLS WILL BE BALANCED TO 400 CFM AND THE OFFICE DUCT BALANCING DAMPER WILL BE OPENED AND SUPPLY 275 CFM TO THE OFFICE.

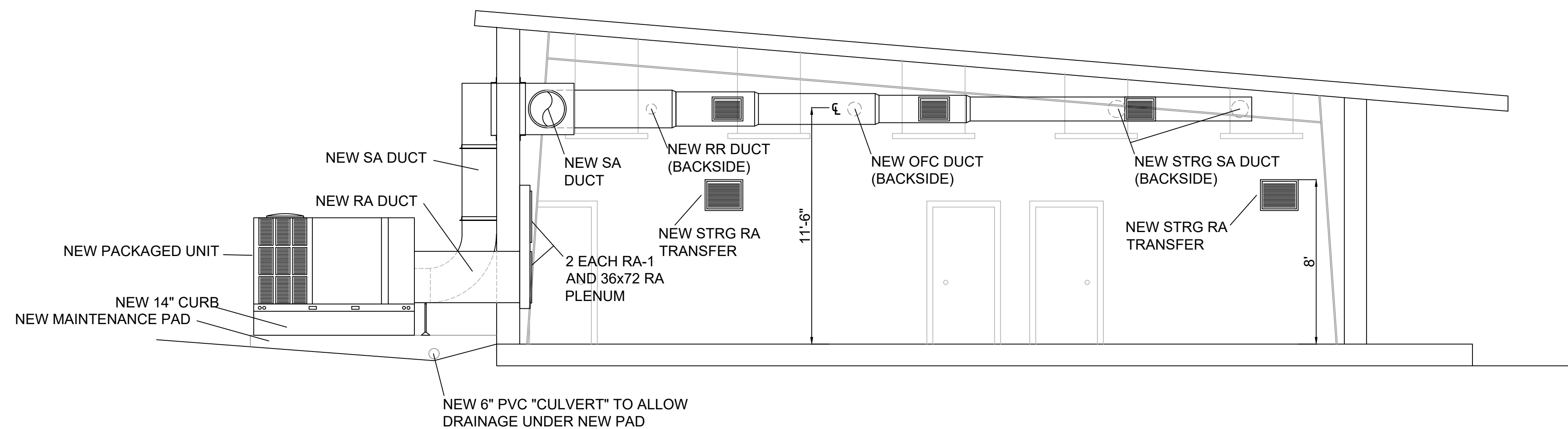


A RENOVATION FLOOR PLAN
Scale: 1/4" = 1'-0"

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A **FRONT ELEVATION**
Scale: 1/4" = 1'-0"



B **RIGHT SECTION**
Scale: 1/4" = 1'-0"

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APPROXIMATE SCALE:
AS SHOWN

SHEET INFO.

DX PACKAGED Heat Pump

Point Name	Point Type				Show on Graphic
	AI	DI	AO	DO	
Zone Temperature	X				X
Occupant Override		X			
Supply Air Temperature	X				X
Return Air Temperature	X				X
Mixed Air Temperature	X				X
Supply Fan Start/Stop			X		X
Supply Fan Run Status		X			X
Cooling/Heating Stage 1			X		X
Cooling/Heating Stage 2 (1)			X		X
Auxiliary Heat			X		X
Reversing Valve Control			X		X
Outside Air Damper Open/Close			X		X
Return Air Damper Open/Close			X		X
Totals	4	2	0	7	

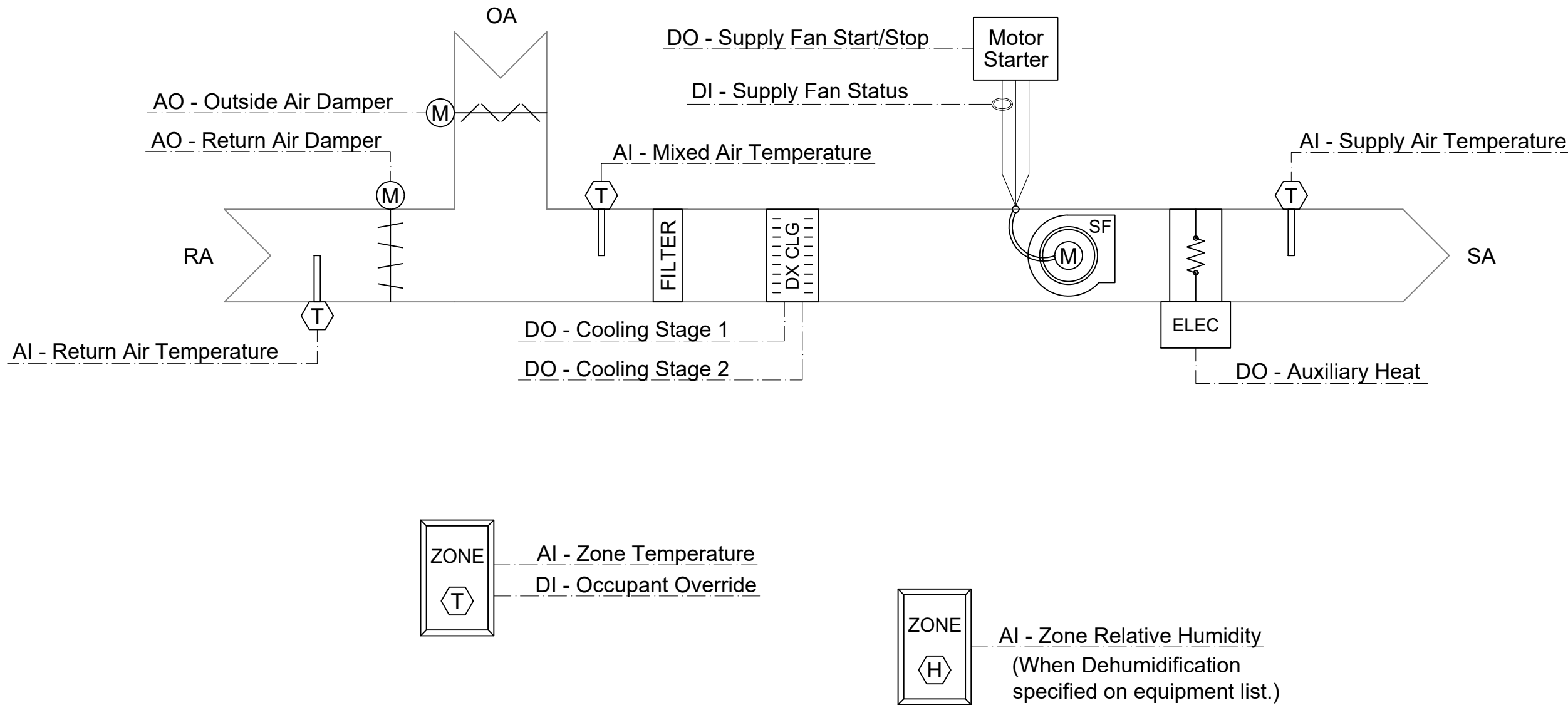
Additional Settings and Statuses to Show on Graphic	
Current Zone Temperature Setpoint	
Current Schedule Status (Occupied or Unoccupied)	
Occupancy Override Status	
Active Program Overrides	
Active Alarms	
Alarms	
High Zone Temperature	
Low Zone Temperature	
High Supply Air Temperature	
Low Supply Air Temperature	
Supply Fan Failure	
Supply Fan Running in Hand	
Supply Fan Runtime Exceeded	

NOTES:
1) Verify number of heat/cool stages per unit.

Adjustable Control Settings (At Minimum)	Initial Setting
Occupied/Unoccupied Mode Scheduling	SEE SCHEDULES
Occupied Zone Temperature Cooling Setpoint	74°F
Occupied Zone Temperature Heating Setpoint	68°F
Unoccupied Zone Temperature Cooling Setpoint	85°F
Unoccupied Zone Temperature Heating Setpoint	55°F
Zone Temperature Cooling/Heating Offset (Drift)	+/-1.5°F
Second Stage Cooling Differential from Setpoint	+1.5°F for 2 minutes
Second Stage Heating Differential from Setpoint	-1.5°F for 2 minutes
Auxiliary Heating Enable Setpoint Differential	>2°F for 5 minutes
Minimum Fan Run Time / Off-Time	5 minutes
Minimum Compressor Runtime/Off-Time	3 minutes
Outside Air Damper Delay at Start-Up	30 minutes
Occupancy Override Run Time	30 minutes
Cooling OAT Lockout	Below 40°F
Heating OAT Lockout	Above 70°F

ARDEMCSCHEDULE

TAG	MAKE (OR APPROVED ENGINEER/EQUAL)	MODEL	QUANTITY	SIZE	CONSTRUCTION	BORDER STYLE	FRONT BLADE ORIENTATION	MOUNTING FRAME	FASTENING TYPE	COLOR
SA-1	PRICE	16x12 / 610 / L / I / A / B12	9	16x12	ALUMINUM	SPIRAL DUCT FRAME	HORIZONTAL	N/A	SCREWS	WHITE
SA-2	PRICE	16x12 / 610DAL / F / L / D / A / B12	2	16x12	ALUMINUM	SURFACE	VERTICAL	F-BORDER	SCREWS	WHITE
SA-3	PRICE	12x6 / 610DAL / F / L / D / A / B12	1	12x6	ALUMINUM	SURFACE	VERTICAL	F-BORDER	SCREWS	WHITE
RA-1	PRICE	30x30 / F / L / D / A / B12	2	30x30	ALUMINUM	SURFACE	HORIZONTAL	BORDER	SCREWS	WHITE
RA-2	PRICE	20x16 / ATG1 / BF / B15	4	20x16	ALUMINUM	SURFACE	HORIZONTAL	F-BORDER	SCREWS	ALUMINUM



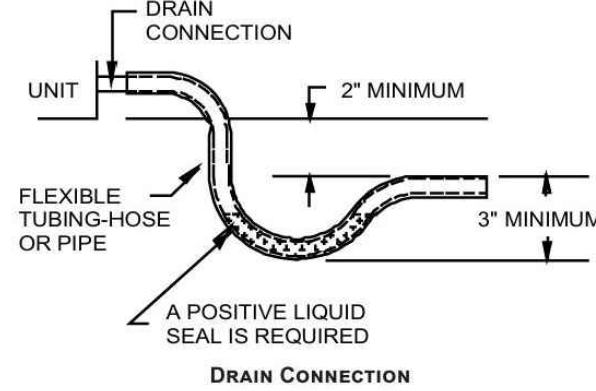
06 DX PACKAGED HEAT PUMP w/ AUX ELECTRIC HEAT AND ECONOMIZER

Scale: None

CONDENSATE DRAIN CONNECTION

CONDENSATE DRAIN CONNECTION

A 3/4" female NPT drain connection is supplied on the end of the unit and bottom of the drain pan for condensate piping. An external trap must be installed for proper condensate drainage. Hand tighten drain fitting to the drain connection.



Install condensate drain trap as shown. Use 3/4" drain line and fittings or larger. Do not operate without trap.

NOTE: ALL THREADED CONNECTIONS SHOULD BE SEALED WITH THREAD SEALER TO PREVENT LEAKS.

13. DX PACKAGEDHEAT PUMP

1) Run Conditions

- The control system shall command the Heat Pump to run according to a User-defined occupied/unoccupied time schedule with the following settings:
 - In occupied mode, the Heat Pump fan shall operate continuously or shall cycle on and off (**refer to equipment list**) while cooling and heating are controlled to maintain a 74°F (adj.) zone cooling setpoint and a 68°F (adj.) zone heating setpoint, with a +/-1.5°F (adj.) offset.
 - In unoccupied mode (night setback) the Heat Pump shall cycle on and off as needed to maintain an 85°F (adj.) zone cooling setpoint and a 55°F (adj.) zone heating setpoint, with a +/-1.5°F (adj.) offset. To prevent short-cycling, the AHU fan shall run for and be off for a minimum period of 5 minutes each (adj.).
- Zone Unoccupied Override: A timed local override control shall allow an occupant to override the schedule and place the system into occupied mode for 30 minutes (adj.). At the expiration of this time, control of the system shall automatically return to the schedule.
- The supply fan shall run anytime the Heat Pump is commanded to run, unless shutdown on safeties. The fan on/off status shall be monitored by the control system.
- Alarms shall be provided as follows:
 - Supply Fan Failure: The fan status is off 2 minutes (adj.) after being commanded on.
 - Supply Fan in Hand: The fan status is on 2 minutes (adj.) after being commanded off.
 - Supply Fan Runtime Exceeded: Status runtime exceeds a User-definable limit.
 - High Zone Temp: The zone temperature is greater than the cooling setpoint by 5°F (adj.) after the Heat Pump has been commanded to run for 60 minutes (adj.).
 - Low Zone Temp: The zone temperature is less than the heating setpoint by 5°F (adj.) after the Heat Pump has been commanded to run for 60 minutes (adj.).

2)Heat Pump Start/Stop Sequence

- When the Heat Pump is called to run, the control system shall command the supply fan to run and enable cooling or heating as required to meet the zone air temperature setpoint.
- If the Heat Pump has a motorized outside air damper, the control system shall open the damper to the design ventilation volume position during occupied mode operation only. The outside air damper shall remain closed during unoccupied mode.
- When the Heat Pump is called to stop, the control system shall stop the supply air fan, fully close the outside air damper (if present) and disable cooling and heating.

3) Cooling Control:

- When the zone temperature is above the zone cooling setpoint, the control system shall activate or deactivate compressors compressor stages as required to maintain the zone temperature at the cooling setpoint.
- To prevent short-cycling, the compressors shall have a minimum on and off time of 2 minutes (adj.)
- Cooling shall be disabled if the supply fan status is OFF.
- Cooling shall be disabled whenever the outside ambient temperature is below 40°F (adj.).

4) Heating Control:

- When the zone temperature is below the zone heating setpoint, the control system shall operate the Heat Pump with the reversing valve in heating mode. The control system shall activate or deactivate compressor stages as required to maintain the zone temperature at the heating setpoint.
- The control system shall operate the auxiliary electric heater if the zone temperature is 2°F (adj.) or more below setpoint while the system is operating in heating mode.
- Heating shall be disabled if the supply fan status is OFF.
- Heating shall be disabled whenever the outside ambient temperature is above 70°F (adj.).

5) Temperature Monitoring:

- The control system shall monitor the Heat Pump mixed air temperature and supply air temperature.
- Alarms shall be provided as follows:
 - High Supply Air Temp: The supply air temperature is greater than 120°F (adj.). Disable the Heat Pump until the alarm is manually reset.
 - Low Supply Air Temp: The supply air temperature is less than 40°F (adj.). Disable the Heat Pump until the alarm is manually reset.

6) Dehumidification:

- If the space humidity is above referenced setpoint (65%, adjustable), the control system shall force the Heat Pump into maximum cooling for a period of 15 minutes (adj.) with the outside air damper (if present) fully closed. If possible, control the fan to first stagelow speed. The maximum cooling period shall be stopped early if the zone temperature falls below 68°F (adj.) to prevent overcooling.
- Next, the system will enter a warm-up period, activating heat if necessary until the zone temperature equals or exceeds the occupied cooling setpoint. There shall also be a time delay to ensure the warm-up period lasts for a minimum of 5 minutes (adj.) before allowing the dehumidification cycle to repeat.