

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

ABBREVIATIONS		PIPING TYPES		MISCELLANEOUS	
AD	ACCESS DOOR, AREA DRAIN	CHS	CHILLED WATER SUPPLY	[Symbol]	FLOOR DRAIN
AFC	ABOVE FINISHED CEILING	CHR	CHILLED WATER RETURN	[Symbol]	AREA DRAIN
APF	ABOVE FINISHED FLOOR	S	STEAM S=0 TO 15#, 60HPS=60" HIGH PRESS. STEAM	[Symbol]	ROOF DRAIN OR OVERFLOW DRAIN
AP	ACCESS PANEL	C	CONDENSATE RETURN	[Symbol]	HOSE BIBB
APD	AIR PRESSURE DROP	PC	PUMPED CONDENSATE	[Symbol]	WALL HYDRANT
BWV	BACK WATER VALVE	RHG	REFRIGERANT HOT GAS LINE	[Symbol]	PLUMBING FIXTURES
CIRC	CIRCULATING	RS	REFRIGERANT SUCTION LINE	[Symbol]	POINT OF NEW CONNECTION TO EXISTING
COND	CONDENSER, CONDENSATE CONNECTION	RL	REFRIGERANT LIQUID LINE	[Symbol]	DRAWING NOTE REFERENCE
CONN	COLD WATER		SANITARY DRAIN BELOW FLOOR	[Symbol]	
CW	COLD WATER		SANITARY DRAIN ABOVE FLOOR	[Symbol]	
D	DEPTH, DRAIN		SANITARY VENT	[Symbol]	
DET	DETAIL	GW	GREASE (KITCHEN) WASTE	[Symbol]	OWNER OR CONTRACTOR FURNISHED EQUIPMENT REFERENCE
DF	DRINKING FOUNTAIN	SD	STORM DRAIN	[Symbol]	MECHANICAL/PLUMBING EQUIPMENT REFERENCE. "aaa" DENOTES TYPE, "bb" DENOTES NUMBER.
DISC	DISCONNECT	OD	OVERFLOW DRAIN	[Symbol]	AIR DISTRIBUTION DEVICE REFERENCE. "a" DENOTES TYPE, "bbb" DENOTES CFM, "cc/dd" DENOTES NECK SIZE
DPR	DAMPER	AW	ACID WASTE	[Symbol]	HVAC TERMINAL UNIT REFERENCE. "aaa" DENOTES TYPE, "bbb" DENOTES CFM, "ccc KW" DENOTES HEATING KW WHERE APPLICABLE
DWH	DOMESTIC WATER HEATER	AV	ACID VENT	[Symbol]	RISER DESIGNATION. "P" DENOTES WASTE/VENT OR WASTE/VENT/WATER, "W" DENOTES WATER, "DS" DENOTES DOWNSPOUT, "F" DENOTES FIRE.
EC	ELECTRICAL CONTRACTOR		COLD WATER	[Symbol]	FLOW SWITCH
ECC	ECCENTRIC		HOT WATER	[Symbol]	VALVE SUPERVISORY SWITCH
EDB	ENTERING DRY BULB		HOT WATER RECIRCULATION	[Symbol]	FIRE HOSE CABINET
EHC	ELECTRIC HEATING COIL	G	NATURAL GAS	[Symbol]	FIRE HOSE RACK
ESP	EXTERNAL STATIC PRESSURE	A	COMPRESSED AIR	[Symbol]	FIRE DEPARTMENT SIAMESE CONNECTION
ETR	EXISTING TO REMAIN	AA	"AA" DENOTES GAS TYPE	[Symbol]	THERMOSTAT
FCO	FLOOR CLEAN OUT	MA	MEDICAL AIR	[Symbol]	TEMPERATURE SENSOR
FCS	FLOOR CONTROL STATION	DI	DEIONIZED WATER	[Symbol]	HUMIDISTAT
FD	FLOOR DRAIN, FIRE DAMPER	V	VACUUM	[Symbol]	FIRESTAT
FLR	FLOOR	F	FIRE STANDPIPE, FIRE LINE	[Symbol]	DUCT SMOKE DETECTOR. "SA" DENOTES SUPPLY AIR, "RA" DENOTES RETURN AIR PROVIDED AND WIRED BY DIV. 16 - INSTALL BY DIV. 15
FUT	FUTURE	FS	FIRE SPRINKLER	[Symbol]	PNEUMATIC TUBING OR CONTROL WIRING
GLV	GLOBE VALVE	TP	TRAP PRIMER	[Symbol]	TEMPERATURE CONTROL PANEL
GV	GATE VALVE	D	DRAIN LINE	[Symbol]	PRESSURE DIFFERENTIAL SENSOR (ANALOG)
HB	HOSE BIBB		EXISTING PIPE, "aaa" DENOTES TYPE	[Symbol]	FLOW SENSOR (ANALOG)
HD	HEAD, HUB DRAIN		EXISTING PIPE TO BE REMOVED, "aaa" DENOTES TYPE	[Symbol]	RELATIVE HUMIDITY SENSOR (ANALOG)
HSC	HORIZONTAL SPLIT CASE			[Symbol]	PRESSURE SENSOR (ANALOG)
HTG	HEATING			[Symbol]	POSITION INDICATOR (ANALOG)
HWC	HOT WATER CIRCULATOR			[Symbol]	HIGH LIMIT T=TEMP P=PRESS F=FLOW RH= REL HUMIDITY LOW LIMIT T=TEMP P=PRESS F=FLOW RH= REL HUMIDITY

GENERAL NOTES

- REFER TO SPECIFICATIONS FOR MATERIALS AND METHODS FOR MECHANICAL/ELECTRICAL CONSTRUCTION.
- REFER TO EXISTING SITE CONDITIONS. VISIT THE SITE TO DETERMINE ANY SPECIAL BUILDING CONDITIONS THAT ARE NOT INDICATED ON THE DOCUMENTS.
- ALL DUCTWORK SIZES SHOWN ARE FREE AIR STREAM DIMENSIONS.
- FURNISH AND INSTALL ACCESS DOORS IN DUCTS, WALL AND CEILINGS WHERE ACCESS IS REQUIRED TO CLEAN, TREAT AND COAT THE DUCTWORK.
- COORDINATE ALL MECHANICAL WORK WITH THE OWNER'S REPRESENTATIVE. ALL MODIFICATIONS TO THE EXISTING ELECTRICAL SHALL BE DONE BY TRADES SPECIALIZING IN THAT WORK.
- 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).
- 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.
- ALL MECHANICAL WORK SHALL COMPLY WITH APPLICABLE STATE & LOCAL BUILDING CODES & REQUIREMENTS.
- THE MECHANICAL CONTRACTOR SHALL VISIT THE SITE & FAMILIARIZE THEMSELVES WITH EXISTING CONDITIONS WHICH WILL IMPACT CONSTRUCTION OF THIS PROJECT, PRIOR TO SUBMITTING PROPOSALS.
- 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.
- COORDINATE THE EXACT LOCATION OF ALL WALL MOUNTED DEVICES WITH THE OWNER'S REPRESENTATIVE.
- FURNISH ACCESS DOORS FOR INSTALLATION BY THE GENERAL CONTRACTOR WHERE ACCESS IS REQUIRED TO CONCEALED EQUIPMENT.

PIPING SYMBOLS

- ELBOW DOWN
- ELBOW UP
- 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

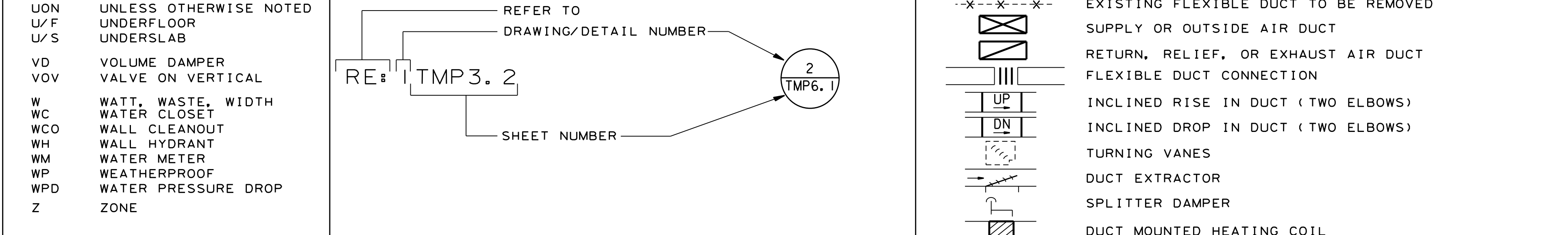
DRAWING LIST

NO.	DESCRIPTION
M000	MECHANICAL SYMBOLS & ABBREVIATIONS
M108	MECHANICAL PENTHOUSE DEMOLITION/ BYPASS PLAN
M109.5	MECHANICAL ROOF DEMOLITION/ BYPASS PLAN - AHU-L5
M109.6	MECHANICAL ROOF DEMOLITION/ BYPASS PLAN - AHU-L6
M208	MECHANICAL PENTHOUSE RENOVATION PLAN
M209	MECHANICAL ROOF RENOVATION PLAN
M300	MECHANICAL AHU PLANS
M400	MECHANICAL SCHEDULES
M500	MECHANICAL DETAILS
M501	MECHANICAL DETAILS
M600	MECHANICAL CONTROL DIAGRAMS

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

DRAWING/DETAIL REFERENCE KEY



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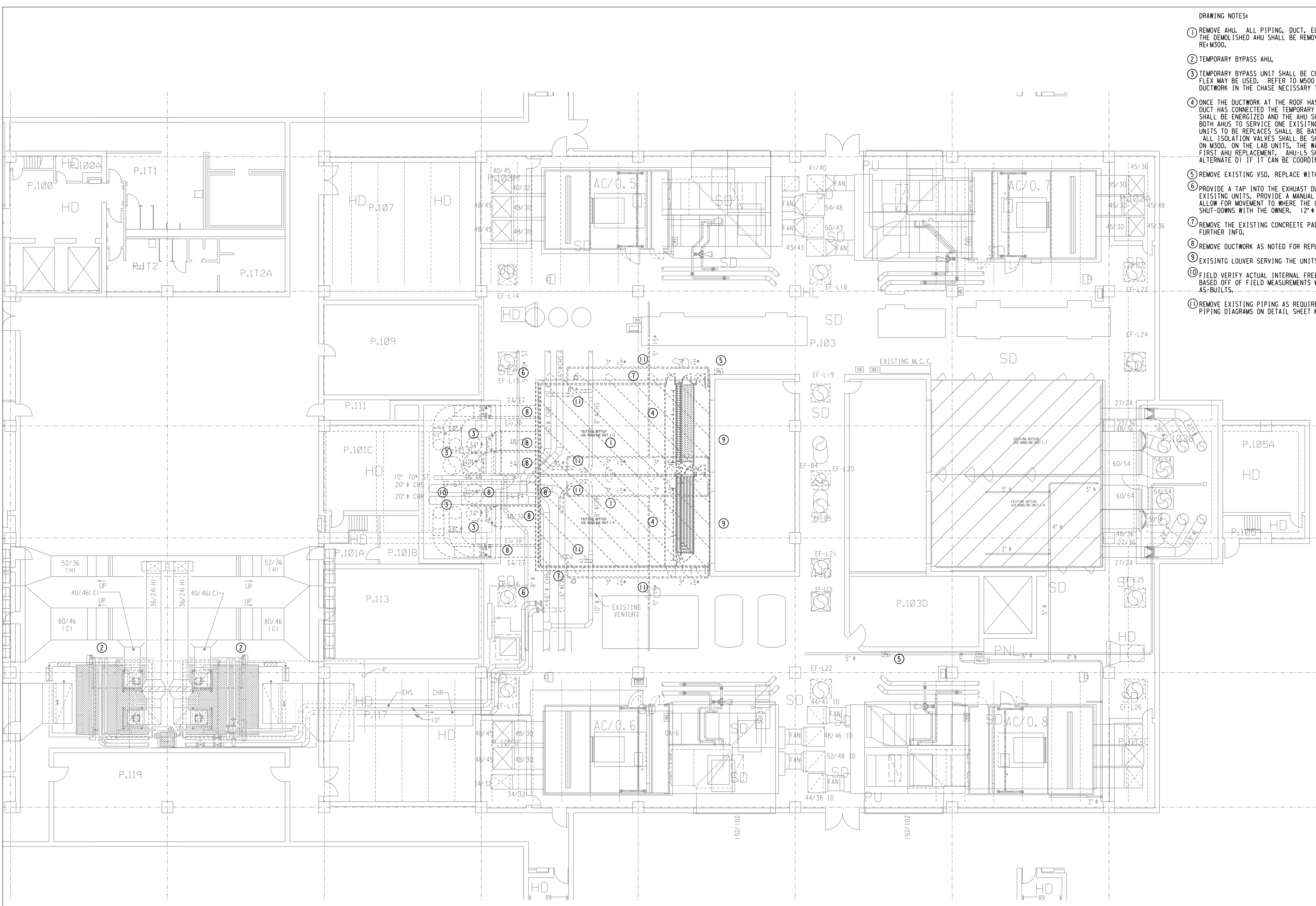
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UTHealth  
 The University of Texas  
 Health Science Center at Houston

**MEDICAL SCHOOL BUILDING SOUTH PENTHOUSE AHU-L5 & L6 REPLACEMENT**

DRAWING TITLE  
**MECHANICAL SYMBOLS AND ABBREVIATIONS**

DRAWING NO.  
**M000**



- DRAWING NOTES:**
- 1 REMOVE AHU. ALL PIPING, DUCT, ELECTRICAL AND CONTROLS SERVING THE DEMOLISHED AHU SHALL BE REMOVED AS REQUIRED FOR RECONNECTION. RE-M300.
  - 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 AHUS 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 LAB AHU OR TWO OFFICE AHUS. THE SEQUENCE OF THE UNITS TO BE REPLACES SHALL BE BASED ON CONSTRUCTABILITY AND CONFIRMED WITH UTHSC-H. ALL ISOLATION VALVES SHALL BE SHUT TO THE AHU AND THE AHU SHALL BE REPLACED AS DETAILED ON M300. ON THE LAB UNITS, THE WALL THE TWO UNITS SHARE MUST REMAIN IN PLACE DURING THE FIRST AHU REPLACEMENT. AHU-L5 SHALL BE REPLACED FIRST, THEN AHU-L6. PROVIDE A DEDUCTIVE ALTERNATE DT IF IT CAN BE COORDINATED TO REPLACE BOTH UNITS AT THE SAME TIME.
  - 5 REMOVE EXISTING VSD. REPLACE WITH NEW VSD. REFER TO ELECTRICAL DRAWINGS.
  - 6 PROVIDE A TAP INTO THE EXHAUST DUCT AS NOTED FOR VENTILLATION 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" φ
  - 7 REMOVE THE EXISTING CONCRETE PAD AND REPOUR. REFER TO STRUCTURAL DRAWINGS FOR FURTHER INFO.
  - 8 REMOVE DUCTWORK AS NOTED FOR REPLACEMENT. EXISTING FIRE DAMPERS TO REMAIN.
  - 9 EXISTING LOUVER SERVING THE UNITS. VACUUM, CLEAN AND REPLACE THE BIRDCREENS.
  - 10 FIELD VERIFY ACTUAL INTERNAL FREE AREA DUCT SIZES. DUCT SIZE SHOWN IS AN ESTIMATE BASED OFF OF FIELD MEASUREMENTS WHERE THE DUCT COULD BE REACHED AND ORIGINAL AS-BUILTS.
  - 11 REMOVE EXISTING PIPING AS REQUIRED TO INSTALL NEW PIPE TO THE NEW UNITS PER THE PIPING DIAGRAMS ON DETAIL SHEET M500.

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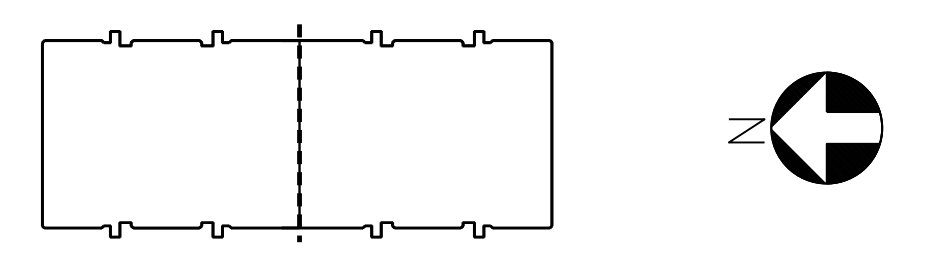
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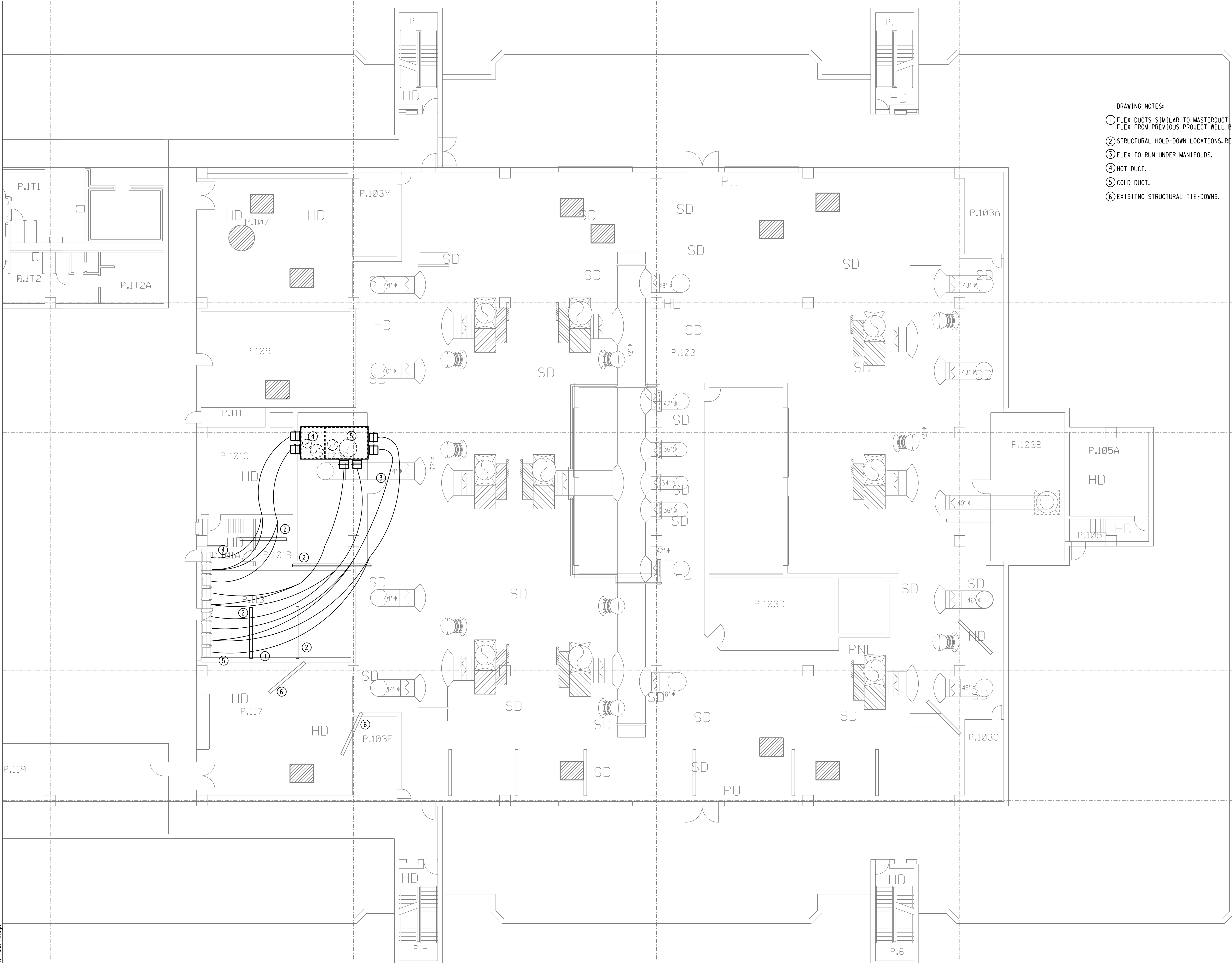


**MEDICAL SCHOOL BUILDING  
 SOUTH PENTHOUSE  
 AHU-L5 & L6 REPLACEMENT**

DRAWING TITLE  
**MECHANICAL  
 RENOVATION PLAN**

DRAWING NO.  
**M108**





- DRAWING NOTES:
- ① FLEX DUCTS SIMILAR TO MASTERDUCT MD ALL-WEATHER FLEXIBLE DUCT R8. FLEX TO BE 20" Ø. FLEX FROM PREVIOUS PROJECT WILL BE STORED BY UTHSC-H. REUSE.
  - ② STRUCTURAL HOLD-DOWN LOCATIONS. RE-DETAIL 12 M501 & STRUCTURAL DRAWINGS.
  - ③ FLEX TO RUN UNDER MANIFOLDS.
  - ④ HOT DUCT.
  - ⑤ COLD DUCT.
  - ⑥ EXISTING STRUCTURAL TIE-DOWNS.

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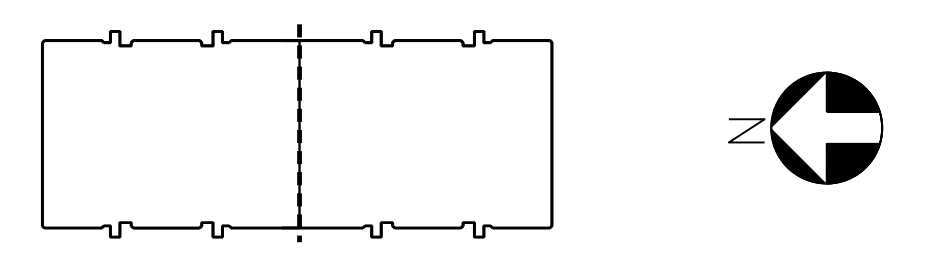
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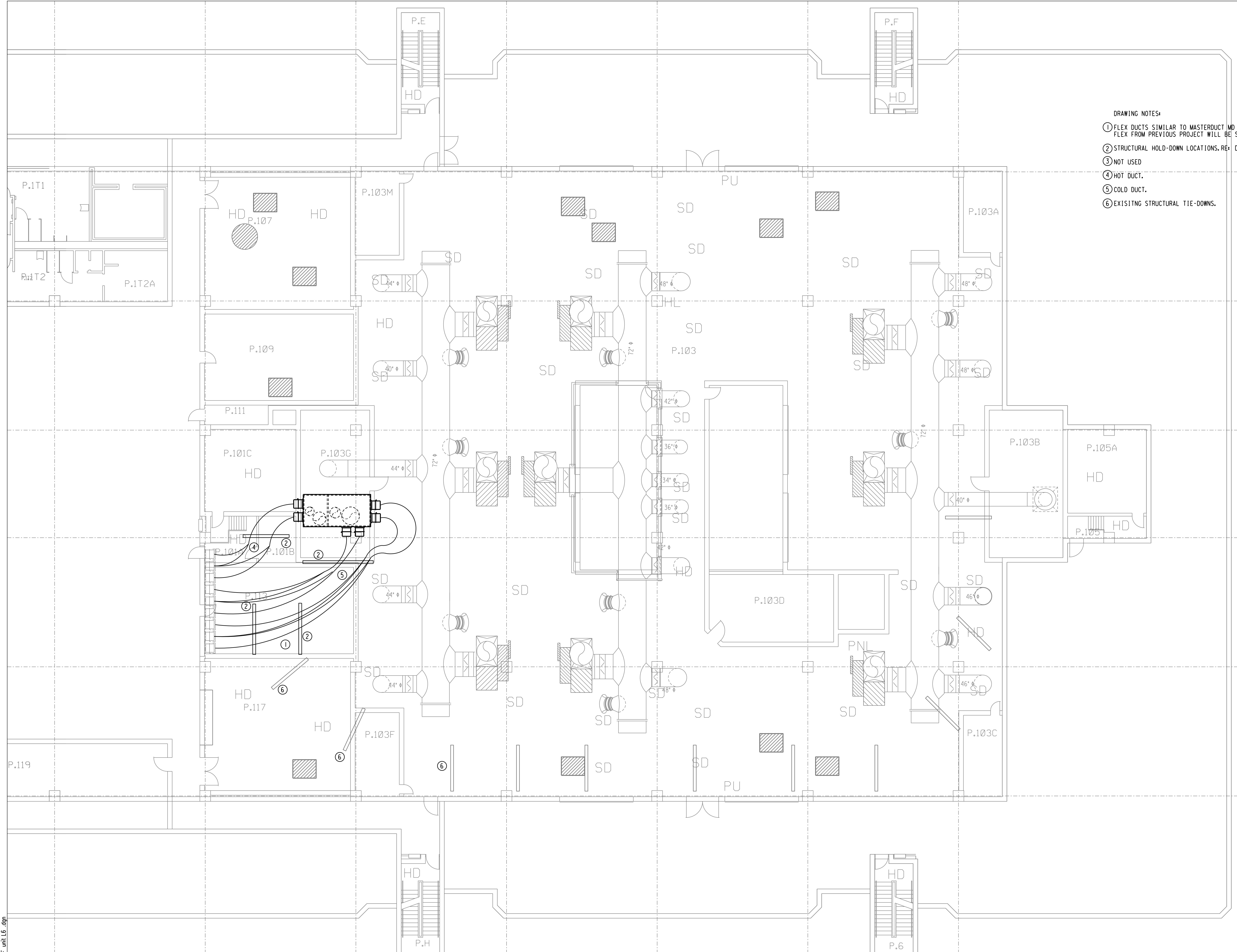


**MEDICAL SCHOOL BUILDING  
 SOUTH PENTHOUSE  
 AHU-L5 & L6 REPLACEMENT**

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

DRAWING NO.  
**M109.5**





- DRAWING NOTES:**
- ① FLEX DUCTS SIMILAR TO MASTERDUCT MD ALL-WEATHER FLEXIBLE DUCT R8. FLEX TO BE 20" ø. FLEX FROM PREVIOUS PROJECT WILL BE STORED BY UTHSC-H. REUSE.
  - ② STRUCTURAL HOLD-DOWN LOCATIONS. RE: DETAIL 12 M501
  - ③ NOT USED
  - ④ HOT DUCT.
  - ⑤ COLD DUCT.
  - ⑥ EXISTING STRUCTURAL TIE-DOWNS.

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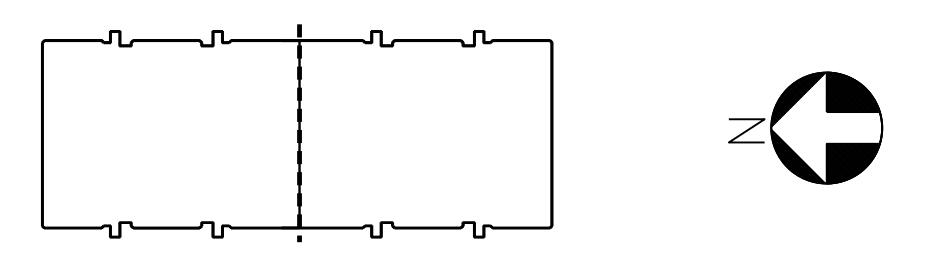
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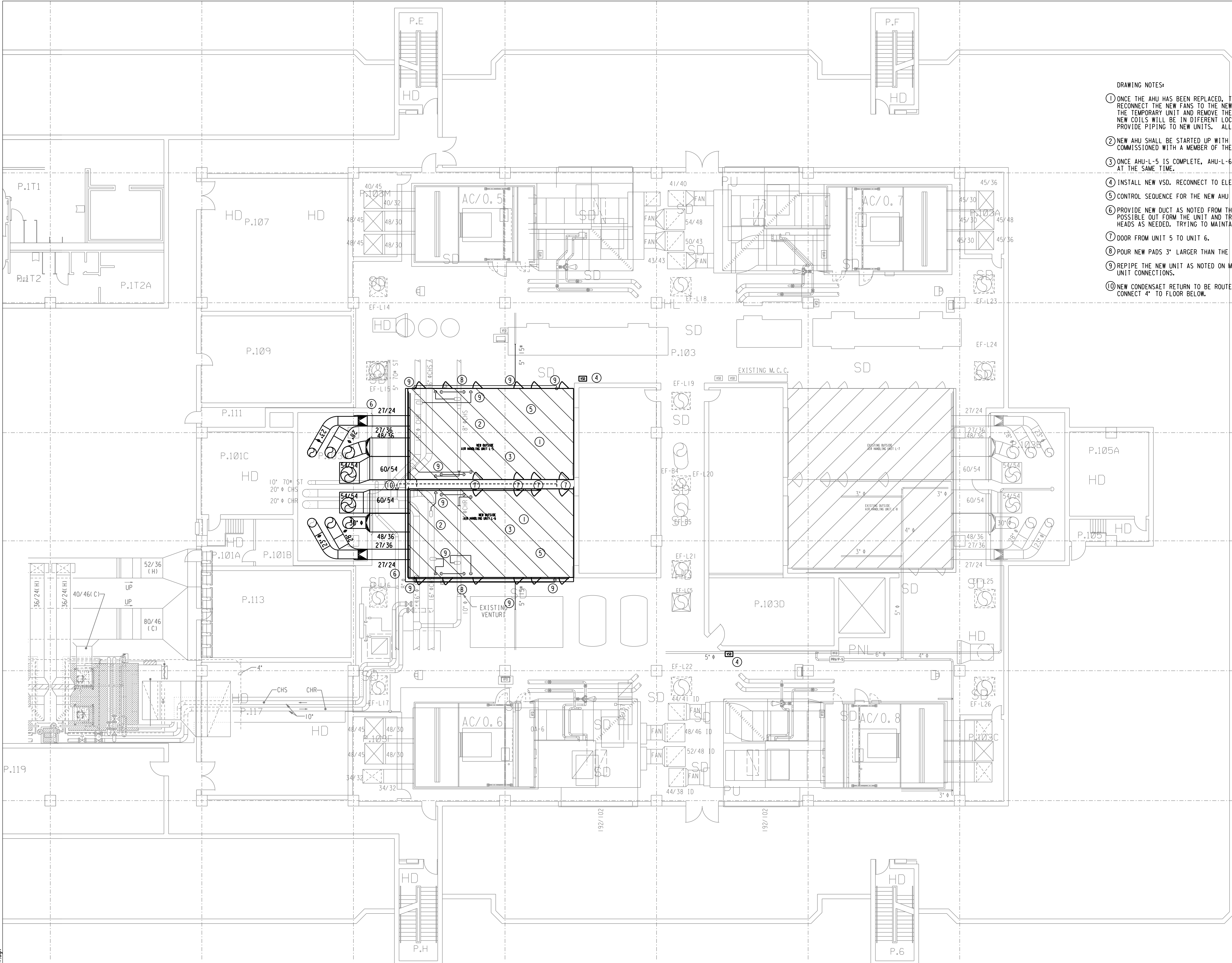


**MEDICAL SCHOOL BUILDING  
 SOUTH PENTHOUSE  
 AHU-L5 & L6 REPLACEMENT**

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

DRAWING NO.  
**M109.5**





- DRAWING NOTES:
- ① ONCE THE AHU HAS BEEN REPLACED, TIE BACK INTO THE CHILLED WATER, STEAM AND DUCTWORK. RECONNECT THE NEW FANS TO THE NEW VFD (REFER TO ELECTRICAL DRAWINGS). 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-5 IS COMPLETE, AHU-L-6 MAY BEGIN. PROVIDE A DEDUCTIVE ALTERNATE FOR REPLACING BOTH UNITS AT THE SAME TIME.
  - ④ INSTALL NEW VSD. RECONNECT TO ELEG AS NEEDED.
  - ⑤ CONTROL SEQUENCE FOR THE NEW AHU SHALL BE AS NOTED ON DRAWING M600 - CONTROL DIAGRAMS.
  - ⑥ PROVIDE NEW DUCT AS NOTED FROM THE AHU TO THE CHASE CONNECTION. DUCT SHALL BE AS HIGH AS POSSIBLE OUT FROM THE UNIT AND TRANSITION DOWN TO THE EXISTING FIRE DAMPER. RELOCATE SPRINKLER HEADS AS NEEDED, TRYING TO MAINTAIN AS MUCH HEAD HEIGHT AS POSSIBLE CLOSE TO THE COLUMNS.
  - ⑦ DOOR FROM UNIT 5 TO UNIT 6.
  - ⑧ POUR NEW PADS 3' LARGER THAN THE AHU FOOTPRINT ON EACH SIDE AND 6" TALL. REFER TO STRUCTURAL.
  - ⑨ REPIPE THE NEW UNIT AS NOTED ON M500 - MECHANICAL DETAILS AND AS REQUIRED FOR LOCATION OF THE NEW UNIT CONNECTIONS.
  - ⑩ NEW CONDENSATE RETURN TO BE ROUTED BETWEEN UNITS. PENETRATE FLOOR IN THE CHASE BELOW AND CONNECT 4" TO FLOOR BELOW.

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ADDENDUM 1		04-04-16		



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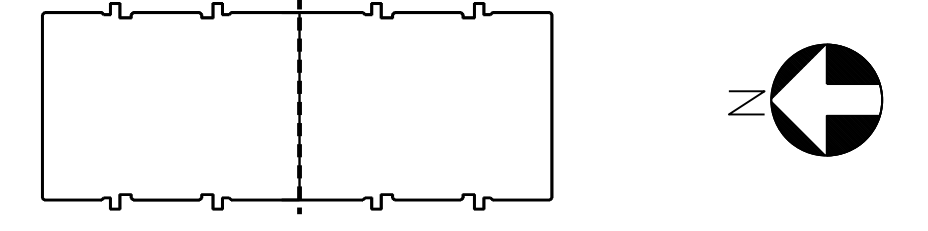
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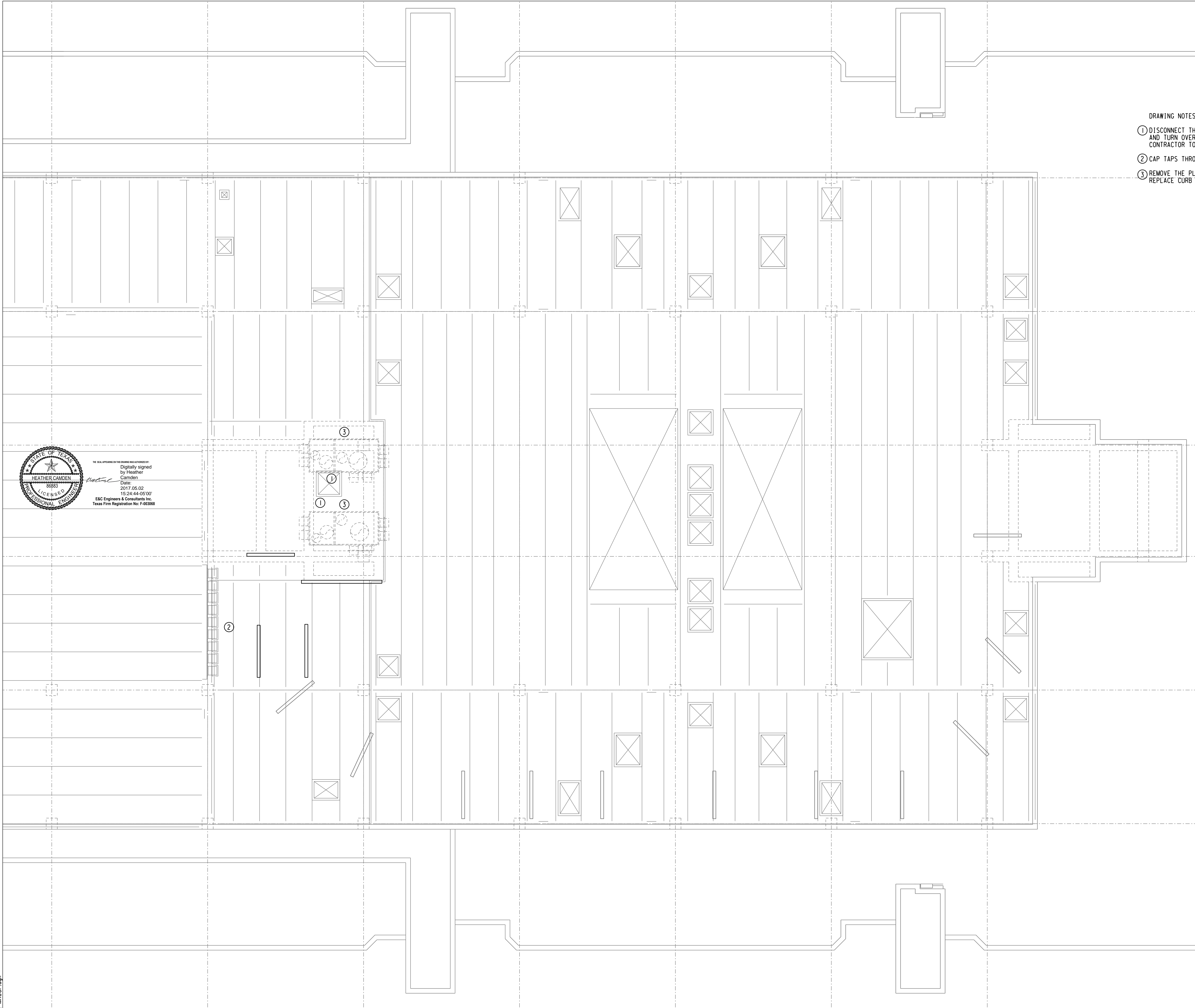


**MEDICAL SCHOOL BUILDING  
 SOUTH PENTHOUSE  
 AHU-L5 & L6 REPLACEMENT**

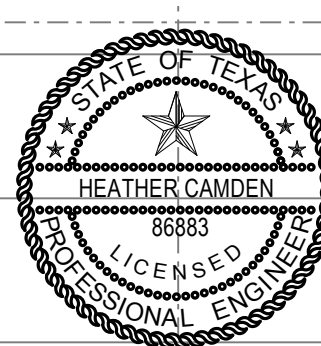
DRAWING TITLE  
**MECHANICAL PH  
 RENOVATION  
 DRAWING**

DRAWING NO.  
**M208**





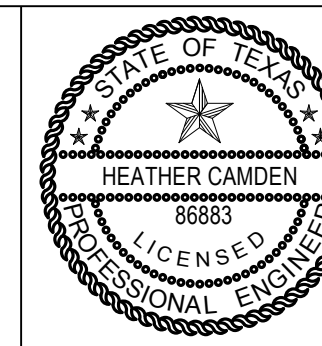
- DRAWING NOTES:
- ① DISCONNECT THE PLENUMS FROM THE RISERS. CAP THE RISERS AIRTIGHT. REMOVE FLEX DUCT FROM THE ROOF AND TURN OVER TO THE OWNER FOR USE ON FUTURE PHASES. IF THE OWNER FINDS THE DUCT UNUSABLE, CONTRACTOR TO DISPOSE.
  - ② CAP TAPS THROUGH EXTERIOR WALL FOR USE ON FUTURE PHASES.
  - ③ REMOVE THE PLENUM ON TOP OF THE RISERS ON THE ROOF. PATCH THE ROOF TO MATCH EXISTING. REPLACE CURB AROUND EXISTING EXHAUST DUCT PENETRATION.


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 Camden.  
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 E&C Engineers & Consultants Inc.  
 Texas Firm Registration No. F-482698

Date: 5/01/2017  
 Drawn By: DV  
 Checked By: HEC

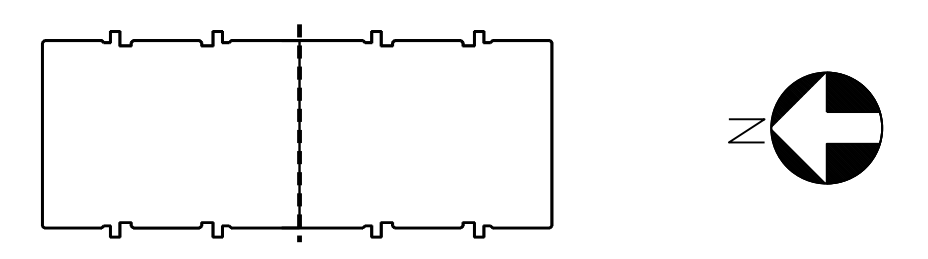
UTHSC Project No. 730022  
 E & C Project No. 3302.00  
 File Name



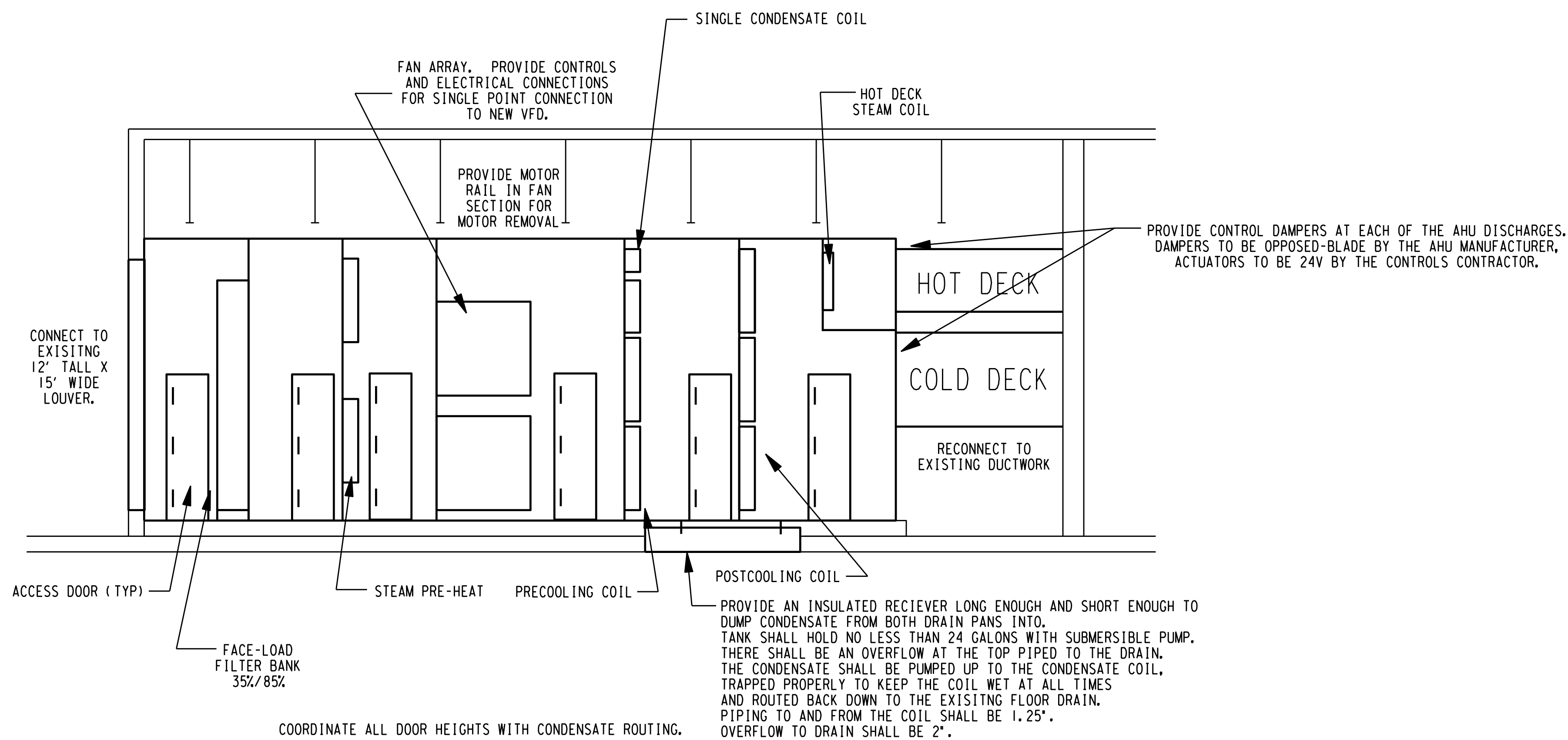
**MEDICAL SCHOOL BUILDING  
 SOUTH PENTHOUSE  
 AHU-L5 & L6 REPLACEMENT**

DRAWING TITLE  
**MECHANICAL ROOF  
 RENOVATION  
 DRAWING**

DRAWING NO.  
**M209**



PROVIDE FANS WITH BALANCE STREAM DAMPERS



**01** LABORATORY REPLACEMENT UNIT  
DETAIL W/ CONDENSATE RECOVERY  
NOT TO SCALE

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

DUCT PENETRATIONS INTO CHASE APPROXIMATE LOCATIONS - FIELD VERIFY:

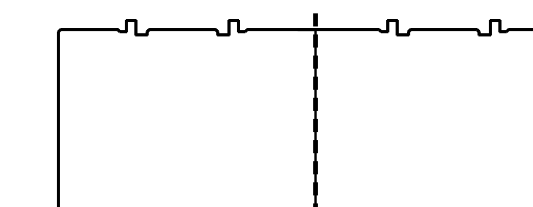
BOTTOM OF HOTDECK L5 EAST - 10' 8"  
BOTTOM OF COLDDECK L5 EAST - 5' 8"  
BOTTOM OF HOTDECK L5 WEST - 9' 4"  
BOTTOM OF COLDDECK L5 WEST - 4' 2"

BOTTOM OF COLDDECK L6 EAST - 4' 2"  
BOTTOM OF HOTDECK L6 EAST - 9' 11"  
BOTTOM OF COLDDECK L6 WEST - 5' 8"  
BOTTOM OF HOTDECK L6 WEST - 10' 9"

UNIT WILL SIT ON A 6" HOUSEKEEPING PAD.

LAB AHU 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.

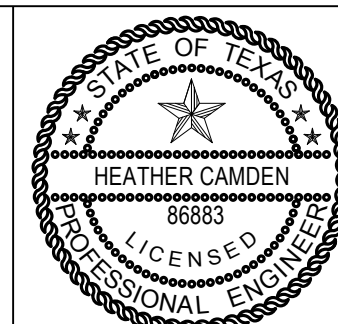
REFER TO THE FLOOR PLANS TO NOTE WHERE DOORS  
ARE REQUIRED TO BE ON ONE OR BOTH SIDES OF THE UNIT.



ISSUE FOR:	Description
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Rev.	
Date	05-01-17

**E & C**

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Date: 2017.05.02 15:24:44-0500  
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Texas Firm Registration No. F-48098

Date: 5/01/2017  
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UTHSC Project No. 730022  
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File Name



**MEDICAL SCHOOL BUILDING  
SOUTH PENTHOUSE  
AHU-L5 & L6 REPLACEMENT**

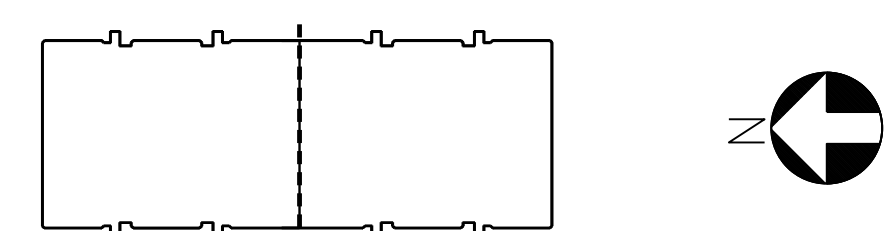
DRAWING TITLE  
**MECHANICAL  
AHU DETAILS**

DRAWING NO.  
**M300**

AIR HANDLING UNIT SCHEDULE - REPLACEMENT		
UNIT INFORMATION		
UNIT NO.	AHU-L-5	AHU-L-6
OPERATION TYPE	NORMAL	NORMAL
LOCATION	SOUTH PENTHOUSE (BLUE CHASE)	SOUTH PENTHOUSE (BLUE CHASE)
MANUFACTURER (BASIS OF DESIGN)	CLIMATECRAFT	CLIMATECRAFT
TYPE	WELDED FRAME OR BUILT ON SITE	WELDED FRAME OR BUILT ON SITE
CONFIGURATION	FANWALL DUAL DUCT	FANWALL DUAL DUCT
SERVICE	GREEN CHASE EAST	GREEN 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	TEMTRON FAN ARRAY 6@ PF11-27	TEMTRON 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
VOLAGE/PHASE	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@58WC39X088-04-09-CW	6@58WC39X088-04-09-CW
CASE MATERIAL	16 GA. 304 S.S.	16 GA. 304 S.S.
QUANTITY OF COILS	3LH/3RH	3LH/3RH
COIL AIRFLOW	78,430	78,430
MAX FACE VELOCITY	550.0	501.0
MINIMUM NUMBER ROWS	4	4
MINIMUM NUMBER OF FINS PER INCH	9	9
MAXIMUM AIR PRESSURE DROP	0.56	0.56
ENTERING AIR TEMP (DB) (°F)	98.0	98.0
ENTERING AIR TEMP (WB) (°F)	80.0	80.0
LEAVING AIR TEMP (DB) (°F)	71.2	71.2
LEAVING AIR TEMP (WB) (°F)	68.8	68.8
ENTERING WATER TEMP (°F)	52.2	52.2
LEAVING WATER TEMP (°F)	62.2	62.2
MINIMUM COIL LATENT HEAT (MHB)	1,416,416.0	1,416,416.0
MINIMUM COIL SENSIBLE HEAT (MBH)	2,272,696.0	2,272,696.0
MINIMUM COIL TOTAL HEAT (MBH)	3,689,112.0	3,689,112.0
MAX WATER FLOW (GPM)	770.0	770.0
CHILLED WATER TEMP DIFFERENCE (°F)	10.0	10.0
MAX WATER PRESSURE DROP (FT OF WATER)	8.6	8.6
TUBE MATERIAL / FIN MATERIAL	CU / CU	CU / CU
UV LIGHTS (YES/NO)	YES	YES
COOLING COIL DESIGN INFORMATION		
COIL POSITION	POST COOLING	POST COOLING
COIL DESCRIPTION	6@58WC45X088-08-08-CW	6@58WC45X088-08-08-CW
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	484.0	484.0
MINIMUM NUMBER ROWS	6	6
MINIMUM NUMBER OF FINS PER INCH	8	8
MAXIMUM AIR PRESSURE DROP	0.56	0.56
ENTERING AIR TEMP (DB) (°F)	71.2	71.2
ENTERING AIR TEMP (WB) (°F)	68.8	68.8
LEAVING AIR TEMP (DB) (°F)	52.7	52.7
LEAVING AIR TEMP (WB) (°F)	52.7	52.7
ENTERING WATER TEMP (°F)	42.0	42.0
LEAVING WATER TEMP (°F)	52.2	52.2
MINIMUM COIL LATENT HEAT (MHB)	2,413,367.0	2,413,367.0
MINIMUM COIL SENSIBLE HEAT (MBH)	1,590,140.0	1,590,140.0
MINIMUM COIL TOTAL HEAT (MBH)	4,003,507.0	4,003,507.0
MAX WATER FLOW (GPM)	770.0	770.0
CHILLED WATER TEMP DIFFERENCE (°F)	10.7	10.7
MAX WATER PRESSURE DROP (FT OF WATER)	17.76	17.76
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@11SD48X85-6-1-W-R	4@11SD48X85-6-1-W-R
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	704	704
MINIMUM NUMBER OF ROWS	1	1
MINIMUM NUMBER OF FINS PER INCH	6	6
MAXIMUM AIR PRESSURE DROP AT FULL HEAT	0.13	0.13
ENTERING AIR TEMP (DB) (°F)	18	18
LEAVING AIR TEMP (DB) (°F)	55.3	55.3
STEAM PRESSURE	10#	10#
CONDENSATE RATE	3384#/HR	3384#/HR
MINIMUM COIL SENSIBLE HEAT (MBH)	3,226,626.0	3,226,626.0
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@11SD48X88-10-1-W-F-R	2@11SC48X88-10-1-W-F-R
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	682	682
MINIMUM NUMBER OF ROWS	1	1
MINIMUM NUMBER OF FINS PER INCH	10	10
MAXIMUM AIR PRESSURE DROP AT FULL HEAT	0.21	0.21
ENTERING AIR TEMP (DB) (°F)	52.5	52.5
LEAVING AIR TEMP (DB) (°F)	96.4	96.4
STEAM PRESSURE	10#	10#
CONDENSATE RATE	1967#/HR	1967#/HR
MINIMUM COIL SENSIBLE HEAT (MBH)	1,899,861.0	1,899,861.0
TUBE MATERIAL / FIN MATERIAL	CU/AL	CU/AL
UV LIGHTS (YES/NO)	NO	NO
FILTER SECTION		
2" - MERV 8 PLEATED PRE-FILTER	YES	YES
12" - MERV 14 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.		
PROVIDE WITH BALANCE STREAM DAMPERS ON FANS		

COIL SCHEDULE - CONDENSATE		
THE TOP EXTERIOR PRE-COOLING COIL SHALL INCLUDE AN ADDITIONAL CONDENSATE COIL AS FOLLOWS:		
UNIT NO.	AHU-L-5	AHU-L-6
COOLING COIL DESIGN INFORMATION		
COIL POSITION	COOLING - CONDENSATE	COOLING - CONDENSATE
COIL DESCRIPTION	1@5WC-8-6X84X8-8CU	1@5WC-8-6X84X8-8CU
CASE MATERIAL	16 GA. 304 S.S.	16 GA. 304 S.S.
QUANTITY OF COILS	1	1
COIL AIRFLOW	1370	1370
MAX FACE VELOCITY	391	391
MINIMUM NUMBER ROWS	6	6
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)	67.4	67.4
LEAVING AIR TEMP (WB) (°F)	66.7	66.7
ENTERING WATER TEMP (°F)	55.0	55.0
LEAVING WATER TEMP (°F)	72.1	72.1
MINIMUM COIL LATENT HEAT (MHB)	25,521.0	25,521.0
MINIMUM COIL SENSIBLE HEAT (MBH)	43,076.0	43,076.0
MINIMUM COIL TOTAL HEAT (MBH)	68,597.0	68,597.0
MAX WATER FLOW (GPM)	8.0	8.0
CHILLED WATER TEMP DIFFERENCE (°F)	17.1	17.1
MAX WATER PRESSURE DROP (FT OF WATER)	6.2	6.2
TUBE MATERIAL / FIN MATERIAL	CU / CU	CU / CU
UV LIGHTS (YES/NO)	YES	YES

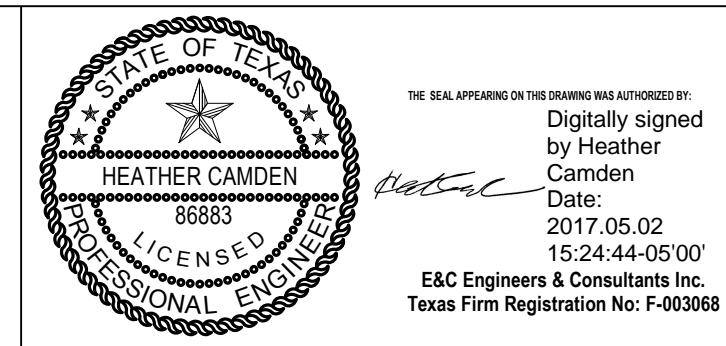
PUMP SCHEDULE - CONDENSATE														
UNIT NO.	LOCATION	SERVICE	TYPE	GPM	FT. HEAD H <sub>2</sub> O	SHUT OFF HEAD FT. H <sub>2</sub> O	DESIGN PRESSURE PSI	MOTOR					REMARKS	
								BHP	HP	RPM	VOLTS @ 60 HZ	PH		
CP-L5	CONDENSATE RECEIVER	CONDENSATE	SUBMERSIBLE	8.5	20.0	22.0	150	4.0	1/6	3450	120	1	SIMILAR TO FLINT & WALLING ECP062S	
CP-L6	CONDENSATE RECEIVER	CONDENSATE	SUBMERSIBLE	8.5	20.0	22.0	150	4.0	1/6	3450	120	1	SIMILAR TO FLINT & WALLING ECP062S	



E:\33000\33002.vw\AHU\_L5&L6\_3302\_MS.dgn

ISSUE FOR:	Area	Rev.	Date	Description
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**E & C** ENGINEERS & CONSULTANTS, INC.  
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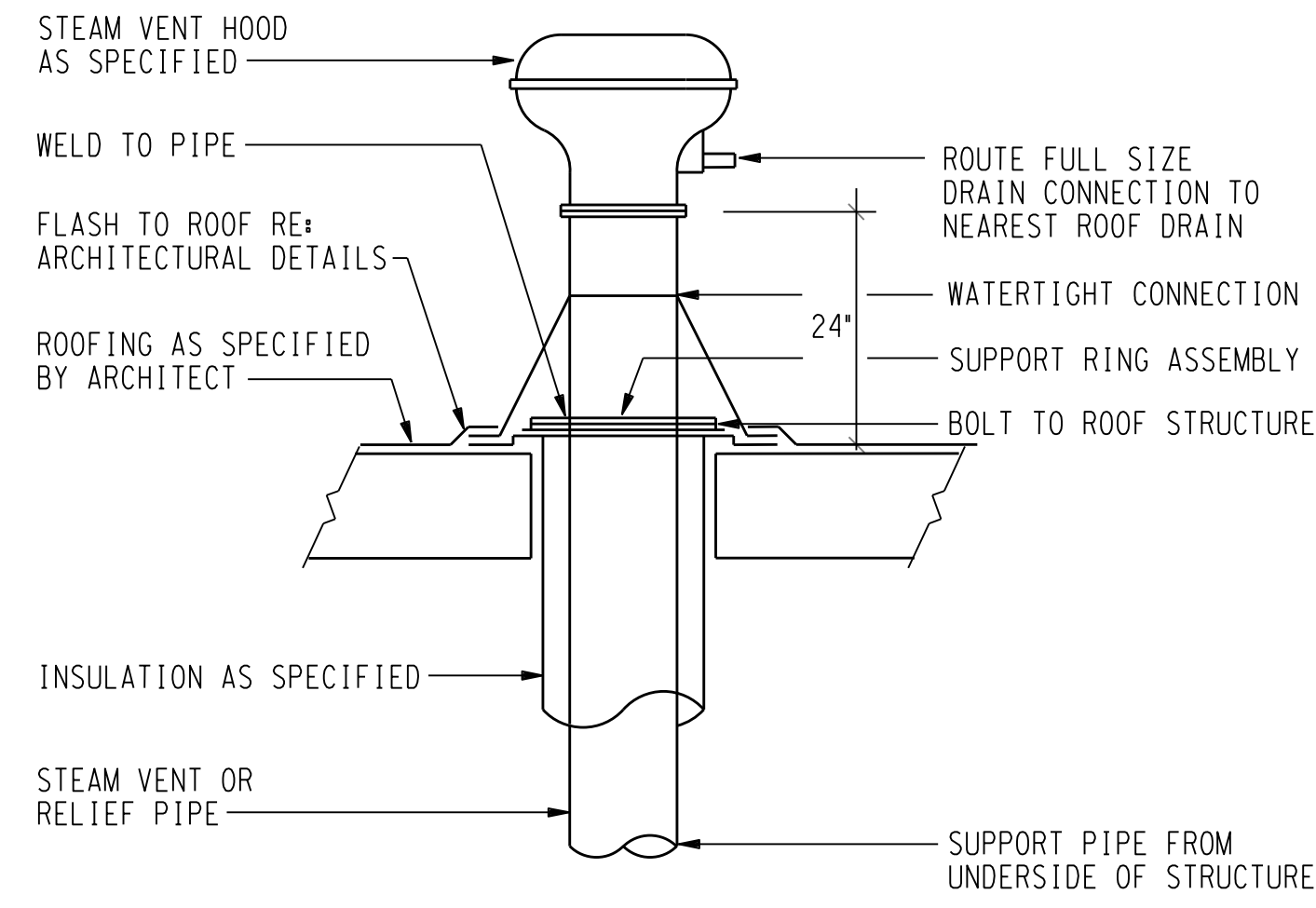


**MEDICAL SCHOOL BUILDING  
 SOUTH PENTHOUSE  
 AHU-L5 & L6 REPLACEMENT**

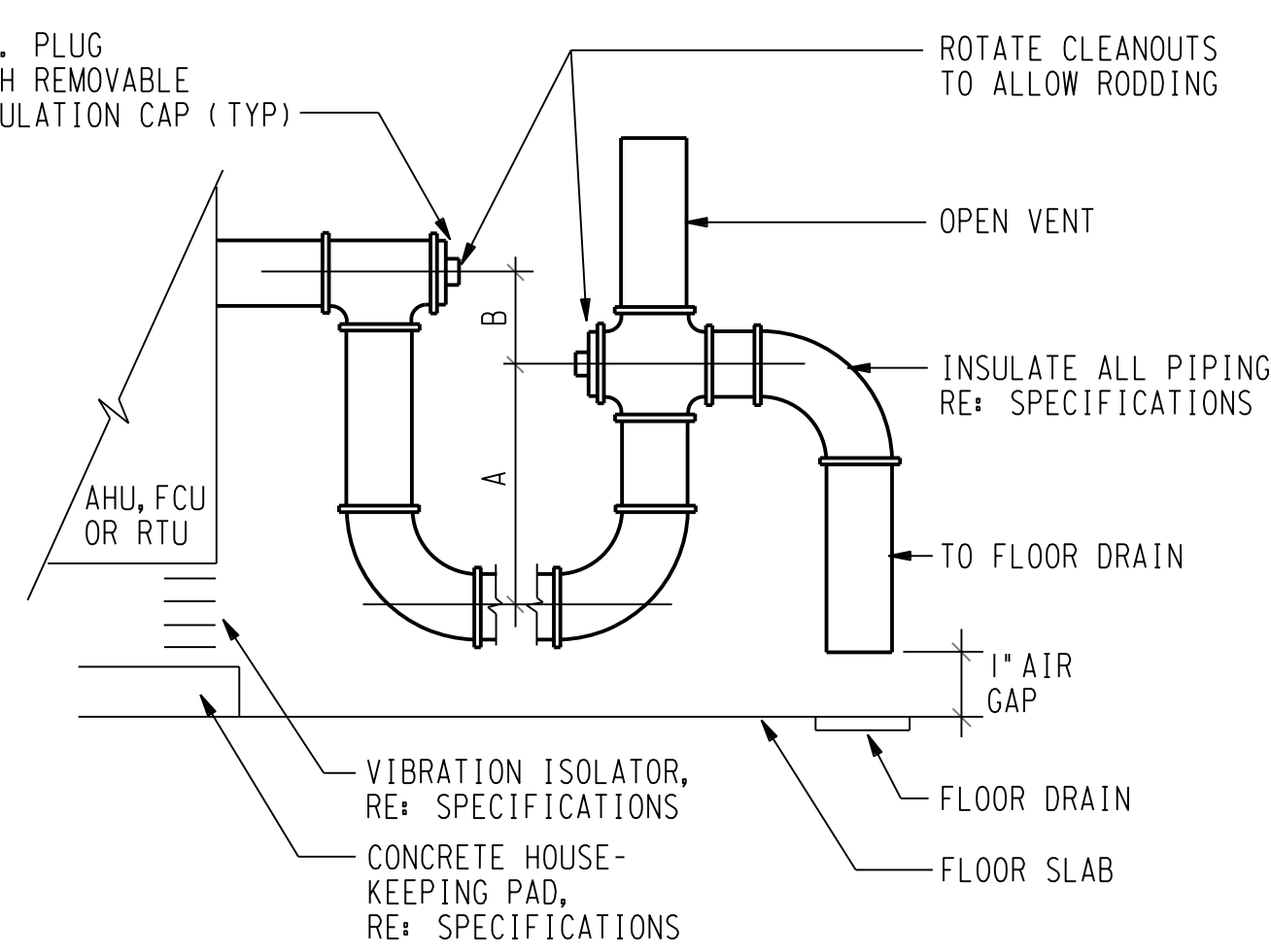
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**MECHANICAL  
 SCHEDULES**

DRAWING NO.  
**M400**

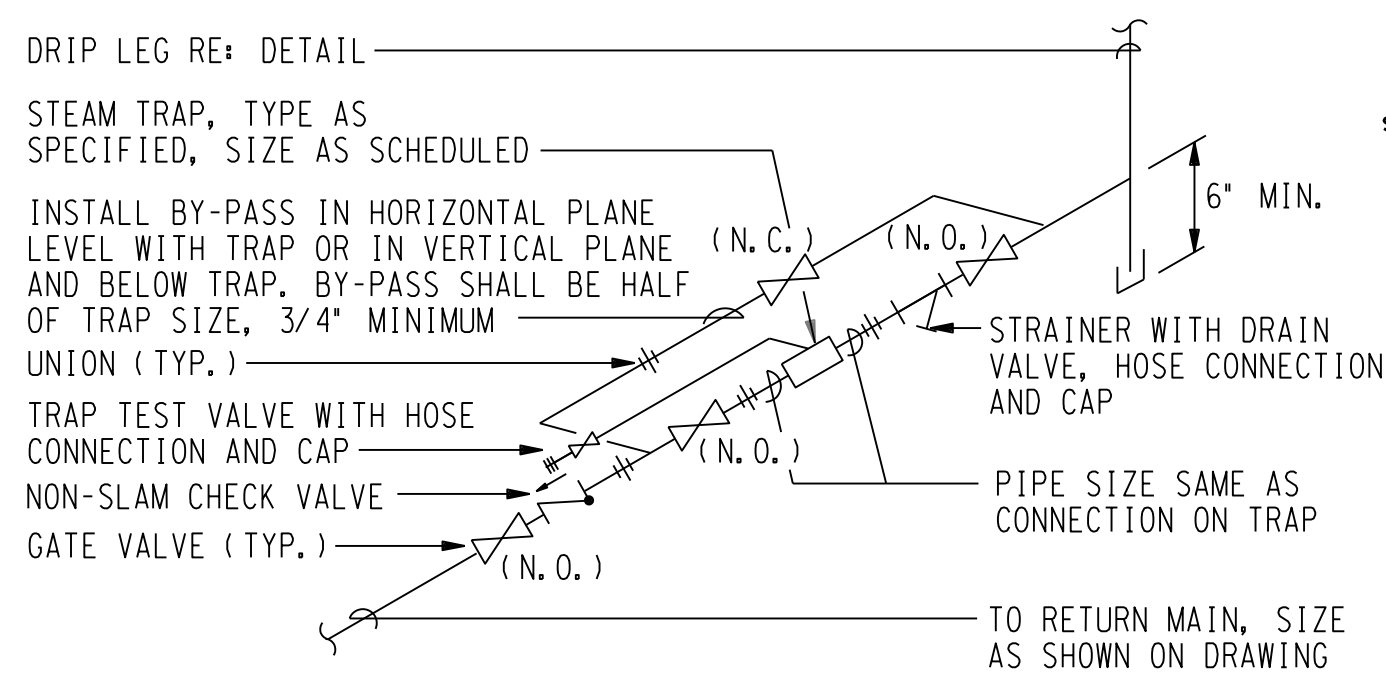




**10** TYPICAL STEAM VENT THRU ROOF ASSEMBLY  
NOT TO SCALE

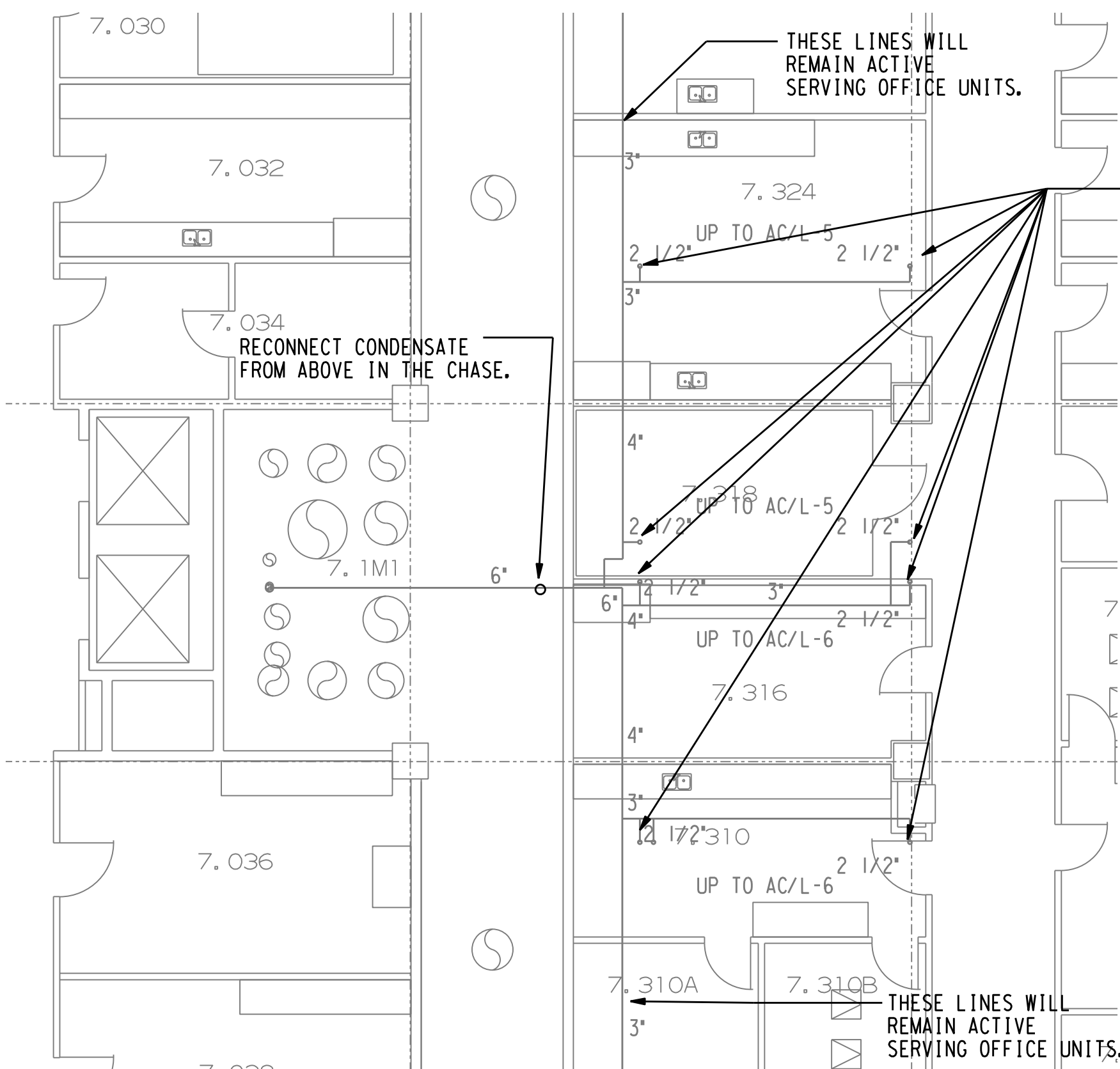


**9** TYPICAL CONDENSATE DRAIN PIPING  
NOT TO SCALE



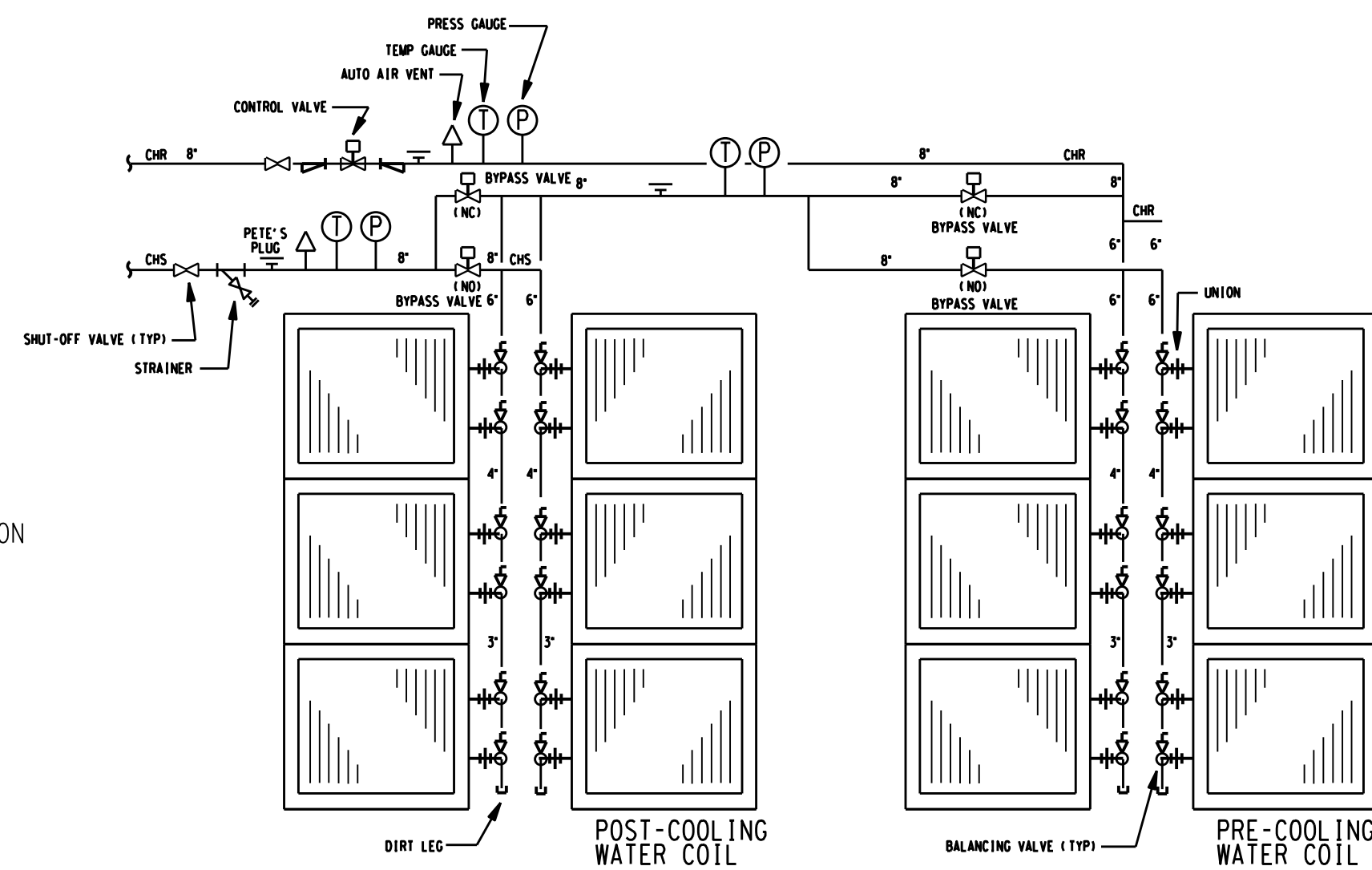
- NOTES:
1. BY-PASS IS NOT REQUIRED ON THE TRAP PROVIDED FOR THE DRIPPING OF LOW PRESSURE SUPPLY MAINS (15 PSIG OR LESS).
  2. CHECK VALVE IS NOT REQUIRED FOR LOW PRESSURE STEAM SYSTEM WITH GRAVITY RETURN.

**8** TYPICAL STEAM DRIP TRAP PIPING  
NOT TO SCALE



**7** 7TH FLOOR CONDENSATE  
NOT TO SCALE

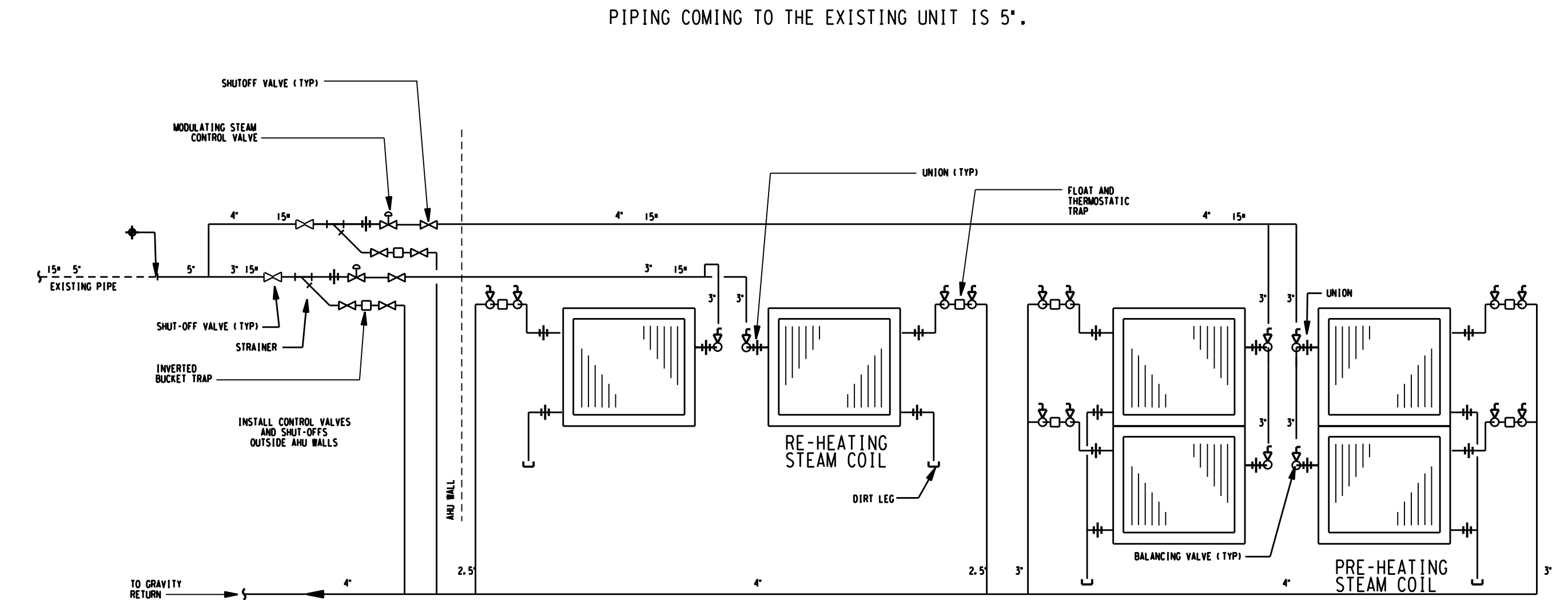
PIPING COMING TO THE EXISTING UNIT IS 10\"/>



- NOTES:
1. INSULATE ALL PIPING, VALVES, FITTINGS AND ACCESSORIES. RE: SPECIFICATIONS.
  2. INSTALL TEST PORTS IN EASILY ACCESSIBLE LOCATIONS WITH MINIMUM OF 12\"/>

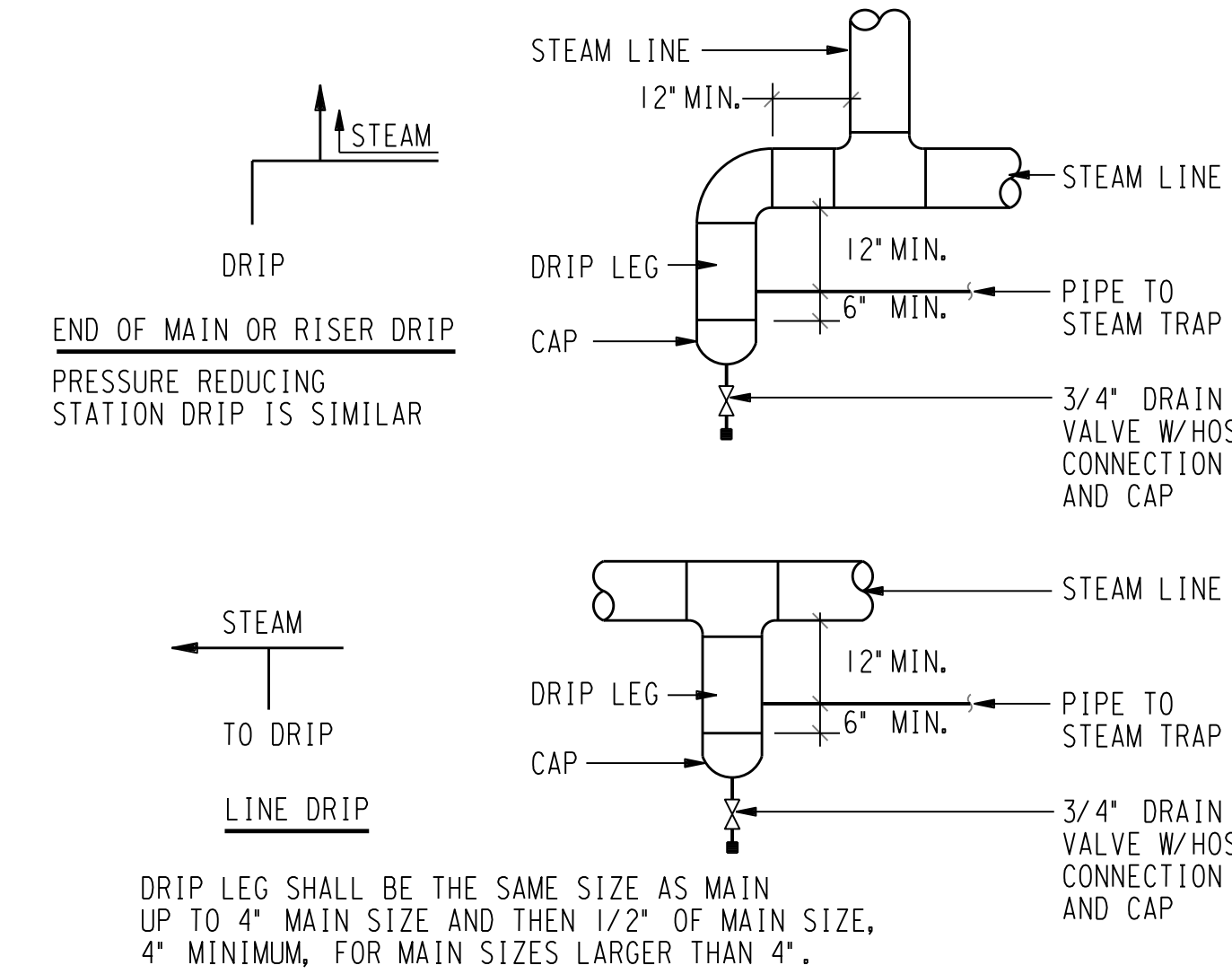
**06** TYPICAL AIR HANDLING UNIT COIL PIPING  
NOT TO SCALE

**06** AIR HANDLING UNIT WITH SERIES COILS CHILLED WATER COIL PIPING DETAIL (REPLACEMENT UNIT)  
NOT TO SCALE

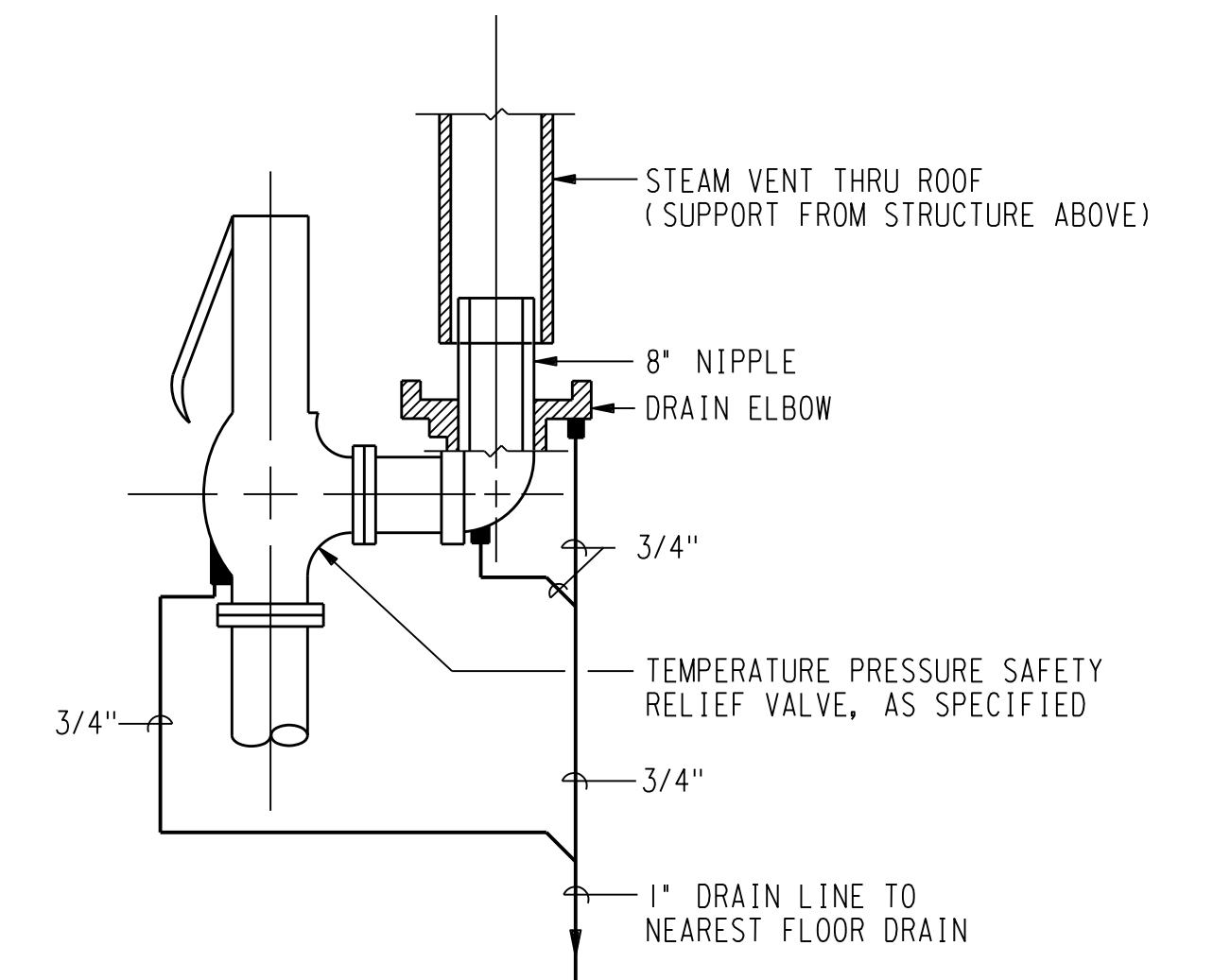


- NOTES:
1. INSULATE ALL PIPING, VALVES, FITTINGS AND ACCESSORIES. RE: SPECIFICATIONS.

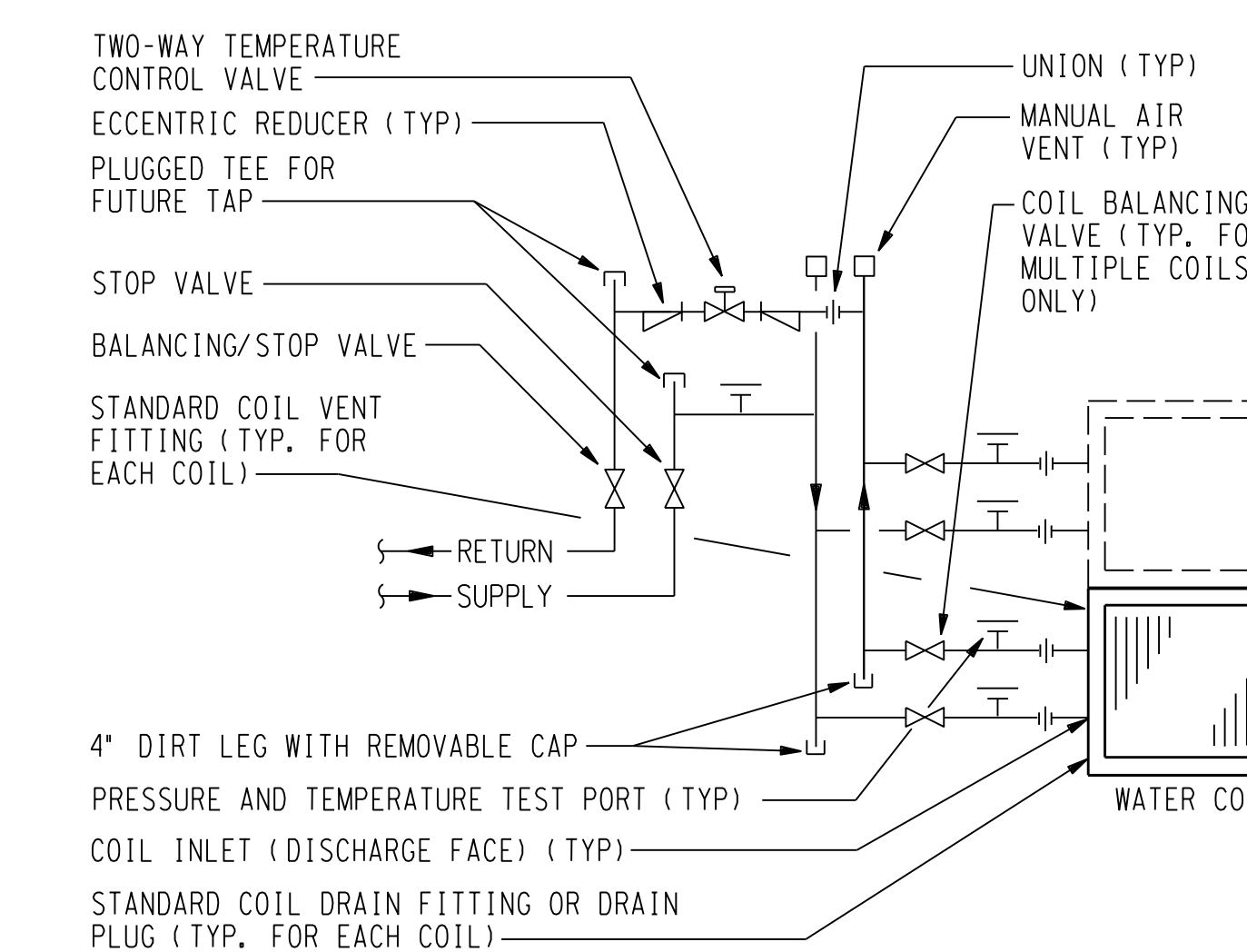
**3** TYPICAL LAB AIR HANDLING UNIT STEAM COIL PIPING  
NOT TO SCALE



**5** TYPICAL STEAM DRIP TRAP POCKETS  
NOT TO SCALE

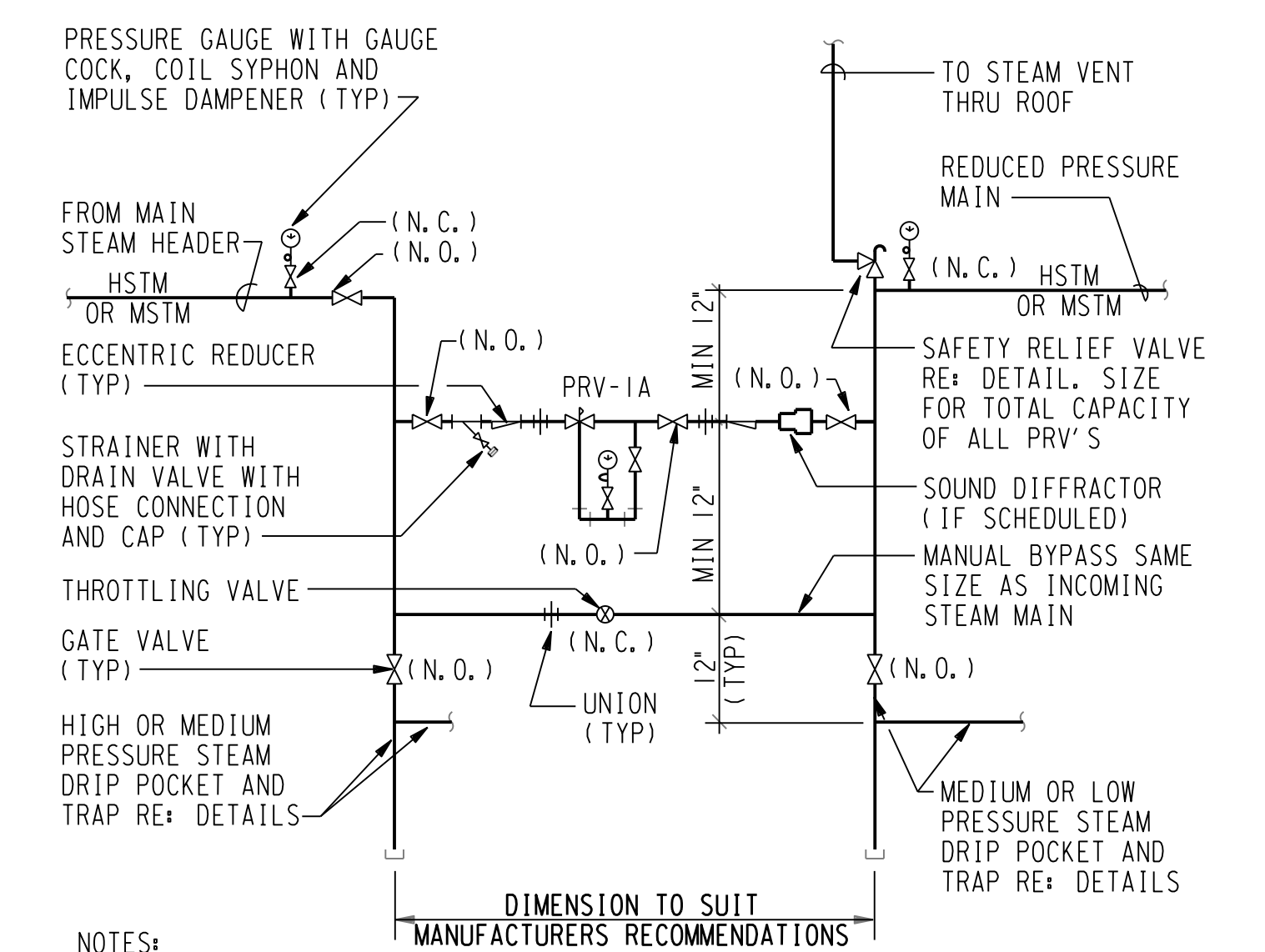


**2** TYPICAL STEAM SAFETY RELIEF VALVE  
NOT TO SCALE



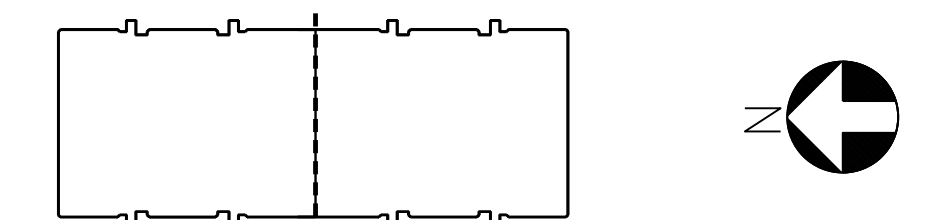
- NOTES:
1. INSULATE ALL PIPING, VALVES, FITTINGS AND ACCESSORIES. RE: SPECIFICATIONS.
  2. INSTALL TEST PORTS IN EASILY ACCESSIBLE LOCATIONS WITH MINIMUM OF 12\"/>

**4** TYPICAL AIR HANDLING UNIT COIL PIPING  
NOT TO SCALE



- NOTES:
1. SIZE PRV-1A SIZED FOR 100% OF REDUCED PRESSURE STEAM LOAD.
  2. HIGH PRESSURE TO MEDIUM PRESSURE OR MEDIUM PRESSURE TO LOW PRESSURE. DO NOT USE FOR HIGH PRESSURE TO LOW PRESSURE.

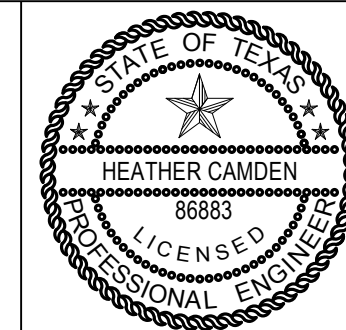
**1** TYPICAL SINGLE STAGE STEAM PRESSURE REDUCING STATION  
NOT TO SCALE



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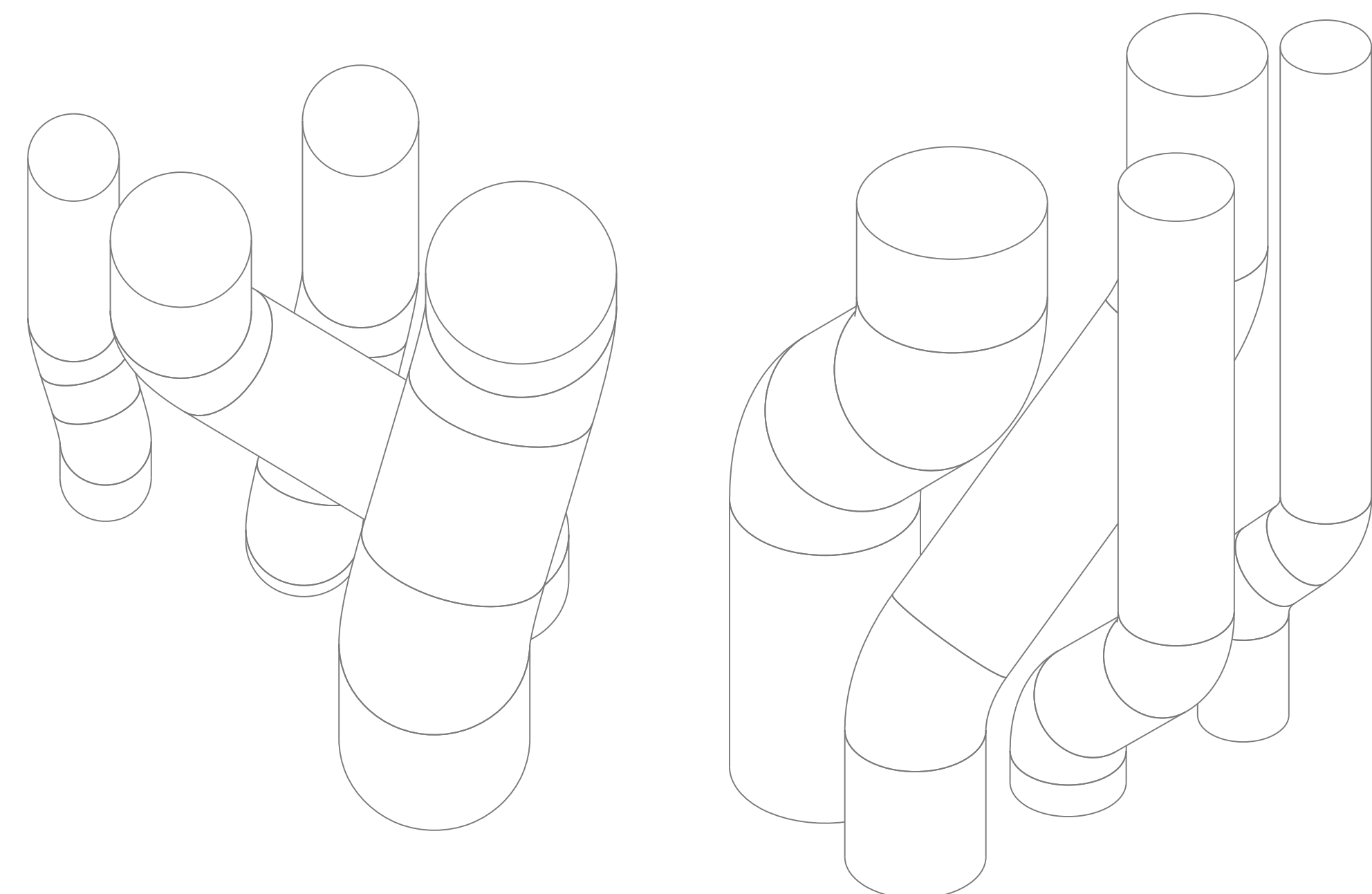
UTHC Project No. 730022  
E & C Project No. 3302.00  
File Name



**MEDICAL SCHOOL BUILDING SOUTH PENTHOUSE AHU-L5 & L6 REPLACEMENT**

DRAWING TITLE  
**MECHANICAL DETAILS**

DRAWING NO.  
**M500**

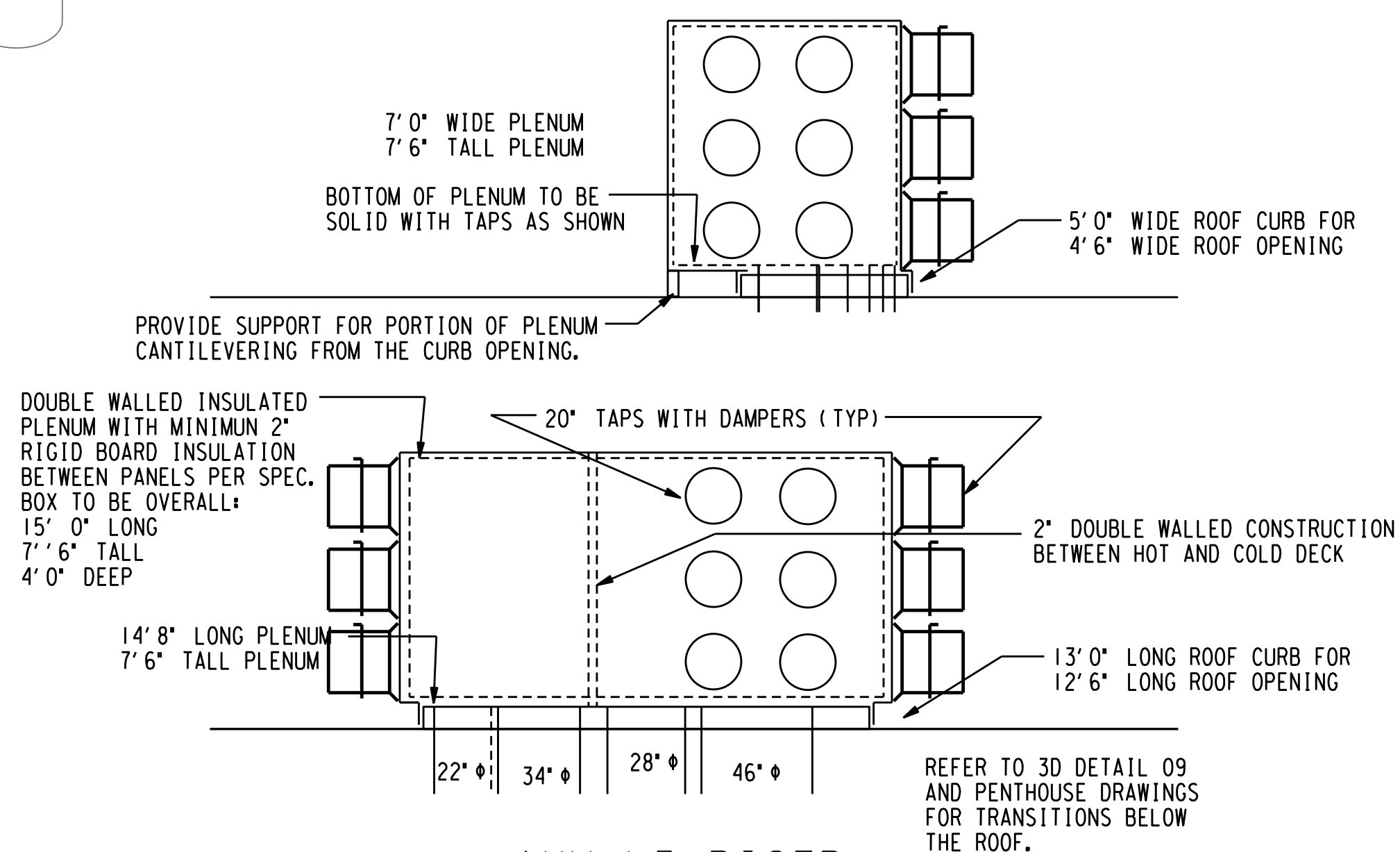


AHU-L5 TEMPORARY CONNECTION ISOMETRIC

AHU-L6 TEMPORARY CONNECTION ISOMETRIC

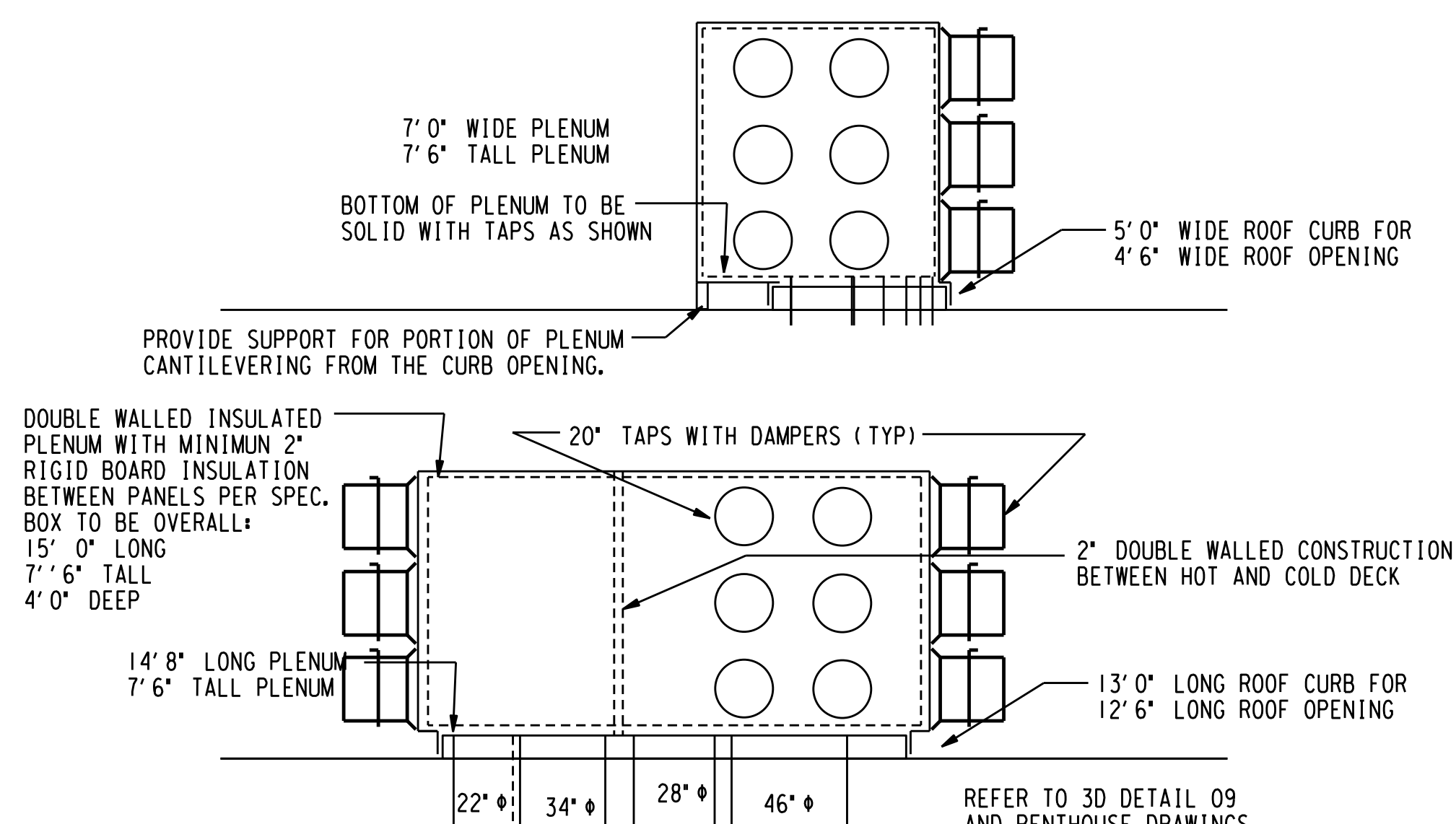
9

DUCT RISER CONNECTIONS IN CHASE ISOMETRIC  
NOT TO SCALE



7

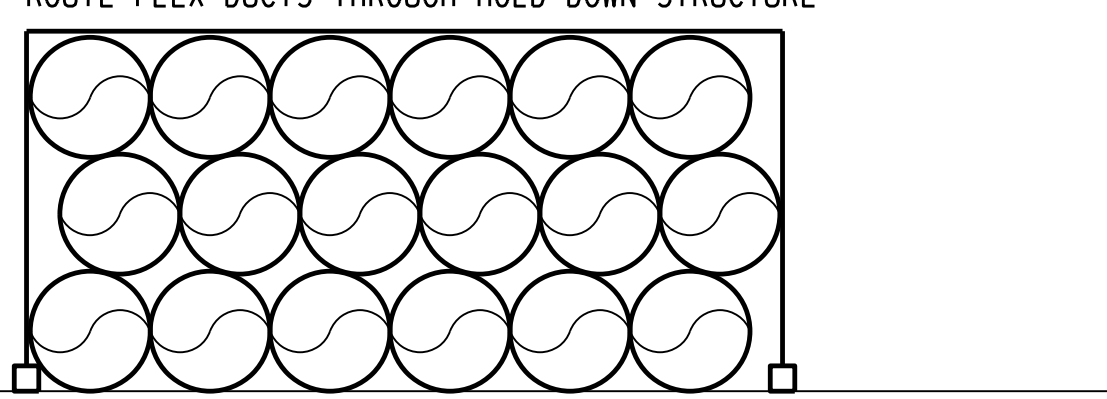
AHU-L5 RISER PLENUM  
NOT TO SCALE



6

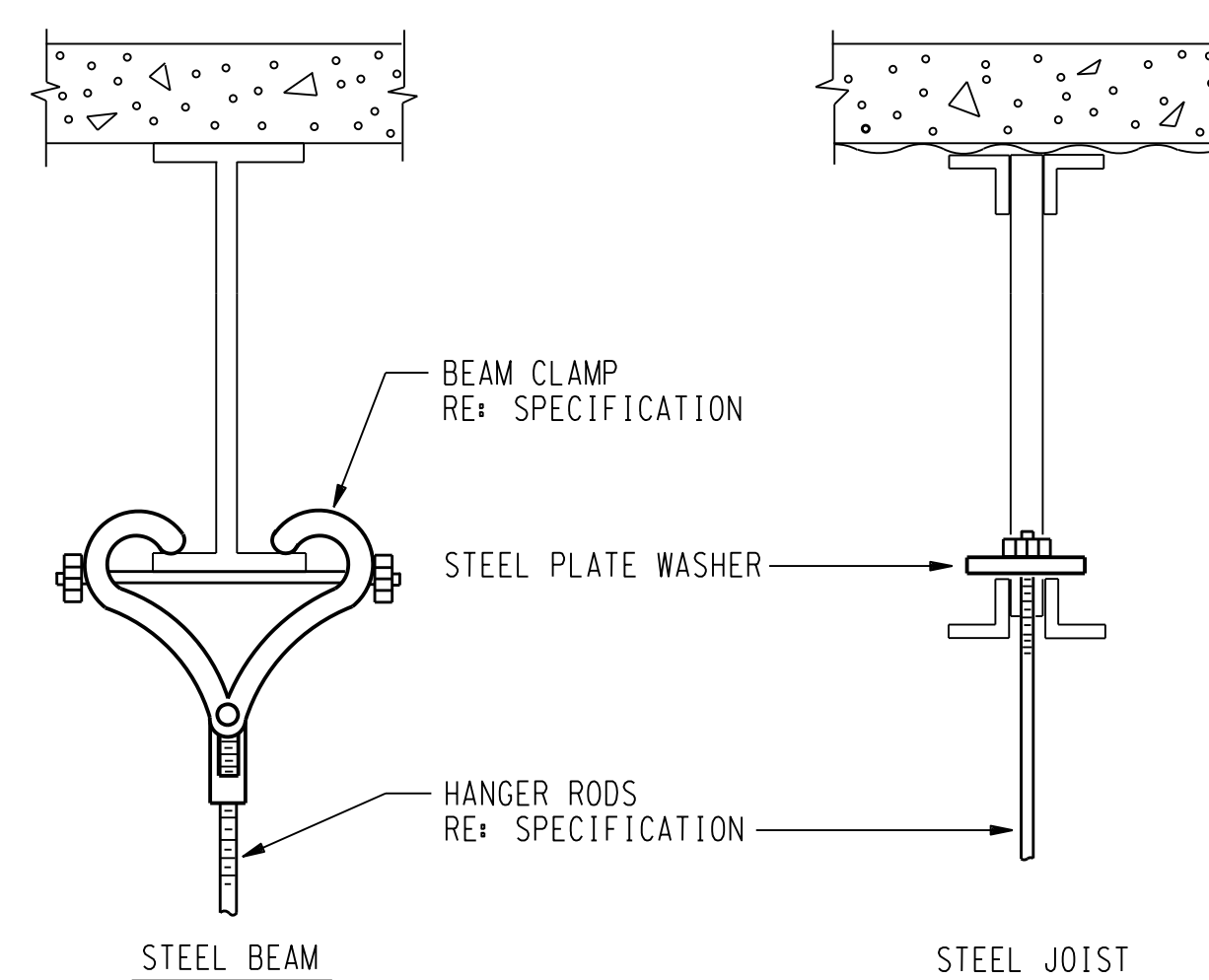
AHU-L6 RISER PLENUM  
NOT TO SCALE

REFER TO STRUCTURE. TIE DOWN TO BE 10' 0" WIDE AND 5' 0" TALL. ROUTE FLEX DUCTS THROUGH HOLD-DOWN STRUCTURE



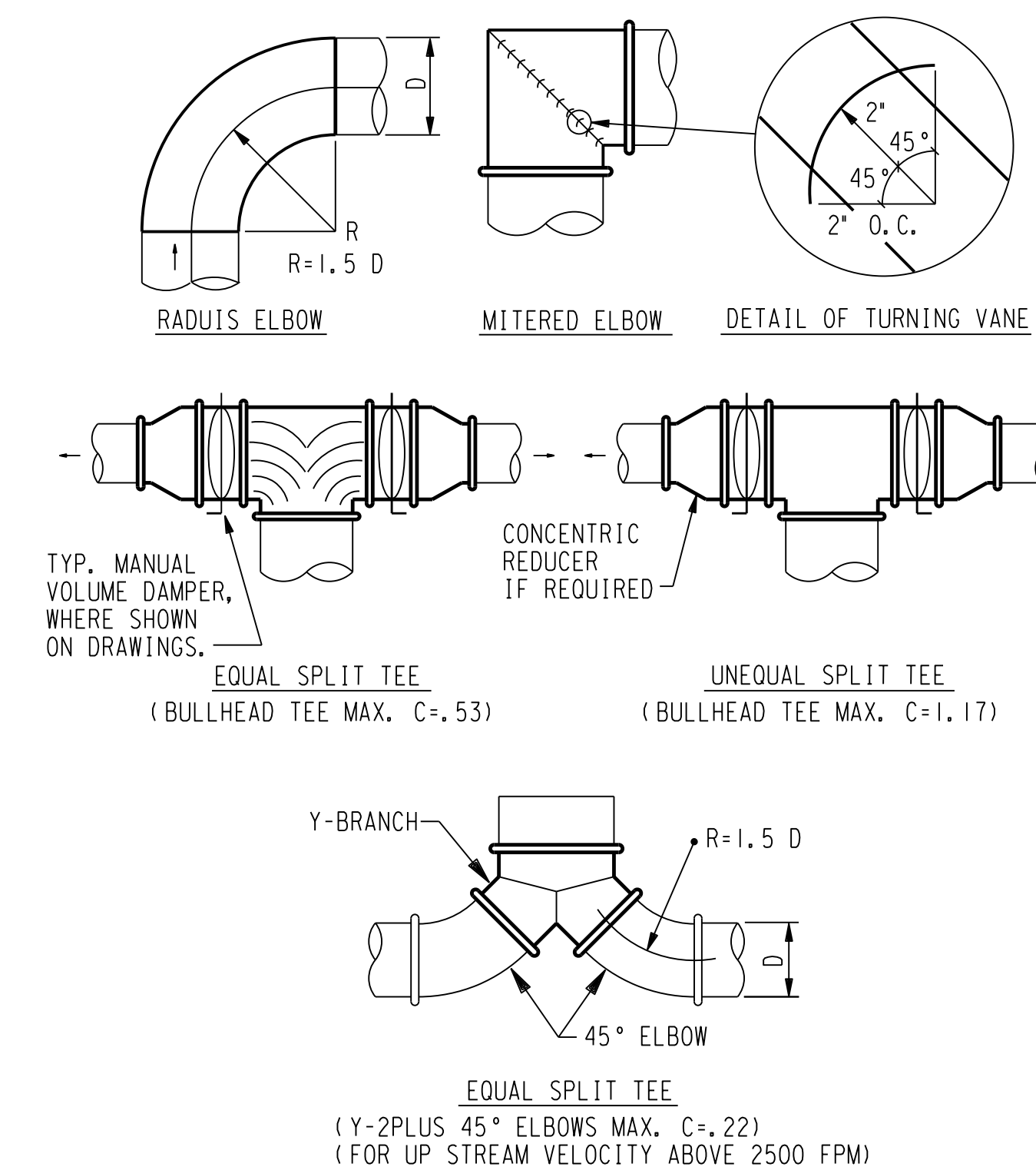
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TYPICAL HOLD-DOWN LAY-OUT - RE: STRUCTURE  
NOT TO SCALE



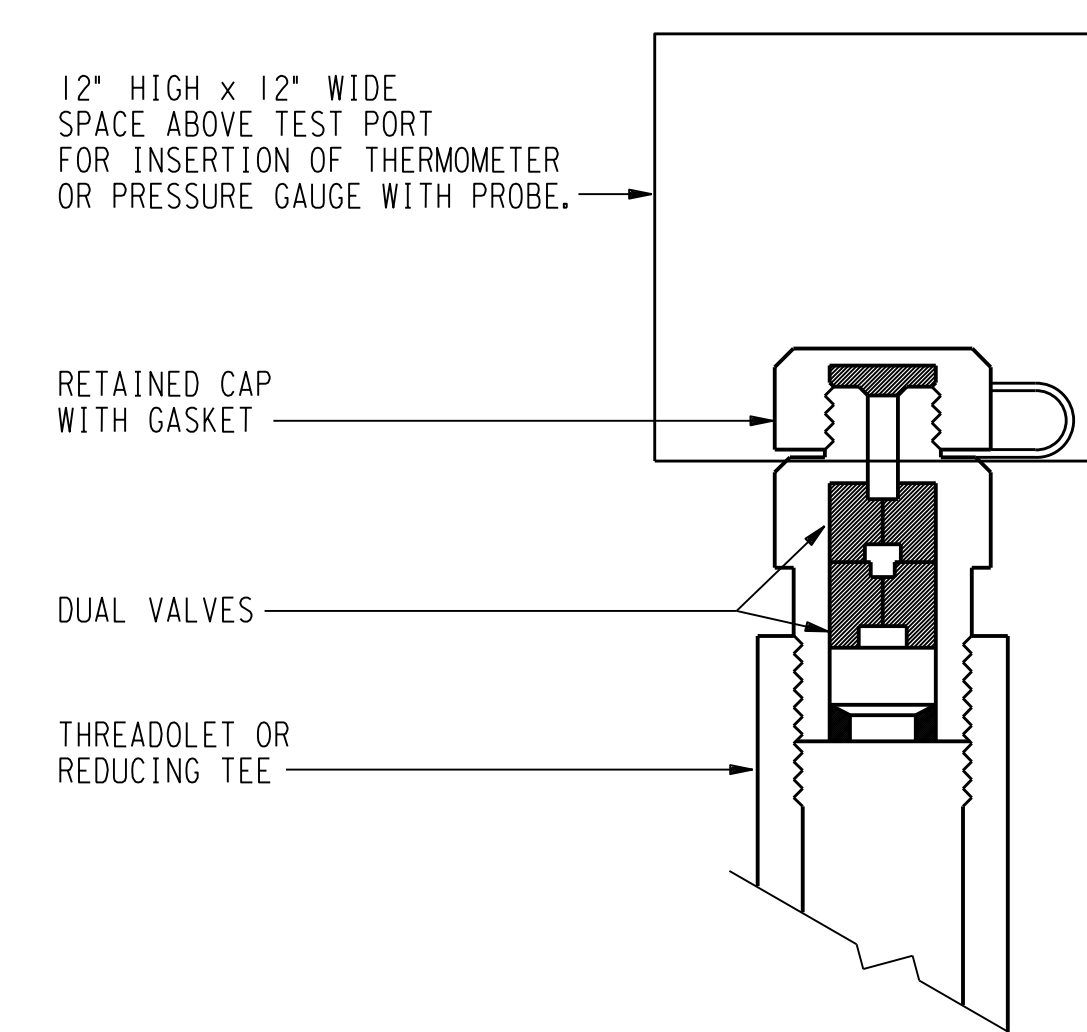
5

TYPICAL PIPE AND DUCT SUPPORT ATTACHMENT  
NOT TO SCALE



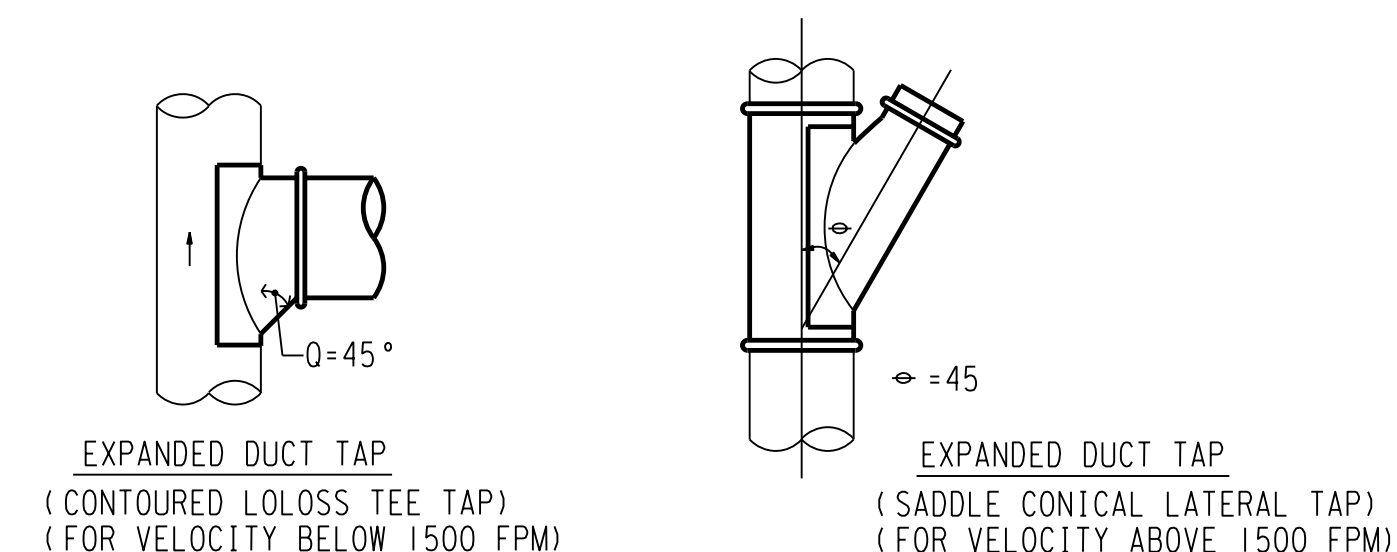
2

TYPICAL ROUND/OVAL DUCT FITTINGS  
NOT TO SCALE



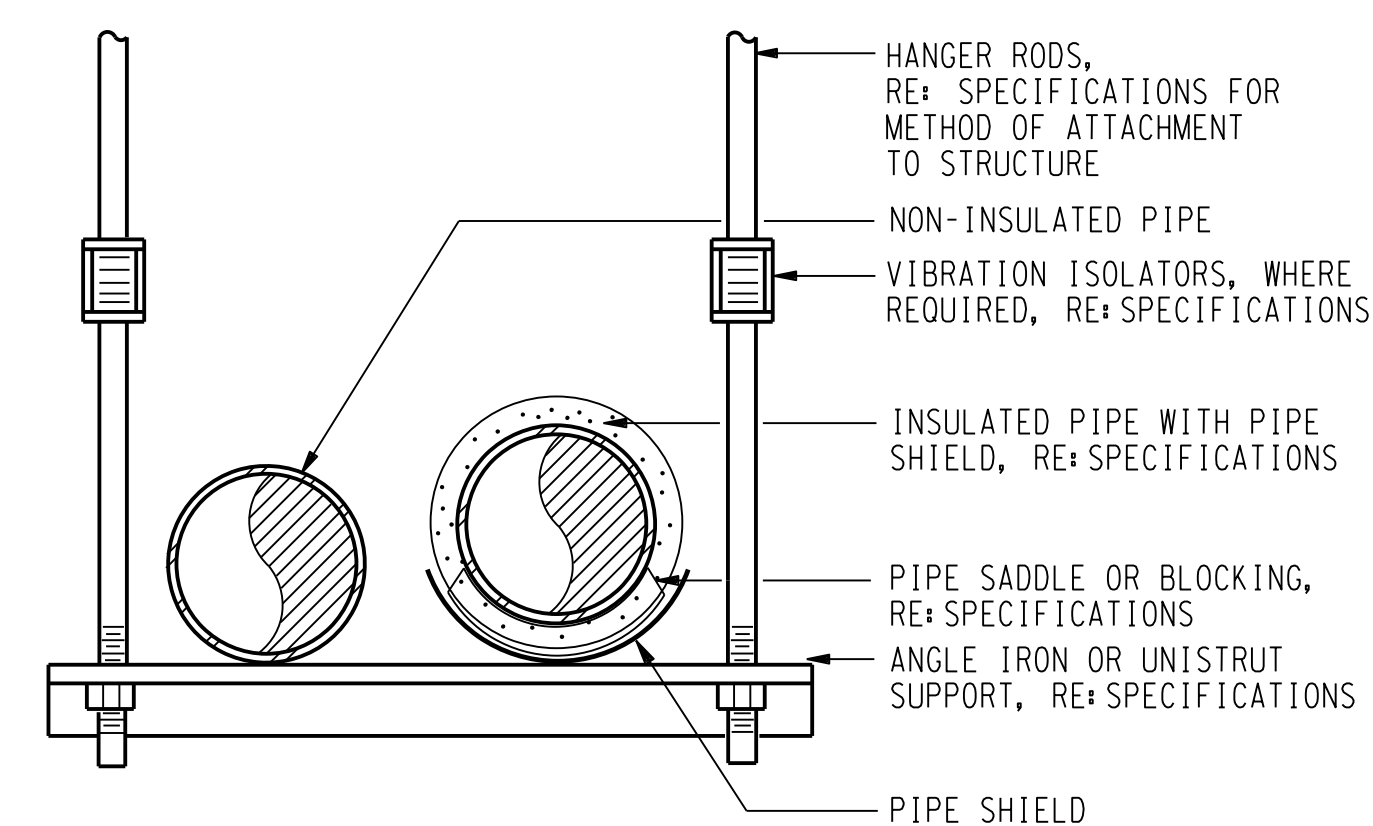
4

TYPICAL PRESSURE/TEMPERATURE TEST PORT INSTALLATION  
NOT TO SCALE



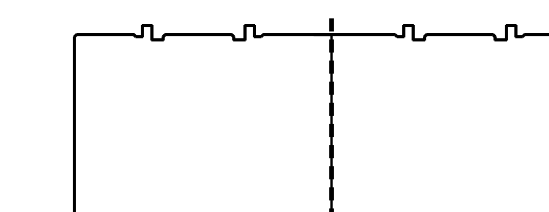
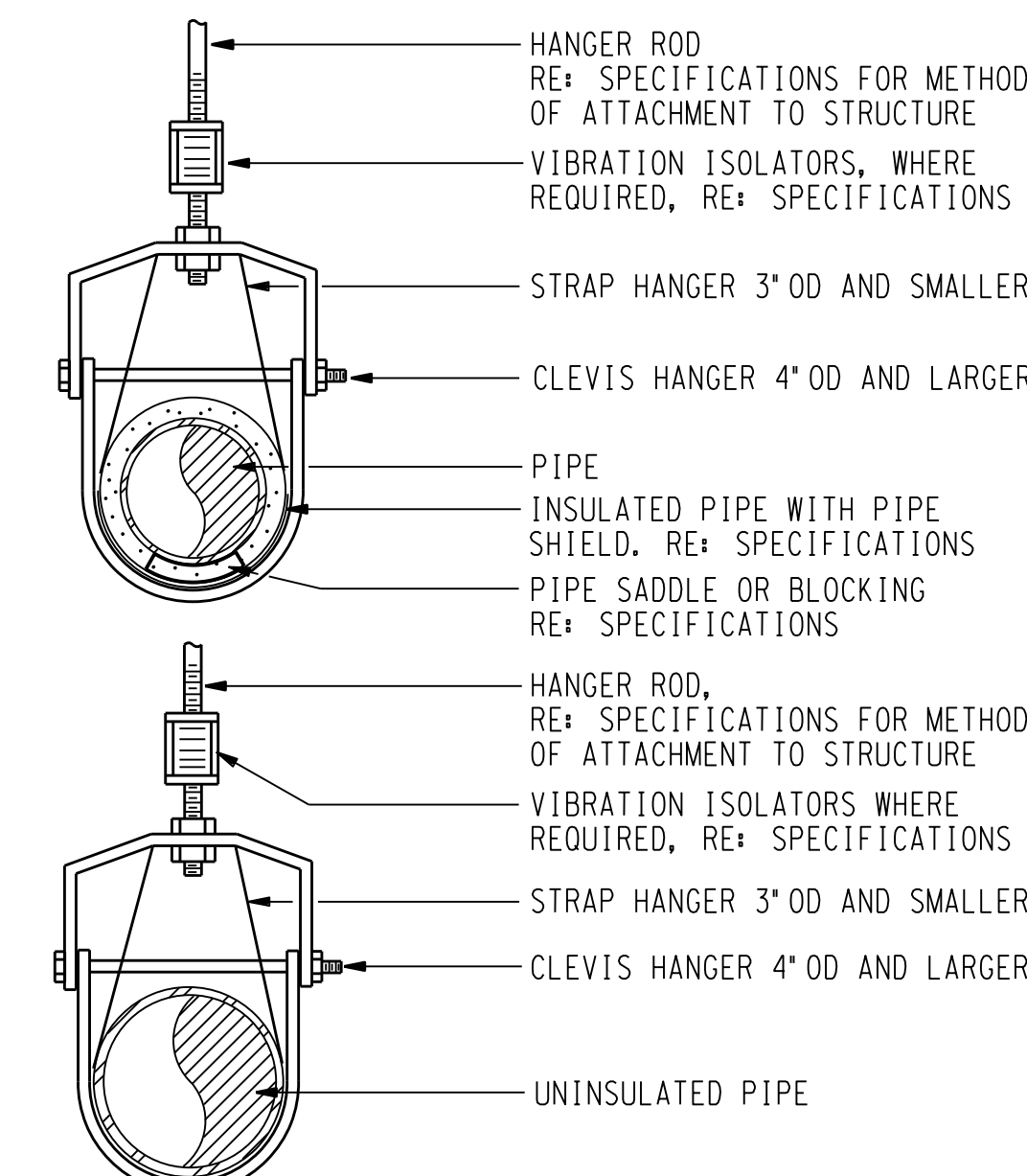
1

TYPICAL SINGLE PIPE HANGER  
NOT TO SCALE



3

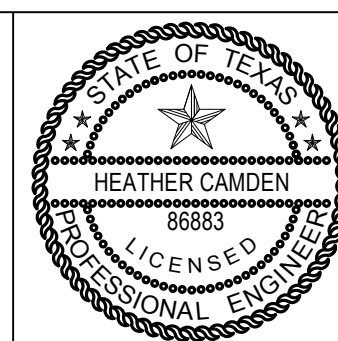
TYPICAL TRAPEZE TYPE MULTIPLE PIPE HANGER  
NOT TO SCALE



Area	Rev.	Date	Description
	05-01-17		FOR CONSTRUCTION
	04-04-16		ADDENDUM

**E & C**

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2017.05.02  
16:24:44-05:07  
E&C Engineers & Consultants Inc.  
Texas Firm Registration No. F-48096

Date: 5/01/2017  
Drawn By: DV  
Checked By: HEC

UTHSC Project No. 730022  
E & C Project No. 3302.00  
File Name



**MEDICAL SCHOOL BUILDING  
SOUTH PENTHOUSE  
AHU-L5 & L6 REPLACEMENT**

DRAWING TITLE  
**MECHANICAL  
DETAILS**

DRAWING NO.  
**M501**

**AIR HANDLING UNIT**

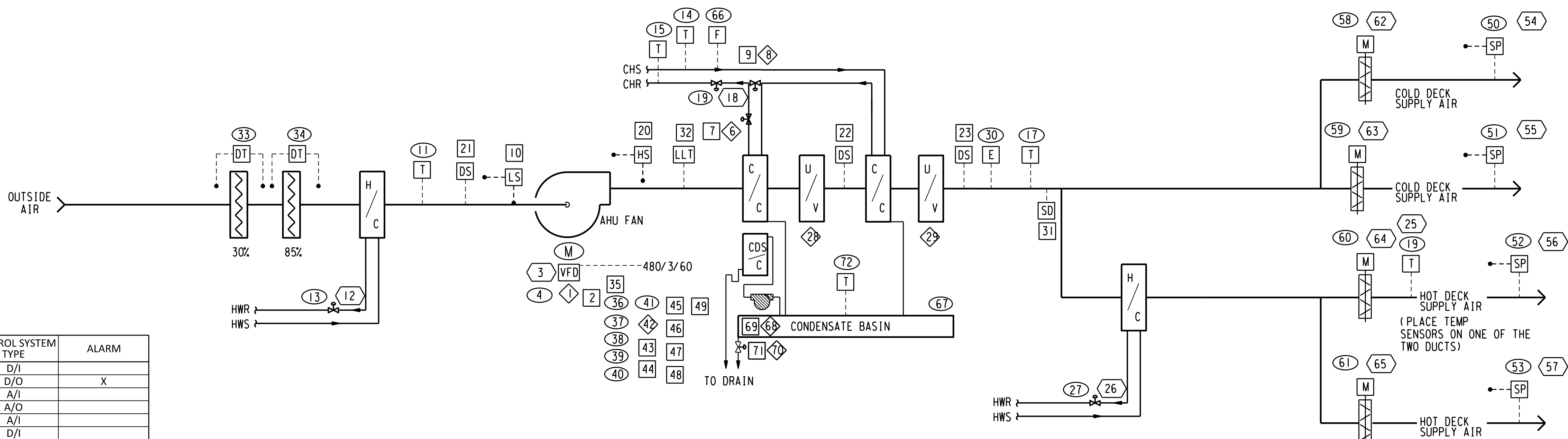
- A. This unit shall be a medium pressure, dual duct, blow-through unit serving multiple dual duct boxes. The unit shall consist of a mixing box, 30%/85% filter bank, a steam preheat coil, fan array section, pre and post cooling coils and a dual duct section with steam heating coils.
- B. When the VFD - H-O-A switch is in automatic, the BAS system shall start and stop the supply fan by way of a signal to the VFD control input port. When the switch is in hand, the supply fan shall start and run at the set speed. When in the bypass mode the fan shall start and run at full speed.
- C. For the supply fans to start in either hand or automatic, the following permissives shall be satisfied:
  1. the smoke detector in the unit discharge.
  2. supply air duct high pressure switch is closed indicating a safe operating condition.
  3. the door switch is closed.
- D. When the supply fan array is off, the heating coils and chilled water valves shall be closed to the coils, except in freeze protection mode. In freeze protection mode, the preheat coil valves shall be open when the outdoor temperature is under 36 degrees.
- E. Upon a signal to start the fan array, the fan array shall be energized and ramp up to control speed through the VFD to maintain the riser pressure requiring the highest speed to achieve the static pressure setpoint (Owner adjustable setpoint).
- F. When the supply fan array is operating, the preheating and chilled water valve shall modulate to maintain the desired leaving air conditions. The discharge conditions for the cold deck shall be set for a dewpoint no greater than 53 degrees and dry bulb no less than 51 degrees. The preheat and cooling coil control valves shall not be open at the same time.
  1. When inlet air temperature entering the AHU is below 65 degrees F (owner adjustable), the normally-open two-position valve located in the return piping for the pre cooling coil shall close, while the normally-closed bypass two-position valve shall open allowing chilled water to flow through the post-cooling coil only. Once the outside air temperature rises above the setpoint, the valves shall actuate to normal positions.
- G. The discharge conditions for the hot deck shall be set for a dry bulb no greater than 97 degrees.
- H. Condensate pump controls:
  1. A condensate pump shall operate to flow condensate through a coil. The trap shall be sized to keep the coil wet. When the condensate collection basin float switch rises to the "pump on" setpoint, the condensate pump shall turn on to flow condensate through the coil.
  2. When the basin float lowers below the shut-off setpoint, the pump shall be de-energized.
  3. If at any time the float rises above a high-limit point, the two-position drain valve shall open to dump to drain until the float lowers back below the "pump on" setpoint.
  4. If the temperature of the condensate rises above 75 degrees, the overflow valve shall open and the condensate shall dump to drain. Once the float is to the "pump off" low limit, the valve shall close and the basin will begin to fill again.
- I. A current sensing relay shall independently indicate status of each of the supply fans. Status shall be input to the BAS system and to the fire alarm system.
- J. The filter bank shall have an adjustable differential pressure switch to indicate high differential pressure across the filters. The switch shall be an alarm input to the BAS system.
- K. The supply air duct shall have a pressure sensor to indicate duct static pressure at the discharge of the unit on both the hot and cold decks. The pressure sensor shall provide an input to the BAS system.
- L. The supply air duct shall have an adjustable pressure switch to indicate high pressure downstream of the fan and a low pressure switch upstream of the fan. The switches shall be an alarm input to the BAS system and shall be an interlock for the supply air fan.
- M. There shall be a discharge smoke detector interlocked with the fire alarm system to shut the system down in the event of smoke in the fan discharge.
- N. There shall be a low temperature limit switch that shall be before the inlet of the cooling coil. Upon a signal from the switch that the temperature is below 35 degrees, the outside air damper shall shut and an alarm shall be sent to the BAS. If the temperature remains below the limit of 35 degrees for more than 1 minute after the outside air damper is shut, the fan shall be de-energized and the cooling coil shall open fully to circulate water to avoid freezing the coil.
- O. There shall be a door switch on the fan section. When the door switch is open, the fan shall be de-energized for safety.
- P. There shall be a door switch on the cooling coil section. When the door switch is open, the UV lights shall be de-energized for safety. Otherwise, the UV lights shall be on if the AHU is operational.
- Q. There shall be a contractor-provided Nutech venture flowmeter installed in the chilled water supply or return line with high and low pressure points (contractor option based on ease of installation). Controls contractor to connect to the ports and provide flow to the BAS.

If Alternate A1 is selected, the risers will be set with a minimum and maximum SP setpoint. Once the worst case riser is satisfied to the minimum SP setpoint, the dampers at the unit discharge will operate to maintain static pressure between the minimum and maximum for that riser.

**NAE B**

POINT NO.	POINT	DESCRIPTION	UNIT OF MEASURE	CONTROL SYSTEM TYPE	ALARM
1	FAN_C	FAN ARRAY COMMAND		ON/OFF	D/I
2	FAN_S	FAN ARRAY STATUS		ON/OFF	D/O
3	VFD_C	VFD COMMAND	%	A/I	
4	VFD_FB	VFD FEEDBACK	%	A/O	
5	OABP_SP	OA TEMP COOLING BYPASS SETPOINT	"F	A/I	
6	BP_V1_C	BYPASS VALVE 1 CONTROL (NO)		OPEN/CLOSE	D/I
7	BP_V1_FB	BYPASS VALVE 1 FEEDBACK (NO)		OPEN/CLOSE	D/O
8	BP_V2_C	BYPASS VALVE 2 CONTROL (NC)		OPEN/CLOSE	D/I
9	BP_V2_FB	BYPASS VALVE 2 FEEDBACK (NC)		OPEN/CLOSE	D/O
10	LS_A	LOW STATIC ALARM		NORMAL/ALARM	D/I
11	PH_T	PREHEAT TEMPERATURE	"F	A/O	
12	PH_V_C	PREHEAT VALVE COMMAND	%	A/I	
13	PH_V_FB	PREHEAT VALVE FEEDBACK	%	A/O	
14	CHW_S_T	CHILLED WATER SUPPLY TEMP	"F	A/O	
15	CHW_R_T	CHILLED WATER RETURN TEMP	"F	A/O	
16	CD1_T_SP	COLD DECK 1 TEMP SETPOINT	"F	A/O	
17	CD1_T	COLD DECK 1 TEMPERATURE	"F	A/I	
18	CHW_V1_C	CHILLED WATER VALVE 1 CMD	%	A/I	
19	CHW_V1_FB	CHILLED WATER VALVE 1 FB	%	A/O	
20	HS_A	HIGH STATIC ALARM		NORMAL/ALARM	D/O
21	DS1	FAN DOOR SWITCH		OPEN/CLOSE	D/O
22	DS2	LUV LIGHT DOOR SWITCH		OPEN/CLOSE	D/O
23	DS3	LUV LIGHT DOOR SWITCH		OPEN/CLOSE	D/O
24	HD1_T_SP	HOT DECK 1 TEMP SETPOINT	"F	A/O	
25	HD1_T	HOT DECK 1 TEMPERATURE	"F	A/I	
26	HTG_V1_C	REHEAT VALVE 1 CMD	%	A/I	
27	HTG_V1_FB	REHEAT VALVE 1 FB	%	A/O	
28	LUV1	LUV LIGHTS ON/OFF		ON/OFF	D/O
29	LUV2	LUV LIGHTS ON/OFF		ON/OFF	D/O
30	LA_DP	LEAVING AIR DEWPOINT	"F	A/I	X
31	LA_SD	LEAVING AIR SMOKE DETECTOR		NORMAL/ALARM	D/O
32	LL_A	LOW LIMIT ALARM		NORMAL/ALARM	D/O
33	PRE_FL_DP	PREFILTER DP	IWC	A/O	X
34	FIN_FL_DP	FINAL FILTER DP	IWC	A/O	X
35	VFD_S	VFD STATUS		ON/OFF	D/O
36	VFD_HTZ	VFD HERTZ	Hz	A/O	
37	VFD_AMP	VFD AMPS	A	A/O	
38	VFD_RPM	VFD RPM	RPM	A/O	
39	VFD_PWR	VFD POWER	kW	A/O	
40	KWH	VFD KILOWATT HOURS	kWh	A/O	
41	VFD_RT	VFD RUNTIME	hours	A/O	
42	VFD_RT_RS	VFD RUNTIME RESET	OFF/RESET	D/I	
43	VFD_FS	VFD FAULT STATUS	OFF/FAULT	D/O	X
44	FAN_S1	FAN 1 STATUS		NORMAL/ALARM	D/O
45	FAN_S2	FAN 2 STATUS		NORMAL/ALARM	D/O
46	FAN_S3	FAN 3 STATUS		NORMAL/ALARM	D/O
47	FAN_S4	FAN 4 STATUS		NORMAL/ALARM	D/O
48	FAN_S5	FAN 5 STATUS		NORMAL/ALARM	D/O
49	FAN_S6	FAN 6 STATUS		NORMAL/ALARM	D/O
50	CD1_DP_SP	COLD DECK 1 STATIC PRESSURE SETPOINT	IWC	A/I	
51	CD2_DP_SP	COLD DECK 2 STATIC PRESSURE SETPOINT	IWC	A/I	
52	HD1_DP_SP	HOT DECK 1 STATIC PRESSURE SETPOINT	IWC	A/I	
53	HD2_DP_SP	HOT DECK 2 STATIC PRESSURE SETPOINT	IWC	A/I	
54	CD1_DP	COLD DECK 1 STATIC PRESSURE	IWC	A/O	X
55	CD2_DP	COLD DECK 2 STATIC PRESSURE	IWC	A/O	X
56	HD1_DP	HOT DECK 1 STATIC PRESSURE	IWC	A/O	X
57	HD2_DP	HOT DECK 2 STATIC PRESSURE	IWC	A/O	X
58	CD1_D_C	COLD DECK 1 DAMPER CONTROL	%	A/I	
59	CD2_D_C	COLD DECK 2 DAMPER CONTROL	%	A/I	
60	HD1_D_C	HOT DECK 1 DAMPER CONTROL	%	A/I	
61	HD2_D_C	HOT DECK 2 DAMPER CONTROL	%	A/I	
62	CD1_D_FB	COLD DECK 1 DAMPER FEEDBACK	%	A/O	
63	CD2_D_FB	COLD DECK 2 DAMPER FEEDBACK	%	A/O	
64	HD1_D_FB	HOT DECK 1 DAMPER FEEDBACK	%	A/O	
65	HD2_D_FB	HOT DECK 2 DAMPER FEEDBACK	%	A/O	
66	CHW_FL	CHILLED WATER FLOW (NUTECH VENTURI PROVIDED BY THE MECHANICAL CONTRACTOR)	GPM	A/I	
67	CDS_FLT	FLOAT POSITION		OFF/ON/OVERFLOW	A/I
68	CDS_P_C	PUMP CONTROL		ON/OFF	A/I
69	CDS_P_FB	PUMP FEEDBACK		ON/OFF	A/O
70	CDS_V_C	OVERFLOW - DUMP CONTROL		OPEN/CLOSE	D/I
71	CDS_V_FB	OVERFLOW - DUMP FEEDBACK		OPEN/CLOSE	D/O
72	CDS_T	CONDENSATE TEMPERATURE	"F	A/O	
73	LEAK	FUTURE LEAK DETECTION ALARM POINT		NORMAL/ALARM	D/I

POINTS 51-53 AND 58-65 SHALL BE PART OF ALTERNATE PRICING A1. VERIFY NAMING ON ALL POINTS WITH UTHSC-H PRIOR TO PROGRAMMING.



**01 AHU CONTROL DIAGRAM AHU-L7 & L8**  
NOT TO SCALE

- GENERAL NOTES:**
- 1 ALL SET POINTS SHALL BE REPORTED AS DISPLAYED.
  - 2 ALL ALARMS SHALL BE REPORTED AND DISPLAYED.
  - 3 ALL ALARM SETTINGS SHALL BE DISPLAYED.
  - 4 REFER TO PIPING DIAGRAMS FOR ACTUAL PIPING DETAILS.
  - 5 ALL CONTROLS EQUIPMENT REQUIRED TO PROVIDE THE SEQUENCE OF OPERATION IS REQUIRED TO BE PROVIDED BY THE CONTRACTOR EVEN IF NOT SPECIFICALLY SHOWN ON THE DRAWING OR POINTS LIST.

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ISSUE FOR	DATE	DESCRIPTION
FOR CONSTRUCTION	05-01-17	FOR CONSTRUCTION



**ENGINEERS & CONSULTANTS, INC.**  
1010 LAMAR, SUITE 650  
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THIS SEAL APPLICABLE TO THE DRAWING WAS APPROVED BY  
Digitally signed by Heather Camden  
Date: 2017.05.02 15:24:44-0500  
E&C Engineers & Consultants Inc.  
Texas Firm Registration No. F-40686

Date: 5/01/2017  
Drawn By: DV  
Checked By: HEC

UTHSC Project No. 730022  
E & C Project No. 3302.00  
File Name



**MEDICAL SCHOOL BUILDING SOUTH PENTHOUSE AHU-L5 & L6 REPLACEMENT**

DRAWING TITLE  
**MECHANICAL CONTROL DIAGRAMS**

DRAWING NO.  
**M600**

ABBREVIATIONS

Table of abbreviations for electrical symbols, including terms like AMP, ABV, AC, A/C, ACC, etc., with their corresponding full names.

Table of abbreviations for electrical symbols, including terms like ELEC, EMER, ENC, ENGR, EPA, EQUIP, etc., with their corresponding full names.

Table of abbreviations for electrical symbols, including terms like LAT, LEAK, LCD, LED, LF, LG, LH, LI, etc., with their corresponding full names.

ELECTRICAL SYMBOLS

Table of electrical symbols for one line/riser diagrams, including transformer, switch, fuse, circuit breaker, shunt trip, ground fault relay, etc.

RECEPTACLES/OUTLETS

Table of electrical symbols for receptacles/outlets, including simplex wall receptacle, duplex wall receptacle, etc.

GENERAL NOTES

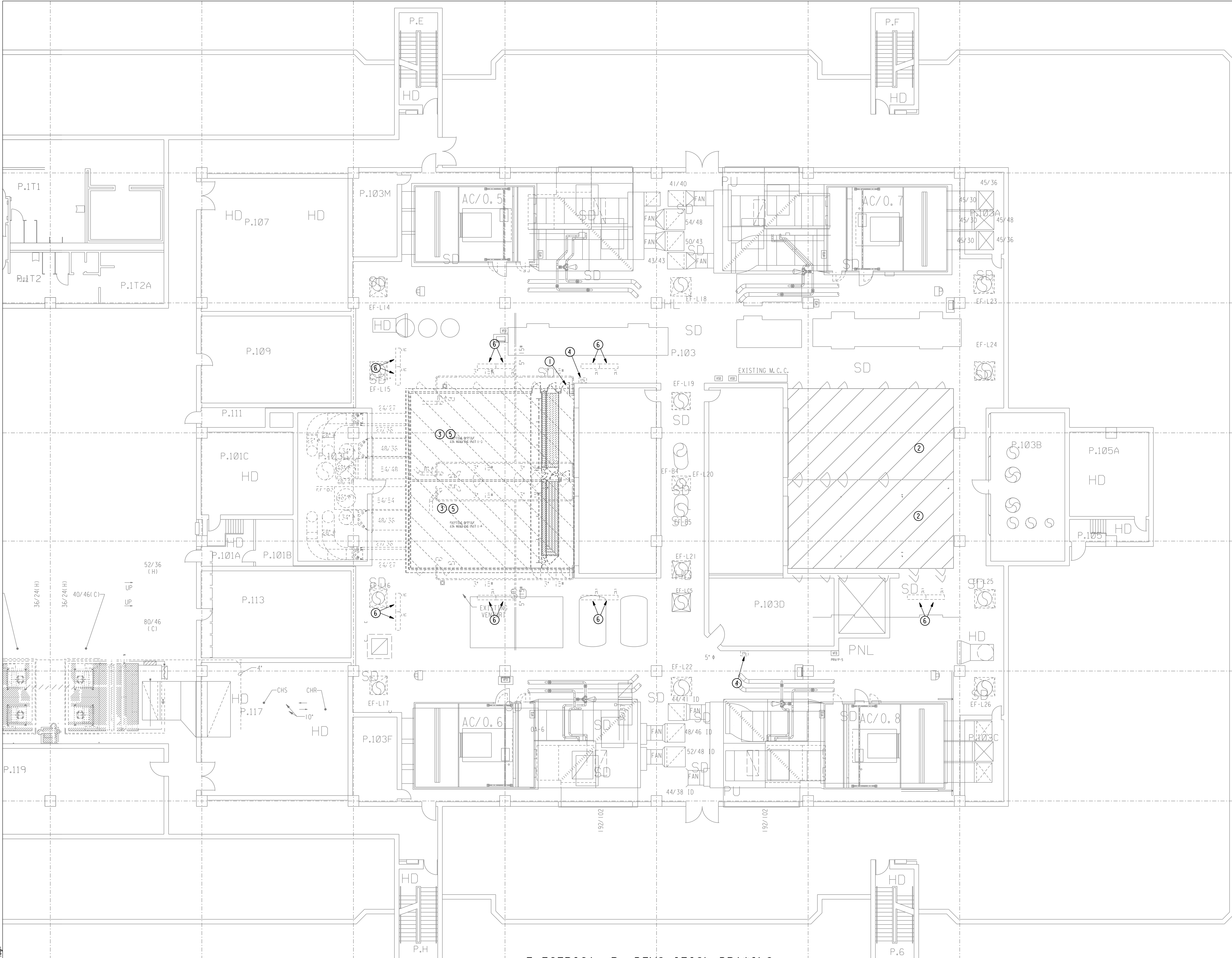
- GENERAL NOTES: COORDINATE ALL SLAB PENETRATIONS WITH THE EXISTING STRUCTURE AND OBTAIN WRITTEN APPROVAL FROM THE OWNER PRIOR TO CORRECTING ALL RATED PARTITION PENETRATIONS...

ISSUE FOR: 05-01-17 FOR CONSTRUCTION. ENGINEERS & CONSULTANTS, INC. 1010 LAMAR, SUITE 500 HOUSTON, TEXAS 77002 TEL 713/580-8800 FAX 713/580-8888

Professional Engineer Seal for Larkin Gentry, License No. 97304, State of Texas.

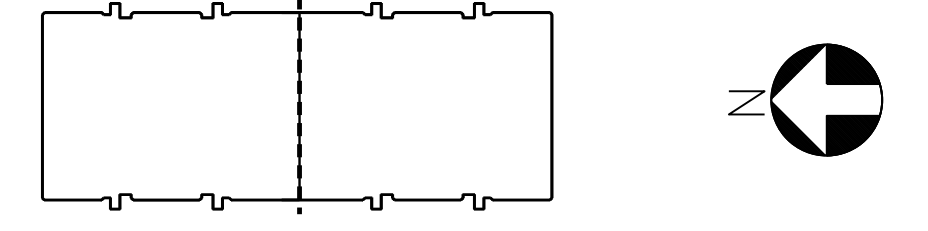
UTHealth logo and project information: UTHSC Project No. 730022, E & C Project No. 3302, 0. Date: 5/01/2017, Drawn By: RLG, Checked By: RLG, File Name: ...

PROJECT TITLE: MEDICAL SCHOOL BUILDING SOUTH PENTHOUSE AHU-L5 & L6 REPLACEMENT. DRAWING NO. E000.



- GENERAL NOTES:**
- A. RE: E000 FOR MORE GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS.
- DRAWING NOTES:**
- RELOCATE FIRE ALARM PANEL TO PROVIDE ACCESS FOR INSTALLATION OF THE NEW UNITS.
  - EXISTING MECHANICAL UNIT TO REMAIN.
  - EXISTING MECHANICAL UNIT TO BE REMOVED AND REPLACED WITH SAME HORSEPOWER NEW UNIT. RE: MECHANICAL PLANS FOR MORE INFORMATION ON SCOPE OF MECHANICAL WORK. EXISTING POWER AND CIRCUITING FOR MOTOR TO REMAIN AND BE RECONNECTED TO NEW UNIT. RE: ELECTRICAL RENOVATION PLAN FOR MORE INFORMATION.
  - EXISTING VSD DRIVES TO BE REMOVED. DRIVES SERVE EXISTING MECHANICAL EQUIPMENT THAT IS BEING REPLACED. REMOVE DRIVES AND MAINTAIN CIRCUITING FROM PANEL SERVING AND TO EQUIPMENT FOR RECONNECTING TO NEW DRIVES AND NEW EQUIPMENT. RE: ALTERATION PLAN FOR MORE INFORMATION.
  - EXISTING 120V CIRCUIT SERVING UNIT LIGHTING AND RECEPTACLES SHALL BE DISCONNECTED AND REMAIN FOR RECONNECTION TO NEW UNIT. RE: ALTERATION PLAN FOR MORE INFORMATION.
  - EXISTING LIGHT FIXTURE TO BE REMOVED AND REPLACED WITH NEW FIXTURE. ALL EXISTING CIRCUITING AND SWITCHING SHALL REMAIN.

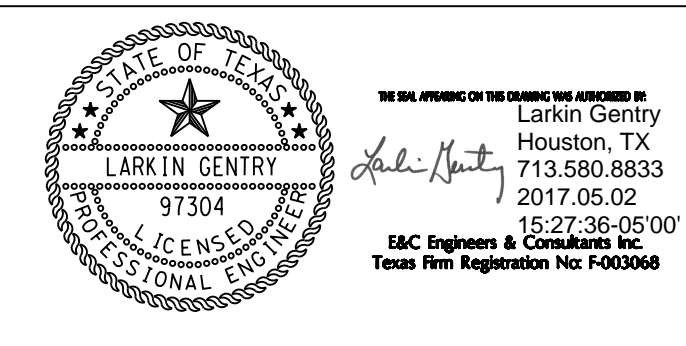
**1 ELECTRICAL PH DEMOLITION DRAWING**  
SCALE: 1/8" = 1'-0"



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ISSUE FOR:	Area	Rev.	Date	Description
FOR CONSTRUCTION		05-01-17		

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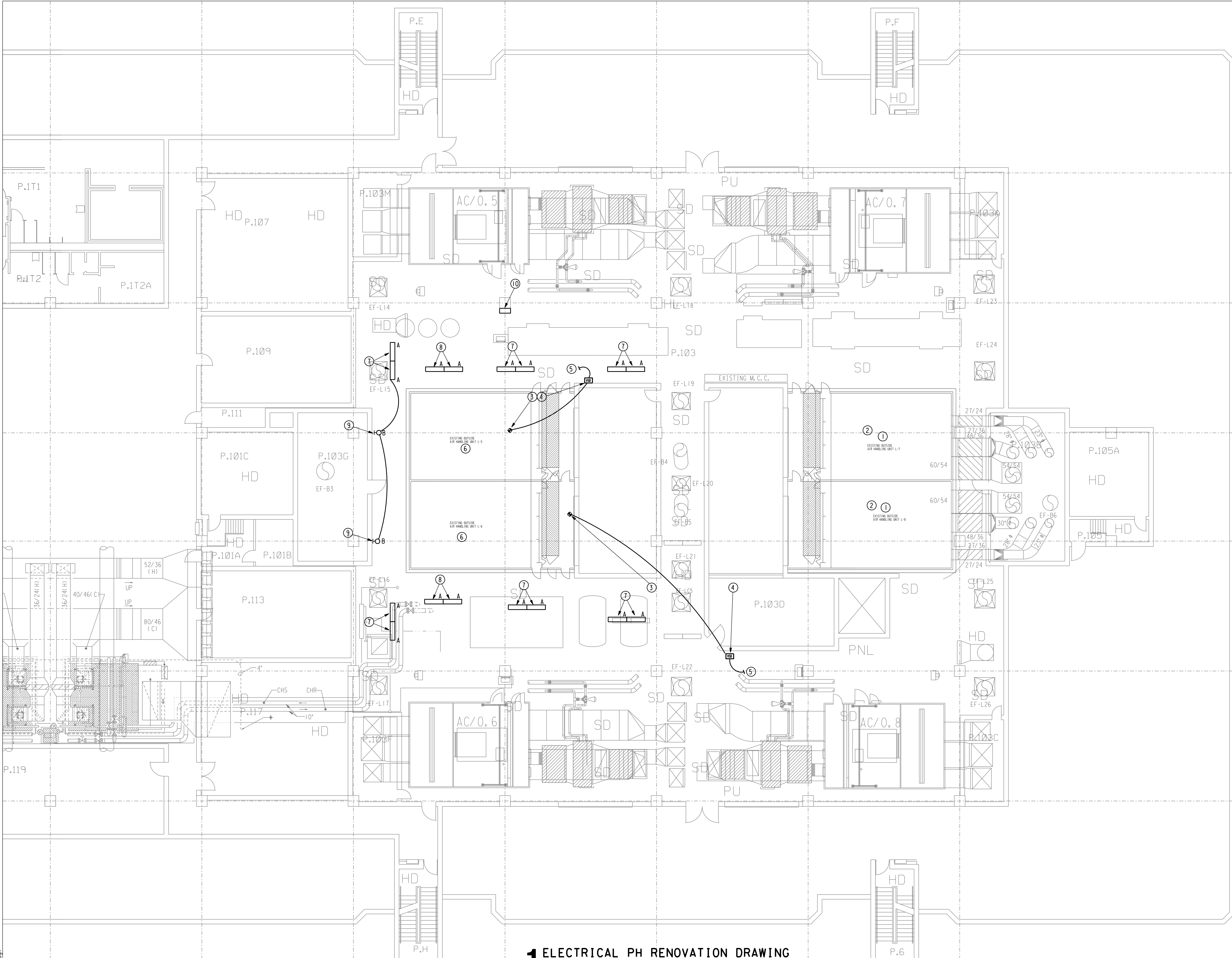


Date: 5/01/2017  
Drawn By: RLG  
Checked By: RLG  
UTHC Project No.: 730022  
E & C Project No.: 3302.00  
File Name:



**MEDICAL SCHOOL BUILDING  
SOUTH PENTHOUSE  
AHU-L5 & L6 REPLACEMENT**

DRAWING TITLE: **ELECTRICAL PH DEMOLITION DRAWING**  
DRAWING NO.: **E108**



- GENERAL NOTES:**
- A. RE: E000 FOR MORE GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS.
  - B. TYPE A: LENSED LED STRIP LIGHT, 4 FEET LONG, 3500K, MEDIUM LUMEN OUTPUT, FIXED OUTPUT DRIVER, UNIVERSAL VOLTAGE BALLAST, CHAIN HANGER ACCESSORY, COLUMBIA LIGHTING \* LCL4-35ML-EU-CSHC OR EQUAL BY COOPER, LITHONIA, OR OTHERS.
  - C. TYPE B: JUNCTION BOX MOUNTED LED FIXTURE, MOUNTED TO COLUMN, FROSTED GLASS GLOBE, ALUMINUM HOUSING, 5000 K, HUBBEL INDUSTRIAL \* VL15PIG-VBLU15 OR EQUAL BY COOPER, LITHONIA, OR OTHERS.
- DRAWING NOTES:**
- ① NO WORK AT THIS UNIT.
  - ② EXISTING MECHANICAL UNIT TO REMAIN.
  - ③ NEW MECHANICAL UNIT OF SAME HORSEPOWER AS EXISTING UNIT TO BE RECONNECTED. RE: MECHANICAL PLANS FOR MORE INFORMATION ON SCOPE OF MECHANICAL WORK. EXISTING POWER AND CIRCUITING FOR MOTOR TO REMAIN AND BE RECONNECTED TO NEW UNIT. EXTEND EXISTING CIRCUITING AS REQUIRED.
  - ④ NEW VSD DRIVES FOR NEW EQUIPMENT. NEW DRIVES SERVE NEW MECHANICAL EQUIPMENT. RECONNECT CIRCUITING FROM PANEL SERVING AND TO NEW EQUIPMENT AS REQUIRED.
  - ⑤ EXISTING HOMERUN TO REMAIN. CAPTURE HOMERUN AND CIRCUIT TO NEW VSD AND MECHANICAL EQUIPMENT AS REQUIRED IN NOTES 3 AND 4.
  - ⑥ EXISTING 120V CIRCUIT SERVING UNIT LIGHTING AND RECEPTACLES SHALL BE RECONNECT TO NEW UNIT. NO MORE THAN 1440 WATTS ON A CIRCUIT.
  - ⑦ NEW LIGHT FIXTURE TO REPLACE EXISTING FIXTURE. ALL EXISTING CIRCUITING AND SWITCHING SHALL REMAIN. RE: GENERAL NOTES FOR TYPE.
  - ⑧ NEW LIGHT FIXTURE. EXTEND EXISTING CIRCUITING AND SWITCHING TO SERVE NEW FIXTURE. CHAIN HANG FIXTURE AT SAME ELEVATION AS EXISTING FIXTURES. NO MORE THAN 3000 WATTS ON A CIRCUIT. RE: GENERAL NOTES FOR TYPE.
  - ⑨ NEW LIGHT FIXTURE. EXTEND EXISTING CIRCUITING AND SWITCHING TO SERVE NEW FIXTURE. SURFACE MOUNT FIXTURE AT 8 FEET A.F.F. NO MORE THAN 3000 WATTS ON A CIRCUIT. RE: GENERAL NOTES FOR TYPE.
  - ⑩ RELOCATED FIRE ALARM PANEL

**1 ELECTRICAL PH RENOVATION DRAWING**  
SCALE: 1/8" = 1'-0"

**ENTHOUSE**

**E & C**

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Larkin Gentry  
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713-580-8833  
2017.05.02  
1577-36-0900  
LIC. ENGINEER & CONSULTANT INC.  
Texas Exp. Expiration: 07/10/2024

Date: 5/01/2017  
Drawn By: RLG  
Checked By: RLG

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



**MEDICAL SCHOOL BUILDING  
SOUTH PENTHOUSE  
AHU-L5 & L6 REPLACEMENT**

DRAWING TITLE  
**ELECTRICAL PH  
RENOVAITON  
DRAWING**

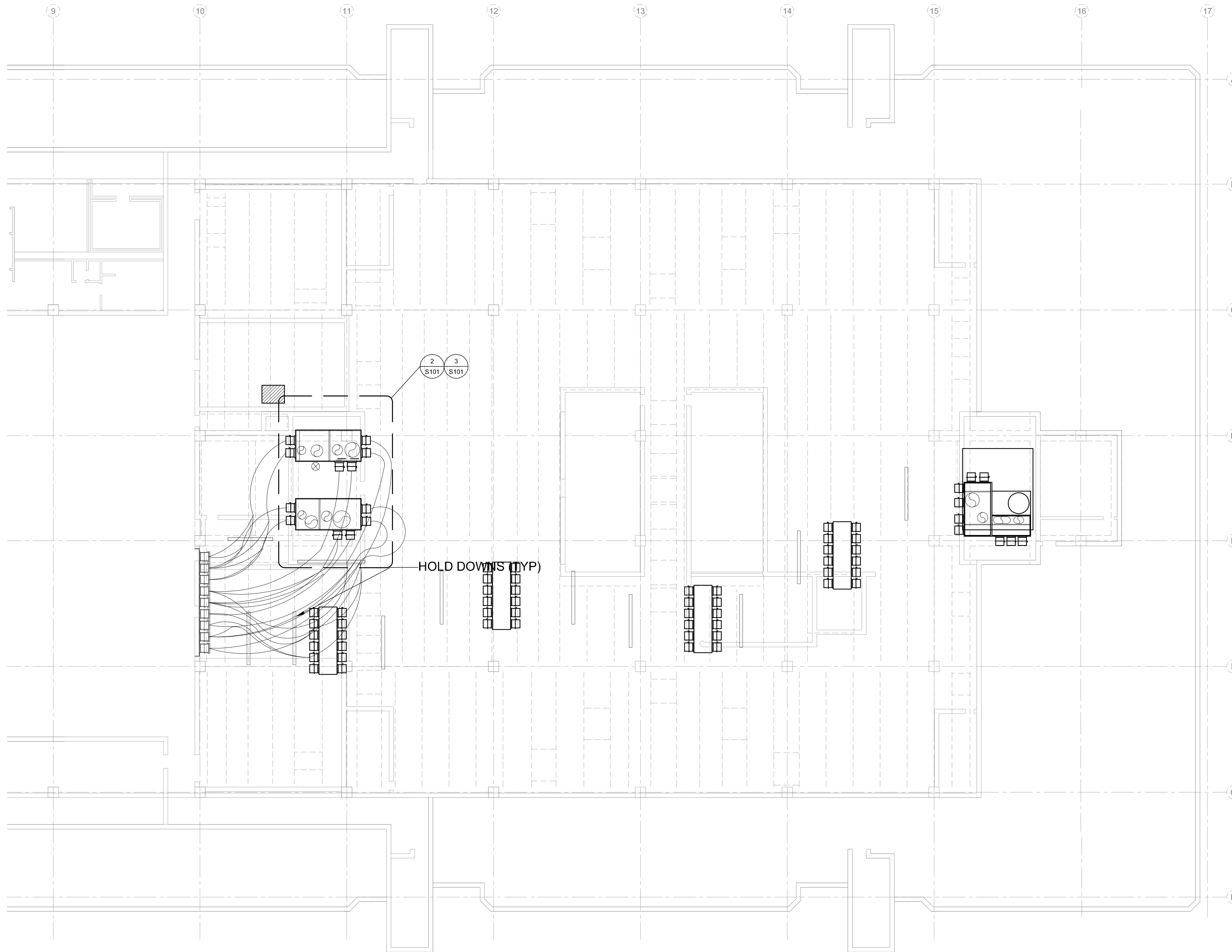
DRAWING NO.  
**E208**

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Area	Rev.	Date	Description
	05-01-17		FOR CONSTRUCTION

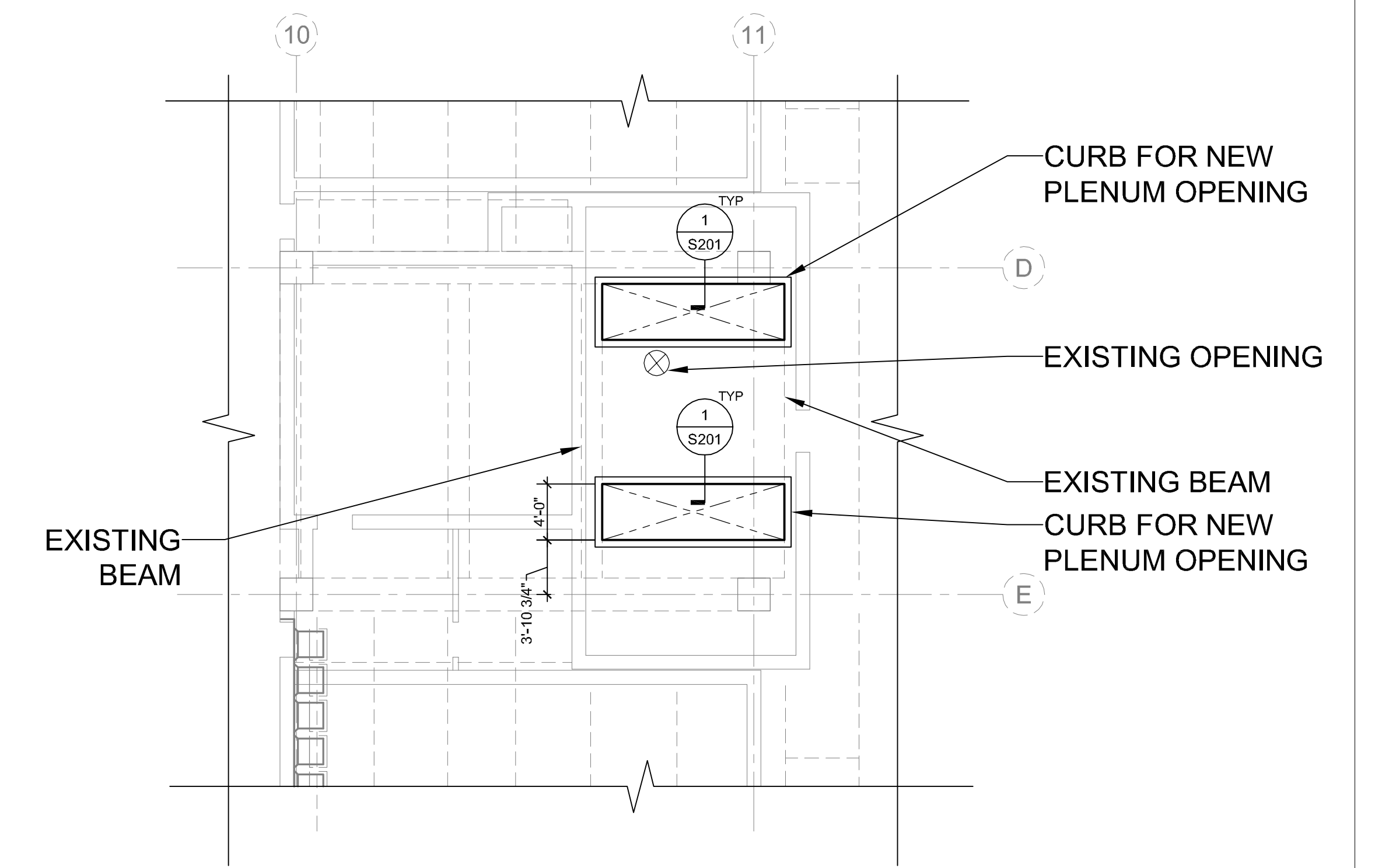


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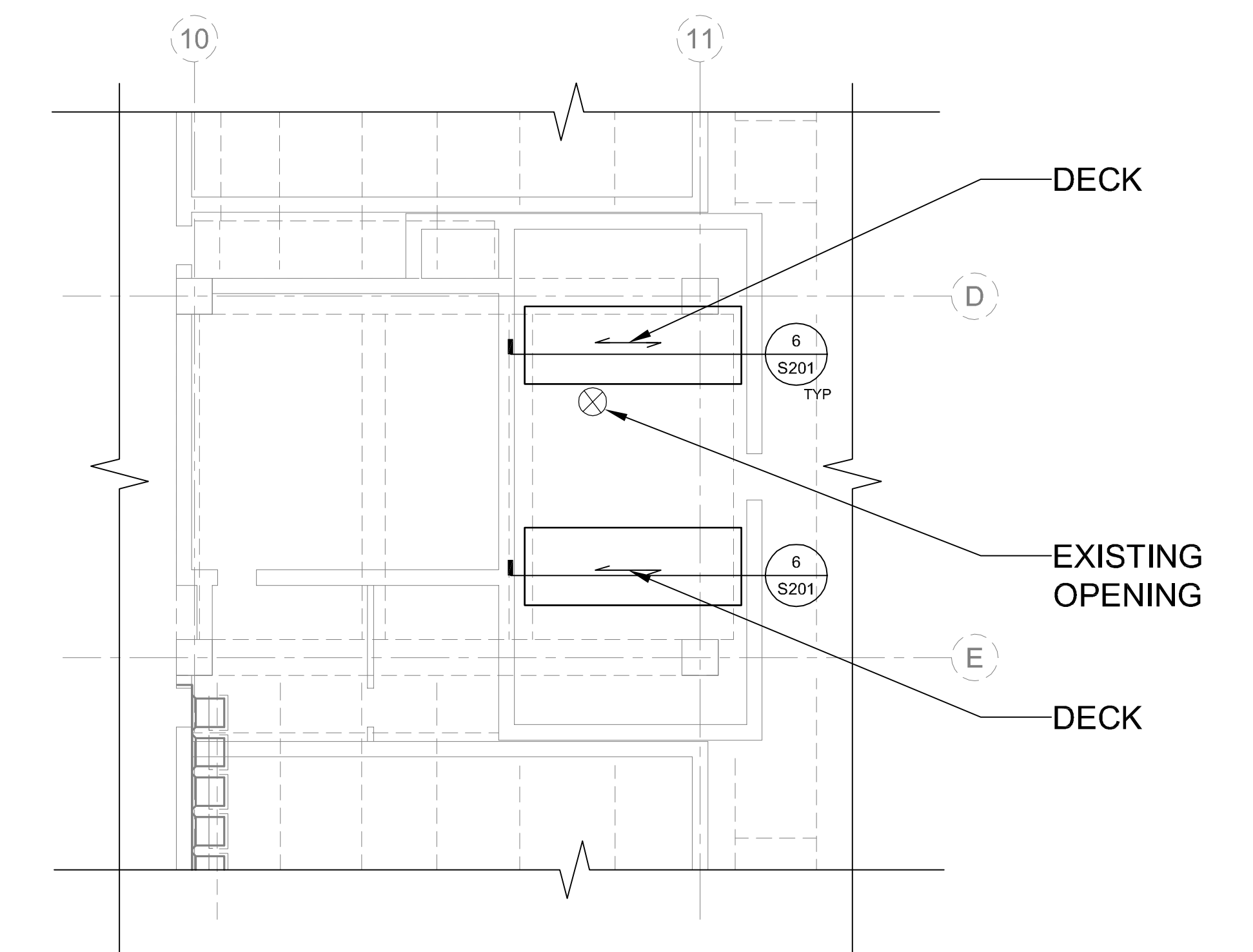
- NOTES:**
1. SEE MECHANICAL DRAWINGS FOR LOCATIONS OF ALL ROOFTOP PLENUMS, DUCTS, AND DUCTS HOLD-DOWNS.
  2. SEE DETAIL 2/S101 FOR NEW TEMPORARY AHU OPENING.
  3. SEE DETAIL 3/S101 FOR SLAB INFILL FOLLOWING REMOVAL OF TEMPORARY AHU
  4. COORDINATE LOCATION OF HOLD-DOWNS WITH MEP DRAWINGS.
  5. SEE DETAIL 3/S201 FOR SUPPORT OF HOLD-DOWNS.

**1 PENTHOUSE ROOF PLAN**  
NTS



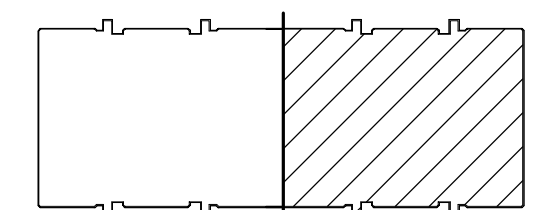
- NOTES:**
1. COORDINATE OPENING SIZE WITH MEP DRAWINGS AND MEP DUCTS.
  2. COORDINATE LOCATION OF CURB FOR AHU WITH MEP DRAWINGS AND APPROVED EQUIPMENT SHOP DRAWINGS. CURB MAY BE SETBACK FROM OPENING EDGE.
  3. KEEP A CLEAR DISTANCE OF 12 INCHES (MINIMUM) BETWEEN THE NEW OPENING AND THE EXISTING OPENING.
  4. DO NOT DAMAGE OR DISTURB THE EXISTING OPENING OR THE EXISTING DUCT.

**2 PENTHOUSE ROOF PLAN**  
NTS



- NOTE:**
1. AFTER REMOVAL OF TEMPORARY UNITS, INFILL THE OPENING AS SHOWN
  2. PROVIDE NEW STEEL ANGLES ALL AROUND AS SHOWN IN DETAIL 6/S201
  3. SEE DETAIL 6/S201 FOR ADDITIONAL INFORMATION

**3 SLAB INFILL PLAN**  
NTS



Area	Rev	Date	Description
	05	03/17	For Construction

**E & C**

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**WALTER P MOORE**  
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1304 MORRIS STREET, SUITE 1100  
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Date  
5/03/17  
Drawn By  
Checked By  
HB

UTHSC Project No.  
730022  
E & C Project No.  
3302.00  
File Name

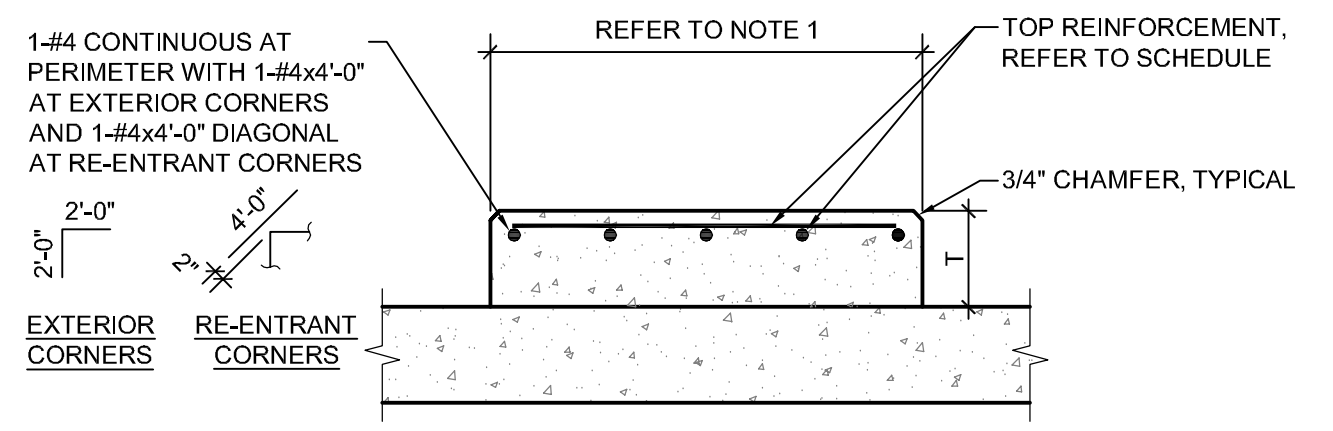


MEDICAL SCHOOL BUILDING  
SOUTH PENTHOUSE  
AHU-L5 & L6 REPLACEMENT

DRAWING TITLE  
PLAN

DRAWING NO.  
S101

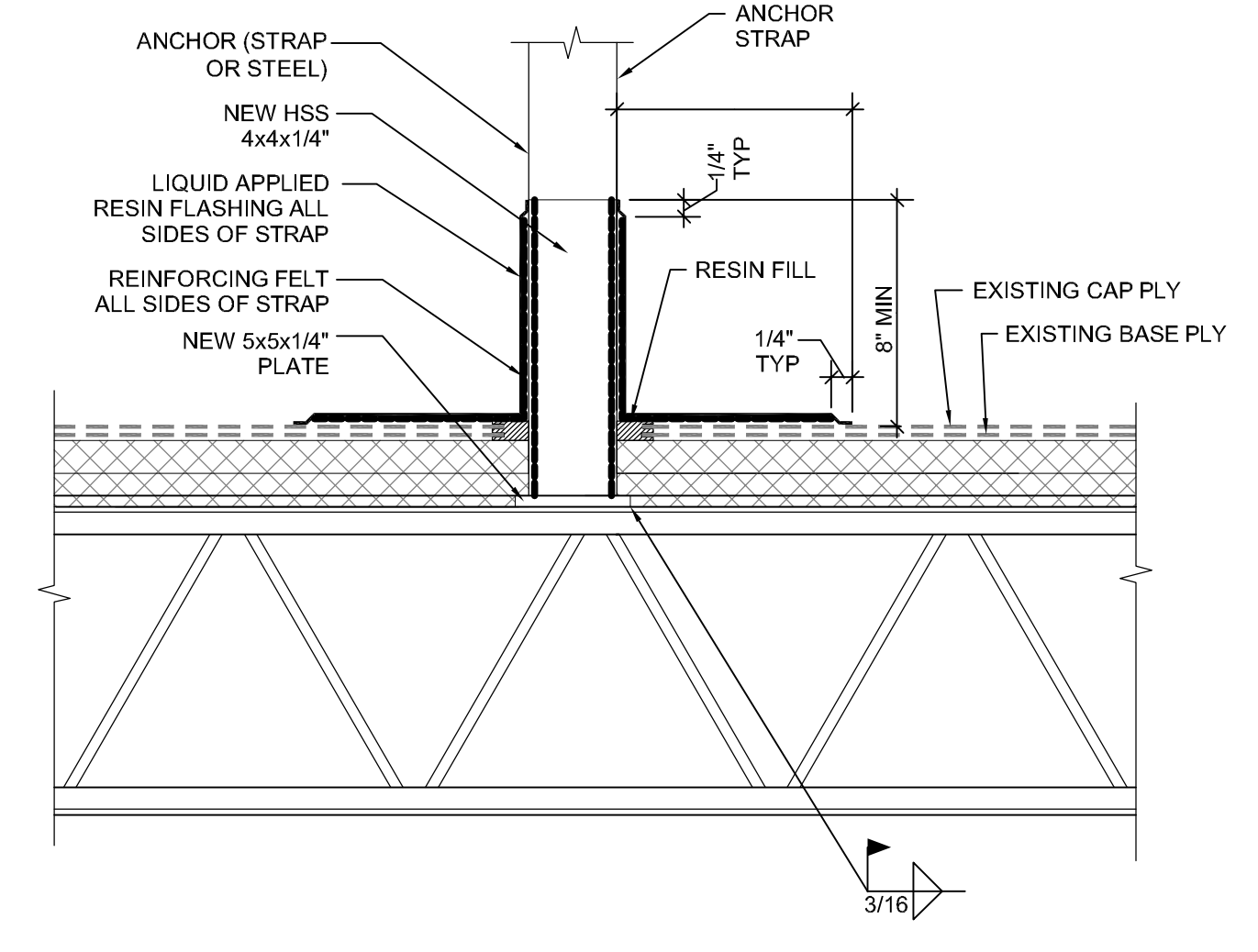




HOUSEKEEPING PAD REINFORCEMENT SCHEDULE		
PAD THICKNESS	TOP REINFORCEMENT	BOTTOM REINFORCEMENT
T = 4"	WWR 4x4-W2.9xW2.9 OR #3@12" EACH WAY	NONE
4" < T ≤ 6"	WWR 4x4-W4xW4 OR #4@18" EACH WAY	NONE
6" < T ≤ 8"	WWR 4x4-W6xW6 OR #4@12" EACH WAY	NONE

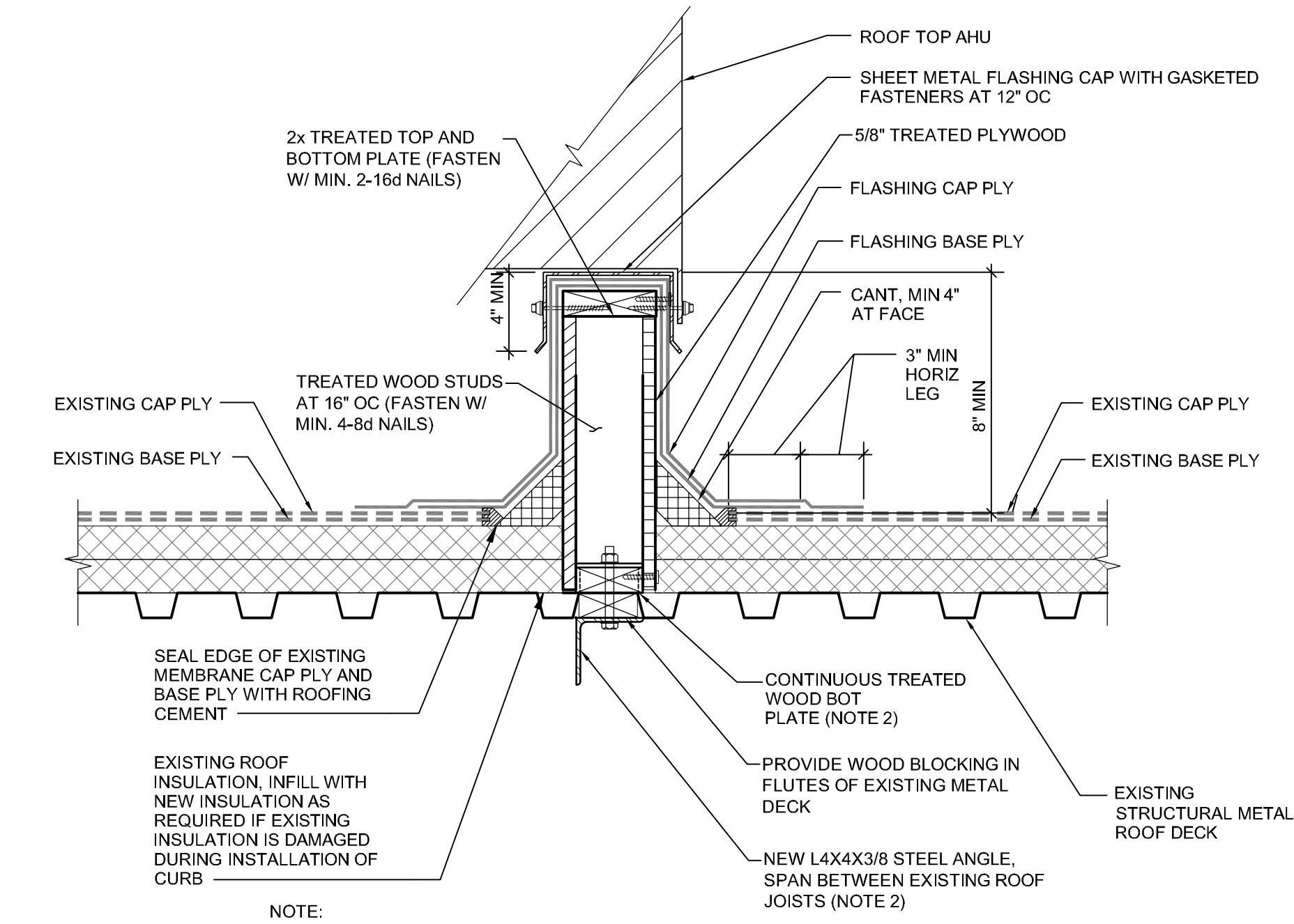
- NOTES:
- REFER TO ARCHITECTURAL OR MEP DRAWINGS FOR HOUSEKEEPING PAD PLAN DIMENSIONS AND THICKNESS (4" MINIMUM THICKNESS).
  - CONTRACTOR SHALL COORDINATE DIMENSIONS AND OTHER SPECIAL REQUIREMENTS WITH EQUIPMENT MANUFACTURERS AND PROVIDE WHERE REQUIRED WHETHER SHOWN ON STRUCTURAL DRAWINGS OR NOT.
  - HOUSEKEEPING PAD IS TO BE USED TO REPLACE THE EXISTING CONCRETE PAD AT THE PENTHOUSE FLOOR LEVEL, SUPPORTING UNITS.

**4** TYPICAL HOUSEKEEPING PAD OVER SLAB  
NO SCALE



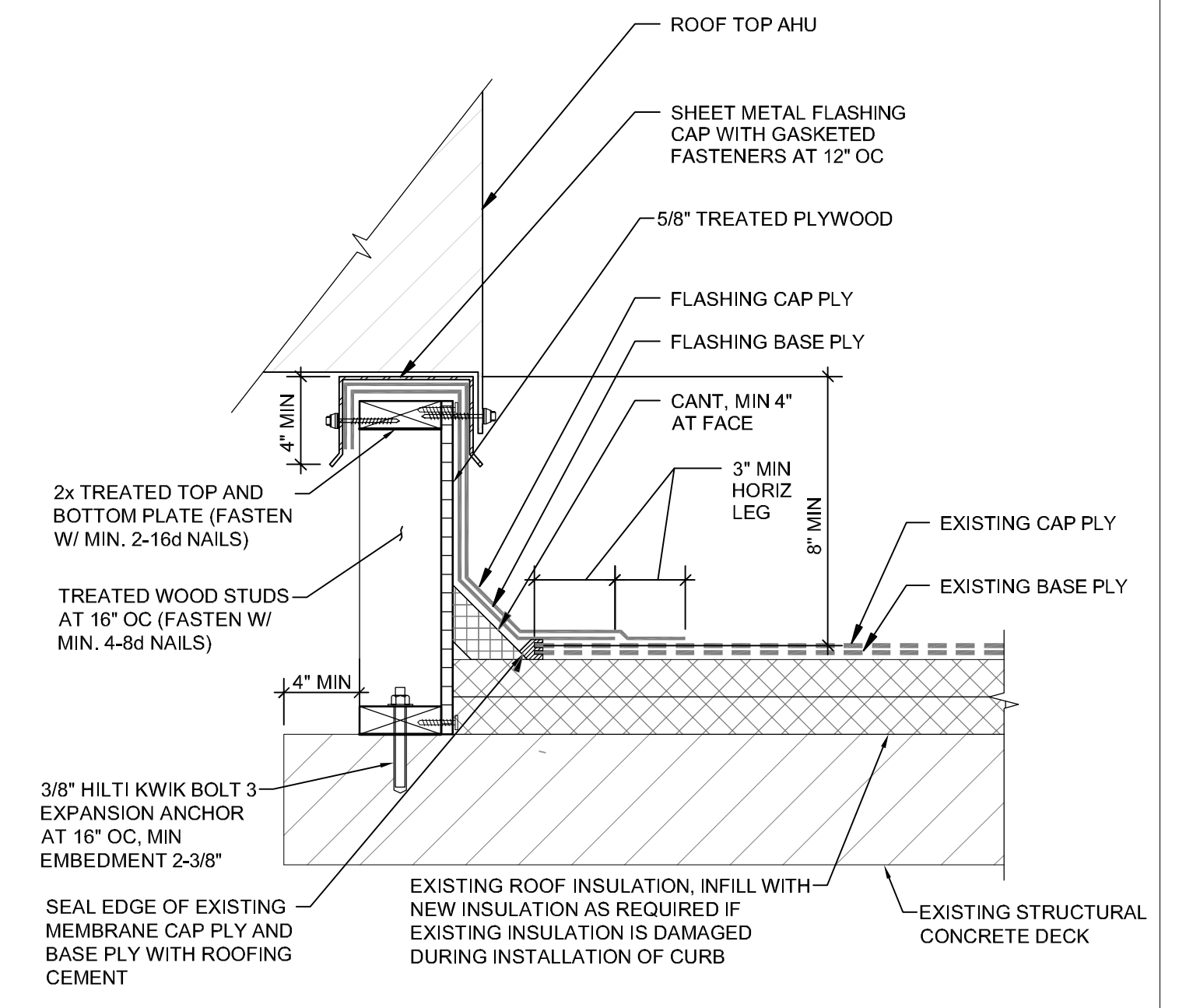
- NOTE:
- LOCATE HSS AT PANEL POINT OF EXISTING JOIST

**3** TYPICAL ANCHOR CONNECTION TO ROOF STRUCTURE  
1-1/2" = 1'-0"



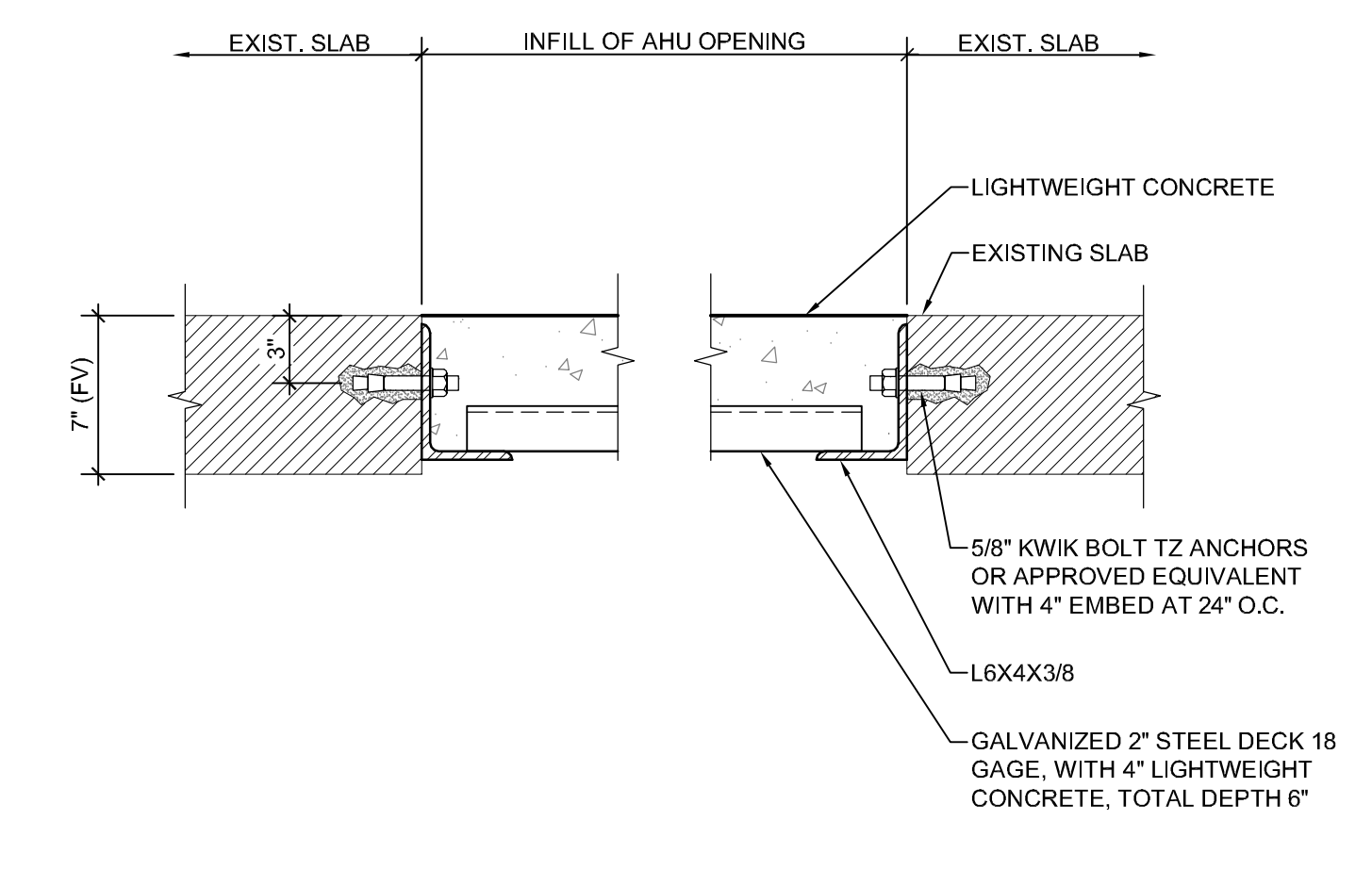
- NOTE:
- ANCHORAGE OF PLENUM TO CURB BY MECHANICAL CONTRACTOR.
  - CONNECT SUPPORT ANGLE TO CURB WITH 1/2" DIA. A307 BOLTS AT 16" O.C. PROVIDE PLATE WASHER AT BOTTOM PLATE.
  - SEE 9/5200 FOR ANGLE SUPPORT INFORMATION.

**2** CURB DETAIL AT STEEL DECK - PLENUM WITHOUT ROOF OPENING  
1-1/2" = 1'-0"



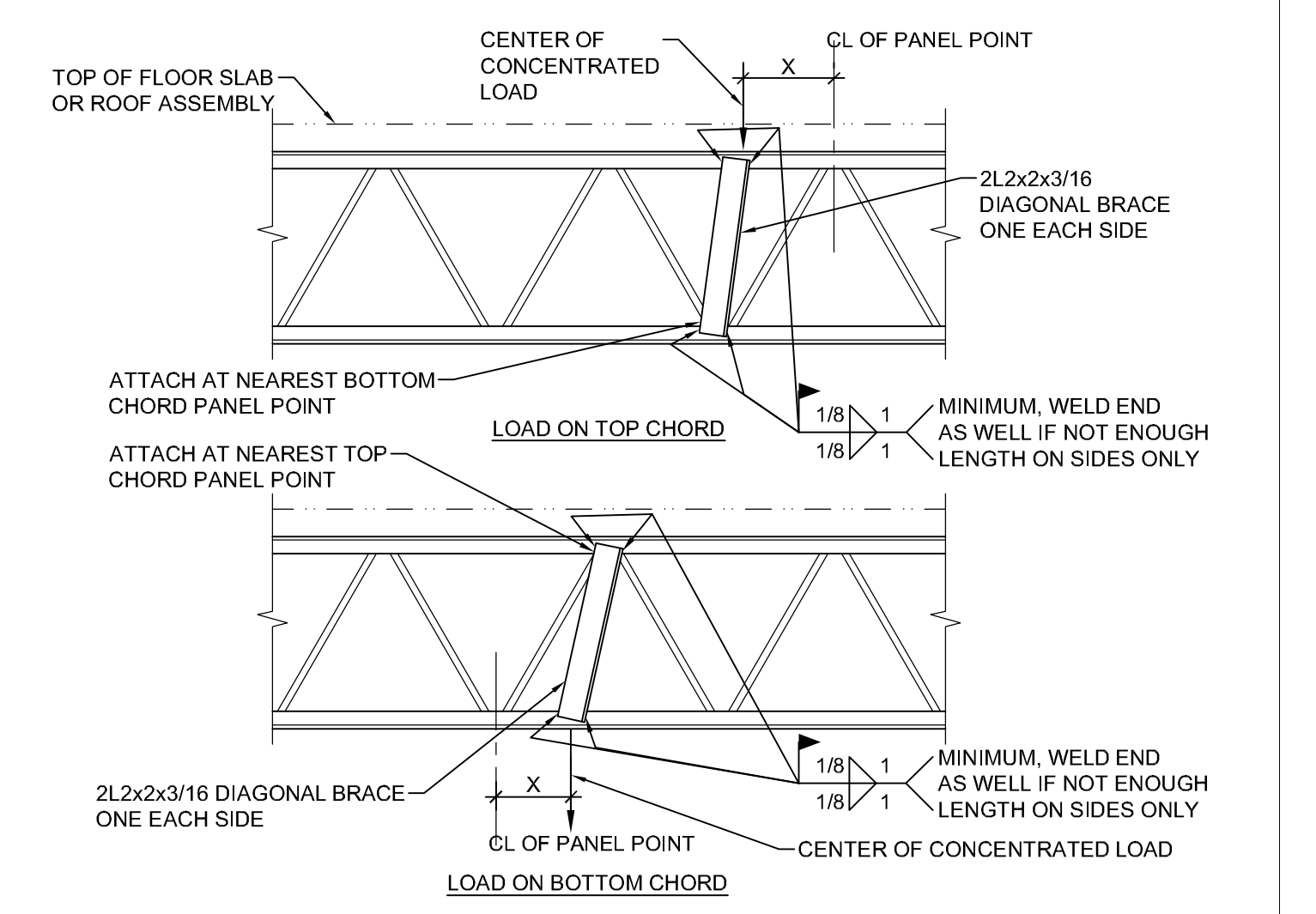
- NOTE:
- SEE DETAIL 2/S201 FOR CURB LOCATED AWAY FROM NEW OPENING.

**1** CURB DETAIL AT CONCRETE SLAB - WITH ROOF PENETRATION  
1-1/2" = 1'-0"



- NOTES:
- THIS DETAIL IS TO BE APPLIED AT THE AREAS OF SLAB OPENING WHICH WILL NEED TO BE INFILLED UPON COMPLETION OF WORK.
  - FASTEN DECK TO STEEL SUPPORTS PER SDI REQUIREMENTS PRIOR TO POURING CONCRETE.
  - APPLY FIREPROOFING AS REQUIRED TO MEET FLOOR RATING.
  - EXTEND ANGLES FULLY ACROSS SHORT OPENING SIDES. ANGLES ON LONG OPENING SIDES SHALL BE TRIMMED TO ALLOW PASSAGE OF SHORT OPENING SIDE ANGLES.

**6** INFILL OF SLAB OPENING  
1-1/2" = 1'-0"



- NOTES:
- DIAGONAL BRACE IS NOT REQUIRED FOR 'X' LESS THAN THREE INCHES.
  - PROVIDE DIAGONAL BRACE AT LOCATION OF CONCENTRATED LOADS SUCH AS PARTITIONS, HEAVY PIPES, MECHANICAL UNITS, HEAVY LIGHTS AND ANY OTHER CONCENTRATED LOADS AND AS NOTED ELSEWHERE IN THE STRUCTURAL DRAWINGS. LOADS MUST BE APPLIED CONCENTRICALLY TO JOIST BOTTOM CHORD.

**5** TYPICAL STIFFENING OF JOIST FOR CONCENTRATED LOADS  
NO SCALE

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Area	Rev	Date	Description
	05/03/17		For Construction

**E & C**

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Date 5/03/17  
Drawn By  
Checked By HB

UTHSC Project No. 730022  
E & C Project No. 3302.00  
File Name



MEDICAL SCHOOL BUILDING  
SOUTH PENTHOUSE  
AHU-L5 & L6 REPLACEMENT

DRAWING TITLE  
DETAILS

DRAWING NO.  
S201

