

MECHANICAL/PLUMBING SYMBOLS (ALL SYMBOLS SHOWN ARE NOT NECESSARILY USED ON THE DRAWINGS)

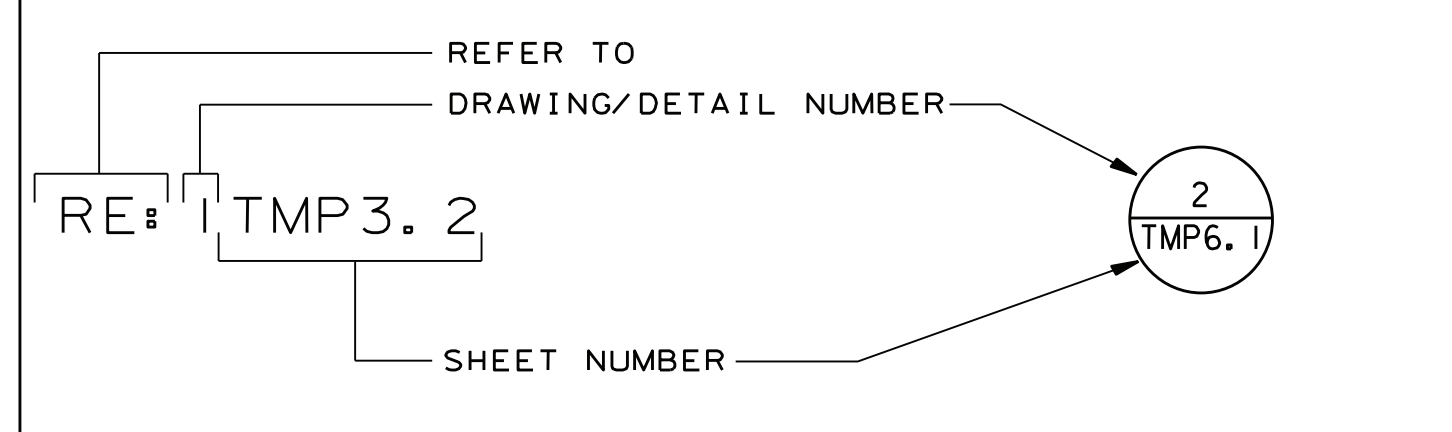
ABBREVIATIONS	
AD	ACCESS DOOR, AREA DRAIN
AFC	ABOVE FINISHED CEILING
AF	ABOVE FINISHED FLOOR
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
BWV	BACK WATER VALVE
CIRC	CIRCULATING
COND	CONDENSER, CONDENSATE CONNECTION
CW	COLD WATER
D	DEPTH, DRAIN
DET	DETAIL
DF	DRINKING FOUNTAIN
DISC	DISCONNECT
DPR	DAMPER
DWH	DOMESTIC WATER HEATER
EC	ELECTRICAL CONTRACTOR
ECC	ECCENTRIC
EDB	ENTERING DRY BULB
EHC	ELECTRIC HEATING COIL
ESP	EXTERNAL STATIC PRESSURE
ETR	EXISTING TO REMAIN
FCO	FLOOR CLEAN OUT
FCS	FLOOR CONTROL STATION
FD	FLOOR DRAIN, FIRE DAMPER
FLR	FLOOR
FUT	FUTURE
GLV	GLOBE VALVE
GV	GATE VALVE
HB	HOSE BIBB
HD	HEAD, HUB DRAIN
HSC	HORIZONTAL SPLIT CASE
HTG	HEATING
HWC	HOT WATER CIRCULATOR
IE	INVERT ELEVATION
IW	INDIRECT WASTE
JB	JUNCTION BOX
JP	JOCKEY PUMP
L	LENGTH, LAVATORY
LAV	LAVATORY
M	METER
MC	MECHANICAL CONTRACTOR
MTD	MOUNTED
MVD	MANUAL VOLUME DAMPER
N.C.	NORMALLY CLOSED
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
OBD	OPPOSED BLADE DAMPER
OD	OUTSIDE DIAMETER, OVERFLOW DRAIN OPENING
OPG	OPENING
PC	PLUMBING CONTRACTOR
PD	PRESSURE DROP, PLANTER DRAIN PANEL
PNL	PLANTER DRAIN PANEL
PT	PLUMBING TRIM
PV	PLUG VALVE
R	RISER
RED	REDUCER
RV	RELIEF VALVE
SAF	SUPPLY AIR FAN
SCR	SILICON CONTROLLED RECTIFIER
SECT	SECTION
SENS	SENSIBLE
SFCS	SPRINKLER FLOOR CONTROL STATION
SKVA	STARTING KILOVOLT-AMPS
SKW	STARTING KILOWATTS
SP	SUMP PUMP
SPR	SPRINKLER
SS	SERVICE SINK
SSFU	SANITARY SEWER FIXTURE UNITS
SSSC	SOLID STATE SPEED CONTROL
STR	STRAINER
SUSP	SUSPEND
SV	SANITARY VENT
TC	TEMPERATURE CONTROL
TDH	TOTAL DYNAMIC HEAD
TF	TRANSFER FAN
TP	TRAP PRIMER
U	URINAL
UON	UNLESS OTHERWISE NOTED
U/F	UNDERFLOOR
U/S	UNDERSLAB
VD	VOLUME DAMPER
VOV	VALVE ON VERTICAL
W	WATT, WASTE, WIDTH
WC	WATER CLOSET
WCO	WALL CLEANOUT
WH	WALL HYDRANT
WM	WATER METER
WP	WEATHERPROOF
WPD	WATER PRESSURE DROP
Z	ZONE

USE INDUSTRY STANDARD FOR OTHER THAN NOTED

PIPING TYPES	
CHS	CHILLED WATER SUPPLY
CHR	CHILLED WATER RETURN
S	STEAM S=0 TO 15", 60HPS=60" HIGH PRESS. STEAM
C	CONDENSATE RETURN
PC	PUMPED CONDENSATE
RHG	REFRIGERANT HOT GAS LINE
RS	REFRIGERANT SUCTION LINE
RL	REFRIGERANT LIQUID LINE
SD	SANITARY DRAIN BELOW FLOOR
SD	SANITARY DRAIN ABOVE FLOOR
SV	SANITARY VENT
GW	GREASE (KITCHEN) WASTE
SD	STORM DRAIN
OD	OVERFLOW DRAIN
AW	ACID WASTE
AV	ACID VENT
---	COLD WATER
---	HOT WATER
---	HOT WATER RECIRCULATION
G	NATURAL GAS
A	COMPRESSED AIR
AA	"AA" DENOTES GAS TYPE
MA	MEDICAL AIR
DI	DEIONIZED WATER
V	VACUUM
F	FIRE STANDPIPE, FIRE LINE
FS	FIRE SPRINKLER
TP	TRAP PRIMER
D	DRAIN LINE
---	EXISTING PIPE, "aaa" DENOTES TYPE
-X-aaa-X-	EXISTING PIPE TO BE REMOVED, "aaa" DENOTES TYPE

PIPING SYMBOLS	
	ELBOW DOWN
	VALVE IN DROP
	VALVE IN RISE
	DIRECTION OF FLOW
	DIRECTION OF SLOPE DOWN
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER
	TEE OUTLET UP
	TEE OUTLET DOWN
	UNION
	PIPE ANCHOR
	EXPANSION JOINT
	STRAINER WITH BLOWDOWN VALVE
	GATE VALVE, HVAC BALANCING/STOP VALVE
	GLOBE VALVE
	BALL VALVE
	BALANCING VALVE WITH DIFFERENTIAL PRESSURE TAPS
	OS&Y VALVE
	CHECK VALVE
	TWO POSITION CONTROL VALVE
	TWO-WAY MODULATING CONTROL VALVE
	THREE-WAY MODULATING CONTROL VALVE
	PRESSURE REDUCING VALVE
	SPRINKLER FLOOR CONTROL STATION
	GAS VALVE
	MANUAL AIR VENT
	AUTOMATIC AIR VENT
	T&P RELIEF VALVE
	VACUUM BREAKER
	LINE CLEANOUT
	FLOOR CLEANOUT
	PRESSURE GAUGE WITH GAUGE COCK
	THERMOMETER
	WATER METER
	FLEXIBLE CONNECTION
	PRESSURE AND TEMPERATURE TAP
	FLOW VENTURI

DRAWING/DETAIL REFERENCE KEY



MISCELLANEOUS	
	FLOOR DRAIN
	AREA DRAIN
	ROOF DRAIN OR OVERFLOW DRAIN
	HOSE BIBB
	WALL HYDRANT
	PLUMBING FIXTURE
	POINT OF NEW CONNECTION TO EXISTING
	DRAWING NOTE REFERENCE
	OWNER OR CONTRACTOR FURNISHED EQUIPMENT REFERENCE
	MECHANICAL/PLUMBING EQUIPMENT REFERENCE. "aaa" DENOTES TYPE, "bb" DENOTES NUMBER.
	AIR DISTRIBUTION DEVICE REFERENCE. "a" DENOTES TYPE, "bbb" DENOTES CFM, "cc/dd" DENOTES NECK SIZE
	HVAC TERMINAL UNIT REFERENCE. "aaa" DENOTES TYPE, "bbb" DENOTES CFM, "ccc KW" DENOTES HEATING KW WHERE APPLICABLE
	RISER DESIGNATION. "P" DENOTES WASTE/VENT OR WASTE/VENT/WATER, "W" DENOTES WATER, "DS" DENOTES DOWNSPOUT, "F" DENOTES FIRE.
	FLOW SWITCH
	VALVE SUPERVISORY SWITCH
	FIRE HOSE CABINET
	FIRE HOSE RACK
	FIRE DEPARTMENT SIAMESE CONNECTION
	THERMOSTAT
	TEMPERATURE SENSOR
	HUMIDISTAT
	FIRESTAT
	DUCT SMOKE DETECTOR. "SA" DENOTES SUPPLY AIR, "RA" DENOTES RETURN AIR PROVIDED AND WIRED BY DIV. 16 - INSTALL BY DIV. 15
	PNEUMATIC TUBING OR CONTROL WIRING
	TEMPERATURE CONTROL PANEL
	PRESSURE DIFFERENTIAL SENSOR (ANALOG)
	FLOW SENSOR (ANALOG)
	RELATIVE HUMIDITY SENSOR (ANALOG)
	PRESSURE SENSOR (ANALOG)
	POSITION INDICATOR (ANALOG)
	HIGH LIMIT T=TEMP P=PRESS F=FLOW RH= REL HUMIDITY
	LOW LIMIT T=TEMP P=PRESS F=FLOW RH= REL HUMIDITY

DUCTWORK

	SUPPLY AIR DIFFUSER, NO LETTER DENOTES NEW, "R" DENOTES RELOCATED EXISTING.
	EXISTING SUPPLY AIR DIFFUSER, NO LETTER DENOTES TO REMAIN, "R" DENOTES TO BE REMOVED AND REUSED AS APPLICABLE.
	RETURN AIR OR EXHAUST GRILL, NO LETTER DENOTES NEW, "R" DENOTES RELOCATED EXISTING.
	EXISTING RETURN AIR OR EXHAUST GRILL, NO LETTER DENOTES TO REMAIN, "R" DENOTES TO BE REMOVED AND REUSED AS APPLICABLE.
	LIGHT TROFFER SUPPLY AIR BOOTS, NO LETTER DENOTES NEW, "R" DENOTES RELOCATED EXISTING, NUMBER DENOTES CFM.
	EXISTING LIGHTING TROFFER SUPPLY AIR BOOTS, NO LETTER DENOTES TO REMAIN, "R" DENOTES TO BE REMOVED AND REUSED AS APPLICABLE, NUMBER DENOTES CFM.
	SUPPLY AIR SLOT, NO LETTER DENOTES NEW, "R" DENOTES RELOCATED EXISTING.
	EXISTING SUPPLY AIR SLOT, NO LETTER DENOTES TO REMAIN, "R" DENOTES TO BE REMOVED AND REUSED AS APPLICABLE.
	RETURN AIR SLOT, NO LETTER DENOTES NEW, "R" DENOTES RELOCATED EXISTING.
	EXISTING RETURN AIR SLOT, NO LETTER DENOTES TO REMAIN, "R" DENOTES TO BE REMOVED AND RELOCATED AS APPLICABLE.
	NEW RECTANGULAR OR ROUND DUCTWORK
	EXISTING DUCTWORK
	EXISTING DUCTWORK TO BE CLEANED, TREATED & COATED
	EXISTING RECTANGULAR OR ROUND DUCTWORK TO BE REMOVED AND RELOCATED AS APPLICABLE
	NEW FLEXIBLE DUCT
	EXISTING FLEXIBLE DUCT
	EXISTING FLEXIBLE DUCT TO BE REMOVED
	SUPPLY OR OUTSIDE AIR DUCT
	RETURN, RELIEF, OR EXHAUST AIR DUCT
	FLEXIBLE DUCT CONNECTION
	INCLINED RISE IN DUCT (TWO ELBOWS)
	INCLINED DROP IN DUCT (TWO ELBOWS)
	TURNING VANES
	DUCT EXTRACTOR
	SPLITTER DAMPER
	DUCT MOUNTED HEATING COIL
	DUCT MOUNTED FILTER
	IN-LINE FAN WITH FLEX CONNECTORS
	DUCT MOUNTED HUMIDIFIER
	DOUBLE DUCT HVAC TERMINAL UNIT
	SINGLE DUCT HVAC TERMINAL UNIT
	FIRE DAMPER
	SMOKE DAMPER
	FIRE/SMOKE DAMPER
	MANUAL BALANCING DAMPER
	GRAVITY BACKDRAFT DAMPER
	MOTORIZED DAMPER
	HIDDEN LINES

GENERAL NOTES	
A.	REFER TO SPECIFICATIONS FOR MATERIALS AND METHODS FOR MECHANICAL/ELECTRICAL CONSTRUCTION.
B.	REFER TO EXISTING SITE CONDITIONS. VISIT THE SITE TO DETERMINE ANY SPECIAL BUILDING CONDITIONS THAT ARE NOT INDICATED ON THE DOCUMENTS.
C.	ALL DUCTWORK SIZES SHOWN ARE FREE AIR STREAM DIMENSIONS.
D.	FURNISH AND INSTALL ACCESS DOORS IN DUCTS, WALL AND CEILINGS WHERE ACCESS IS REQUIRED TO CLEAN, TREAT AND COAT THE DUCTWORK.
E.	COORDINATE ALL MECHANICAL WORK WITH THE OWNER'S REPRESENTATIVE. ALL MODIFICATIONS TO THE EXISTING ELECTRICAL SHALL BE DONE BY TRADES SPECIALIZING IN THAT WORK.
F.	THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PAINTING ANY MECHANICAL AND PLUMBING ITEMS WHICH ARE REQUIRED TO BE FIELD PAINTED. REFERENCE THE REQUEST FOR PROPOSAL (RFP).
G.	THESE DOCUMENTS ARE BASED ON ACTUAL CONDITIONS DOCUMENTED DURING DESIGN. THE MECHANICAL CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY CONDITIONS WHICH VARY FROM THE DOCUMENTS AND BE RESPONSIBLE FOR COORDINATING THE LOCATION OF DUCTWORK WITH EXISTING CONDITIONS.
H.	ALL MECHANICAL WORK SHALL COMPLY WITH APPLICABLE STATE & LOCAL BUILDING CODES & REQUIREMENTS.
I.	THE MECHANICAL CONTRACTOR SHALL VISIT THE SITE & FAMILIARIZE THEMSELVES WITH EXISTING CONDITIONS WHICH WILL IMPACT CONSTRUCTION OF THIS PROJECT, PRIOR TO SUBMITTING PROPOSALS.
J.	ALL INTERRUPTIONS TO SERVICES & ALL WORK IN OCCUPIED SPACES SHALL BE SCHEDULED WITH THE OWNER'S REPRESENTATIVE PER THE SPECIFICATIONS & SHALL BE PERFORMED AT TIMES WHICH ARE ACCEPTABLE TO THE OWNER.
K.	COORDINATE THE EXACT LOCATION OF ALL WALL MOUNTED DEVICES WITH THE OWNER'S REPRESENTATIVE.
L.	FURNISH ACCESS DOORS FOR INSTALLATION BY THE GENERAL CONTRACTOR WHERE ACCESS IS REQUIRED TO CONCEALED EQUIPMENT.

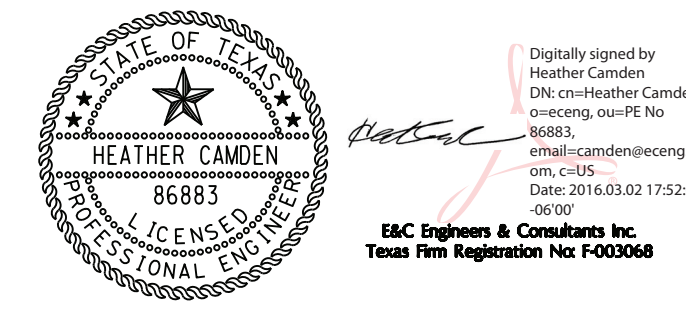
DRAWING LIST

M000	MECHANICAL SYMBOLS & ABBREVIATIONS
M108	MECHANICAL PENTHOUSE DEMOLITION/ BYPASS PLAN
M109.7	MECHANICAL ROOF DEMOLITION/ BYPASS PLAN - AHU-L7
M109.8	MECHANICAL ROOF DEMOLITION/ BYPASS PLAN - AHU-L8
M208	MECHANICAL PENTHOUSE RENOVATION PLAN
M209	MECHANICAL ROOF RENOVATION PLAN
M300	MECHANICAL AHU PLANS
M400	MECHANICAL SCHEDULES
M500	MECHANICAL DETAILS
M501	MECHANICAL DETAILS

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FOR BID		03-02-16		FOR BID

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UTMSC Project No. 730022
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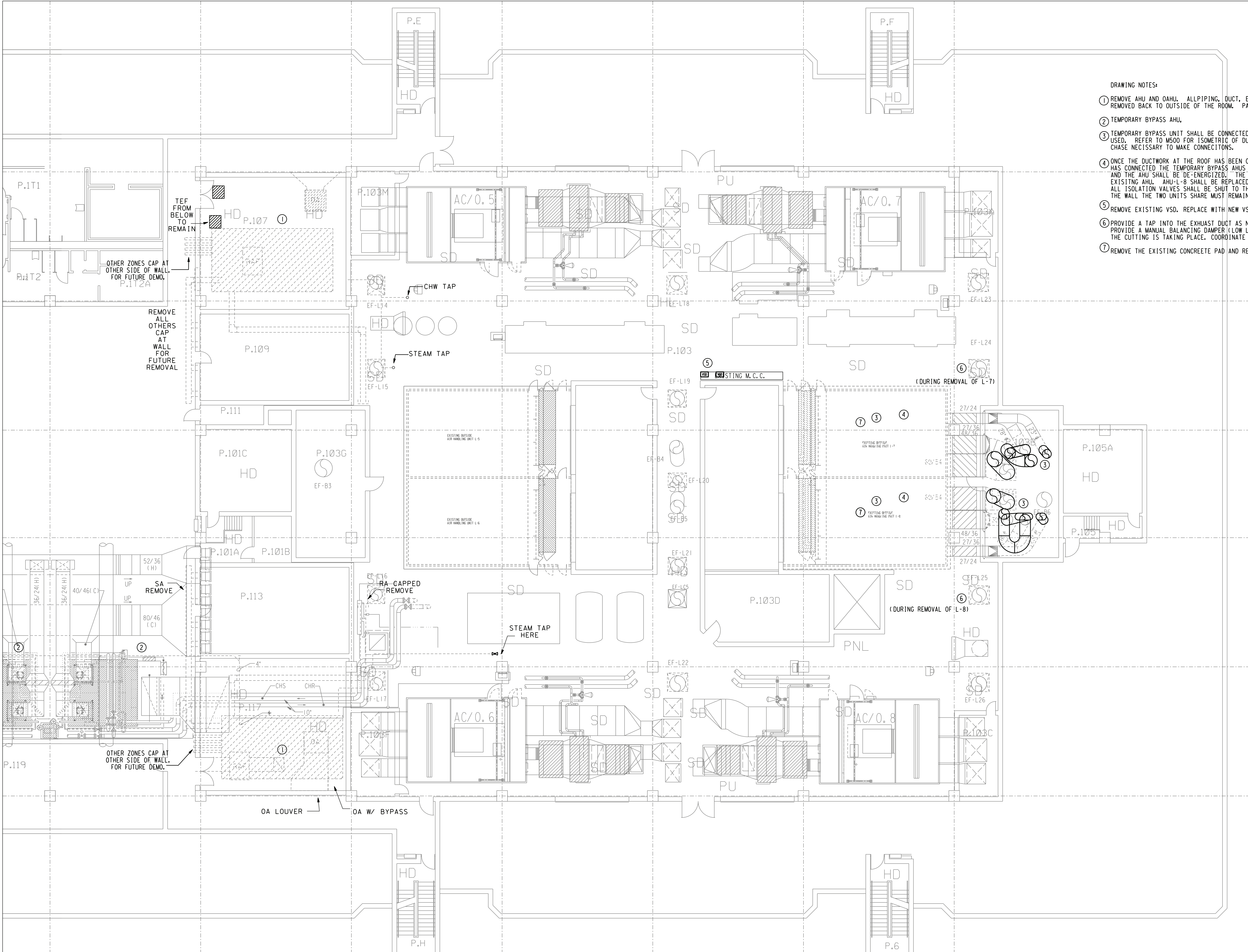


MEDICAL SCHOOL BUILDING AHU L-7 & 8 REPLACEMENT

MECHANICAL SYMBOLS AND ABBREVIATIONS

M000

DRAWING TITLE: MEDICAL SCHOOL BUILDING AHU L-7 & 8 REPLACEMENT
 DRAWING NO.: M000



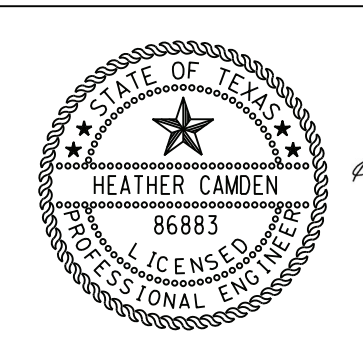
- DRAWING NOTES:
- 1 REMOVE AHU AND OAHU. ALL PIPING, DUCT, ELECTRICAL AND CONTROLS SERVING THE DEMOLISHED AHU SHALL BE REMOVED BACK TO OUTSIDE OF THE ROOM. PATCH THE WALL TO MEET THE EXISTING FIRE RATING.
 - 2 TEMPORARY BYPASS AHU.
 - 3 TEMPORARY BYPASS UNIT SHALL BE CONNECTED TO THE RISERS AS NOTED ON THE ROOF PLAN. FLEX MAY BE USED. REFER TO M500 FOR ISOMETRIC OF DUCT CONNECTIONS. REMOVE ANY DUCTWORK IN THE CHASE NECESSARY TO MAKE CONNECTIONS.
 - 4 ONCE THE DUCTWORK AT THE ROOF HAS BEEN CONNECTED TO THE RISERS AND THE FLEXIBLE DUCT HAS BEEN CONNECTED TO THE TEMPORARY BYPASS AHU TO THE RISERS, THE TEMPORARY AHUS SHALL BE ENERGIZED AND THE AHU SHALL BE DE-ENERGIZED. THE BYPASS AHUS ARE SIZED FOR BOTH AHUS TO SERVICE ONE EXISTING AHU. AHU-L-8 SHALL BE REPLACED FIRST AND AHU-L-7 SHALL BE DONE AFTER. ALL ISOLATION VALVES SHALL BE SHUT TO THE AHU AND THE AHU SHALL BE REPLACED AS DETAILED ON M300. THE WALL THE TWO UNITS SHARE MUST REMAIN IN PLACE DURING THE FIRST AHU REPLACEMENT.
 - 5 REMOVE EXISTING VSD. REPLACE WITH NEW VSD. REFER TO RENO FOR DETAIL.
 - 6 PROVIDE A TAP INTO THE EXHAUST DUCT AS NOTED FOR VENTILATION DURING CUTTING OF THE EXISTING UNITS. PROVIDE A MANUAL BALANCING DAMPER (LOW LEAK) WITH FLEXIBLE DUCT TO ALLOW FOR MOVEMENT TO WHERE THE CUTTING IS TAKING PLACE. COORDINATE ANY NEEDED SHUT-DOWNS WITH THE OWNER. 12"
 - 7 REMOVE THE EXISTING CONCRETE PAD AND REPOUR. REFER TO STRUCTURAL DRAWINGS FOR FURTHER INFO.

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 E&C Engineers & Consultants Inc.
 Texas Firm Registration No: F000066

Date: 3/2/16
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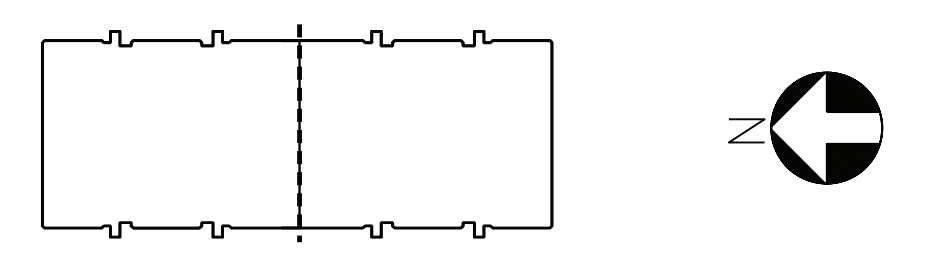
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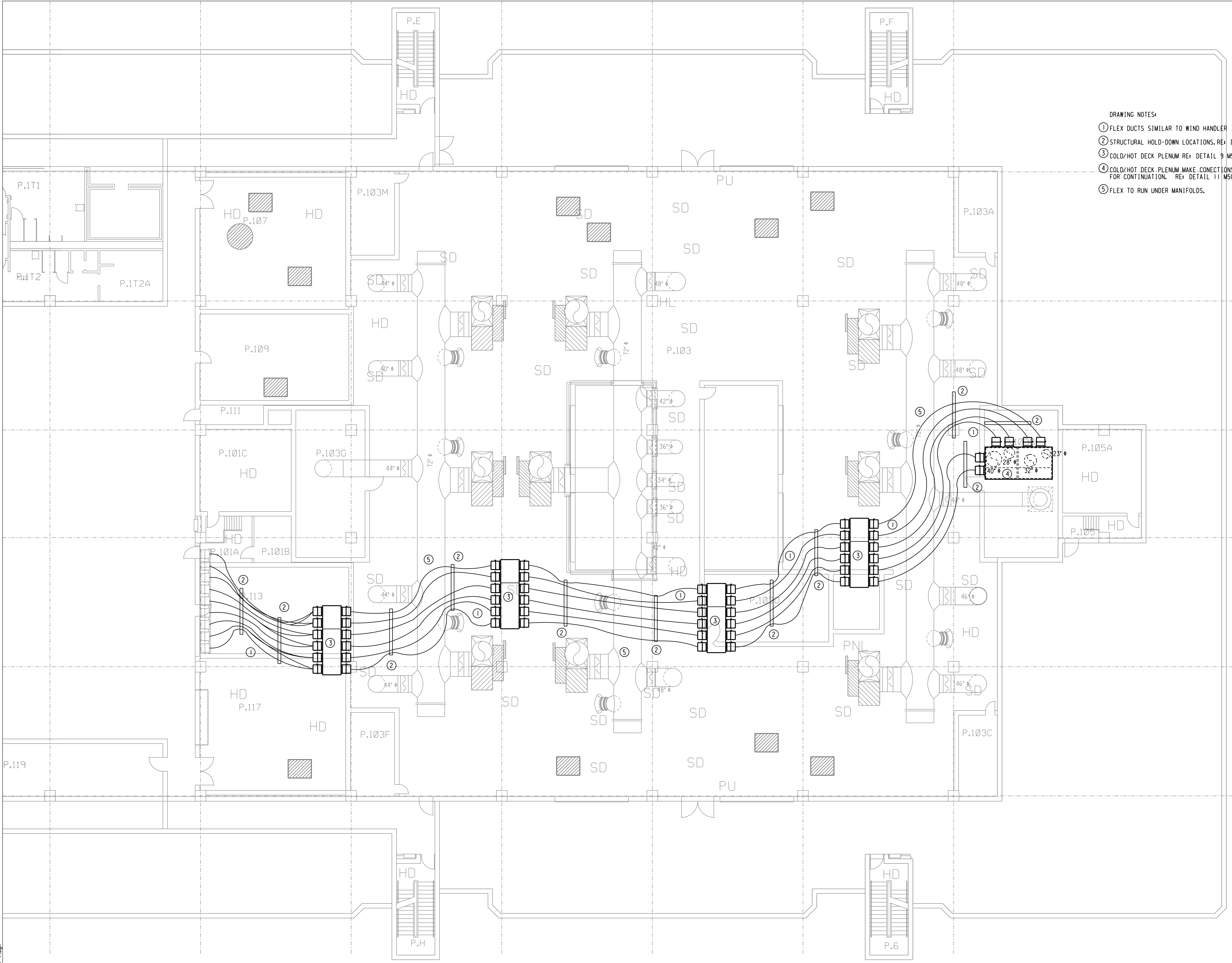
MEDICAL SCHOOL BUILDING AHU L-7 & 8 REPLACEMENT

DRAWING TITLE
**MECHANICAL PH
 DEMOLITION/
 BYPASS DRAWING**

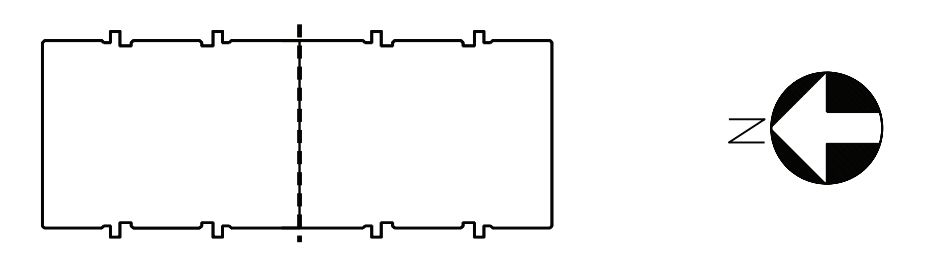
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M108



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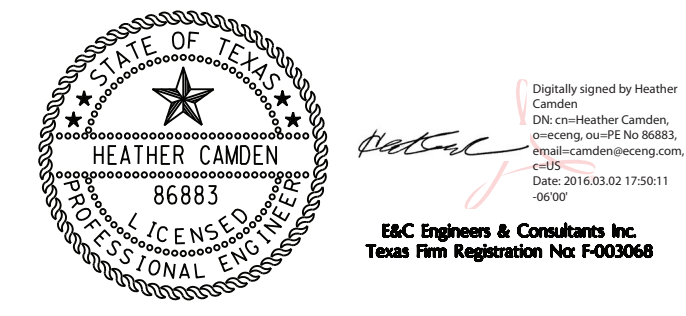
- DRAWING NOTES:
- ① FLEX DUCTS SIMILAR TO WIND HANDLER INSULATED TU FLEX. FLEX TO BE 20" φ.
 - ② STRUCTURAL HOLD-DOWN LOCATIONS. RE: DETAIL 12 M501
 - ③ COLD/HOT DECK PLENUM RE: DETAIL 9 M501
 - ④ COLD/HOT DECK PLENUM MAKE CONNECTIONS TO COLD & HOT DECK AS NOTED. TAP DOWN TO BELOW RE:M108 FOR CONTINUATION. RE: DETAIL 11 M501
 - ⑤ FLEX TO RUN UNDER MANIFOLDS.



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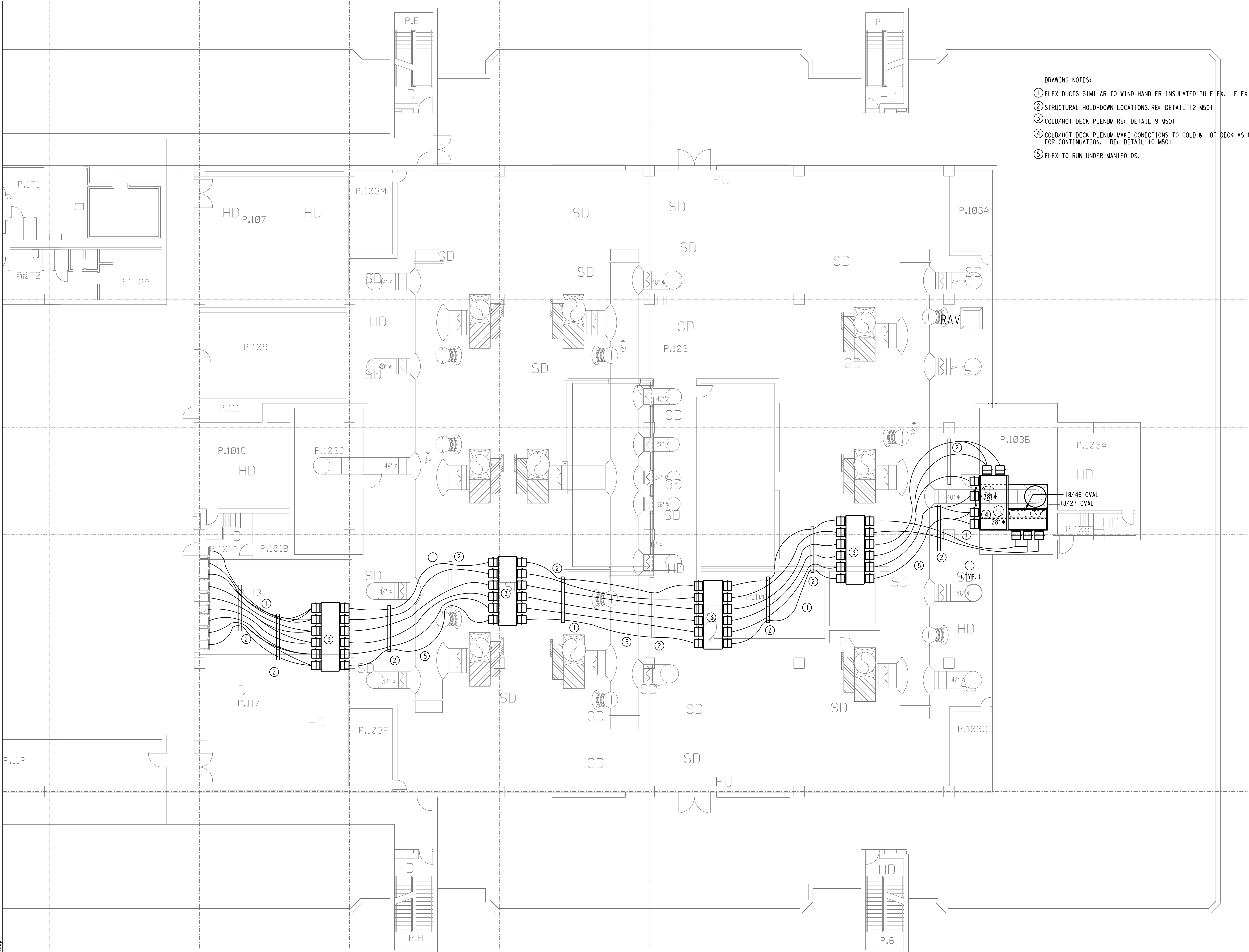
**MEDICAL SCHOOL BUILDING
 AHU L-7 & 8 REPLACEMENT**

DRAWING TITLE
**MECHANICAL ROOF
 DEMOLITION/
 BYPASS DRAWING**

DRAWING NO.
M109.7

DRAWING NOTES:

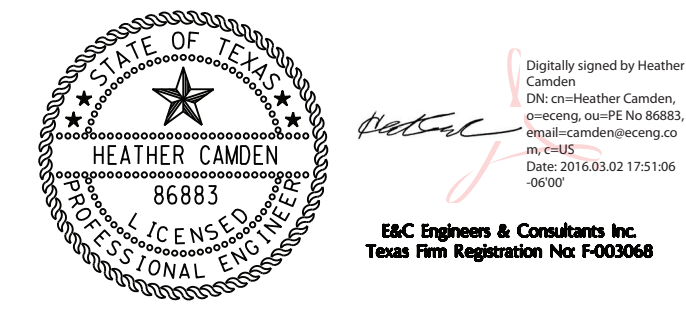
- ① FLEX DUCTS SIMILAR TO WIND HANDLER INSULATED TU FLEX. FLEX TO BE 20" φ.
- ② STRUCTURAL HOLD-DOWN LOCATIONS. RE: DETAIL 12 M501
- ③ COLD/HOT DECK PLENUM RE: DETAIL 9 M501
- ④ COLD/HOT DECK PLENUM MAKE CONNECTIONS TO COLD & HOT DECK AS NOTED. TAP DOWN TO BELOW RE:M108 FOR CONTINUATION. RE: DETAIL 10 M501
- ⑤ FLEX TO RUN UNDER MANIFOLDS.



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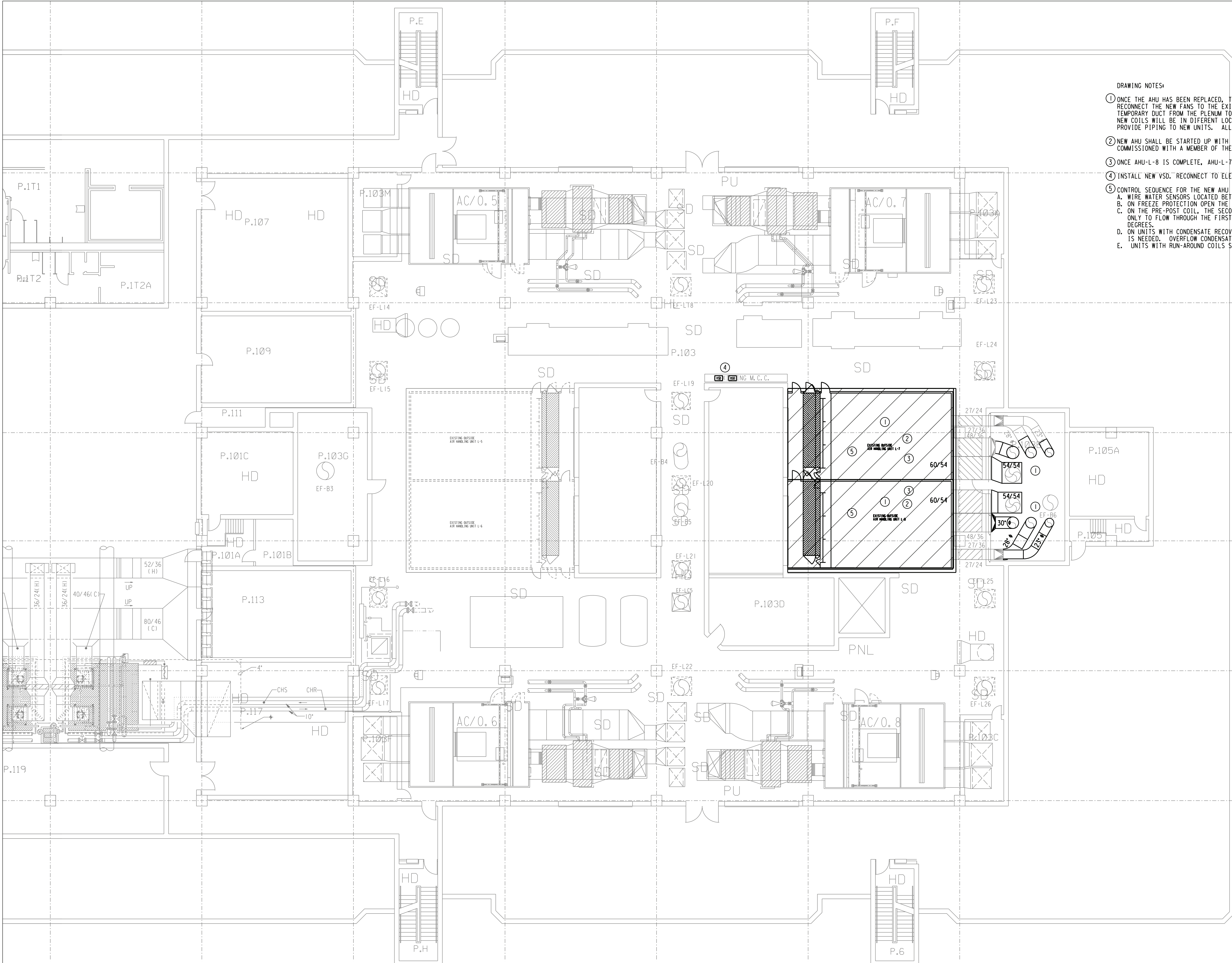
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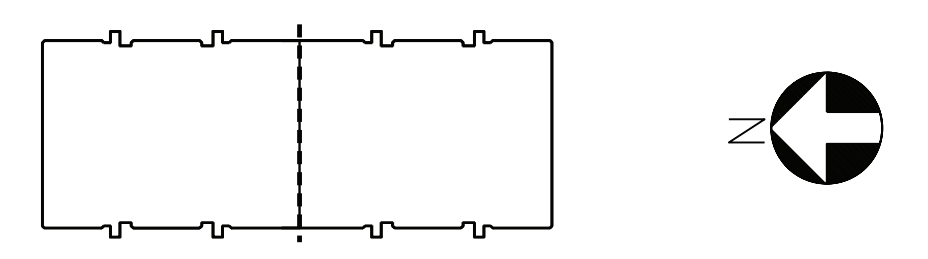
**MEDICAL SCHOOL BUILDING
 AHU L-7 & 8 REPLACEMENT**

DRAWING TITLE
**MECHANICAL ROOF
 DEMOLITION/
 BYPASS DRAWING**

DRAWING NO.
M109.8



- DRAWING NOTES:
- ① ONCE THE AHU HAS BEEN REPLACED, TIE BACK INTO THE CHILLED WATER, STEAM AND DUCTWORK. RECONNECT THE NEW FANS TO THE EXISTING VFD. DE-ENERGIZE THE TEMPORARY UNIT AND REMOVE THE TEMPORARY DUCT FROM THE PLENUM TO THE RISERS AND CAP TO MATCH EXISTING. NEW COILS WILL BE IN DIFFERENT LOCATIONS. ROUTE PIPE THROUGH STRUCTURAL OPENINGS AS NECESSARY TO PROVIDE PIPING TO NEW UNITS. ALL CONTROL VALVING SHALL BE PIPED IN THE UNITS AS NOTED.
 - ② NEW AHU SHALL BE STARTED UP WITH A REPRESENTATIVE FROM THE FACTORY AND COMMISSIONED WITH A MEMBER OF THE UTHSC-H STAFF IN ATTENDANCE.
 - ③ ONCE AHU-L-8 IS COMPLETE, AHU-L-7 MAY BEGIN.
 - ④ INSTALL NEW VSD. RECONNECT TO ELEC AS NEEDED.
 - ⑤ CONTROL SEQUENCE FOR THE NEW AHU SHALL MATCH THE EXISTING AHU CONTROLS WITH THE FOLLOWING EXCEPTIONS:
 - A. WIRE WATER SENSORS LOCATED BETWEEN THE UNIT AND THE PAD BACK TO THE BAS. PROVIDE ALARM.
 - B. ON FREEZE PROTECTION OPEN THE CHILLED WATER COIL VALVE 100%.
 - C. ON THE PRE-POST COIL, THE SECOND COIL ISOLATION VALVE SHALL CLOSE AND ALLOW THE CHILLED WATER ONLY TO FLOW THROUGH THE FIRST COIL WHEN THE TEMPERATURE OF THE OUTSIDE AIR IS UNDER 60 DEGREES.
 - D. ON UNITS WITH CONDENSATE RECOVERY, THE PUMP SHALL OPERATE WHEN THE TANK IS FULL AND COOLING IS NEEDED. OVERFLOW CONDENSATE SHALL BE ROUTED TO DRAIN.
 - E. UNITS WITH RUN-AROUND COILS SHALL HAVE DAMPER SEQUENCE AS NOTED ON THE SCHEDULE SHEET M400.

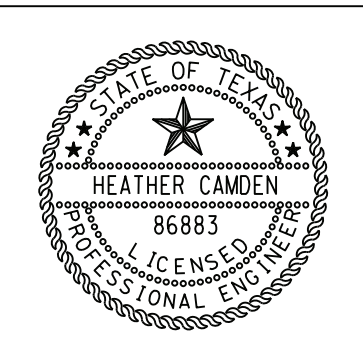


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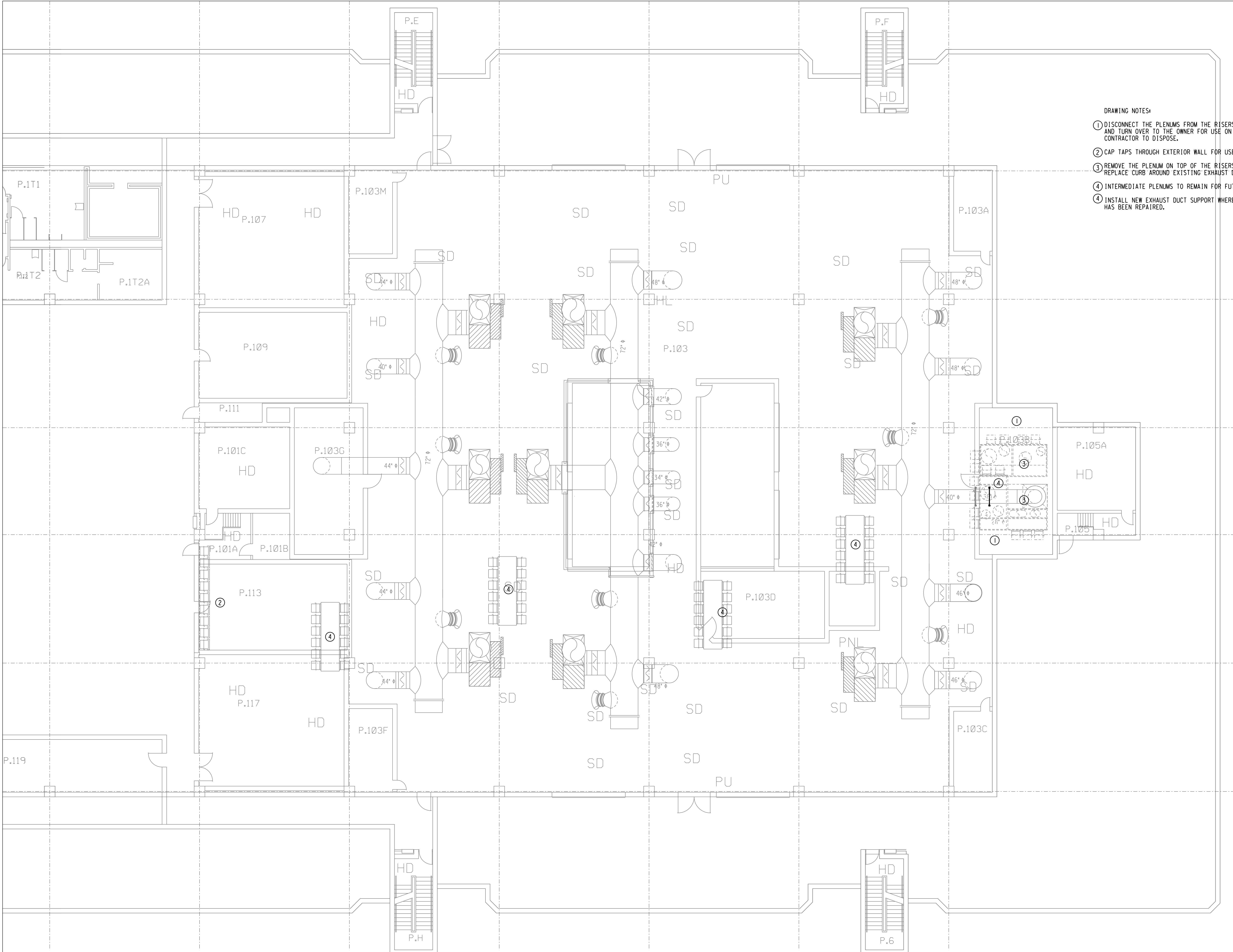


**MEDICAL SCHOOL BUILDING
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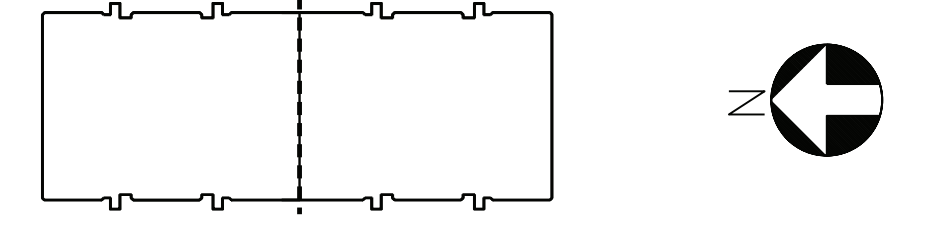
DRAWING TITLE
**MECHANICAL PH
 RENOVATION
 DRAWING**

DRAWING NO.
M208

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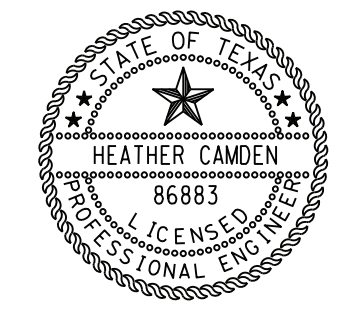
- DRAWING NOTES:
- ① DISCONNECT THE PLENUMS FROM THE RISERS. CAP THE RISERS AIRTIGHT. REMOVE FLEX DUCT FROM THE ROOF AND TURN OVER TO THE OWNER FOR USE ON FUTURE PHASES. IF THE OWNER FINDS THE DUCT UNUSABLE, CONTRACTOR TO DISPOSE.
 - ② CAP TAPS THROUGH EXTERIOR WALL FOR USE ON FUTURE PHASES.
 - ③ REMOVE THE PLENUM ON TOP OF THE RISERS ON THE ROOF. PATCH THE ROOF TO MATCH EXISTING. REPLACE CURB AROUND EXISTING EXHAUST DUCT PENETRATION.
 - ④ INTERMEDIATE PLENUMS TO REMAIN FOR FUTURE USE. CAP ALL INLETS AND OUTLETS.
 - ④ INSTALL NEW EXHAUST DUCT SUPPORT WHERE PREVIOUSLY REMOVED ONCE THE ROOF HAS BEEN REPAIRED.



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 Date: 2016.03.02 17:45:59 -0500
 Texas Firm Registration No: F000066

Date: 3/2/16
 Drawn By: DV
 Checked By: HEC

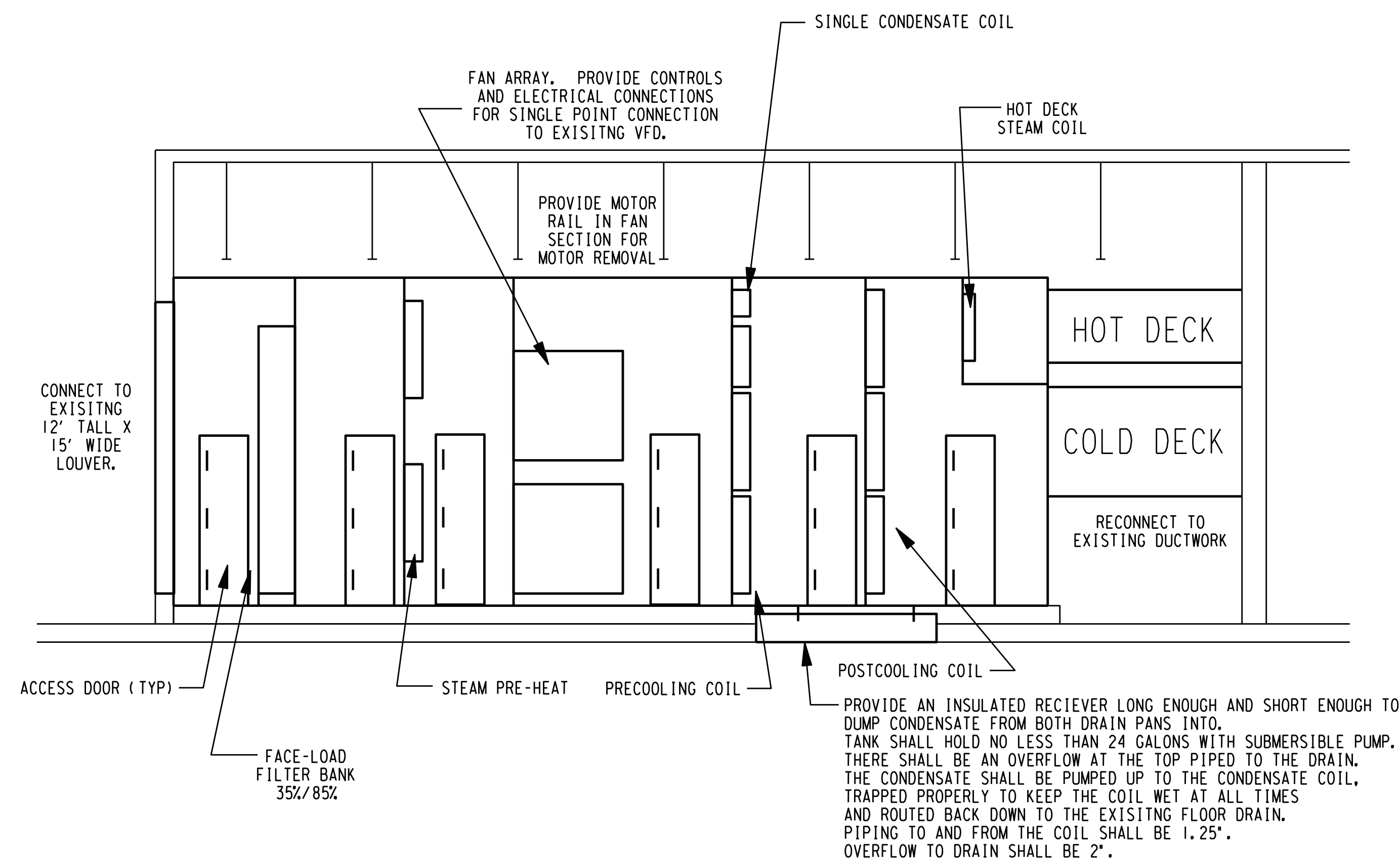
UTHC Project No.: 730022
 E & C Project No.: 3302.00
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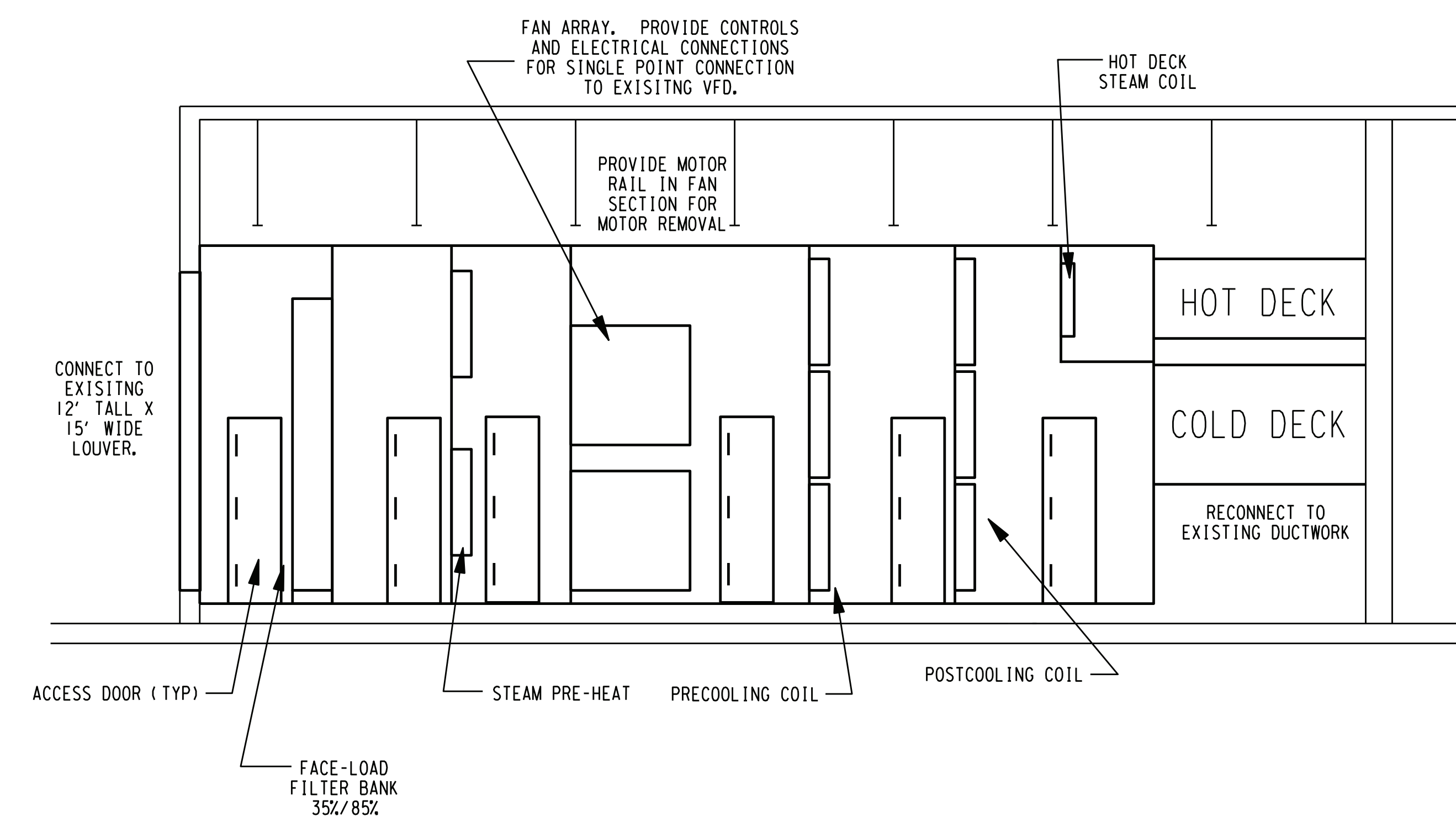
**MEDICAL SCHOOL BUILDING
 AHU L-7 & 8 REPLACEMENT**

DRAWING TITLE
**MECHANICAL ROOF
 RENOVATION
 DRAWING**

DRAWING NO.
M209



03 REPLACEMENT UNIT DETAIL W/
CONDENSATE RECOVERY
NOT TO SCALE

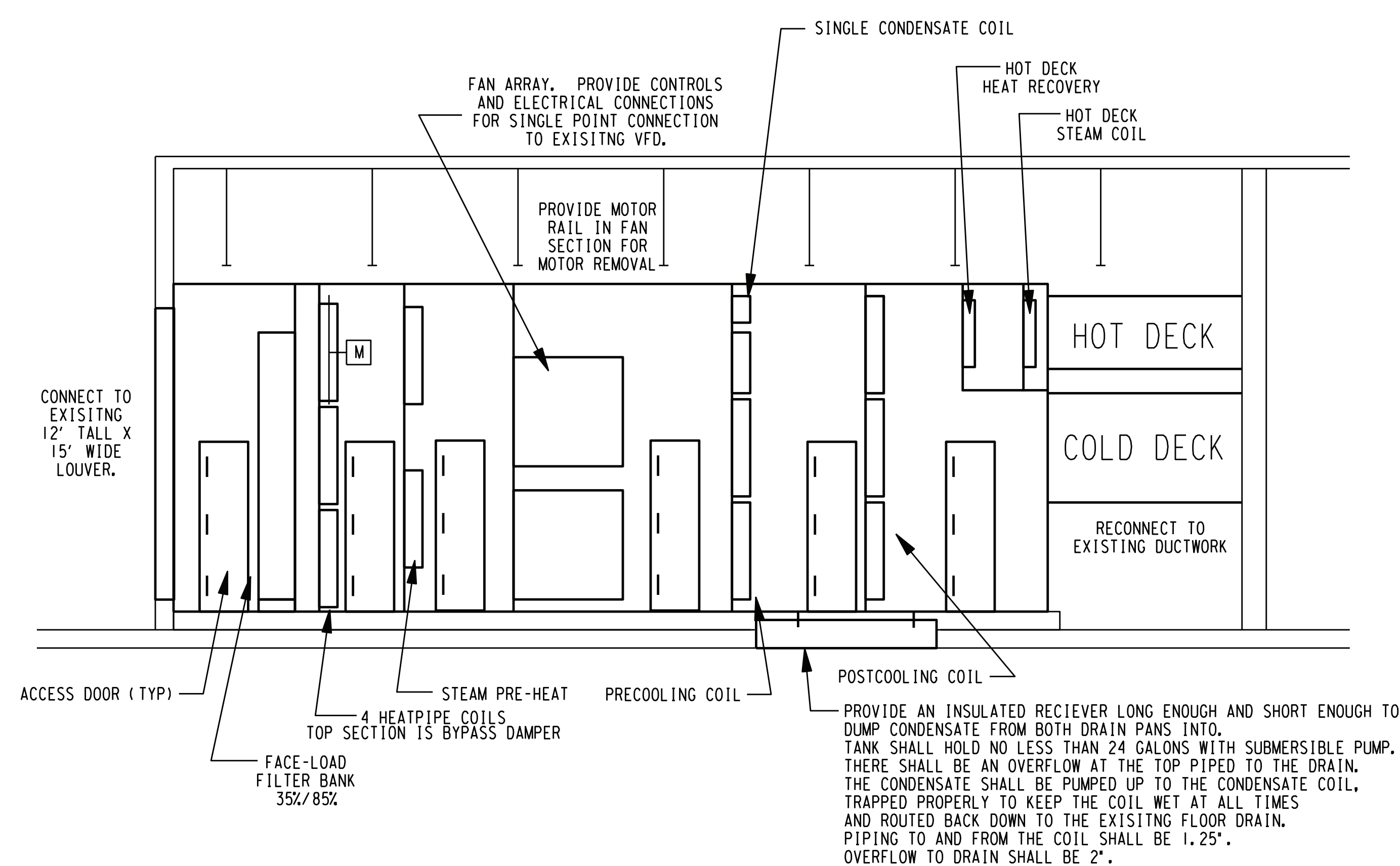


01 REPLACEMENT UNIT DETAIL
NOT TO SCALE

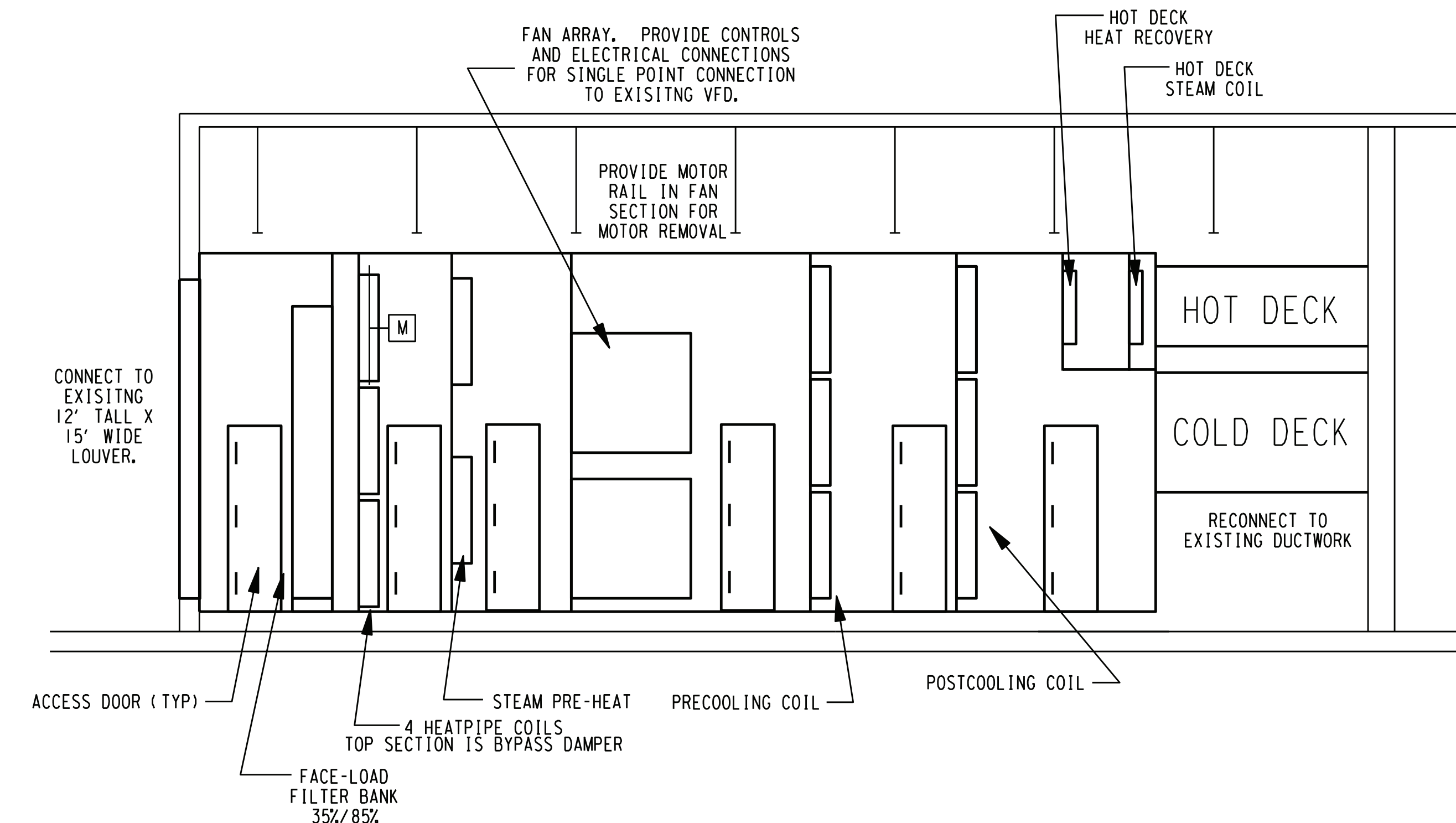
ALL UNITS MAXIMUM DIMENSIONS ARE:
14' 0" TALL
36' 0" LONG
18' 6" WIDE

DUCT TAPS:
BOTTOM OF COLD DECK AT 5' 3" AFF.
TOP OF COLD DECK AT 9' 9" AFF.
BOTTOM OF HOT DECK AT 10' 9" AFF.
TOP OF HOT DECK AT 13' 9" AFF.

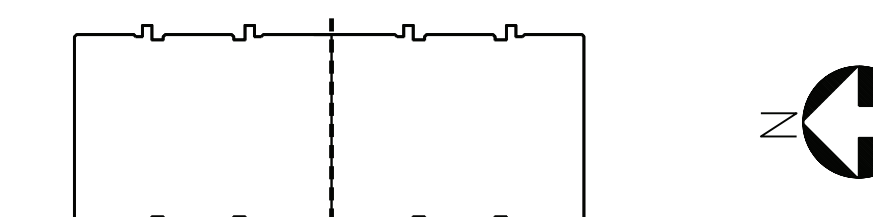
UNIT WILL SIT ON A 6" HOUSEKEEPING PAD.
COIL PIPING IS HOUSED INSIDE THE UNIT.
THERE SHALL BE ONE PIPING INLET TO THE AHU
ON EACH SIDE SERVED FROM THE TOP OF THE UNIT.
THE MANIFOLD SHALL DROP AND COIL
ISOLATION AND BALANCING VALVES SHALL BE
ACCESSED INSIDE THE UNIT.
COILS SHALL BE INTERNALLY DEMOUNTABLE TO BE
REMOVED FROM INSIDE THE UNIT FORWARD AND
OUT THE CLOSEST ACCESS DOOR.



04 REPLACEMENT UNIT DETAIL W/
HEATPIPE AND CONDENSATE RECOVERY
NOT TO SCALE

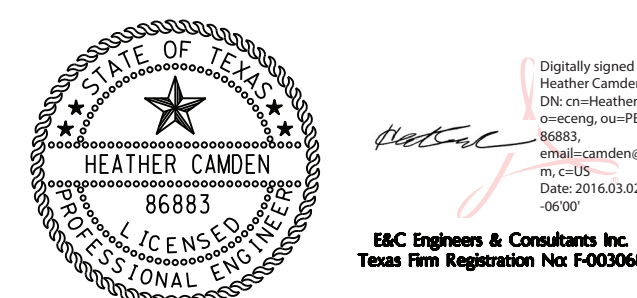


02 REPLACEMENT UNIT DETAIL W/ HEATPIPE
NOT TO SCALE



ISSUE FOR:	Description
Area Rev. Date	FOR BID
03-02-16	

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Date 3/2/16
Drawn By DV
Checked By HEC
UTHC Project No. 730022
E & C Project No. 3302.00
File Name



**MEDICAL SCHOOL BUILDING
AHU L-7 & 8 REPLACEMENT**

DRAWING TITLE
**MECHANICAL
AHU DETAILS**

DRAWING NO.
M300

AIR HANDLING UNIT SCHEDULE - REPLACEMENT

UNIT INFORMATION		
UNIT NO.	AHU-L-7	AHU-L-8
OPERATION TYPE	NORMAL	NORMAL
LOCATION	SOUTH PENTHOUSE (BLUE CHASE)	SOUTH PENTHOUSE (BLUE CHASE)
MANUFACTURER (BASIS OF DESIGN)	TEMPROL	TEMPROL
TYPE	WELDED FRAME OR BUILT ON SITE	WELDED FRAME OR BUILT ON SITE
CONFIGURATION	FANWALL DUAL DUCT	FANWALL DUAL DUCT
SERVICE	BLUE CHASE EAST	BLUE CHASE WEST
SUPPLY FAN DESIGN INFORMATION		
DESIGN SET FAN AIR QUANTITY	79,800	79,800
MAX OA	79,800	79,800
TOTAL STATIC PRESSURE (IN.W.G.)	5.50	5.50
BASIS OF DESIGN	TEMPROL FAN ARRAY 6@ PF11-27	TEMPROL FAN ARRAY 6@ PF11-27
FAN DESCRIPTION	6 @ 27" MAXIMUM DIAMETER	6 @ 27" MAXIMUM DIAMETER
FAN TYPE	PLUG FAN ARRAY (PF)	PLUG FAN ARRAY (PF)
FAN RPM	1696	1696
BRKE HP	16.9 MAX/FAN	16.9 MAX/FAN
NOMINAL MOTOR HP	20 MAXIMUM / FAN	20 MAXIMUM / FAN
NOMINAL MOTOR RPM	1750 MAX	1750 MAX
VOLTAGEPHASE	480/3	480/3
EMERGENCY POWER REQUIRED (YES/NO)	NO	NO
VFD REQUIRED	YES - NEW 125HP	YES - NEW 125HP
DRIVE ARRANGEMENT TYPE	DIRECT	DIRECT
COOLING COIL DESIGN INFORMATION		
COIL POSITION	PRE COOLING	PRE COOLING
COIL DESCRIPTION	6@5WC-4-48X84X4-8CU	6@5WC-4-48X84X4-8CU
CASE MATERIAL	16 GA. 304 S.S.	16 GA. 304 S.S.
QUANTITY OF COILS	3LH/3RH	3LH/3RH
COIL AIRFLOW	79800	79800
MAX FACE VELOCITY	475.0	475.0
MINIMUM NUMBER ROWS	4	4
MINIMUM NUMBER OF FINS PER INCH	8	8
MAXIMUM AIR PRESSURE DROP	0.42	0.42
ENTERING AIR TEMP (DB) (°F)	98.0	98.0
ENTERING AIR TEMP (WB) (°F)	80.0	80.0
LEAVING AIR TEMP (DB) (°F)	67.5	67.5
LEAVING AIR TEMP (WB) (°F)	65.3	65.3
ENTERING WATER TEMP (°F)	50.1	50.1
LEAVING WATER TEMP (°F)	62.0	62.0
MINIMUM COIL LATENT HEAT (MHB)	1,858,928.0	1,858,928.0
MINIMUM COIL SENSIBLE HEAT (MBH)	2,504,646.0	2,504,646.0
MINIMUM COIL TOTAL HEAT (MBH)	4,363,574.0	4,363,574.0
MAX WATER FLOW (GPM)	731.2	731.2
CHILLED WATER TEMP DIFFERENCE (°F)	11.9	11.9
MAX WATER PRESSURE DROP (FT OF WATER)	10.11	10.11
TUBE MATERIAL / FIN MATERIAL	CU / CU	CU / CU
UV LIGHTS (YES/NO)	YES	YES
HEATING COIL DESIGN INFORMATION		
COIL POSITION	PREHEAT	PREHEAT
COIL DESCRIPTION	4@9NS-48X78X1-4CU	4@9NS-48X78X1-4CU
CASE MATERIAL	16 GA. 304 S.S.	16 GA. 304 S.S.
QUANTITY OF COILS	4	4
COIL AIRFLOW IN FULL HEATING	79,800	79,800
MAX FACE VELOCITY AT FULL HEATING	767	767
MINIMUM NUMBER OF ROWS	1	1
MINIMUM NUMBER OF FINS PER INCH	4	4
MAXIMUM AIR PRESSURE DROP AT FULL HEAT	0.18	0.18
ENTERING AIR TEMP (DB) (°F)	19	19
LEAVING AIR TEMP (DB) (°F)	52.5	52.5
STEAM PRESSURE	10#	10#
CONDENSATE RATE	347#HR	347#HR
MINIMUM COIL SENSIBLE HEAT (MBH)	3,314,717.0	3,314,717.0
TUBE MATERIAL / FIN MATERIAL	CU/AL	CU/AL
UV LIGHTS (YES/NO)	NO	NO
HEATING COIL DESIGN INFORMATION		
COIL POSITION	REHEAT	REHEAT
COIL DESCRIPTION	2@9NS-48X84X1-6CU	2@9NS-48X84X1-6CU
CASE MATERIAL	16 GA. 304 S.S.	16 GA. 304 S.S.
QUANTITY OF COILS	2	2
COIL AIRFLOW IN FULL HEATING	40,000	40,000
MAX FACE VELOCITY AT FULL COOLING	714	714
MINIMUM NUMBER OF ROWS	1	1
MINIMUM NUMBER OF FINS PER INCH	6	6
MAXIMUM AIR PRESSURE DROP AT FULL HEAT	0.2	0.2
ENTERING AIR TEMP (DB) (°F)	52.5	52.5
LEAVING AIR TEMP (DB) (°F)	96.1	96.1
STEAM PRESSURE	10#	10#
CONDENSATE RATE	2052#HR	2052#HR
MINIMUM COIL SENSIBLE HEAT (MBH)	1,955,674.0	1,955,674.0
TUBE MATERIAL / FIN MATERIAL	CU/CU	CU/CU
UV LIGHTS (YES/NO)	NO	NO
FILTER SECTION		
2" - 30# PLEATED PRE-FILTER	YES	YES
2" - 85# FINAL FILTER	YES	YES
NOTES		
UNIT SHALL BE PROVIDED WITH FACTORY INSTALLED JUNCTION BOXES AUXILIARIES, RECEPTACLES, SERVICING LIGHTS, ETC. RE: ELECTRICAL DRAWINGS FOR FURTHER INFORMATION.		
FACTORY INSTALLED JUNCTION BOXES ARE FOR CONNECTION BY DIVISION 26. DIVISION 26 IS NOT TO PENETRATE AIR HANDLING UNIT HOUSING. WIRING FROM JUNCTION BOX TO LOAD INSIDE AIR HANDLING UNIT SHALL BE BY THE MANUFACTURER.		
ALL POWER WIRING BETWEEN VARIABLE FREQUENCY DRIVES, MOTOR CONTROLLERS AND MOTORS SHALL BE COMPLETED BY THE AIR HANDLING UNIT MANUFACTURER.		
INFORMATION SHOWN IS PER UNIT.		

ENERGY RECOVERY COILS SCHEDULE - ALTERNATE # 1

LOCATION	DESIGN CFM	AIR HANDLING UNIT COIL										HOT DECK COIL										REMARKS										
		ENT. AIR		LVG. AIR		TOTAL MBH	GPM (1)	"H" x "L" IN.	NO. OF COILS	MIN. F.A. SO. FT.	MAX. FACE VEL. FPM	NO. OF ROWS	FIN SERIES	MAX. P.D.		ENT. AIR		LVG. AIR		TOTAL MBH	GPM (1)		"H" x "L" IN.	NO. OF COILS	MIN. F.A. SO. FT.	MAX. FACE VEL. FPM	NO. OF ROWS	FIN SERIES	MAX. P.D.			
		DB °F	WB °F	DB °F	WB °F									AIR IN.	---	DB °F	WB °F	DB °F	WB °F										AIR IN.	---		
AHU-L-7	53,200	98.0	80	88.5	77.5	671	---	84X48	4	112	475	6	8	0.57	---	REHEAT	40,000	52.7	52.7	68.2	--	671	---	84X60	2	60.0	571	6	8	0.78	---	THE HEATPIPE WRAP-AROUND SYSTEM SHALL BE VERIFIED BY THE MANUFACTURER TO NOT REQUIRE A PUMP. THE COIL PRESSURE DROP MUST NOT EXCEED THE NOTED TOTAL.
AHU-L-8	53,200	98.0	80	88.5	77.5	671	---	84X48	4	112	475	6	8	0.57	---	REHEAT	40,000	52.7	52.7	68.2	--	671	---	84X60	2	60.0	571	6	8	0.78	---	

ALTERNATE #1 - WRAP-AROUND HEAT PIPE COIL UNIT, SHALL REQUIRE A DIFFERENT FAN DUE TO THE INCREASED STATIC PRESSURE THROUGH THE COILS. THE COOLING COILS SHALL NOT CHANGE, SO THAT IF THERE IS A FAILURE IN THE HEAT-PIPE, THE COILS SHALL BE ABLE TO ACHIEVE THE FULL CAPACITY OF THE SYSTEM REQUIREMENTS.

THE FANS FOR THE UNITS WITH WRAP-AROUND COILS SHALL BE:
 60 PF10-27
 1782 RPM
 15.9 MAX BHP/FAN
 20 MAX HP/FAN
 1750 HP MOTOR
 480/3 PHASE
 NO EMERGENCY POWER
 NEW 125HP VFD
 DIRECT-DRIVE

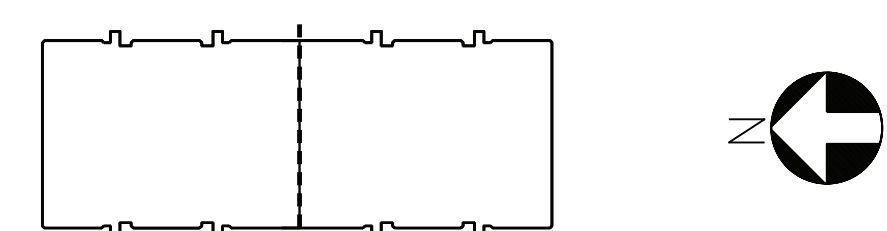
THE BYPASS DAMPER SHALL BE FULL OPEN IN FULL COOLING MODE. THE BYPASS DAMPER SHALL CLOSE AS THE UNIT REQUIRES REHEAT. THE DAMPER SHALL BE SEQUENCED TO FULLY MODULATE TO MAINTAIN STATIC PRESSURE ACROSS THE DAMPER OF 0.57". THIS SHALL ENSURE THE MAXIMUM AMOUNT OF AIR WILL TRAVEL THROUGH THE HEAT PIPES WITHOUT INCREASING THE STATIC PRESSURE OF THE UNIT ABOVE THE ABILITIES OF THE FAN.

COIL SCHEDULE - ALTERNATE #2 - CONDENSATE

THE TOP EXTERIOR PRE-COOLING COIL IN THE CONDENSATE RECOVERY UNITS SHALL BE REPLACED BY THE FOLLOWING TWO COILS		
UNIT NO.	AHU-L-7	AHU-L-8
COOLING COIL DESIGN INFORMATION		
COIL POSITION	COOLING - CONDENSATE	
COIL DESCRIPTION	1@5WC-8-6X84X6-8CU	
CASE MATERIAL	16 GA. 304 S.S.	
QUANTITY OF COILS	4	
COIL AIRFLOW	3LH/3RH	
MAX FACE VELOCITY	391	
MINIMUM NUMBER ROWS	8	
MINIMUM NUMBER OF FINS PER INCH	8	
MAXIMUM AIR PRESSURE DROP	0.42	
ENTERING AIR TEMP (DB) (°F)	98.0	
ENTERING AIR TEMP (WB) (°F)	80.0	
LEAVING AIR TEMP (DB) (°F)	67.4	
LEAVING AIR TEMP (WB) (°F)	66.7	
ENTERING WATER TEMP (°F)	55.0	
LEAVING WATER TEMP (°F)	72.1	
MINIMUM COIL LATENT HEAT (MHB)	25,521.0	
MINIMUM COIL SENSIBLE HEAT (MBH)	43,076.0	
MINIMUM COIL TOTAL HEAT (MBH)	68,597.0	
MAX WATER FLOW (GPM)	8.0	
CHILLED WATER TEMP DIFFERENCE (°F)	17.1	
MAX WATER PRESSURE DROP (FT OF WATER)	6.2	
TUBE MATERIAL / FIN MATERIAL	CU / CU	
UV LIGHTS (YES/NO)	YES	
COOLING COIL DESIGN INFORMATION		
COIL POSITION	COOLING	
COIL DESCRIPTION	1@5WC-4-42X84X4-8CU	
CASE MATERIAL	16 GA. 304 S.S.	
QUANTITY OF COILS	3LH/3RH	
COIL AIRFLOW	11,930	
MAX FACE VELOCITY	487.0	
MINIMUM NUMBER ROWS	4	
MINIMUM NUMBER OF FINS PER INCH	8	
MAXIMUM AIR PRESSURE DROP	0.42	
ENTERING AIR TEMP (DB) (°F)	98.0	
ENTERING AIR TEMP (WB) (°F)	80.0	
LEAVING AIR TEMP (DB) (°F)	67.8	
LEAVING AIR TEMP (WB) (°F)	65.5	
ENTERING WATER TEMP (°F)	50.1	
LEAVING WATER TEMP (°F)	60.7	
MINIMUM COIL LATENT HEAT (MHB)	273,027.0	
MINIMUM COIL SENSIBLE HEAT (MBH)	370,848.0	
MINIMUM COIL TOTAL HEAT (MBH)	643,875.0	
MAX WATER FLOW (GPM)	131.8	954.9
CHILLED WATER TEMP DIFFERENCE (°F)	10.6	15.0
MAX WATER PRESSURE DROP (FT OF WATER)	10.1	20.90
TUBE MATERIAL / FIN MATERIAL	CU / CU	CU / CU
UV LIGHTS (YES/NO)	YES	YES

PUMP SCHEDULE - ALTERNATE #2 - CONDENSATE

UNIT NO.	LOCATION	SERVICE	TYPE	GPM	FT. HEAD H ₂ O	SHUT OFF HEAD FT. H ₂ O	DESIGN PRESSURE PSI	MOTOR					REMARKS
								BHP	HP	RPM	VOLTS @ 60 HZ	PH	
CP-L7	CONDENSATE RECEIVER	CONDENSATE	SUBMERSIBLE	8.5	20.0	22.0	150	4.0	1/6	3450	120	I	SIMILAR TO FLINT & WALLING ECP0625
CP-L8	CONDENSATE RECEIVER	CONDENSATE	SUBMERSIBLE	8.5	20.0	22.0	150	4.0	1/6	3450	120	I	SIMILAR TO FLINT & WALLING ECP0625



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 Texas Registration No. F00064

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UTSOC Project No.: 730022
 E & C Project No.: 3302.00
 File Name:

**MEDICAL SCHOOL BUILDING
 AHU L-7 & 8 REPLACEMENT**

DRAWING TITLE: **MECHANICAL SCHEDULES**
 DRAWING NO.: **M400**

