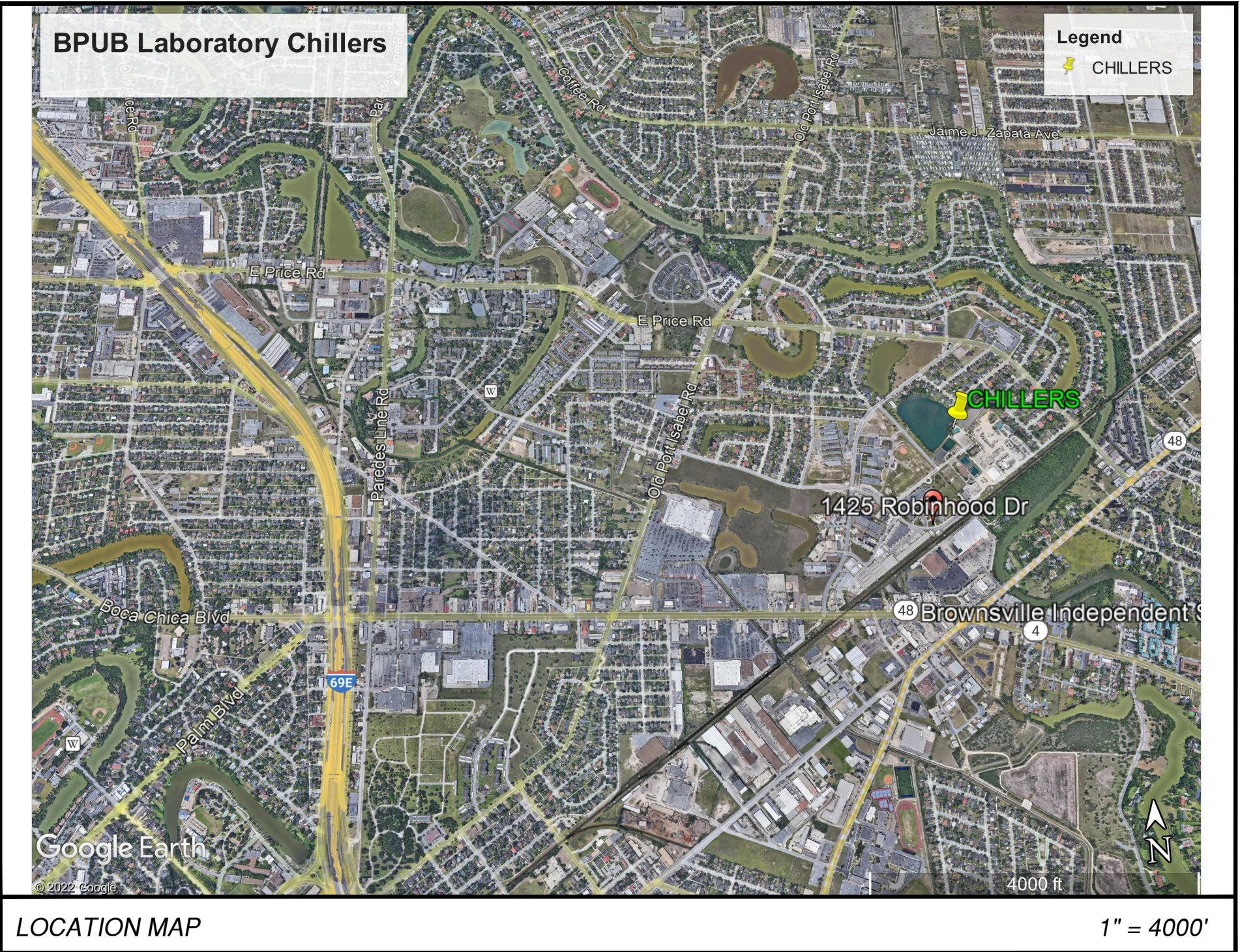


CONSTRUCTION PLANS  
FOR  
BPUB Laboratory Facility HVAC Replacement Project  
  
BID #



- Board of Directors
- SANDRA SAENZ.....CHAIR
  - PATRICIO SAMPAYO.....VICE-CHAIR
  - SANDRA LOPEZ - LANGLEY.....SECRETARY/TREASURER
  - ANNA OQUIN.....MEMBER
  - JUDE A. BENAVIDES, PhD.....MEMBER
  - ARTHUR RENDON.....MEMBER
  - MAYOR TREY MENDEZ.....EX-OFFICIO MEMBER



SHEET INDEX

LABORATORY FACILITY HVAC REPLACEMENT PROJECT

SHEET	TITLE
01	LEGEND AND ABBREVIATIONS AND MECHANICAL NOTES
02	BPUB LABORATORY FACILITY FLOOR PLAN
03	BPUB LABORATORY FACILITY ROOF PLAN
04	BPUB LABORATORY BUILDING ROOF FRAMING PLAN AND SECTIONS
05	BPUB LABORATORY BUILDING HVAC FLOOR PLAN
06	BPUB LABORATORY BUILDING HVAC DEMOLITION PLAN
07	HVAC SCHEDULES
08	BPUB LABORATORY BUILDING HVAC SCHEMATIC
09	BPUB LABORATORY BUILDING ROOM AIR BALANCES
10	HVAC DETAIL SHEET 1 OF 4
11	HVAC DETAIL SHEET 2 OF 4
12	HVAC DETAIL SHEET 3 OF 4
13	HVAC DETAIL SHEET 4 OF 4
14	LAB FUME HOODS
15	SITE PHOTOS
16	DEMOLITION SITE PHOTOS



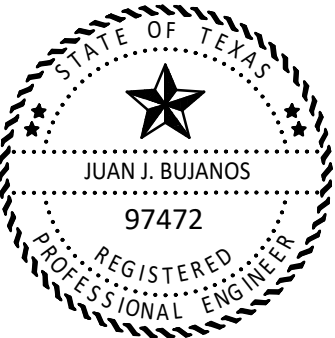
6/29/22



HVAC LEGEND					
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	HOT WATER SUPPLY		UNION		BUTTERFLY VALVE
	HOT WATER RETURN		STRAINER		GATE VALVE
	CHILLED WATER SUPPLY		STRAINER WITH BLOW OFF		ANGLE VALVE
	CHILLED WATER RETURN		THERMOMETER		GLOBE VALVE
	SUCTION DIFFUSER WITH STRAINER		CIRCUIT SETTER		CONTROL VALVE, THREE WAY
	PUMP SYMBOL		PRESSURE INDICATOR		CONTROL VALVE, TWO WAY
	CONCENTRIC REDUCER		TRIPLE DUTY VALVE		PRESSURE REDUCING VALVE
	ECCENTRIC REDUCER FLAT ON BOTTOM		BALANCING VALVE		AUTOMATIC FLOW CONTROL VALVE
	ECCENTRIC REDUCER FLAT ON TOP		AUTOMATIC AIR VALVE		CHECK VALVE
	ELBOW TURNED DOWN		MANUAL AIR VALVE WITH DICHARGE TUBE		NEEDLE VALVE
	ELBOW TURNED UP		TEE		END CAP
	TEE OUTLET UP		PLUG VALVE		BLIND FLANGED
	EXISTING PIPING TO REMAIN		BALL VALVE		FLOW METER STATION
	PIPING TO BE DEMOLISHED		TEE OUTLET DOWN		
	EXISTING PIPING BELOW GRADE		CONNECT TO EXISTING		

ABBREVIATIONS			
ACC#	Air Cooled Chiller - No.	MIN	Minimum
A/C	Air Conditioning	M/D	Motor Operated Damper
AAV	Automatic Air Vent	MPT	Male Pipe Thread
ABV	Above	N/A	Not Applicable
AD	Access Door	NC	Normally Closed
ADP	Apparatus Dew Point	NIC	Not in Contract
AF	Above Finished Floor	NO	Normally Open
BFP	Backflow Preventer	NPSH	Net Positive Suction Head
BHP	Brake Horsepower	NPT	National Pipe Thread
BMS	Building Management System	NTS	Not To Scale
BOP	Bottom of Pipe	PD	Pressure Drop
CHHR	Chilled Water Return	PI	Pressure Indicator
CHWS	Chilled Water Supply	POC	Point of Connection
CO	Clean Out	PRV	Pressure Reducing Valve
COL	Column Line	PS	Pressure Switch
DB	Dry Bulb Temperature	PSI	Pounds Per Square Inch
DP	Dew Point	PSIA	Pounds Per Square Inch Absolute
EAT	Entering Air Temperature	PSIG	Pounds Per Square Inch Gauge
EDB	Entering Air Dry Bulb	REG	Register
ELEC	Electric or Electrical	RH	Relative Humidity
ELEV	Elevation	SEER	Seasonal Energy Efficiency Ratio
EWB	Entering Air Wet Bulb	SHT	Sheet
EWT	Entering Water Temperature	SP	Static Pressure
FL	Floor	SPEC	Specifications
FOB	Flat On Bottom	SPL	Supply
FOT	Flat On Top	SS	Stainless Steel
FPT	Female Pipe Thread	STD	Standard
FT	Feet	T	Thermostat
FT HD	Feet of Head	T-#	Tank - No.
FZ	Freeze/Stat (low limit thermostat)	VB	Total Dynamic Head
GAL	Gallons	TEMP	Temperature
GPD	Gallons Per Day	TCC	Top of Concrete
GRH	Gallons Per Hour	TOD	Top of Duct
GPM	Gallons Per Minute	TOP	Top of Pipe
HD	Head	TOS	Top of Steel
HP	Horsepower	TSTAT	Thermostat
HVAC	"Heating, Ventilating & Air Conditioning"	TYP	Typical
ID	Inside Diameter	VB	Vacuum Breaker
IE	Invert Elevation	VENT	"Ventilate, Ventilator"
LAT	Leaving Air Temperature	VFD	Variable Frequency Drive
LWB	Leaving Air Wet Bulb	WB	Wet Bulb Temperature
LWT	Leaving Water Temperature	XFMR	Transformer
MAV	Manual Air Vent		
MAX	Maximum		
MBH	Thousand BTU/Hr (thousands)		

MECHANICAL GENERAL NOTES	
1.	DO NOT SCALE DRAWINGS.
2.	USE ECCENTRIC REDUCERS ON AUTOMATIC VALVES WHERE REQUIRED.
3.	EXTEND ALL DRAIN LINES TO NEAREST FLOOR DRAIN OR AS INDICATED. ROUTE TO AVOID INTERFERENCE WITH PASSAGEWAYS. CONDENSATE DRAINS SHALL BE TRAPPED. SLOPE DRAIN LINES 1/8" PER FOOT.
4.	ALL PIPING SHALL PITCH DOWN IN DIRECTION OF FLOW OR AS INDICATED ON DRAWINGS. 1" PER 40 FEET WITH MANUAL AIR VENTS AT ALL HIGH POINTS. AND 3/4" DRAIN VALVES AT ALL LOW POINTS.
5.	ALL PIPING AND DUCTWORK INSULATION SHALL BE RUN CONTINUOUSLY THROUGH FLOORS, ROOFS AND PARTITIONS EXCEPT WHERE PROHIBITED BY FIRE CODES.
6.	EXTEND DRAIN LINES FROM RELIEF VALVES TO 2' ABOVE NEAREST FLOOR DRAIN OR AS INDICATED.
7.	ALL PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH THE SPECIFICATIONS AND FURTHER SUPPORTS OR HANGERS SHALL BE ADJACENT TO ELBOWS, TO PREVENT WEIGHT OF PIPING BEING PLACED ON THE EQUIPMENT. SUPPORT DETAILS SHALL BE SUBMITTED TO THE MECHANICAL ENGINEER.
8.	ALL PIPING AND DUCTWORK LOCATIONS SHALL BE COORDINATED WITH THE WORK UNDER OTHER DIVISIONS OF THE SPECIFICATIONS TO AVOID INTERFERENCE.
9.	CORRECT BETTINGS ON ALL BALANCING FITTINGS SHALL BE PERMANENTLY MARKED.
10.	RUNOUTS SHALL PITCH DOWN IN DIRECTION OF FLOW A MINIMUM OF 1" IN 30 FEET.
11.	ALL PIPING, DUCTS, VENTS, ETC. EXTENDING THRU EXTERIOR WALLS AND ROOFS SHALL BE FLASHED AND COUNTERFLASHED.
12.	COORDINATE ORIENTATION OF SUPPLY AND RETURN PIPING BEFORE FABRICATION.
13.	PROVIDE DIELECTRIC FITTINGS AT ALL LOCATIONS WHERE DISSIMILAR METALS ARE JOINED IN PIPING AND DUCT SYSTEMS.



*[Signature]*

6/29/22

PROJECT:

BPUB LABORATORY FACILITY  
HVAC REPLACEMENT PROJECT

SHEET TITLE

LEGEND AND ABBREVIATIONS  
AND MECHANICAL NOTES

J N B  
ENGINEERING

29798 COUNTY RD. 725; 956-454-6740  
LOS FRESNOS, TEXAS 78566

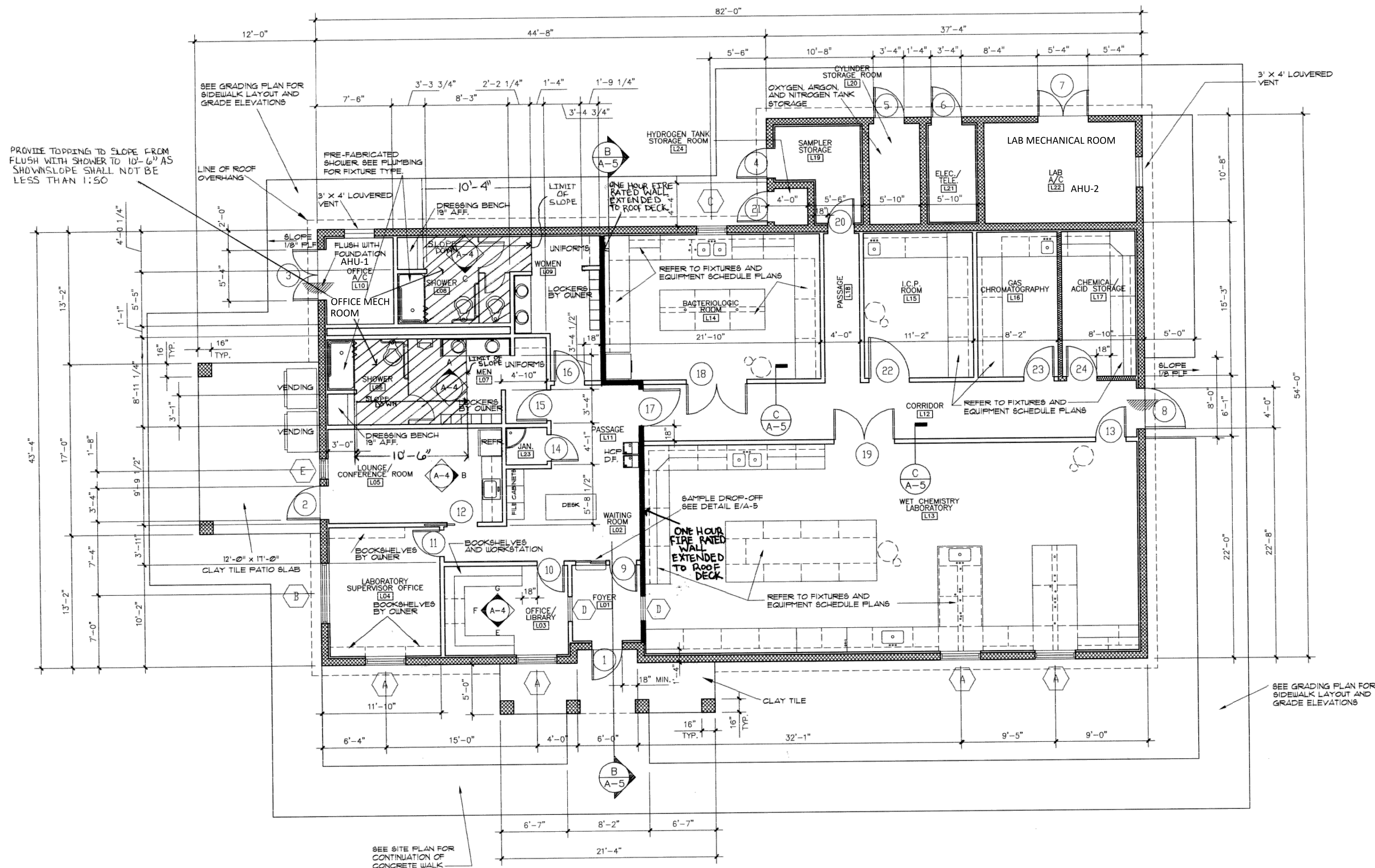
PROJECT #

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DATE:  
6-29-2022

SHEET  
1 OF 16





### WALL LEGEND :

- 8" CONCRETE MASONRY UNITS  
(SEE ELEVATIONS & SECTIONS  
FOR CMU TYPES)
- 8" CMU WITH 1" RIGID INSULATION  
AS SPECIFIED & 5/8" GYP. BD.  
(SEE ELEVATIONS & SECTIONS  
FOR CMU TYPES) FILL ALL VOID CELLS  
W/ "VERMICULITE" INSULATION TO 10' AFF
- COMMON PARTITION (5/8" F.C. GYP. BD.  
EACH SIDE OF 3 5/8" MTL. STUDS  
# 16" O.C.) WALL TO EXTEND TO 6" ABOVE  
CEILING UNLESS NOTED OTHERWISE.
- INSULATED PARTITION (5/8" F.C. GYP. BD.  
EACH SIDE OF 3 5/8" MTL. STUDS  
# 16" O.C.) WALL TO EXTEND TO  
ROOF STRUCTURE. PROVIDE "RACO" TRI  
# CEILING TO MATCH COMMON PARTITION

### ABBREVIATION LEGEND:

- HCP HANDICAPPED
- D.F. DRINKING FOUNTAIN
- PLF PER LINEAR FEET

PROJECT:

BPUB LABORATORY FACILITY  
HVAC REPLACEMENT PROJECT

SHEET TITLE

BPUB LABORATORY FACILITY  
EXISTING FLOOR PLAN

J N B  
ENGINEERING

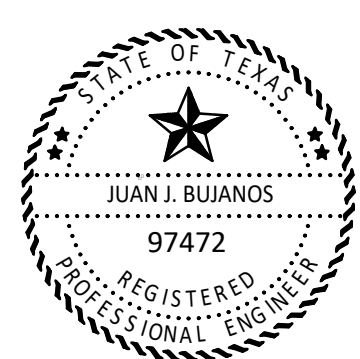
29798 COUNTY RD. 725; 956-454-6740  
LOS FRESNOS, TEXAS 78566

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6-29-2022

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2 OF 16

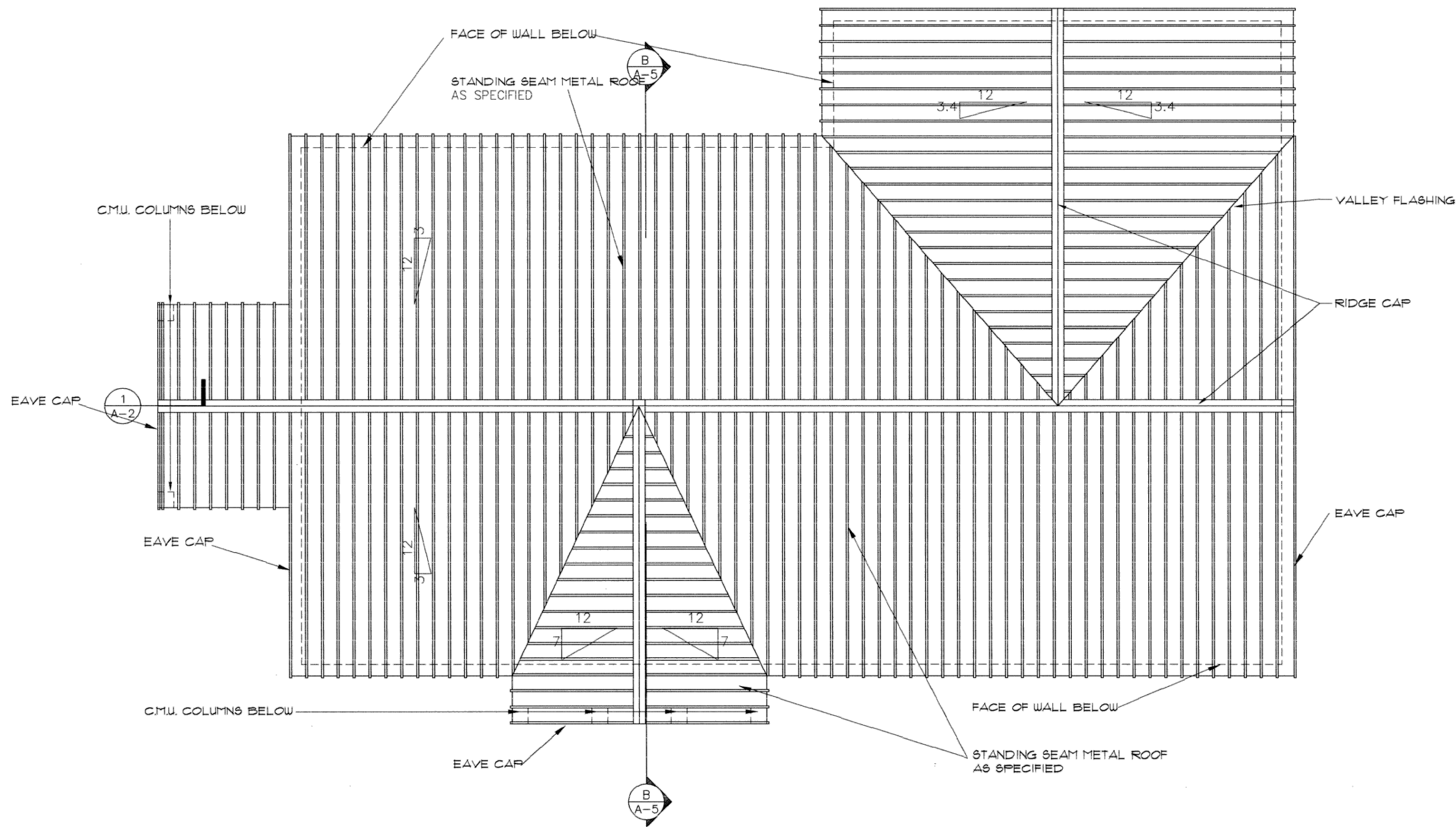


6/29/22

1 LABORATORY BUILDING AS-BUILT  
2 SCALE: N.T.S.

EXISTING JUNE 1998 AS-BUILT DRAWINGS BY NRS CONSULTING  
ENGINEERS WERE PROVIDED BY THE OWNER FOR OUR USE.





2 EXISTING ROOF PLAN  
3 SCALE: N.T.S.



6/29/22

PROJECT:

BPUB LABORATORY FACILITY  
HVAC REPLACEMENT PROJECT

SHEET TITLE

BPUB LABORATORY FACILITY  
EXISTING ROOF PLAN

JNB  
ENGINEERING

29798 COUNTY RD. 725, 956-454-6740  
LOS FRESNOS, TEXAS 78566

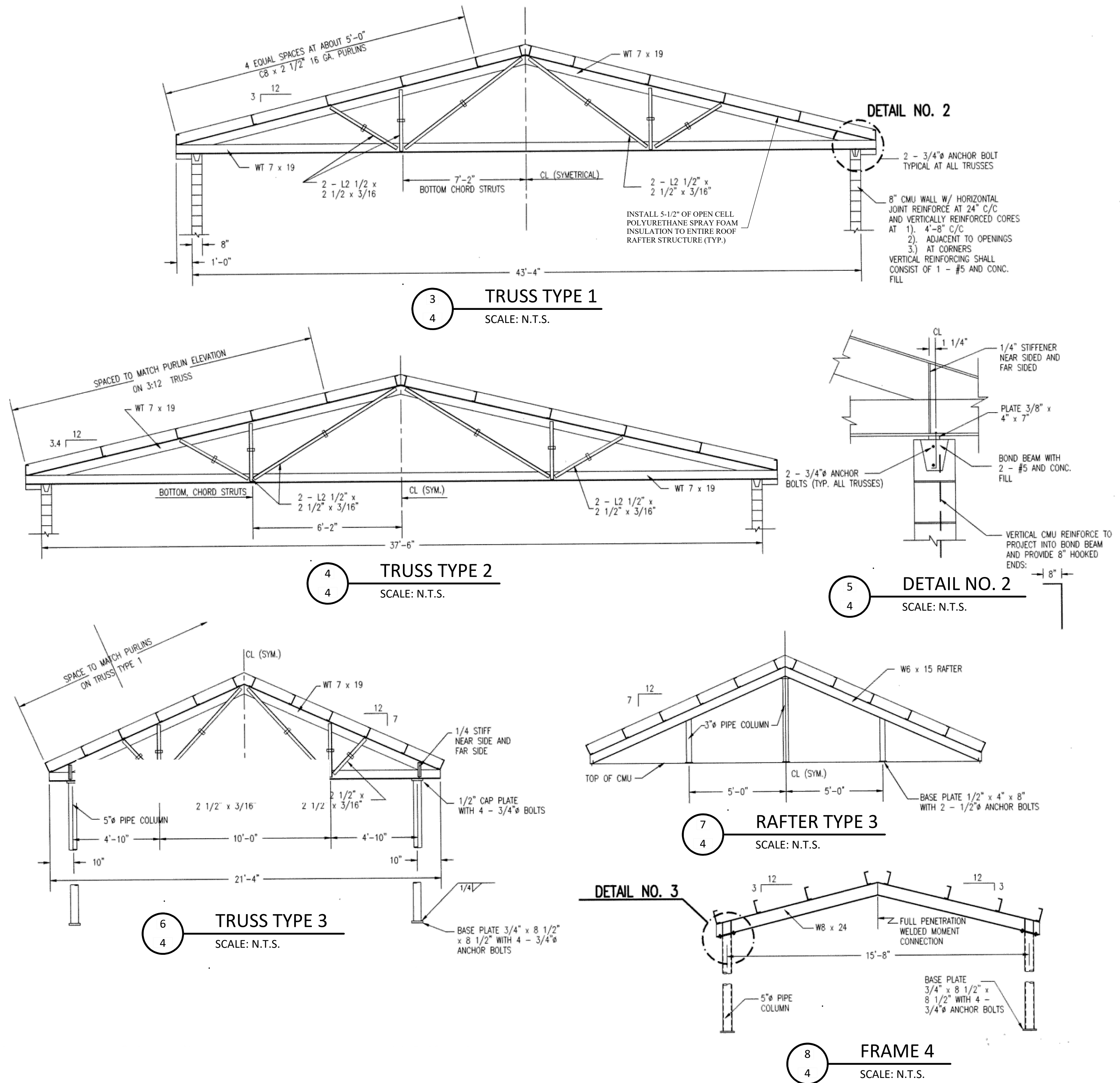
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DATE:  
6-29-2022

SHEET  
3 OF 16





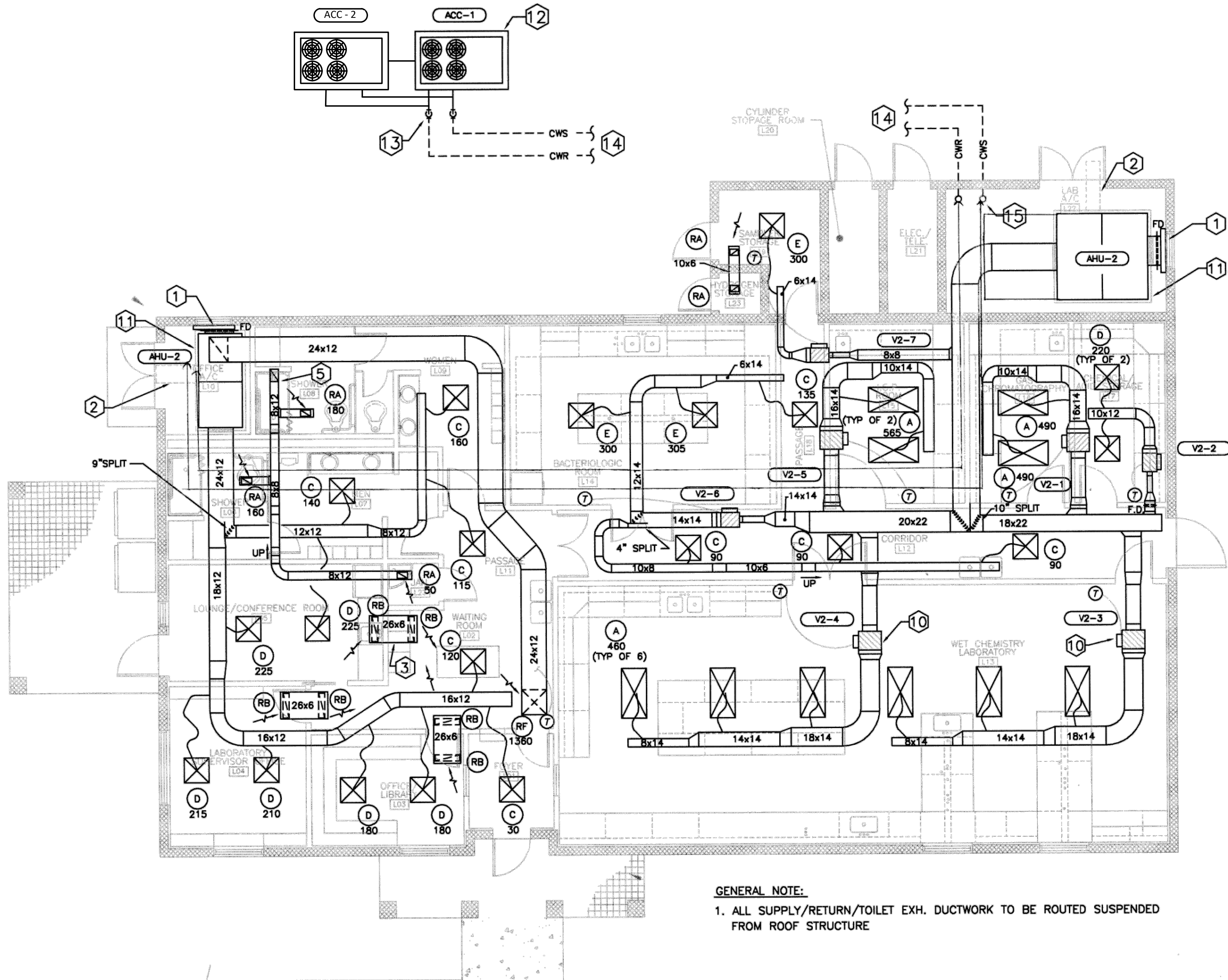
6/29/22

PROJECT:	BPUB LABORATORY FACILITY HVAC REPLACEMENT PROJECT	
	BPUB LABORATORY EXISTING BUILDING ROOF FRAMING PLAN AND SECTIONS	
SHEET TITLE	J N B ENGINEERING 29798 COUNTY RD. 725; 956-454-6740 LOS FRESNOS, TEXAS 78566	
PROJECT #		
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DATE: 6-29-2022		
SHEET 4 OF 16		





6/29/22



**GENERAL NOTE:**

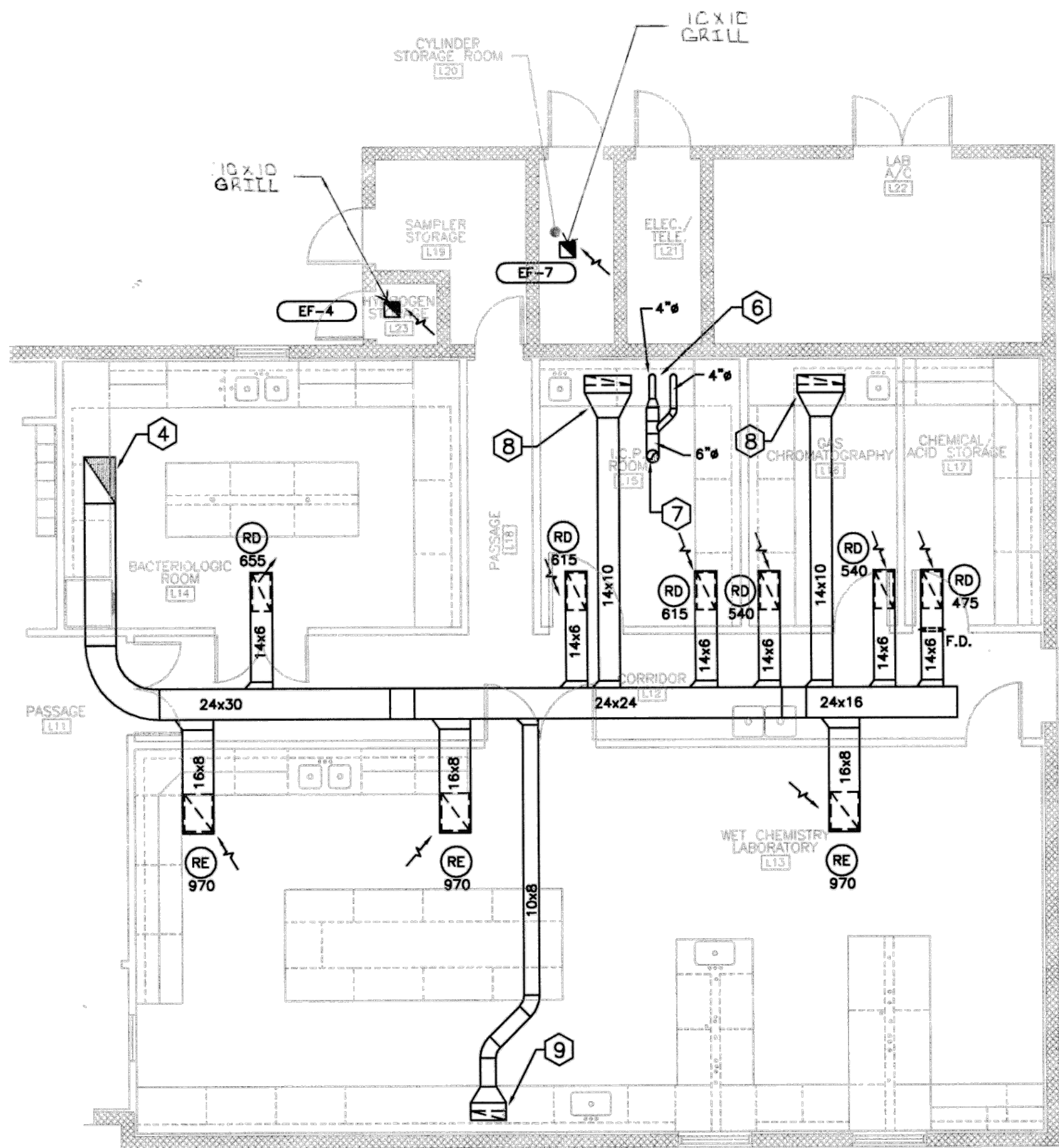
1. ALL SUPPLY/RETURN/TOILET EXH. DUCTWORK TO BE ROUTED SUSPENDED FROM ROOF STRUCTURE

**9** **LABORATORY FLOOR PLAN**  
SCALE: N.T.S.

**KEYED NOTES:**

- 1 O.A. INTAKE PLENUM, FULL SIZE OF LOUVER. SLOPE BOTTOM OF PLENUM BOX TO DRAIN WATER THROUGH LOUVER. ROUTE O.A. DUCT TO AIR HANDLER AS SHOWN
- 2 COIL PULL SPACE
- 3 TRANSFER DUCT (TYPICAL)
- 4 TRANSITION TO 30"Ø IN RISER TO EF-2
- 5 TRANSITION IN RISER TO EF-1

- 6 SEE DETAIL 5/M502 FOR ICP-SPECTROMETER CONNECTION
- 7 TRANSITION IN RISER TO EF-3
- 8 TRANSITION TO 6"x30" IN DROP TO FUME HOOD, SEE ARCH.
- 9 TRANSITION TO 6"x23" IN DROP TO FUME HOOD, SEE ARCH.
- 10 24"x24" CEILING ACCESS DOOR IN GYP BOARD CEILING AT POINT INDICATED. PAINT TO MATCH CEILING



**GENERAL NOTE:**

1. ALL LABORATORY EXHAUST DUCTWORK TO BE INSTALLED WITHIN ROOF STRUCTURE, COORDINATE WITH ROOF FRAMING PLAN
2. ALL LABORATORY EXHAUST DUCTWORK TO BE CONSTRUCTED OF STAINLESS STEEL AND SHALL BE EXTERNALLY INSULATED

**10** **LABORATORY EXHAUST PLAN**  
SCALE: N.T.S.

- 11 EXISTING 5-1/2" CONCRETE HOUSEKEEPING PAD. PAD SHALL BE 3" LARGER THAN UNIT IN ALL DIRECTIONS. CONTRACTOR SHALL ENLARGE PAD IF NEEDED FOR NEW AHU-2.

- 13 SEE CHILLED WATER EQUIPMENT SCHEMATIC 1/M400 FOR CONNECTION
- 14 SEE CHILLED WATER PIPING SCHEMATIC 2/M400 FOR CHILLED WATER ROUTING AND SIZE
- 15 SEE CHILLED WATER EQUIPMENT SCHEMATIC 1/M400 FOR MECHANICAL ROOM LAYOUT.

SHEET TITLE

PROJECT:

BPUB LABORATORY BUILDING  
EXISTING HVAC FLOOR PLAN

BPUB LABORATORY FACILITY  
HVAC REPLACEMENT PROJECT

**JNB**  
**ENGINEERING**

29798 COUNTY RD. 725; 956-454-6740  
LOS FRESNOS, TEXAS 78566

PROJECT #

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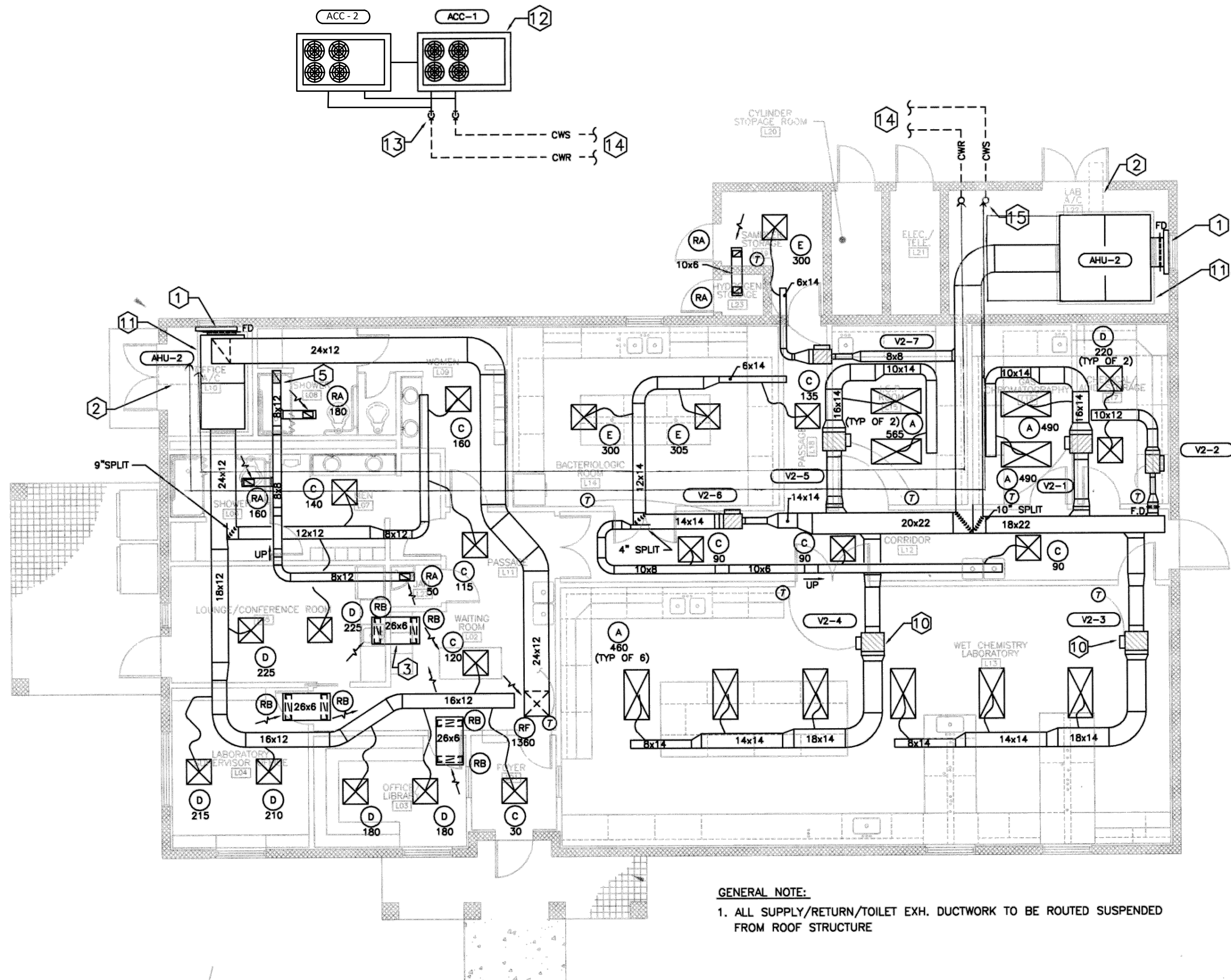
DATE:  
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SHEET  
5 OF 16





6/29/22



**GENERAL NOTE:**

1. ALL SUPPLY/RETURN/TOILET EXH. DUCTWORK TO BE ROUTED SUSPENDED FROM ROOF STRUCTURE

**9** **LABORATORY FLOOR PLAN**  
SCALE: N.T.S.

**KEYED NOTES:**

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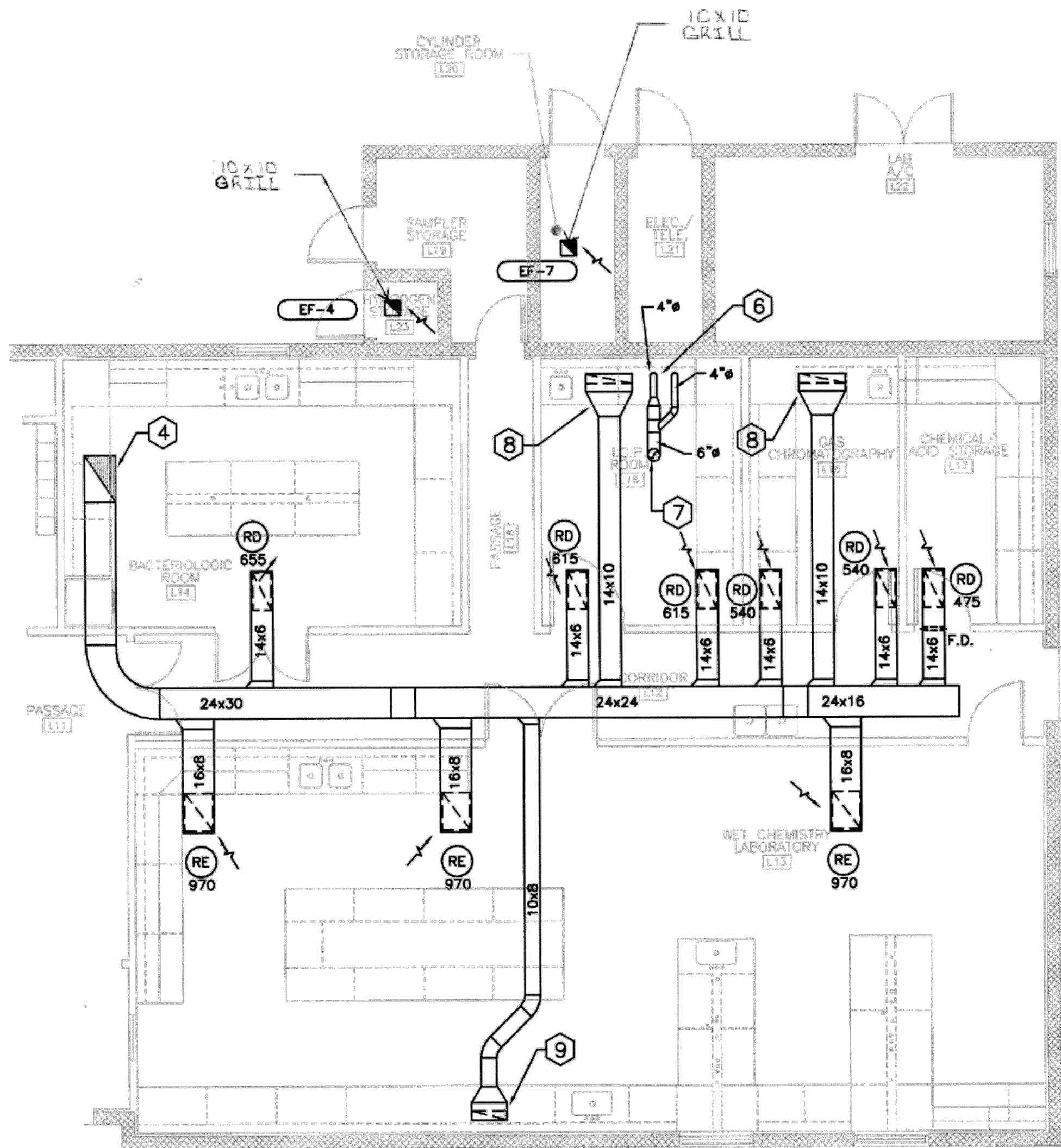
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- 15 SEE CHILLED WATER EQUIPMENT SCHEMATIC 1/M400 FOR MECHANICAL ROOM LAYOUT.

**10** **LABORATORY EXHAUST PLAN**  
SCALE: N.T.S.

**GENERAL NOTE:**

1. ALL LABORATORY EXHAUST DUCTWORK TO BE INSTALLED WITHIN ROOF STRUCTURE, COORDINATE WITH ROOF FRAMING PLAN
2. ALL LABORATORY EXHAUST DUCTWORK TO BE CONSTRUCTED OF STAINLESS STEEL AND SHALL BE EXTERNALLY INSULATED



**DEMOLITION PLAN:**

1. REMOVE AND REPLACE ALL HVAC DUCTWORK, SUPPLY / RETURN AIR DEVICES, INSULATION SYSTEMS, HANGER SUPPORT SYSTEMS AND VAVs, REUSE SMOKE AND FIRE DAMPERS, AND SENSORS.
2. REMOVE AND REPLACE ALL EXHAUST DUCTWORK, ROOF EXHAUST FANS, SUPPLY / RETURN AIR DEVICES AND HANGER SUPPORT SYSTEMS, REUSE SMOKE AND FIRE DAMPERS AND SENSORS.
3. REMOVE AND REPLACE AHU-1 AND AHU-2

SHEET TITLE

PROJECT:

BPUB LABORATORY BUILDING  
HVAC DEMOLITION PLAN

BPUB LABORATORY FACILITY  
HVAC REPLACEMENT PROJECT

**JNB**  
**ENGINEERING**

29798 COUNTY RD. 725; 956-454-6740  
LOS FRESNOS, TEXAS 78566

PROJECT #

DRAWN BY: AJM

DATE:  
6-29-2022

SHEET  
6 OF 16



AIR COOLED CHILLER SCHEDULE																																	
MARK	LOCATION	AREA AND/OR BLDG SERVED	TYPE	CAPACITY		# OF COMP	MAX KW/TON	MIN COP	MAX IPLV (KW/TON)	EVAPORATOR					FOULING FACTOR	CONDENSER AMBIENT OA TEMP		ELECTRICAL								REMARKS	MANUFACTURER	MODEL NO					
										FLOW		EWT		LWT		MAX WPD		COMPRESSOR MOTOR				CONDENSER FAN MOTORS											
				TONS	[KW]					GPM	[L/s]	°F	[°C]	°F		[°C]	FT	[kPa]	# COMP	HP	[KW]	PHASE	VOLT	# FANS	NOMINAL POWER HP				[W]	PHASE	VOLT		
					[ ]						[ ]				[ ]		°F	[°C]	# COMP	HP	[KW]	PHASE	VOLT	# FANS		NOMINAL POWER HP	[W]	PHASE	VOLT				
ACCH-1	Exterior	Office	SCREW	62.29	[220]	5	1.05	3.3	.156	148.7	[9]	54	[12]	44	[7]	12	[36]	0.0001	95	[35]	5	87	[65]	3	460	4	2	[1500]	3	460		York	YLAA 0065HE46XFSXTX
ACCH-2	Exterior	Lab	SCREW	62.29	[220]	5	1.05	3.3	.156	148.7	[9]	54	[12]	44	[7]	12	[36]	0.0001	95	[35]	5	87	[65]	3	460	4	2	[1500]	3	460		York	YLAA 0065HE46XFSXTX
					[ ]						[ ]					[ ]						[ ]					[ ]						
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					[ ]						[ ]					[ ]						[ ]					[ ]						
NOTES																																	
1. SEE SPECIFICATIONS FOR OTHER APPLICABLE ENGINEERING REQUIREMENTS.															3. PROVIDE WITH PART WINDING STARTER																		
2. PROVIDE WITH HOT GAS BYPASS SUCH THAT YOU CAN MODULATE DOWN TO 5%															4. PROVIDE WITH SINGLE POINT POWER CONNECTION																		

## SINGLE DUCT SCHEDULE - ELECTRIC HEAT

RESULTS															ELECTRIC HEAT								SOUND			RAD SOUND POWER						DIS SOUND POWER					
TAG	MFG	QTY	MODEL	SIZE	CONTROLS	MAX PRIMARY CFM	MIN PRIMARY CFM	INLET SP IN WC	MIN SP IN WC	DOWN SP IN WC	ARRANGEMENT	MCA **	MSCP **	WEIGHT lb	HEAT CFM	EAT DEG F	LAT DEG F	HTR KW	HTR AMPS	HTR VOLT	PHASE	STEPS	RAD NC	DIS NC	ATTEN METHOD	125	250	500	1000	2000	4000	125	250	500	1000	2000	4000
V2-1	JCI	1	TSS	08		980	105	1	0.37	0.25	LH Controls / LH Coil	18.04	20	32	980	55	93.7	12	14.43	480	3	3	20	16	AHRI-885E	58	47	45	40	35	28	66	60	55	52	48	44
V2-2	JCI	1	TSS	06		440	53	1	0.48	0.25	LH Controls / LH Coil	9.02	15	29	440	55	98.09	6	7.22	480	3	2	16	15	AHRI-885E	52	47	43	37	32	27	63	58	53	50	43	41
V2-3 V2-4	JCI	2	TSS	10		1380	165	1	0.19	0.25	LH Controls / LH Coil	27.06	30	34	1380	55	96.22	18	21.65	480	3	3	21	19	AHRI-885E	57	49	47	40	34	30	68	62	58	55	51	48
V2-5	JCI	1	TSS	10		1130	165	1	0.13	0.25	LH Controls / LH Coil	22.55	25	34	1130	55	96.95	15	18.04	480	3	3	19	16	AHRI-885E	55	47	45	38	32	30	65	60	56	53	49	46
V2-6	JCI	1	TSS	10		1010	165	1	0.11	0.25	LH Controls / LH Coil	19.55	20	34	1010	55	95.67	13	15.64	480	3	3	18	16	AHRI-885E	54	46	44	37	32	29	64	60	56	52	49	46
V2-7	JCI	1	TSS	05		300	48	1	0.19	0.25	LH Controls / LH Coil	6.01	15	29	300	55	97.13	4	4.81	480	3	2	20	24	AHRI-885E	51	50	46	38	34	30	68	65	55	51	46	44

- \* "-" signifies a NC value (radiated or discharge) that is less than 15
- \* Actual coil APD shown is at max airflow, not heating airflow.
- \*\* MCA/MSCP number may vary from unit nameplate due to component changes related to actual product selections and devices applied.

CHILLER PUMP SCHEDULE																								
MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	TYPE	CIRCULATING FLUID										MIN % EFF	ELECTRICAL MOTOR					REMARKS	MANUFACTURER	MODEL NO	
					FLUID	FLOW		HEAD		NPSH AVAILABLE		TEMPERATURE		SP GR		NOMINAL POWER		PHASE	VOLT	MAX RPM				SPEED CONTROL
						GPM	[L/s]	FT	[kPa]	FT	[kPa]	°F	[°C]			HP	[kW]							
P-1	OUTDOORS	LAB/OFFICE	CHILLED WATER	END SUCTION	CHILLED WATER	180	[11]	45	[720]	N/A	#VALUE!	95	[35]	1	85	7.5	[6]	3	460	1800	VARIABLE	----	BELL & GOSSETT	209251
P-2	1220 MER	SURGERY	CHILLED WATER	END SUCTION	CHILLED WATER	255	[16]	46	[730]	N/A	N/A	95	[35]	1	85	7.5	[6]	3	460	1800	VARIABLE	----	BELL & GOSSETT	209251
																					----			

DESIGNER NOTES

1. ANTIFREEZE FLUID IS USUALLY PROPYLENE GLYCOL WATER (PGW). ADJUST FLOW, HEAD, AND POWER FOR FLUID PUMPED, EXCEPT SIZE MOTORS FOR HOT FLUIDS ON COLD CONDITIONS.



AIR HANDLING UNITS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
TAG	LOCATION	SERVICE	AIR FLOW (CFM)	MIN. OA (CFM)	SUPPLY FAN CHARACTERISTICS					MOTOR					RETURN FAN CHARACTERISTICS					MOTOR					HEATING COIL					COOLING COIL										MANUFACTURER																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
					WHEEL TYPE	WHEEL DIA. (IN)	TSP ("WG)	ESP ("WG) (1)	RPM	BHP	HP	PH	VOLT	VFD	WHEEL TYPE	WHEEL DIA. (IN)	ESP ("WG) (1)	RPM	BHP	HP	PH	VOLT	VFD	TYPE	EAT (°F)	LAT (°F)	CAPACITY (MBH)	MAX. FACE VEL (FPM)	AIRFLOW AT MAX HEATING (CFM)	AIR PD AT UNIT MAX AIRFLOW ("wg)	STEAM COIL PRESSURE (PSIG) (2)	STEAM FLOW (LBS/HR)	HOT WATER COIL MAX. WATER PD (FT)	GPM	EWI (°F)	LWT (°F)	EAT (°F) DB	WB	LAT (°F) DB		WB	MAX. FINS/INCH	MAX. FACE VEL (FPM)	MAX. AIR PD ("WG)	MAX. WATER PD (FT)	CAPACIT (MBH) (TOTAL)	GPM	EWT (°F)	LWT (°F)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
AHU-2	LAB MECH RM	DRAW-THRU	6620	100%	AF-FS	15	2.63	1.75	2246	5.71	7.5	3	460		DWDI	15	1.75	3500	6.02	7.5	3	460		STAGED	36	64.89	3876		6620	0.03								95.7	79.9	53.6	52.8	11	453	0.74	12.3	603	144	44	54	YORK XT1-45X72																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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(1) ESP TO EXCLUDE PD OF UNIT COMPONENTS FURNISHED BY UNIT MANUFACTURER SUCH AS COILS, FACE AND BYPASS DAMPERS, HOT AND COLD DECK DAMPERS, INLET VANES AND PERFORATED DIFFUSER PLATES WHERE REQUIRED.

(2) STEAM PRESSURE INDICATED IS STEAM PRESSURE AVAILABLE DOWNSTREAM OF CONTROL VALVE.

PROJECT:

BPUB LABORATORY FACILITY  
HVAC REPLACEMENT PROJECT

SHEET TITLE

HVAC SCHEDULES

J N B  
ENGINEERING

29798 COUNTY RD. 725; 956-454-6740  
LOS FRESNOS, TEXAS 78566

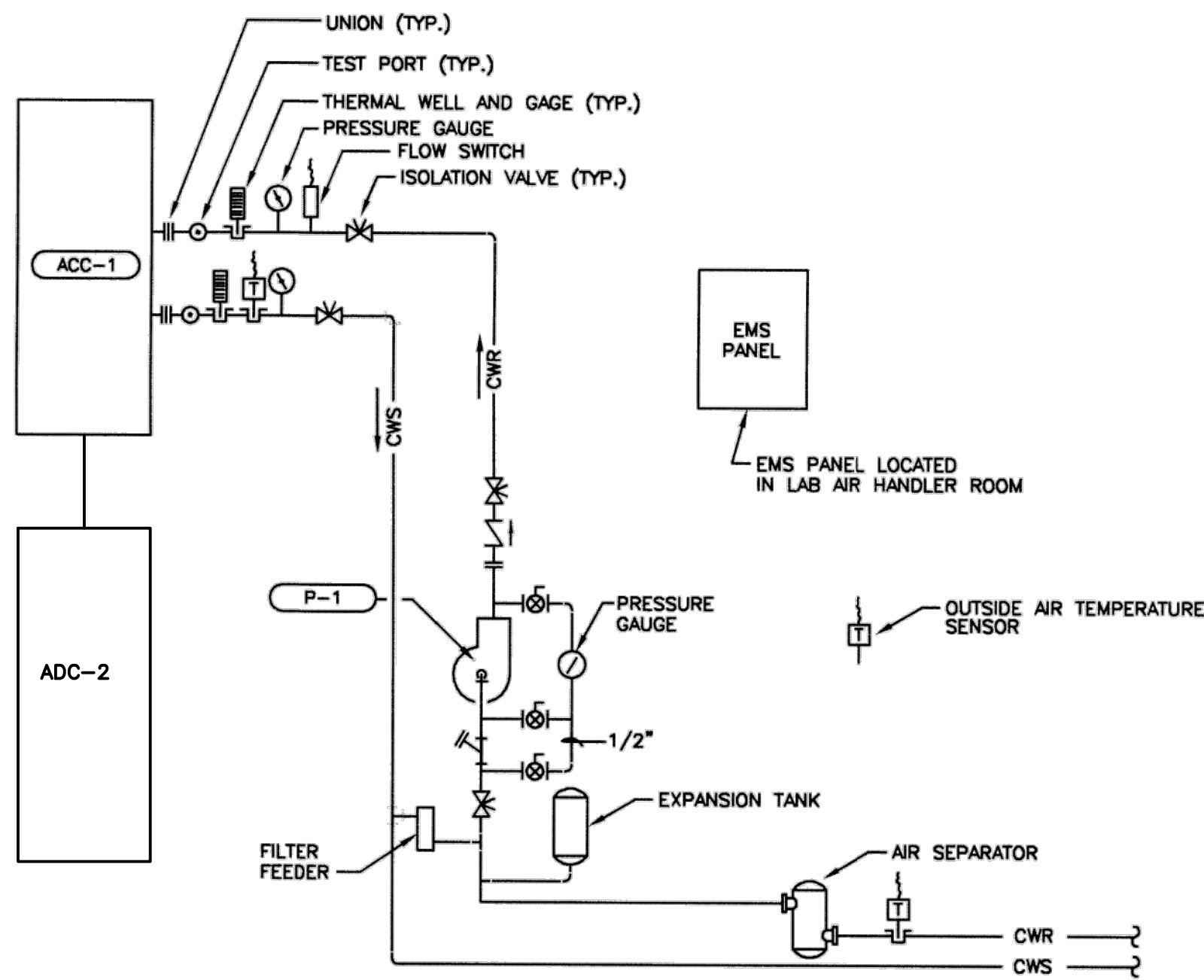
PROJECT #

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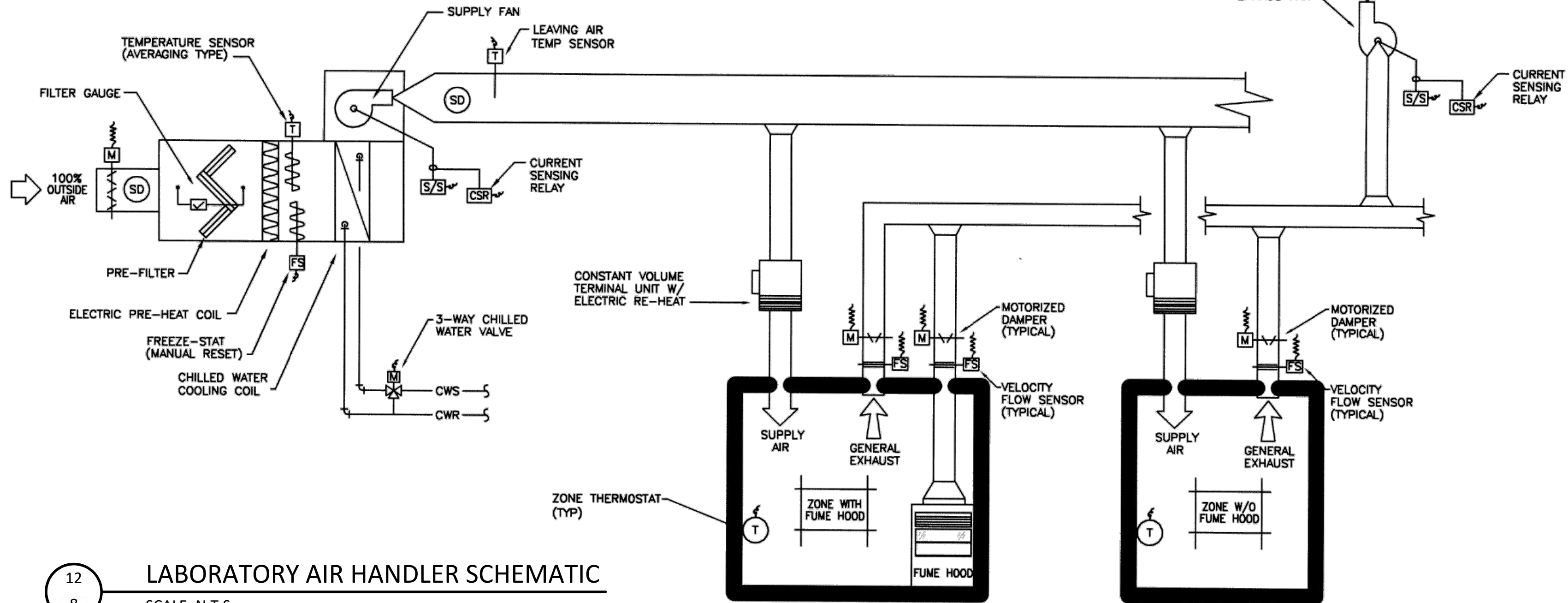
DATE:  
6-29-2022

SHEET  
7 OF 16





11  
8  
CHILLED WATER EQUIPMENT SCHEMATIC  
SCALE: N.T.S.



12  
8  
LABORATORY AIR HANDLER SCHEMATIC  
SCALE: N.T.S.

**DEMOLITION NOTES:**

1. REMOVE EXISTING CHILLED WATER PUMPS AND ASSOCIATED CONTROLS AND REPLACE WITH NEW. PUMPS WILL BE SALVAGE BY THE OWNER.
2. REMOVE AIR SEPARATOR, EXPANSION TANK, AND CHEMICAL POT FEEDER AND REPLACE WITH NEW.
3. REMOVE AIR COOLED CHILLERS, DISCONNECT MECHANICAL PIPING, ELECTRICAL AND CONTROLS. REMOVE & REPLACE BOTH PUMP ELECTRICAL DISCONNECTS, AND RECONNECT.
4. REMOVE & REPLACE CHILLED WATER PUMP SUPPLY / RETURN INSULATION SYSTEMS.
5. ALTERNATE BID ITEM - REMOVE & REPLACE ABOVE GROUND CHILLED WATER SUPPLY / RETURN PIPING.
6. CONTRACTOR SHALL MEASURE AND DOCUMENT FLOW AND PRESSURE AT EACH AIR HANDLER.

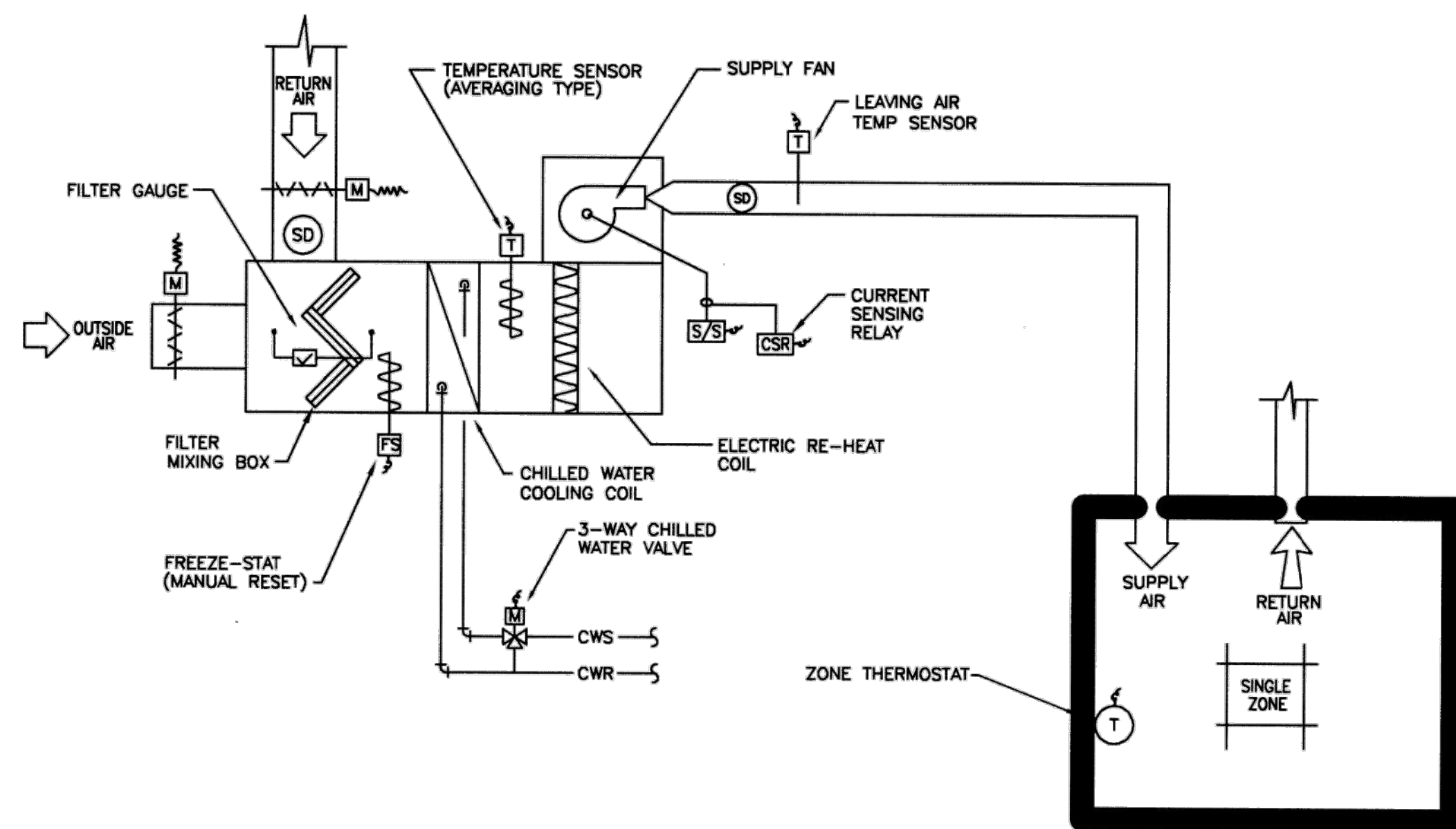
**CHILLED WATER SYSTEM HAS THE FOLLOWING EQUIPMENT:**

1. AHU-1 -
2. AHU-2 -
3. CH-1 -
4. CH-2 -

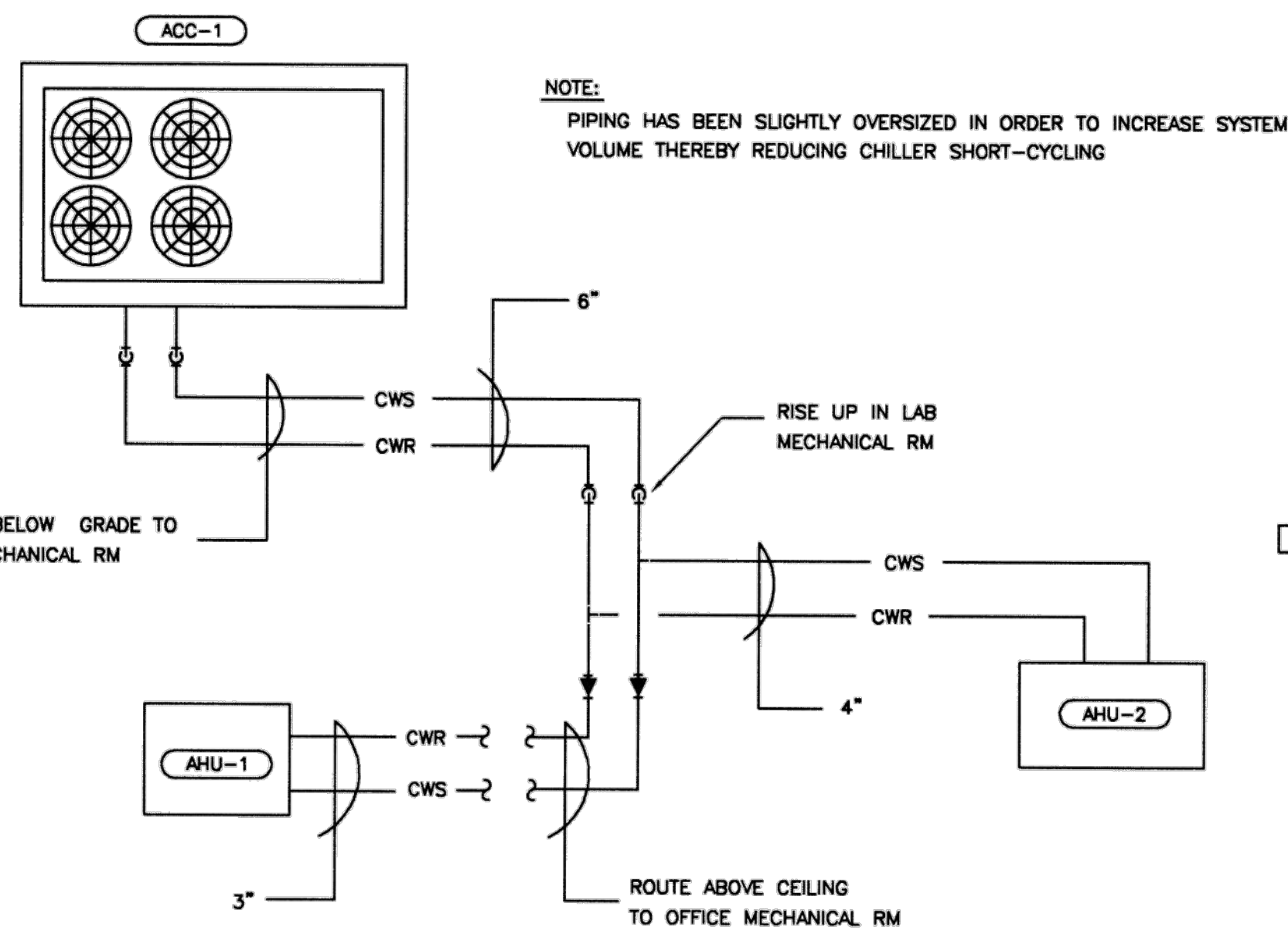
DOCUMENT MEASURED FLOW , PRESSURE AND PRESSUREE; SUBMIT REPORT TO ENGINEER FOR REVIEW PRIOR TO DEMOLITION ANY OF THE CHILLED WATER SYSTEM.

**KEYED NOTES: MECHANICAL DEMOLITION**

1. EXISTING BUFFER TANK TO BE REMOVED AND REPLACED.
2. EXISTING CHILLED WATER LINE INSULATION, AND ALUMINUM JACKET TO BE REMOVED / REPLACED. EXISTING PIPE STANDS TO BE REMOVED AND REPLACED WITH NEW. FIELD VERIFY HEIGHT AND QUANTITY.
3. CHILLERS TO BE REMOVED AND RETURNED TO OWNER (IF OWNER SO DESIRES).
4. CHILLED WATER LINES VALVES TO BE REMOVED AND REPLACED AS NEEDED.
5. EXISTING AIR-DIRT SEPARATOR TO BE REMOVED AND REPLACED WITH NEW.
6. EXISTING CHILLER PUMPS TO BE REMOVED AND REPLACED & RETURNED TO OWNER.
7. EXISTING CHEMICAL BYPASS POT FEEDER TO BE REMOVED AND REPLACED WITH NEW.
8. EXISTING CHILLER DISCONNECTS TO BE REMOVED REPLACED WITH NEW.
9. CONCRETE PADS TO REMAIN. VSDs FOR AIR HANDLERS TO BE REMOVED AND REPLACED.
10. CHILLERS VIBRATION ISOLATORS, BASES AND ANCHORS TO MEET ALL TDI WINDSTORM REQUIREMENTS; DESIGN TO BE PROVIDED BY CONTRACTOR WINDSTORM ENGINEER AS A SUBMITTAL.



14  
8  
OFFICE AIR HANDLER SCHEMATIC  
SCALE: N.T.S.



13  
8  
CHILLED WATER PIPING SCHEMATIC  
SCALE: N.T.S.



*[Signature]*

6/29/22

PROJECT:

BPUB LABORATORY FACILITY  
HVAC REPLACEMENT PROJECT

SHEET TITLE

BPUB LABORATORY BUILDING  
HVAC SCHEMATIC

J N B  
ENGINEERING

29798 COUNTY RD. 725; 956-454-6740  
LOS FRESNOS, TEXAS 78566

PROJECT #

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6-29-2022

SHEET  
8 OF 16



SEQUENCES OF OPERATION

1. AIR COOLED CHILLER:

FMS SHALL START/STOP CHILLER PER USER DEFINED SCHEDULE. UPON CALL FOR COOLING, FMS SHALL INITIATE PUMP P-1. UPON PROOF OF FLOW, CHILLER ACC-1 SHALL BE INITIATED. CHILLER'S INTEGRAL CONTROLS SHALL STAGE CHILLER TO MAINTAIN LOOP SET POINT OF 44°F (ADJ).

IF OUTSIDE AIR TEMPERATURE FALLS BELOW 38°F (AS MEASURED BY OUTSIDE AIR TEMPERATURE SENSOR), PUMP P-1 SHALL BE INITIATED AND RUN CONTINUOUSLY UNTIL TEMPERATURE RISES ABOVE 40°F (FREEZE PROTECTION).

2. OFFICE AIR HANDLING UNIT (AHU-1)

FMS SHALL START/STOP AIR HANDLING UNIT PER USER DEFINED SCHEDULE; OUTSIDE AIR DAMPERS AND RETURN AIR DAMPERS CLOSE WHEN UNIT IS OFF.

WHEN UNIT IS ON, CHILLED WATER 3-WAY VALVE SHALL MODULATE TO MAINTAIN 55°F (ADJ) LEAVING AIR TEMPERATURE AND ELECTRIC RE-HEAT COIL SHALL BE STAGED TO MAINTAIN ROOM SET POINT.

UPON SIGNAL FROM DUCT MOUNTED SMOKE DETECTOR, THE AIR HANDLER SHALL BE STOPPED.

AIR HANDLER SHALL BE STOPPED IF CAPILLARY TYPE FREEZE STAT SENSES LESS THAN 40°F. RESET SHALL BE MANUAL. FMS SHALL BE ALARMED.

EXHAUST FAN EF-1 SHALL BE INTERLOCKED WITH AIR HANDLER.

3. 100% OUTSIDE AIR LABORATORY AIR HANDLING UNIT (AHU-2)

FMS SHALL START/STOP AIR HANDLING UNIT PER USER DEFINED SCHEDULE; OUTSIDE AIR DAMPER CLOSES WHEN UNIT IS OFF.

ELECTRIC PRE-HEAT COIL SHALL BE STAGED TO MAINTAIN 50°F (ADJ) COOLING COIL ENTERING AIR TEMPERATURE (FREEZE PROTECTION).

WHEN UNIT IS ON, CHILLED WATER 3-WAY VALVE SHALL MODULATE TO MAINTAIN 55°F (ADJ) LEAVING AIR TEMPERATURE. CONSTANT VOLUME TERMINAL UNIT ELECTRIC RE-HEAT COIL SHALL BE STAGED TO MAINTAIN ROOM SET POINT.

UPON SIGNAL FROM DUCT MOUNTED SMOKE DETECTOR, THE AIR HANDLER SHALL BE STOPPED.

AIR HANDLER SHALL BE STOPPED IF CAPILLARY TYPE FREEZE STAT SENSES LESS THAN 40°F. RESET SHALL BE MANUAL. FMS SHALL BE ALARMED.

EXHAUST FAN EF-2 SHALL BE INTERLOCKED WITH AIR HANDLER. ROOM EXHAUST AIRFLOW RATES SHALL BE MAINTAINED PER ROOM PRESSURIZATION SCHEDULE (M401) BY MODULATING DUCT MOUNTED MOTORIZED DAMPERS. FLOW RATES SHALL BE MONITORED WITH DUCT MOUNTED VELOCITY FLOW SENSORS. UPON SIGNAL FROM FUME HOODS INTEGRAL ON/OFF SWITCH, FUME HOOD DAMPER SHALL BE MODULATED OPEN TO MAINTAIN PROPER HOOD FLOW RATE WHILE LAB'S GENERAL EXHAUST DAMPER SHALL MODULATED PARTIALLY/FULLY CLOSED AS NECESSARY TO MAINTAIN ROOM'S OVERALL EXHAUST FLOW RATE PER SCHEDULE. EXHAUST FAN EF-2 SHALL RUN AT CONSTANT RATE.

EXHAUST FAN EF-3 SHALL BE INTERLOCKED WITH ICP FUME HOOD ON/OFF SWITCH. ICP EXHAUST DUCT SHALL BE PROVIDED WITH A MOTORIZED DAMPER AND A VELOCITY FLOW SENSOR. WHEN UNIT IS ENERGIZED, DAMPER SHALL BE MODULATED TO MAINTAIN FLOW RATE PER ROOM PRESSURIZATION SCHEDULE (M401) AND ICP ROOM'S GENERAL EXHAUST SHALL BE MODULATED ACCORDINGLY TO MAINTAIN ROOM'S OVERALL EXHAUST FLOW RATE.

AIR SEPARATOR SCHEDULE

AIR SEPARATOR SCHEDULE											
MARK	LOCATION	SYSTEM AND/OR SERVICE	TYPE	AIR SEPARATOR						REMARKS	
				SIZE IN		FLOW		WPD			BUILT-IN STRAINER REQ'D
				IN	[mm]	GPM	[L/s]	FT	[kPa]		
AS-1	MECH ROOM	CHILLED WATER	FULL FLOW TANGENTIAL	1	[ 25 ]	500	[ 32 ]	3.5	[ 10 ]	YES	---
					[   ]		[   ]		[   ]		

EXPANSION TANK SCHEDULE

EXPANSION TANK SCHEDULE																										
MARK	LOCATION	SYSTEM AND/OR SERVICE	TYPE	APPROX SYSTEM VOLUME		SYSTEM TEMPERATURE RANGE				INITIAL PRESSURE IN TANK		MAX OPERATING PRESSURE		FILL PRESSURE AT TANK				MIN VOLUME TANK		MIN BLADDER VOLUME		PIPE SIZE TO TANK		MAKE-UP WATER FILL SIZE		REMARKS
						MIN		MAX						RELIEF VALVE		AT TANK										
				GAL	[L]	°F	[°C]	°F	[°C]	PSIG	[kPa]	PSIG	[kPa]	PSIG	[kPa]	PSIG	[kPa]	GAL	[L]	GAL	[L]	IN	[mm]	IN	[mm]	
EX-1	MECH ROOM	CHILLED WATER	VERT DIAPHRAGM	500	[ 1900 ]	40	[ 4 ]	105	[ 41 ]	5	[ 35 ]	30	[ 210 ]	125	[ 860 ]		[   ]	5	[ 19 ]	20	[ 76 ]	6	[ 150 ]	1	[ 25 ]	
					[   ]						[   ]		[   ]		[   ]		[   ]		[   ]		[   ]		[   ]		[   ]	

DESIGNER NOTE

1. INCLUDE STRAINER

PROJECT:

BPUB LABORATORY FACILITY  
HVAC REPLACEMENT PROJECT

SHEET TITLE

BPUB LABORATORY BUILDING  
ROOM AIR BALANCES

JNB  
ENGINEERING

29798 COUNTY RD. 725; 956-454-6740  
LOS FRESNOS, TEXAS 78566

PROJECT #

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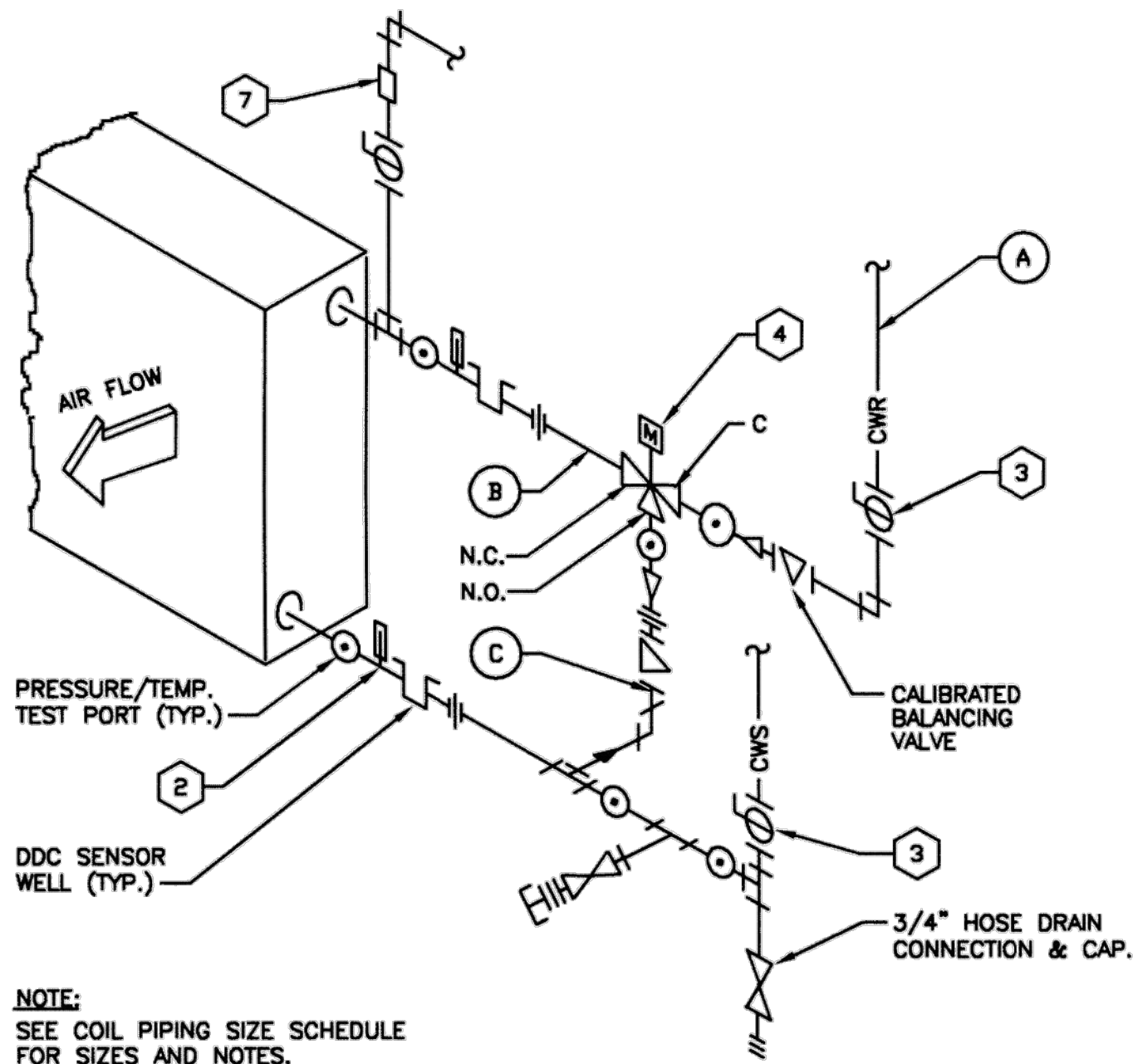
DATE:  
6-29-2022

SHEET  
9 OF 16



6/29/22





15  
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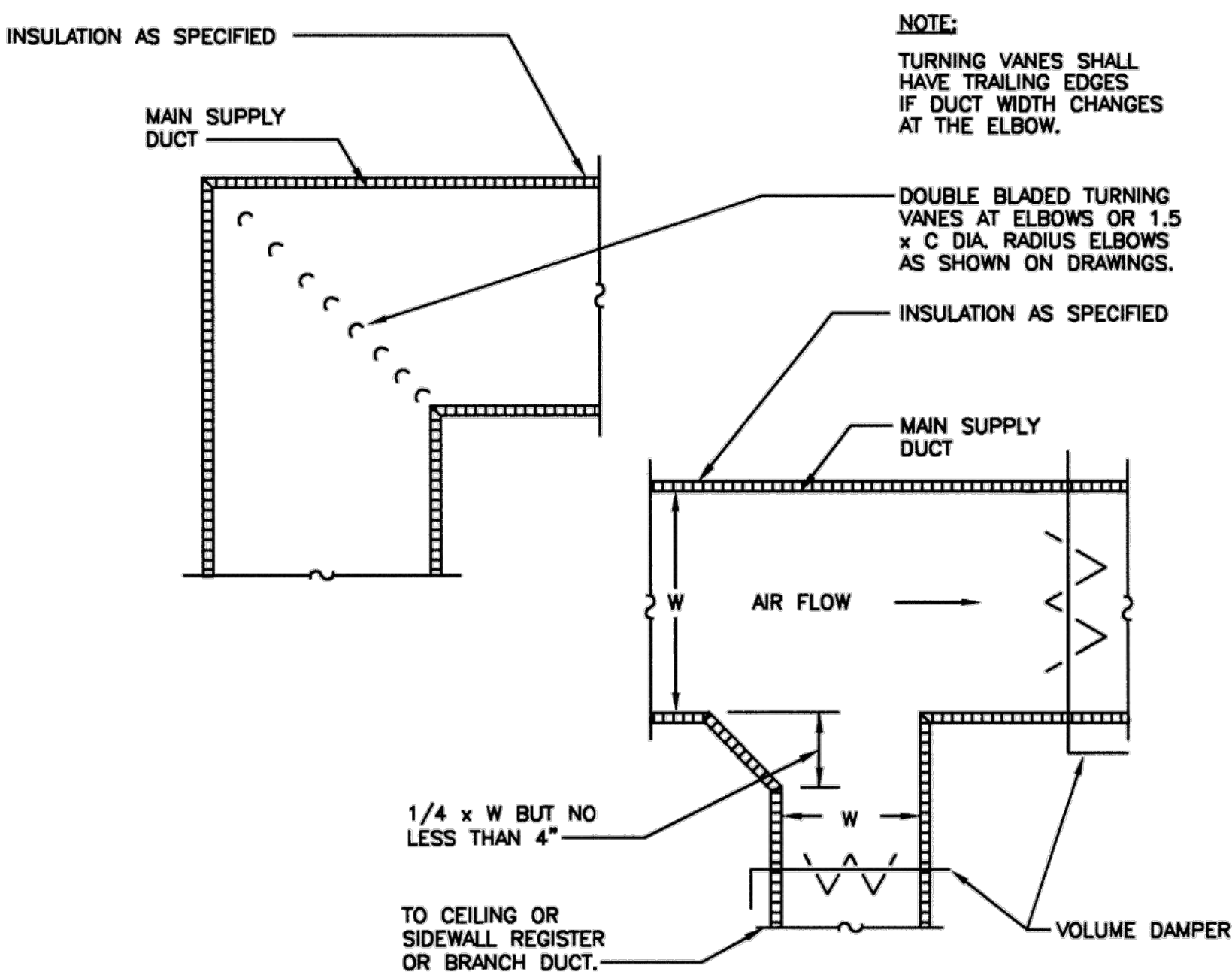
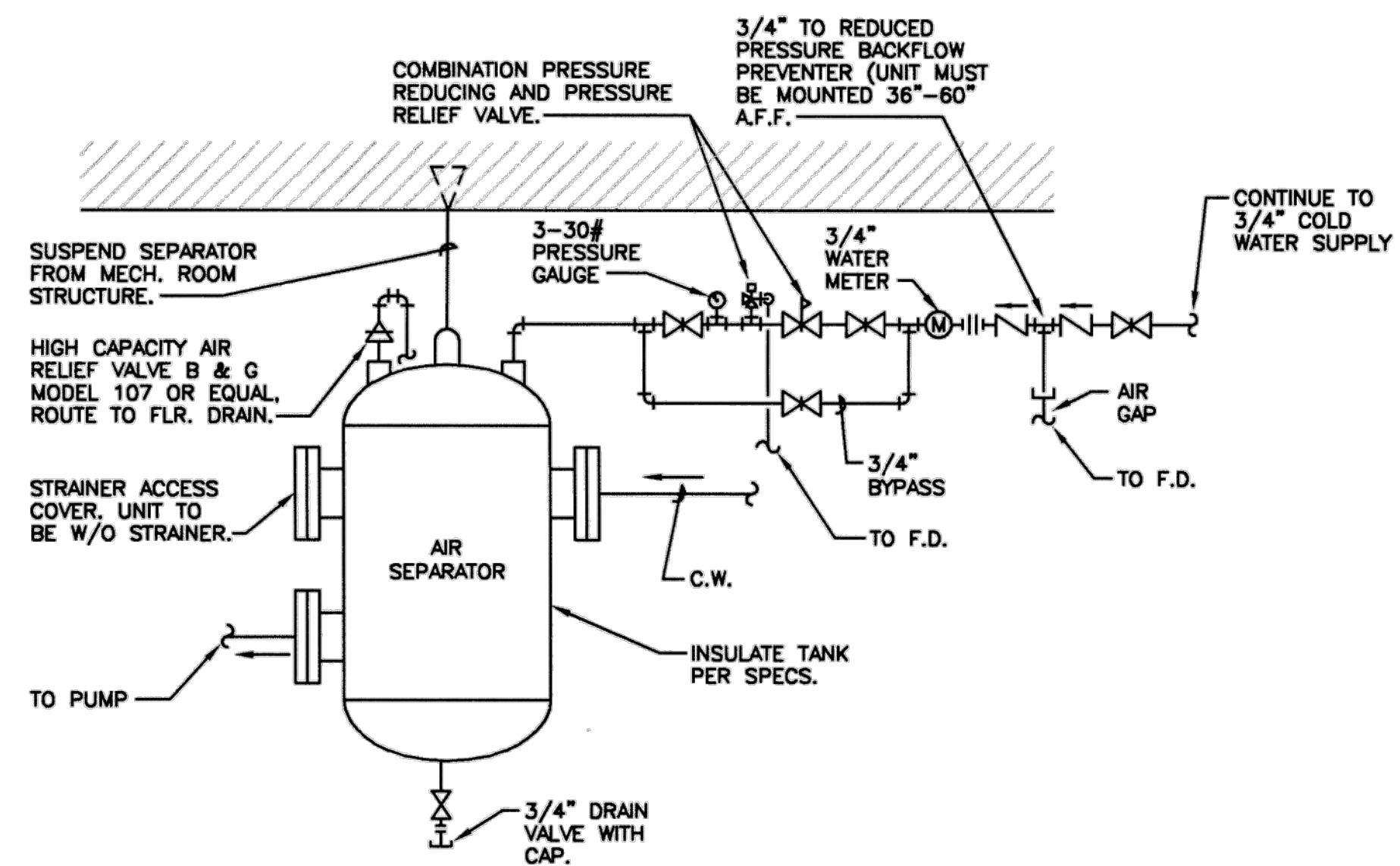
**CHILLED WATER COIL PIPING**  
SCALE: N.T.S.

SIZE SCHEDULE				
MARK NO.	CHILL H <sub>2</sub> O COILS			
	(A)	(B)	(C)	
AHU-1	3"	3"	1 1/2"	
AHU-2	4"	4"	2"	

- NOTES:**
- 1 NOT USED
  - 2 THERMOMETER WELL AND PETES PLUG TO BE INSTALLED FULLY ACCESSABLE.
  - 3 BALL OR BUTTERFLY ISOLATION VALVE DEPENDING ON SIZE.
  - 4 2-WAY MODULATING VALVE IS REQUIRED WHEN NO VALUE IS GIVEN FOR (C), AND SHALL BE INSTALLED IN SUPPLY LINE.
  - 5 PIPE ALL COILS FOR COUNTER FLOW WATER TO AIR HEAT EXCHANGE.
  - 6 LINE SIZE VALVES AND BYPASSES FOR COOLING COIL MAY BE USED AT THE CONTRACTORS OPTION.
  - 7 AUTOMATIC AIR VENT PIPED TO FLOOR DRAIN. PROVIDE WHEN MAINS ARE LOCATED BELOW COIL.

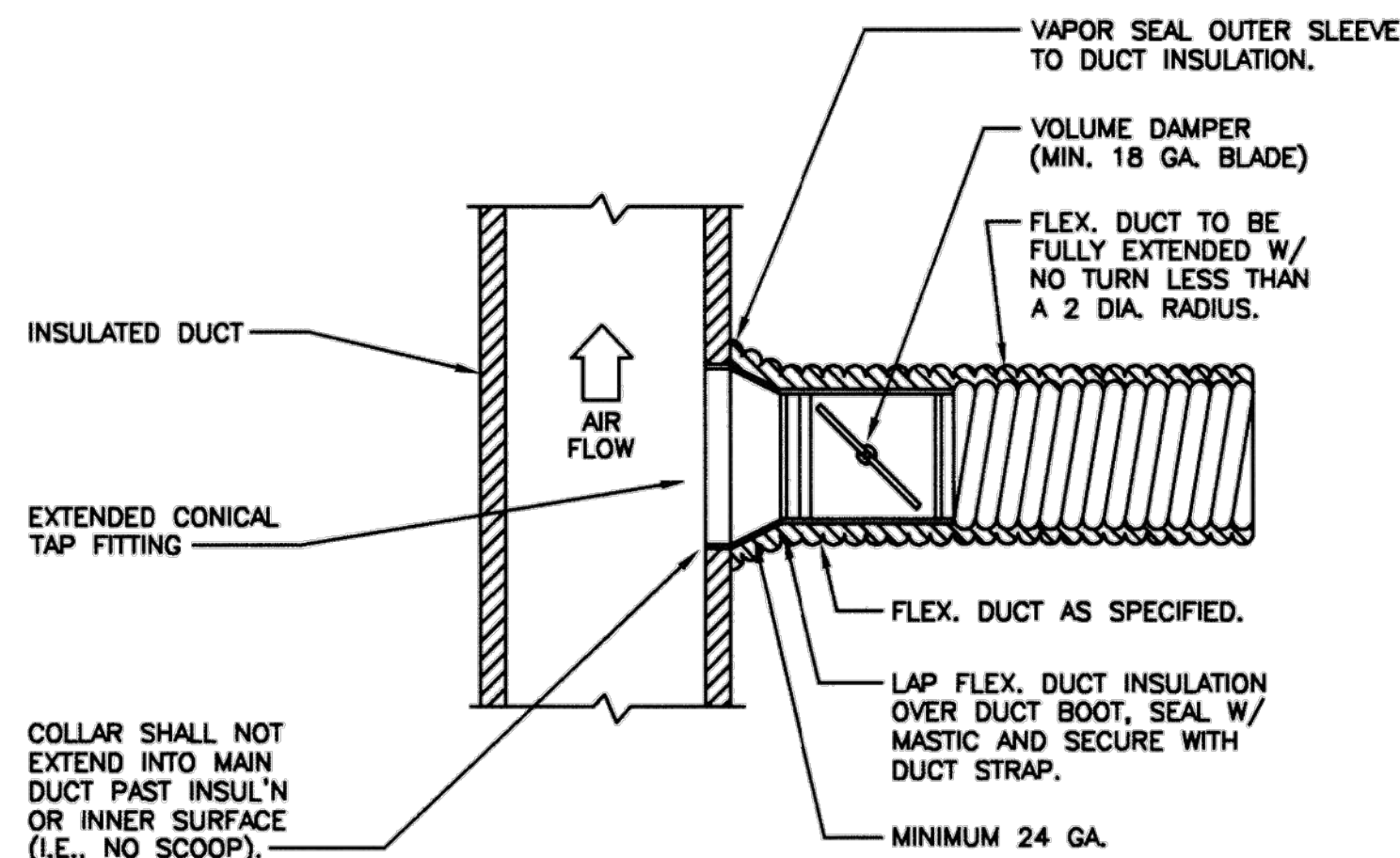
16  
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**COIL PIPING SIZE SCHEDULE AND NOTES**  
SCALE: N.T.S.



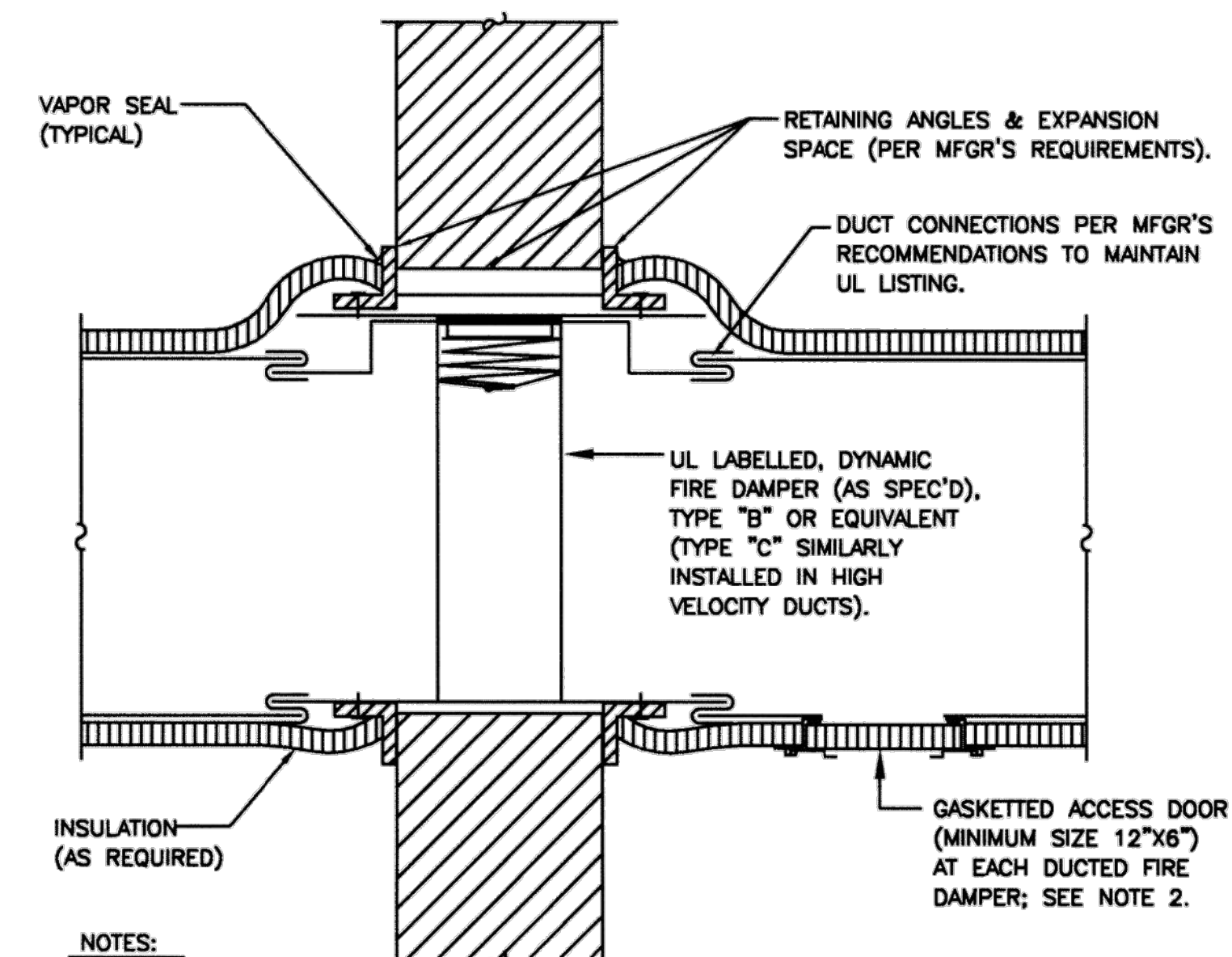
18  
10

**ELBOW AND DUCT TAKE-OFF**  
SCALE: N.T.S.



19  
10

**SPIN TAP**  
SCALE: N.T.S.



20  
10

**FIRE DAMPER**  
SCALE: N.T.S.



6/29/22

PROJECT:

BPUB LABORATORY FACILITY  
HVAC REPLACEMENT PROJECT

SHEET TITLE

HVAC DETAIL SHEET  
1 OF 4

J N B  
ENGINEERING

29798 COUNTY RD. 725; 956-454-6740  
LOS FRESNOS, TEXAS 78566

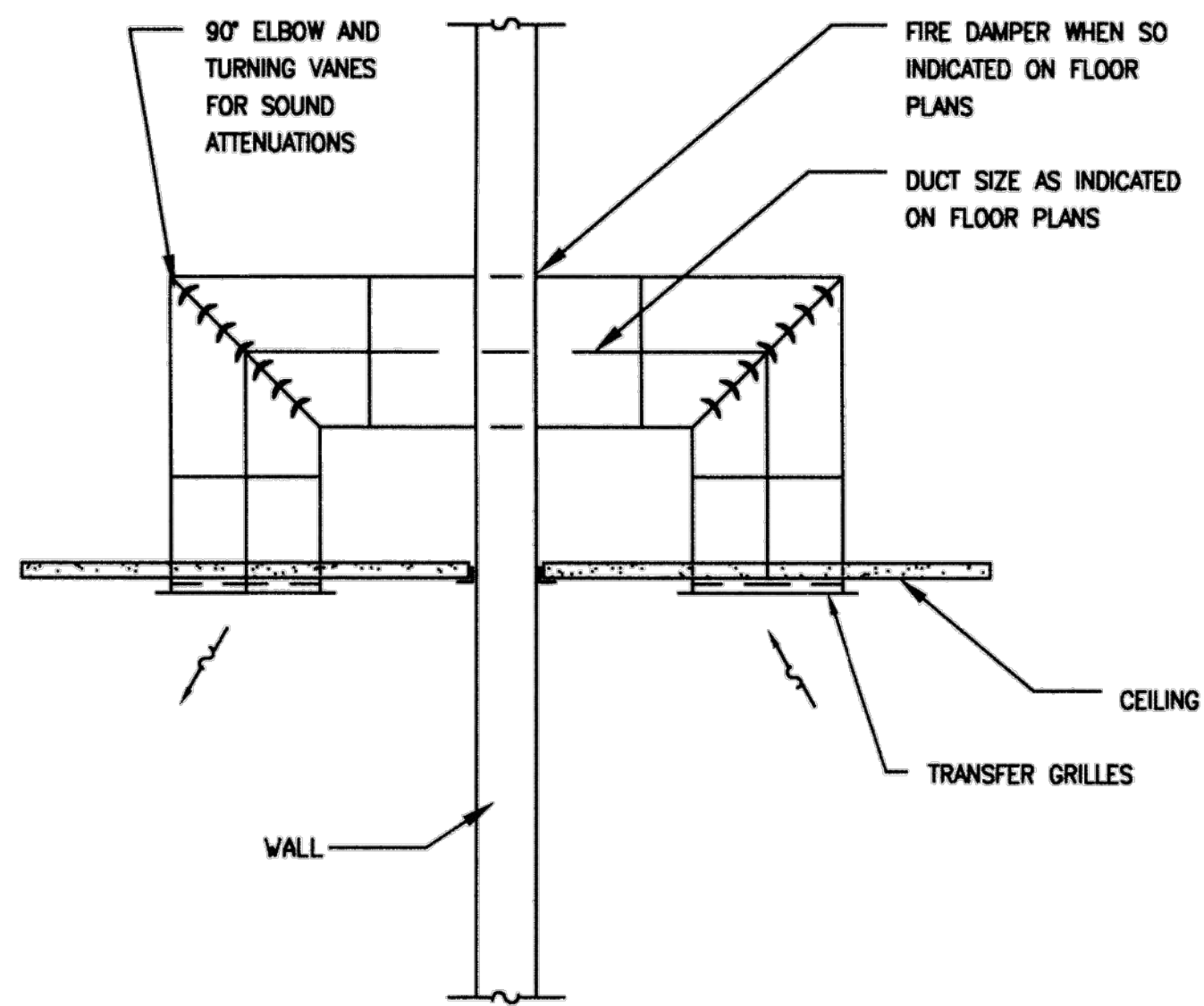
PROJECT #

DRAWN BY: AJM

DATE:  
6-29-2022

SHEET  
10 OF 16

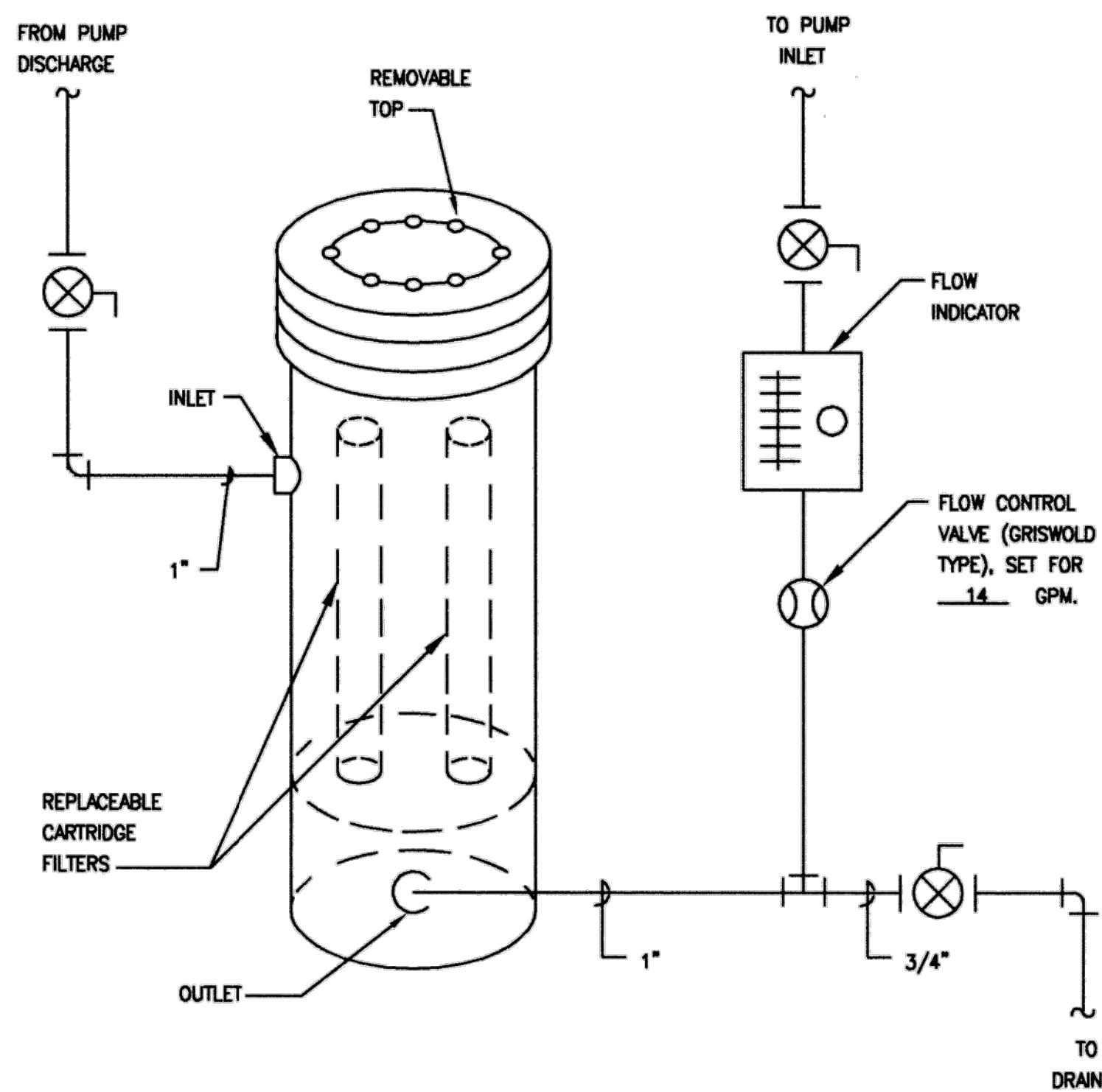




21  
11

TRANSFER GRILLE

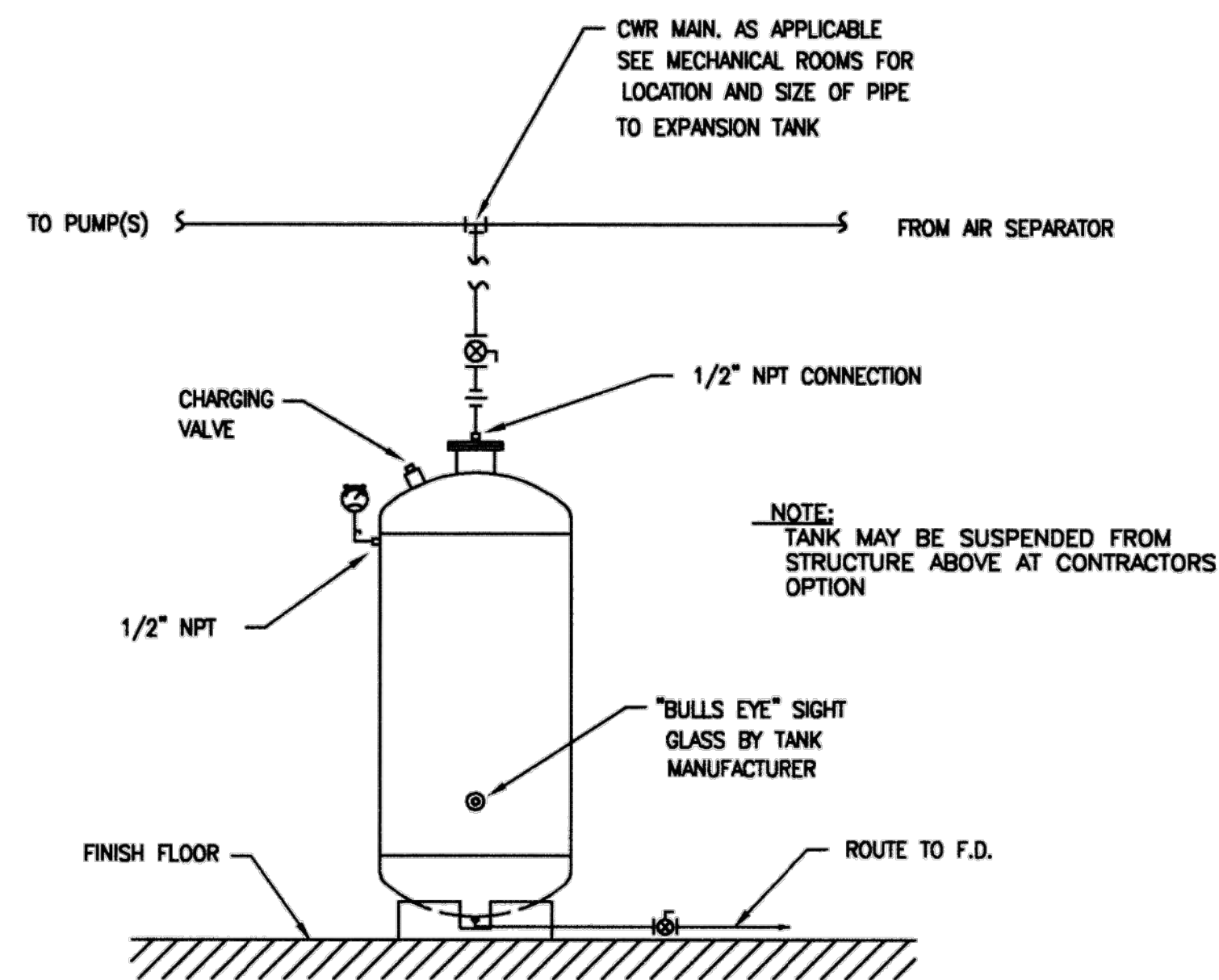
SCALE: N.T.S.



23  
11

FILTER FEEDER DETAIL

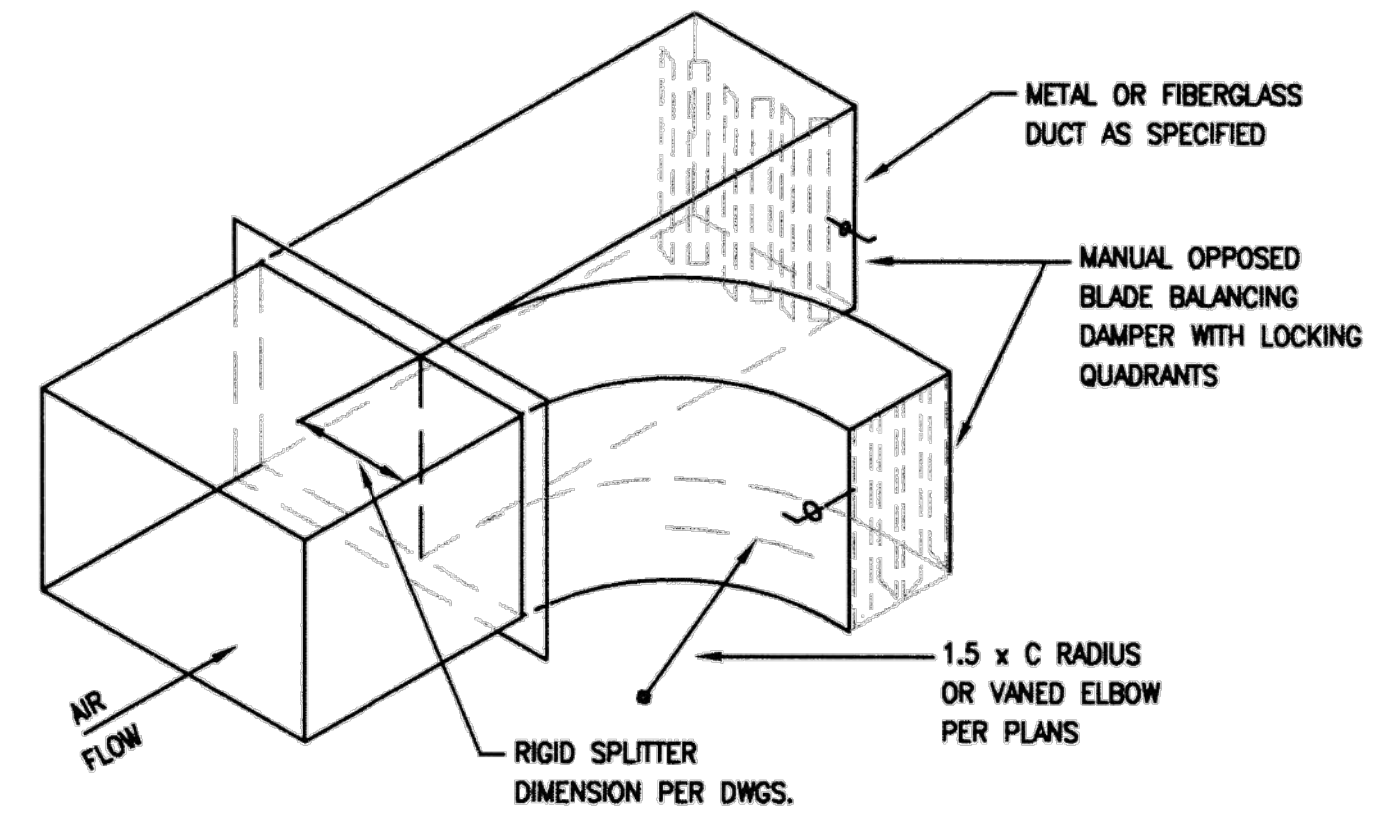
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24  
11

BLADDER - TYPE EXPANSION TANK

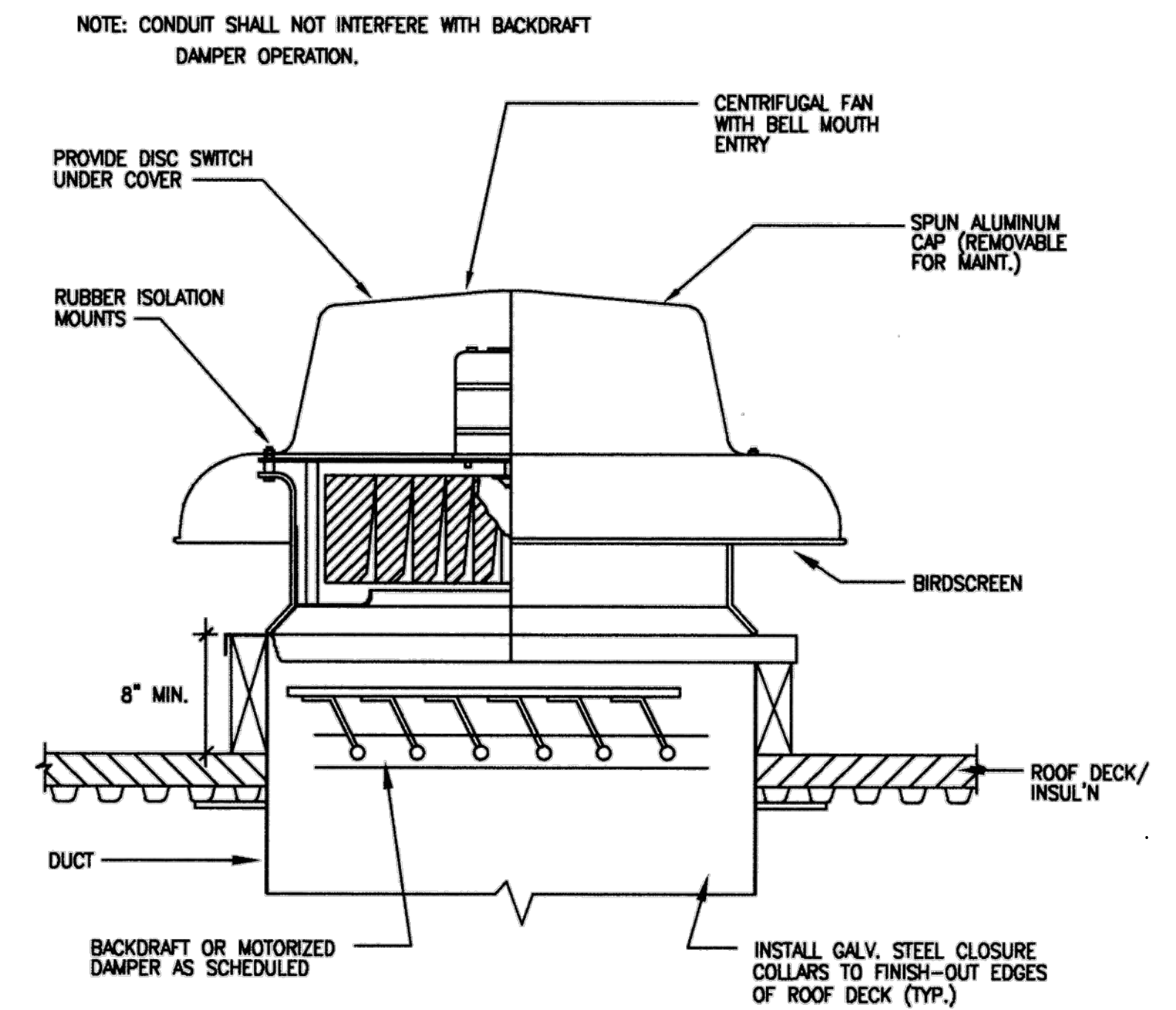
SCALE: N.T.S.



22  
11

DUCT SPLITTER DETAIL

SCALE: N.T.S.



25  
11

TYP. ROOF MOUNTED EXHAUST FAN DETAIL

SCALE: N.T.S.



6/29/22

PROJECT:

BPUB LABORATORY FACILITY  
HVAC REPLACEMENT PROJECT

SHEET TITLE

HVAC DETAIL SHEET  
2 OF 4

J N B  
ENGINEERING

29798 COUNTY RD. 725; 956-454-6740  
LOS FRESNOS, TEXAS 78566

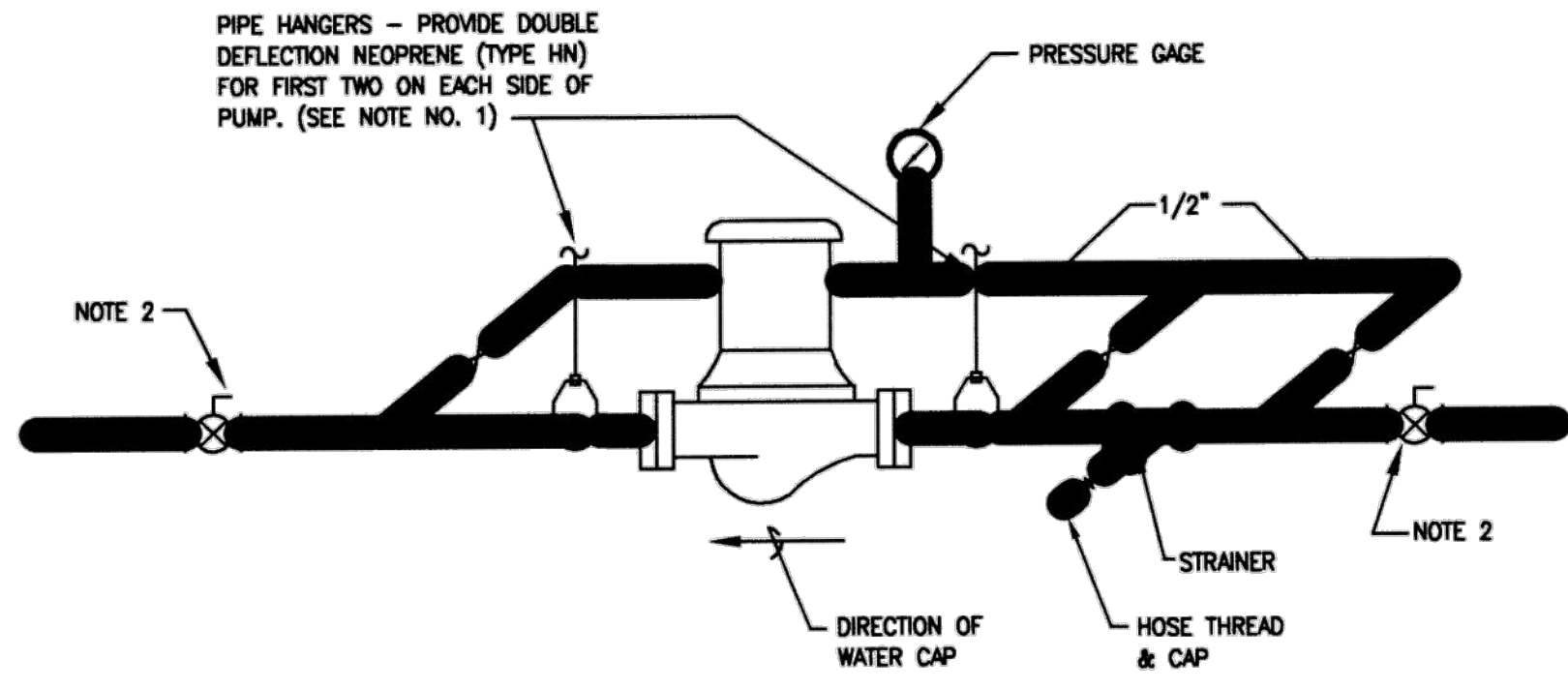
PROJECT #

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DATE:  
6-29-2022

SHEET  
11 OF 16



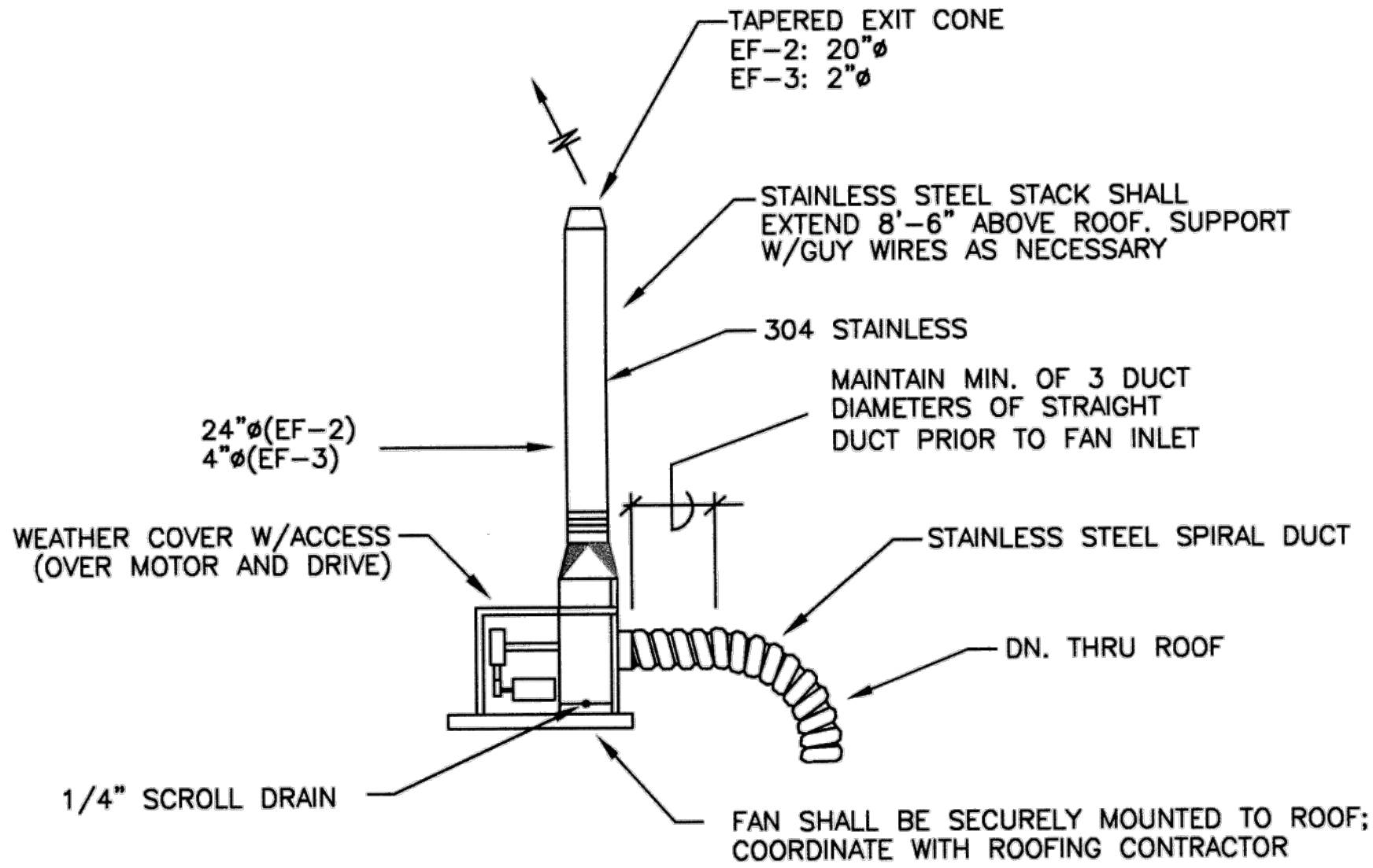


- NOTE:
1. SUPPORT PUMP FROM PIPING ONLY. DO NOT SUPPORT PUMP FROM MOTOR ON VERTICAL OR HORIZONTAL IN-LINE PUMPS.
  2. BALL VALVE TO 2", BUTTERFLY VALVE 2 1/2" & LARGER.

26  
12

IN-LINE PUMP DETAIL

SCALE: N.T.S.

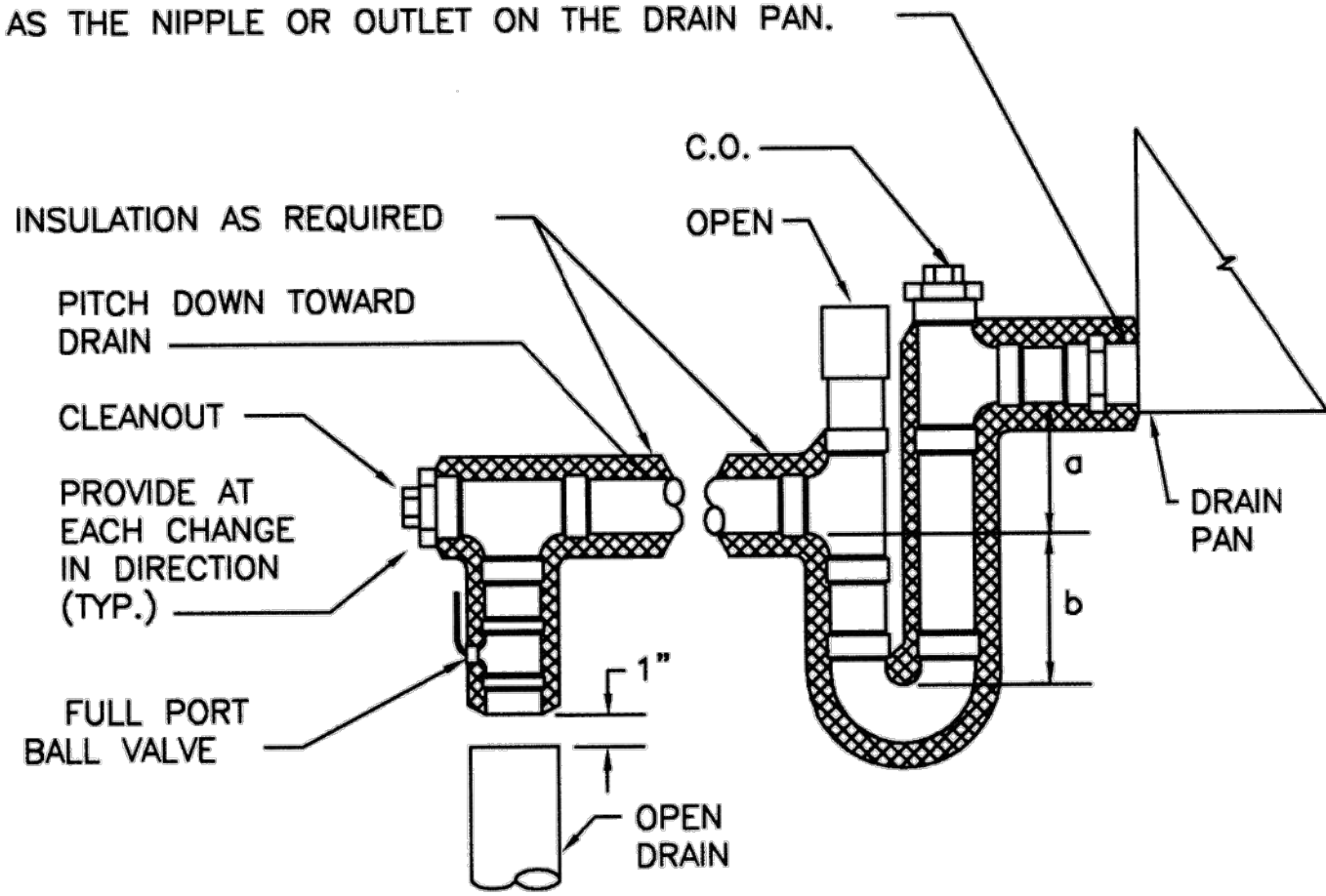


27  
12

LABORATORY EXHAUST FAN INSTALLATION

SCALE: N.T.S.

DRAIN LINE SHALL BE AT LEAST THE SAME SIZE AS THE NIPPLE OR OUTLET ON THE DRAIN PAN.



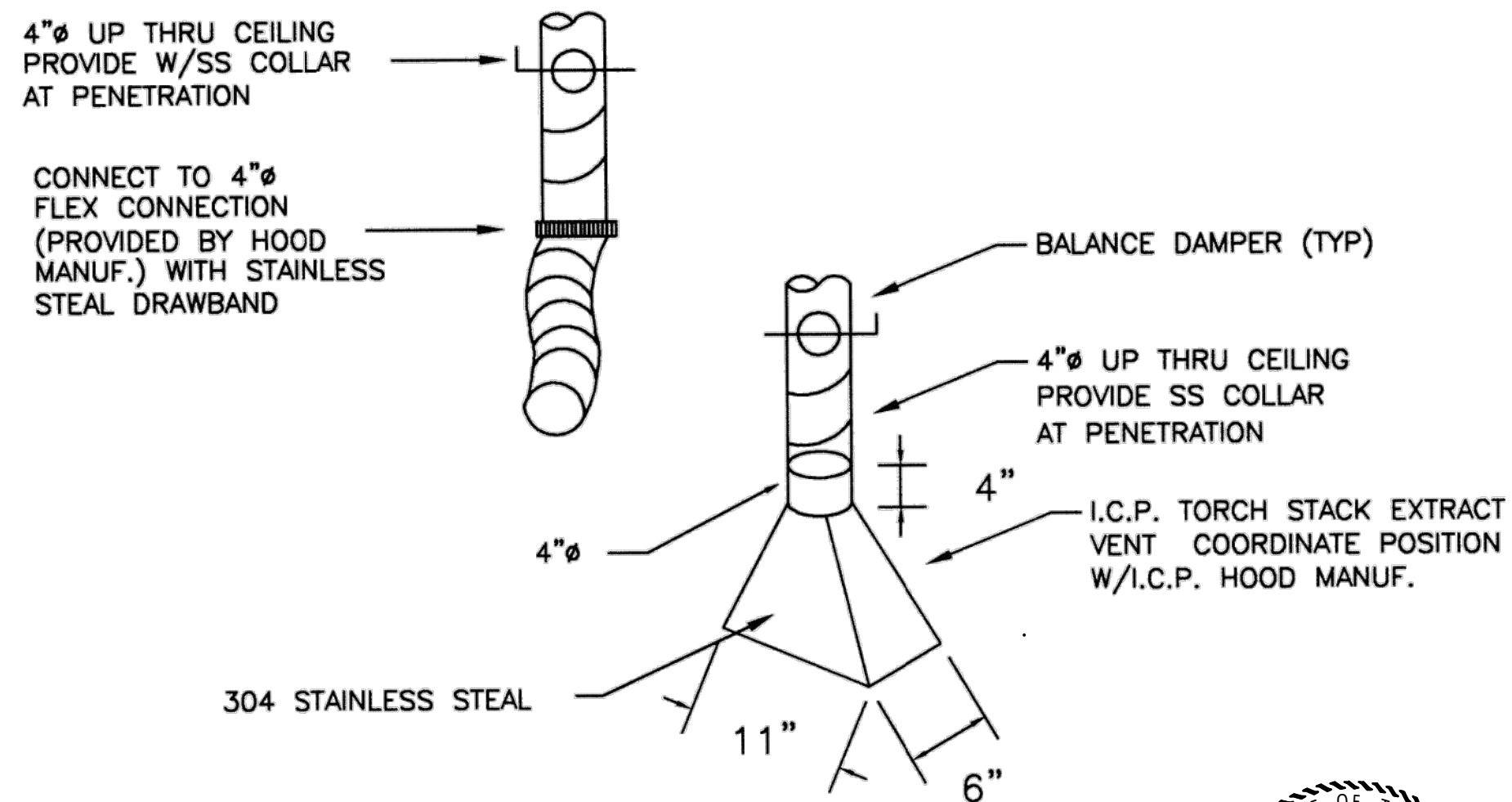
UNIT STATIC PRESS.	a	b
0"-1"	1"	3"
1"-2"	2"	4"
2"-3"	3"	5"

- NOTES:
1. FOR DEPTH OF SEAL, SEE SCHEDULE BELOW.
  2. LOCATE TRAP SO AS TO BE ACCESSIBLE FOR CLEANING.
  3. PROVIDE ADEQUATE AHU HEIGHT TO ALLOW FOR TRAP HEIGHT.

28  
12

AIR HANDLING UNIT DRAIN TRAP

SCALE: N.T.S.



29  
12

I.C.P. HOOD

SCALE: N.T.S.



6/29/22

PROJECT:

BPUB LABORATORY FACILITY  
HVAC REPLACEMENT PROJECT

SHEET TITLE

HVAC DETAIL SHEET  
3 OF 4

J N B  
ENGINEERING

29798 COUNTY RD. 725, 956-454-6740  
LOS FRESNOS, TEXAS 78566

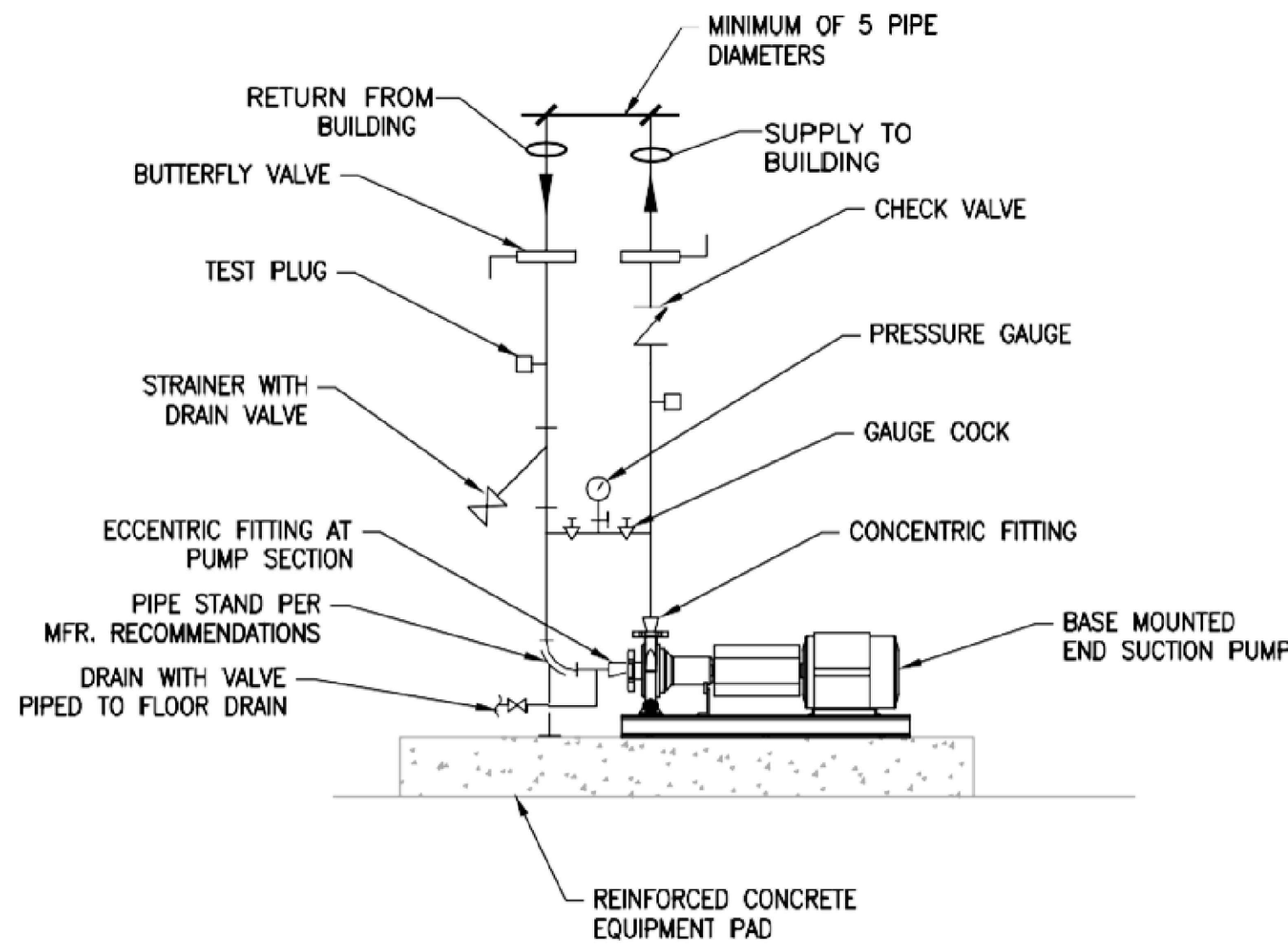
PROJECT #

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6-29-2022

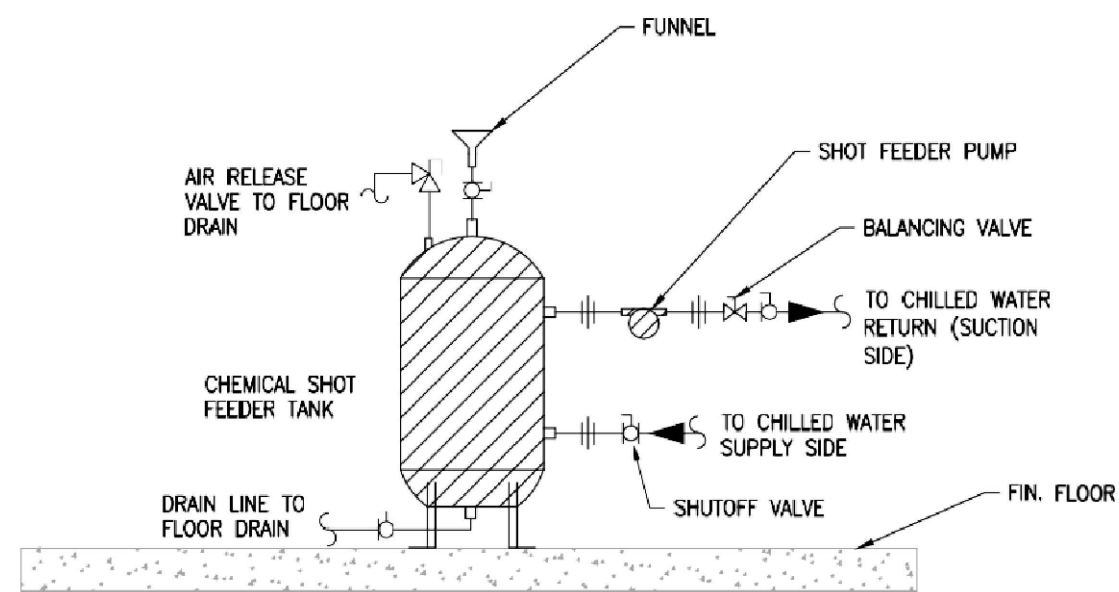
SHEET  
12 OF 16





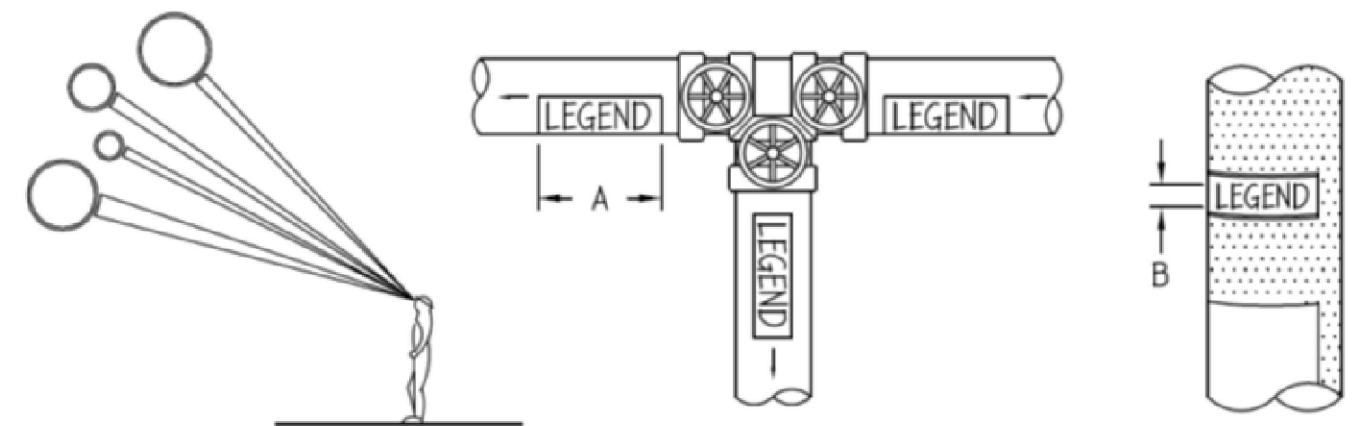
30  
13

**END SUCTION PUMP DETAIL**  
SCALE: N.T.S.



31  
13

**SHOT FEEDER - CHEMICAL TREATMENT DETAIL**  
SCALE: N.T.S.



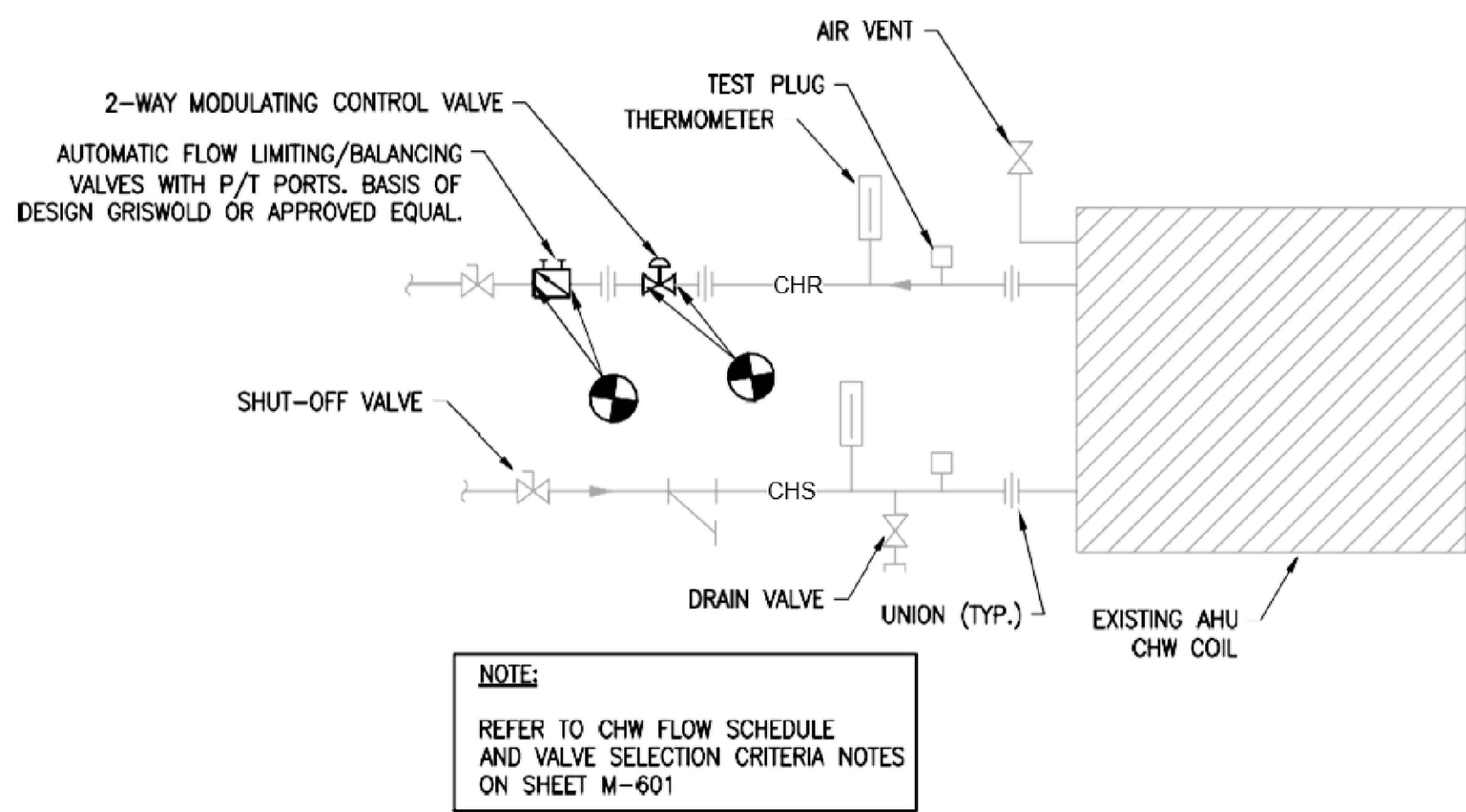
**NOTE:**  
IDENTIFICATION MARKERS OR STRIPS TO BE PLACED ON ALL EXPOSED COVERED AND UNCOVERED PIPES AT 50'-0" INTERVALS, ADJACENT TO ALL VALVES OR BRANCHES, AND AT BOTH SIDES OF WALL/FLOOR PENETRATIONS. ARROWS OF SAME COLOR AS IDENTIFICATION MARKERS SHALL ALSO BE PLACED ON PIPES POINTING AWAY FROM MARKER INDICATING DIRECTION OF FLOW.

SIZE OF LEGEND LETTERS		
OUTSIDE DIAMETER OF PIPE OR COVERING	LENGTH OF COLOR FIELD A	SIZE OF LETTERS B
3/4" TO 1 1/4"	8"	1/2"
1 1/2" TO 2"	8"	3/4"
2" 1/2" TO 6"	12"	1 1/4"

SERVICE	BACKGROUND OR COLOR BAND	LETTER COLOR
CHILLED WATER SUPPLY	SAFETY GREEN	WHITE
CHILLED WATER RETURN	SAFETY GREEN	WHITE
CONDENSER WATER RETURN	SAFETY GREEN	WHITE
CONDENSER WATER SUPPLY	SAFETY GREEN	WHITE
MAKE-UP WATER	SAFETY GREEN	WHITE

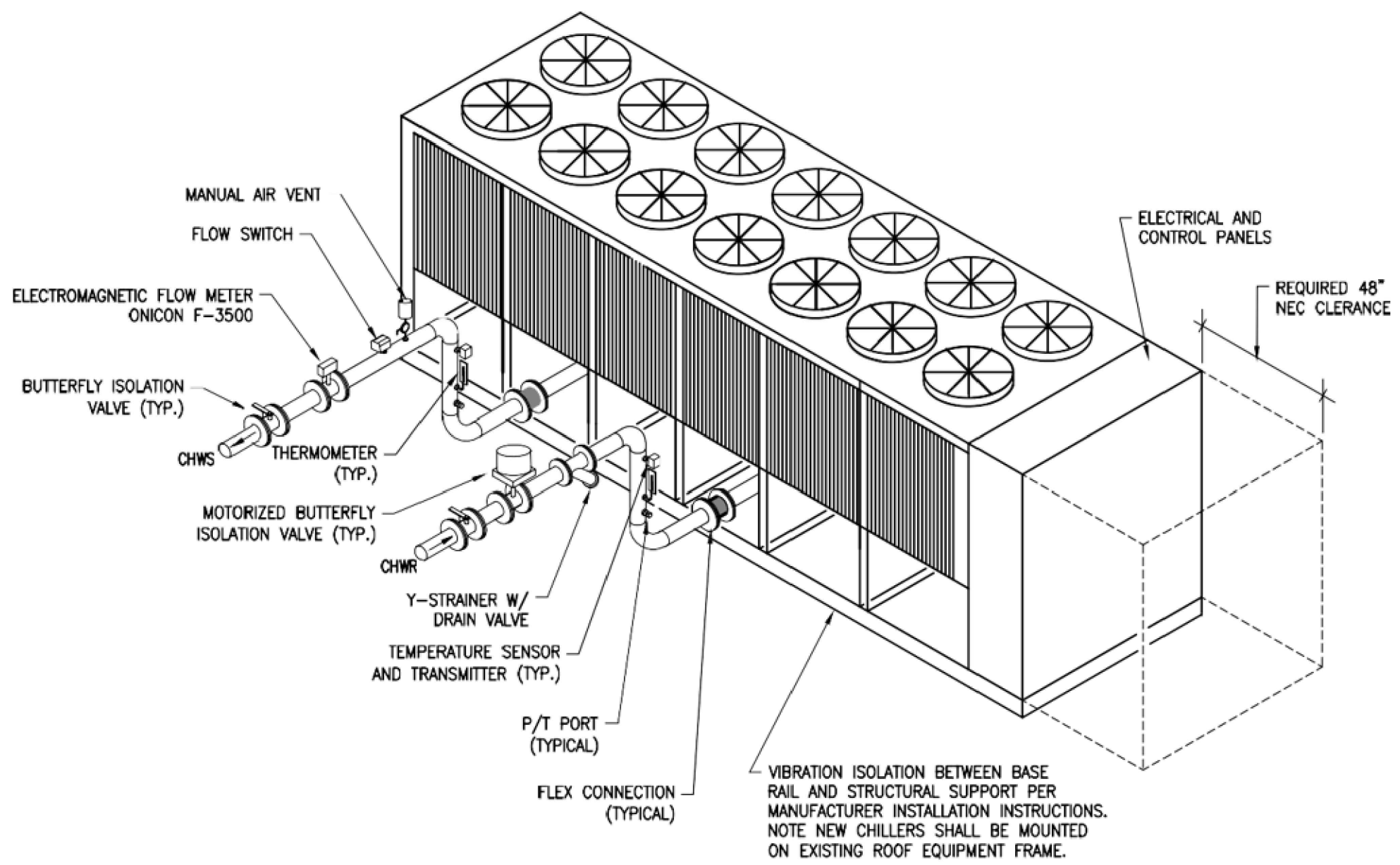
32  
13

**TYPICAL PIPE IDENTIFICATION MARKERS**  
SCALE: N.T.S.



33  
13

**COIL PIPING DETAIL (3-WAY)**  
SCALE: N.T.S.



34  
13

**AIR-COOLED CHILLER PIPING DETAIL**  
SCALE: N.T.S.



6/29/22

PROJECT:

BPUB LABORATORY FACILITY  
HVAC REPLACEMENT PROJECT

SHEET TITLE

HVAC DETAIL SHEET  
4 OF 4

J N B  
ENGINEERING

29798 COUNTY RD. 725; 956-454-6740  
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PROJECT #

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6-29-2022

SHEET  
13 OF 16





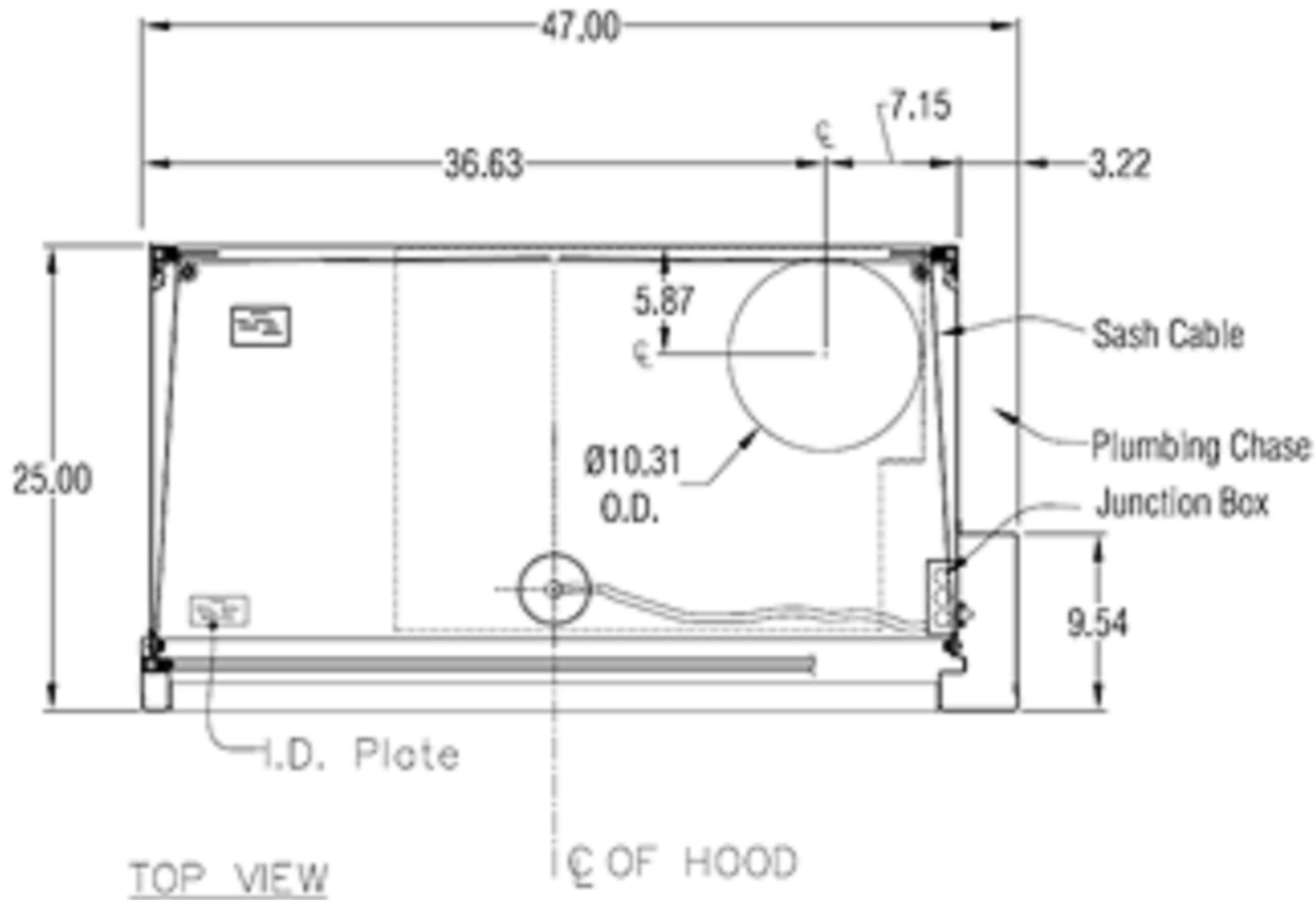
35  
14

GENERAL CHEMISTRY LAB AREA FUME HOOD



36  
14

IPC ROOM FUME HOOD



**DETAILS**  
FULLY ASSEMBLED. HOOD INTERIOR AND EXTERIOR ARE CONSTRUCTED OF GLACIER WHITE, 16 GAUGE, EPOXY STEEL. HOOD INCLUDES 3/16"THICK CLEAR TEMPERED SAFETY GLASS COUNTERBALANCED SASH AND 10 5/16" OD DUCT COLLAR FOR CONNECTION TO THE EXHAUST SYSTEM. HOOD INCLUDES A REMOVABLE FRONT PANEL, AIR FOIL AND TWO-PIECE ADJUSTABLE BAFFLE. THE RIGHT SIDE FIXTURE PANEL IS FACTORY PREPARED TO ACCEPT UP TO THREE SERVICE FIXTURES, ONE FRONT MOUNTED DUPLEX ELECTRICAL RECEPTACLE, AND ONE SIDE WALL-MOUNTED CUP SINK WITH TURRET. THE HOOD LINER IS FACTORY PREPARED FOR TWO APPARATUS RODS.

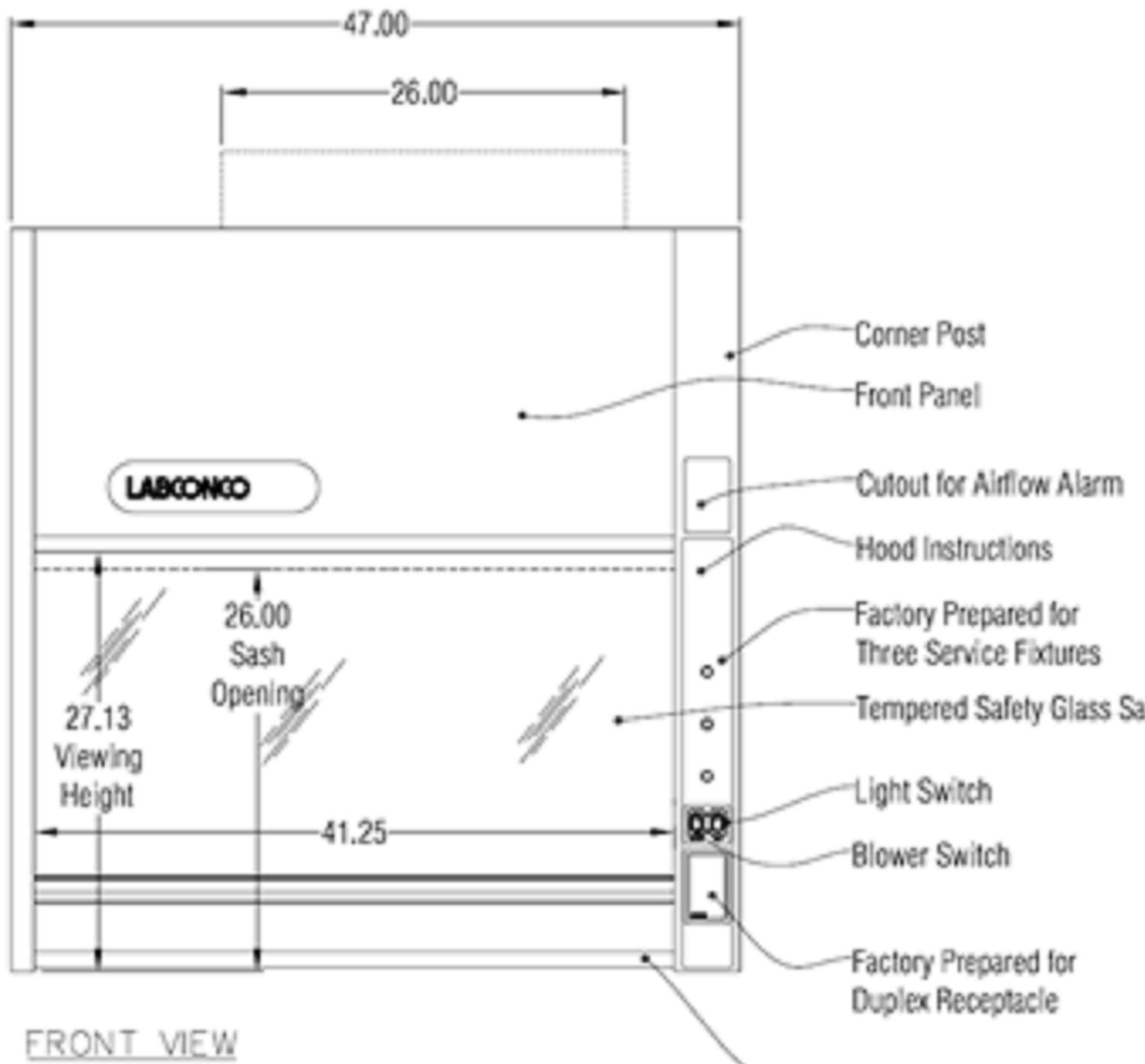
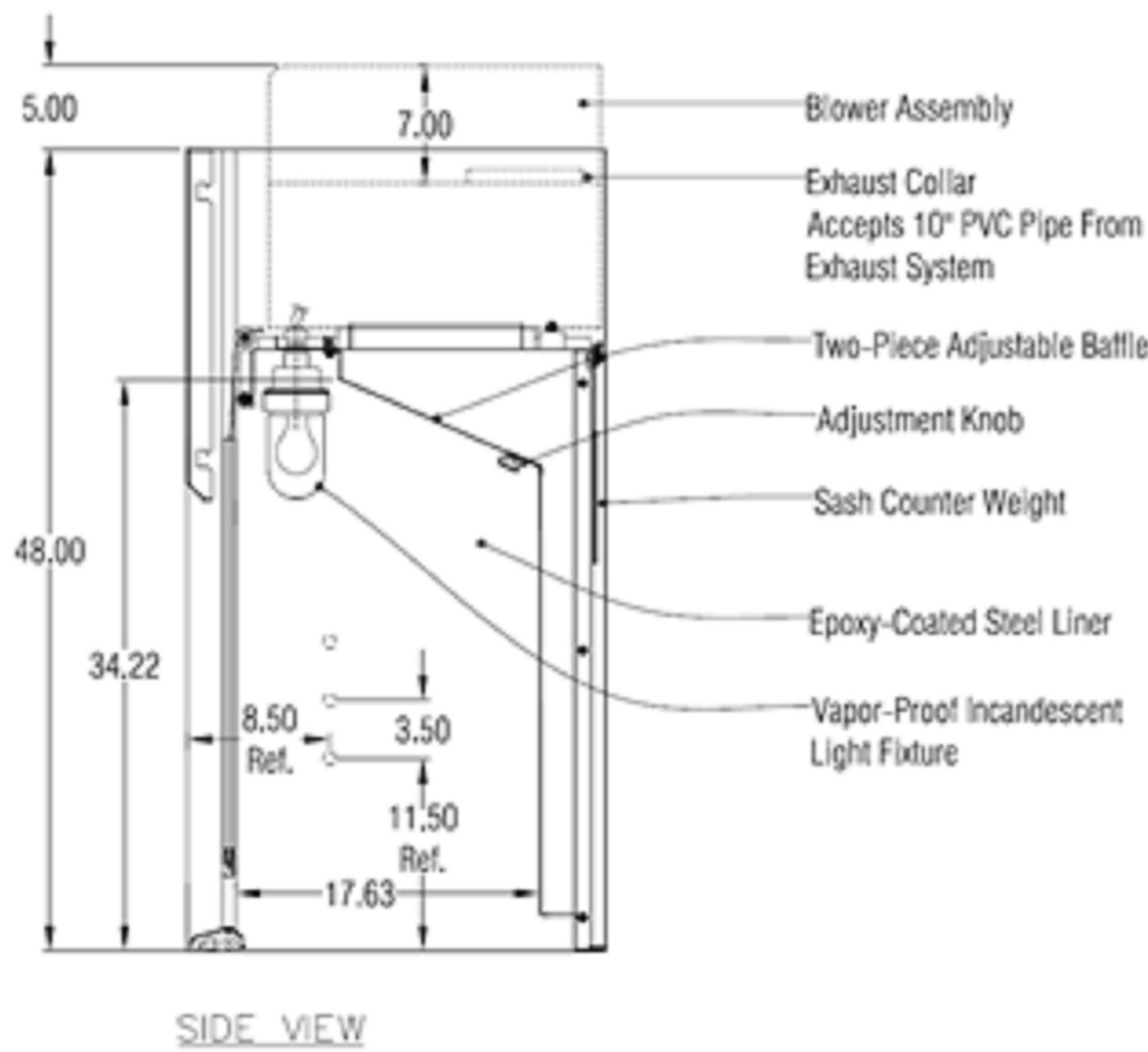
**DIMENSIONS**  
47"W X 25"D X 48"H

**ELECTRICAL**  
115 VOLTS, SINGLE PHASE, 60 Hz, 6.8 AMP HOOD INCLUDES 100 WATT VAPOR-PROOF INCANDESCENT LIGHT FIXTURE, INTERNAL WIRING AND SWITCHES.

**PERFORMANCE**  
OVERCOMES EXTERNAL STATIC PRESSURE: .25" @ 100 FPM (720 CFM)

**SHIPPING WEIGHT**  
375 LBS.

**NOTES:**  
HOOD HAS A 1/3 HP BLOWER FOR OPERATION



SHEET TITLE

LAB FUME HOODS

J N B  
ENGINEERING

29798 COUNTY RD. 725; 956-454-6740  
LOS FRESNOS, TEXAS 78566

PROJECT #

DRAWN BY: AJM

DATE:  
6-29-2022

SHEET  
14 OF 16







37  
15

EXTERIOR MECH ROOM - AHU - 2



38  
15

ACC-1 AND CHILLER PUMP P-1



39  
15

ACC-1 AND ACC-2



40  
15

ACC-1 AND ACC-2



41  
15

CWS AND SWR PIPING



42  
15

CWS AND SWR PIPING



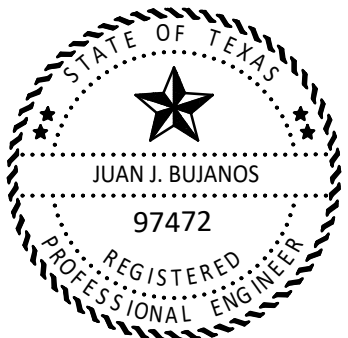
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ELECTRICAL, CWS AND CWR PIPING



44  
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AREA VIEW OF EXTERIOR CHILLER LAYOUTS



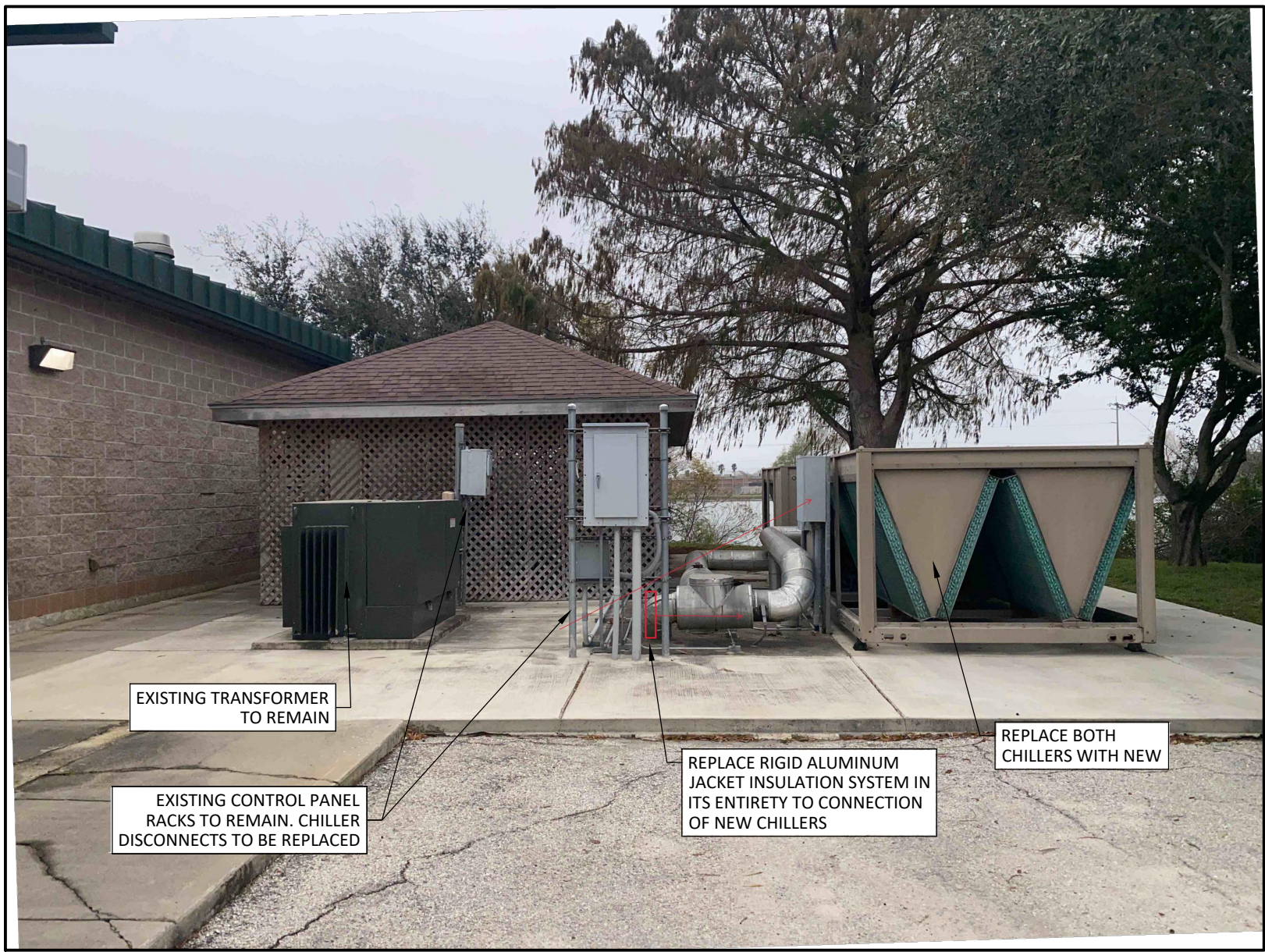
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REMOVE AND REPLACE PRESSURE GAUGES, SHOT OFF VALVE AND INSULATION SYSTEMS

45  
16 AHU-1



EXISTING TRANSFORMER TO REMAIN

EXISTING CONTROL PANEL RACKS TO REMAIN. CHILLER DISCONNECTS TO BE REPLACED

REPLACE RIGID ALUMINUM JACKET INSULATION SYSTEM IN ITS ENTIRETY TO CONNECTION OF NEW CHILLERS

REPLACE BOTH CHILLERS WITH NEW

46  
16 EXTERIOR CHILLERS



REPLACE EXHAUST FANS, DISCONNECTS AND DUCT SYSTEMS

REPLACE CHILLERS, CHILLED WATER PUMPS, PIPING, VALVES, SENSORS, INSULATION SYSTEMS, CHILLER DISCONNECTS AND WIRING.

47  
16 EXTERIOR CHILLERS AND ROOFTOP EXHAUST FANS



REMOVE AND REPLACE AHU-1, VARIABLE SPEED DRIVE (VSD), ASSOCIATED INTAKE AIR DUCT, FIRE AND SMOKE ACTUATOR DAMPERS, DUCTWORK AND INSULATION SYSTEMS, CABLE TRAY, J-BOXES, CONDUITS AND WIRE. PRESSURE GUAGES, ISOLATION SHUT OFF VALVES.

48  
16 AHU-1



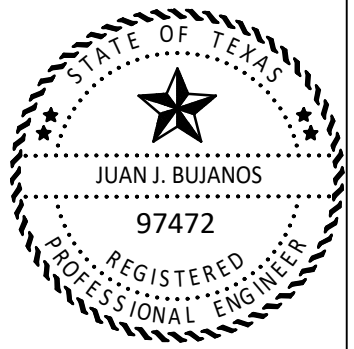
AND REPLACE CHILLERS, CHILLED WATER PUMPS, BUTTERFLY VALVES, PRESSURE GAUGES, INSULATION SYSTEMS, CONDUITS, WIRING, UNISTRUT BASES, FITTINGS.

49  
16 CHILLERS ACC-1 & ACC-2



REPLACE AHU-2, ACTUATED FIRE AND DAMPERS, J-BOXES, CONDUITS AND WIRING

50  
16 AHU-2



6/29/22

PROJECT:  
BPUB LABORATORY FACILITY  
HVAC REPLACEMENT PROJECT

SHEET TITLE  
DEMOLITION PLAN

J N B  
ENGINEERING  
29798 COUNTY RD. 725; 956-454-6740  
LOS FRESNOS, TEXAS 78566

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