

“IOR Certification Code/Plans Questions” Part 1 Mechanical/Plumbing



Mechanical/Plumbing



Code

- Class A 10 Questions
- Class B 12 Questions



Sample Mechanical Question

In Fuel Gas Piping, per Pressure Testing and Inspection, The minimum test pressure and test duration for a hospital with fuel gas piping at house pressure shall be not less than:

- a) 3 psi for 30 minutes
- b) 5 psi for 15 minutes
- c) 10 psi for 15 minutes
- d) 5 psi for 30 minutes

• How to look for the response? 



• Sample #3- in CMC where is Fuel Gas Piping?

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FORMAT OF THE UNIFORM MECHANICAL CODE

The format of the *Uniform Mechanical Code* (UMC) arranges each chapter in accordance with a specific subject matter. However, Chapter 3 is dedicated to general requirements that are applicable to every chapter. The subject matters are divided as follows:

CHAPTERS	SUBJECTS
1	Administration
2	Definitions
3	General Regulations
4	Ventilation Air
5	Exhaust Systems
6	Duct Systems
7	Combustion Air
8	Chimneys and Vents
9	Installation of Specific Appliances
10	Boilers and Pressure Vessels
11	Refrigeration
12	Hydronics
13	Fuel Gas Piping
14	Process Piping
15	Solar Energy Systems
16	Stationary Power Plants
17	Referenced Standards
Appendix A	Residential Plan Examiner Review Form for HVAC System Design
Appendix B	Procedures to be Followed to Place Gas Equipment in Operation
Appendix C	Installation and Testing of Oil (Liquid) Fuel-Fired Equipment
Appendix D	Fuel Supply: Manufactured/Mobile Home Parks and Recreational Vehicle Parks
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1313.3 Test Pressure. This inspection shall include an air, CO₂, or nitrogen pressure test, at which time the gas piping shall stand a pressure of not less than 10 psi (69 kPa) gauge pressure. Test pressures shall be held for a length of time satisfactory to the Authority Having Jurisdiction but in no case less than 15 minutes with no perceptible drop in pressure. For welded piping, and for piping carrying gas at pressures in excess of 14 inches water column (3.5 kPa) pressure, the test pressure shall be not less than 60 psi (414 kPa) and shall be continued for a length of time satisfactory to the Authority Having Jurisdiction, but in no case for less than 30 minutes. For CSST carrying gas at pressures in excess of 14 inches water column (3.5 kPa) pressure, the test pressure shall be 30 psi (207 kPa) for 30 minutes. These tests shall be made using air, CO₂, or nitrogen pressure and shall be made in the presence of the Authority Having Jurisdiction. Necessary apparatus for conducting tests shall be furnished by the permit holder. Test gauges used in conducting test shall be in accordance with Section 1303.3.3.1 through Section 1303.3.3.4.

Response:

- a) 3 psi for 30 minutes
- b) 5 psi for 15 minutes
- c) 10 psi for 15 minutes
- d) 5 psi for 30 minutes



Plan

- Class A 13 Questions
- Class B 9 Questions



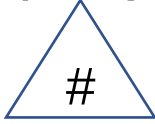
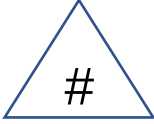
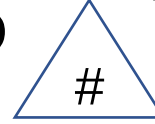
Mechanical/Plumbing Plan Questions

- Let's analyze the questions with the correct responses...
- How to read/interpret the question
- How to arrive to a response (sometimes it is easy, sometimes it is not easy)
- Remember: Plans are not perfect. And this is why RFIs exist during construction



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- Drawing Content (Original set, RFI, ASI, ACD)

• delta symbol RFI  ASI  ACD 
RFI# ASI# ACD#

- Depending on the size and complexity of the project
- the information provided on the fire and life safety drawings **should provide a clear description of how the project complies with the various provisions of the CBC.** Some of the general information for the project may also appear on the drawing title sheet.
- Also, much of the specific information will be contained in the body of drawing details and schedules.



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Z	Contractor / Shop Drawings
O	Operations



Sheet Types

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3	Sections
4	Large Scale Drawings: plans, elevations, sections (NOT details)
5	Details
6	Schedules and Diagrams
7	User Defined
8	User Defined
9	3D drawings: isometric, perspective, photos



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SR M5 SEISMIC RESTRAINT MECHANICAL DETAIL
SR E1 SEISMIC RESTRAINT ELECTRICAL DETAIL
SR E2 SEISMIC RESTRAINT ELECTRICAL DETAIL
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SEISMIC RESTRAINT

SR A1 SEISMIC RESTRAINT ARCHITECTURAL DETAIL
SR A2 SEISMIC RESTRAINT ARCHITECTURAL DETAIL
SR A3 SEISMIC RESTRAINT ARCHITECTURAL DETAIL
SR A4 SEISMIC RESTRAINT ARCHITECTURAL DETAIL
SR A5 SEISMIC RESTRAINT ARCHITECTURAL DETAIL
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SR A12 SEISMIC RESTRAINT ARCHITECTURAL DETAIL
SR C1 SEISMIC RESTRAINT GENERAL DETAIL
SR M1 SEISMIC RESTRAINT MECHANICAL DETAIL
SR M2 SEISMIC RESTRAINT MECHANICAL DETAIL
SR M3 SEISMIC RESTRAINT MECHANICAL DETAIL
SR M4 SEISMIC RESTRAINT MECHANICAL DETAIL
SR M5 SEISMIC RESTRAINT MECHANICAL DETAIL
SR E1 SEISMIC RESTRAINT ELECTRICAL DETAIL
SR E2 SEISMIC RESTRAINT ELECTRICAL DETAIL
SR E3 SEISMIC RESTRAINT ELECTRICAL DETAIL
SR P1 SEISMIC RESTRAINT PLUMBING DETAIL



What to remember

- Notes
- Key Words
- Typical Details
- General Notes
- Look into all the disciplines

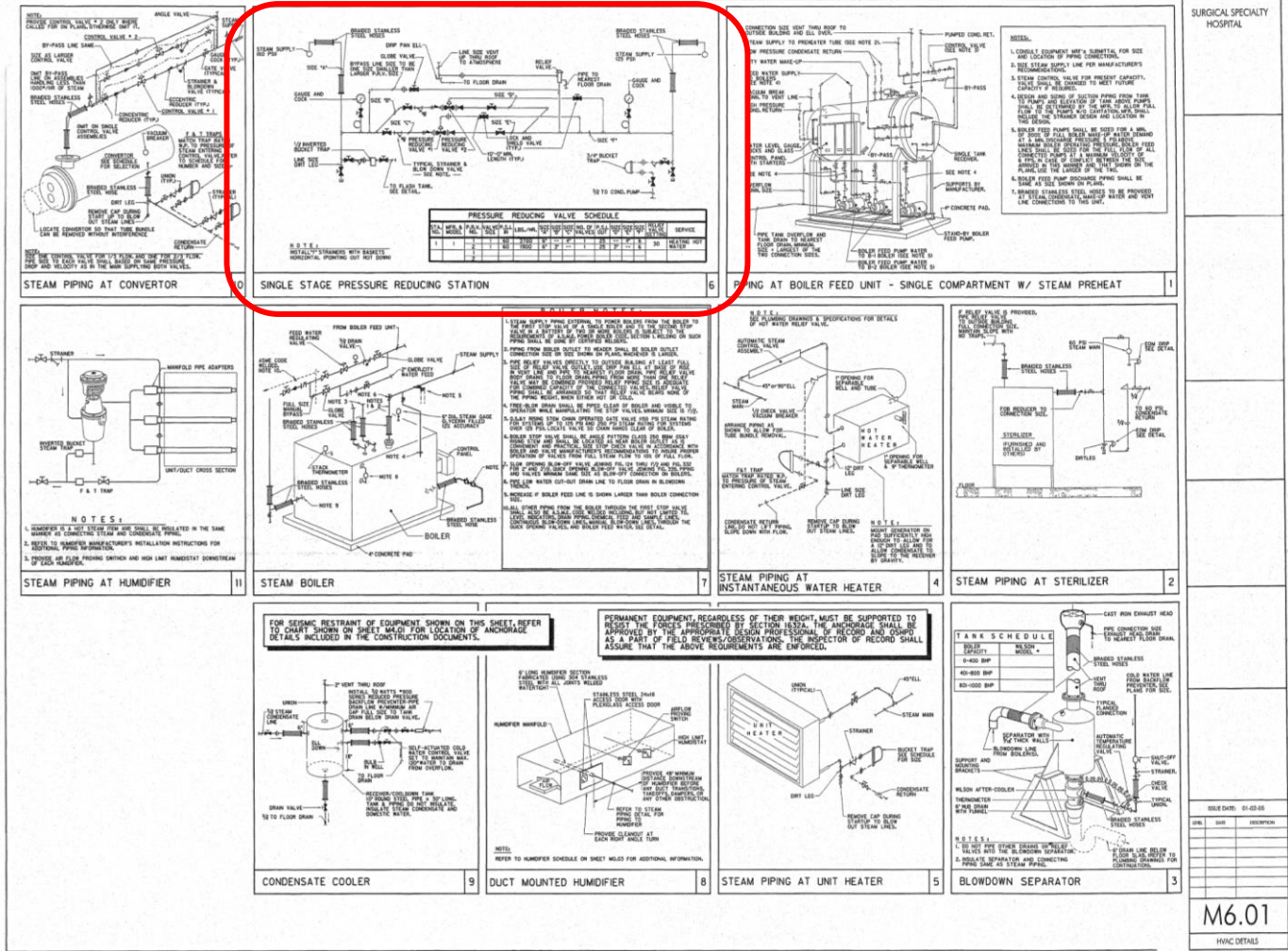


Example #1



What is the inlet pressure to the single stage pressure reducing station?

What do you have to look for?
See if there is Single Stage Pressure
Reducing Station Detail..... And there
is

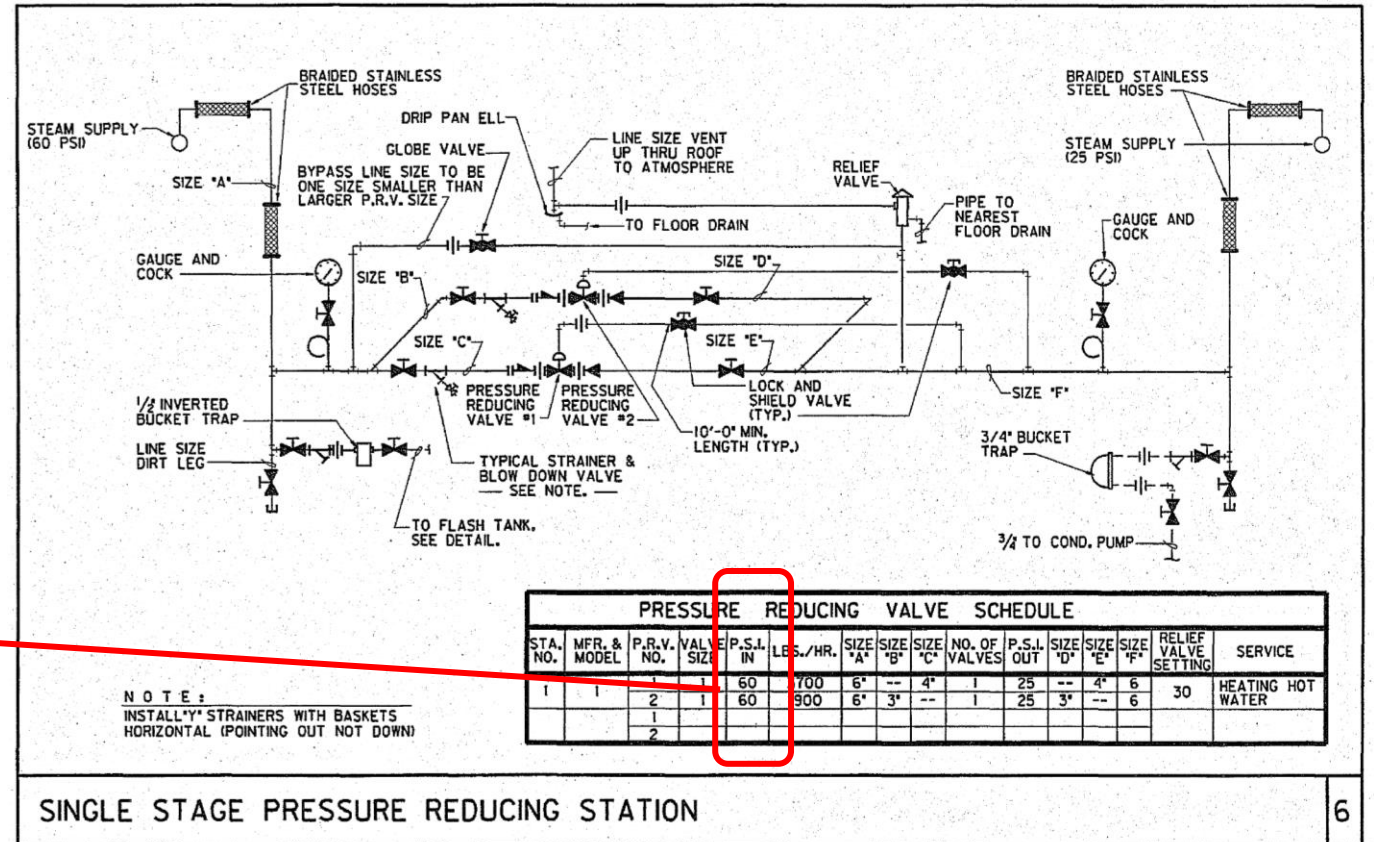


What is the inlet pressure to the single stage pressure reducing station?

- A. 25 psi
- B. 40 psi
- C. 45 psi
- D. 60 psi



PRESSURE REDUCING VALVE SCHEDULE		
VALVE SIZE	P.S.I. IN	LEBS./H
1	60	700
1	60	900



Example #2



The source valve for the nitrogen system is located in room _____.

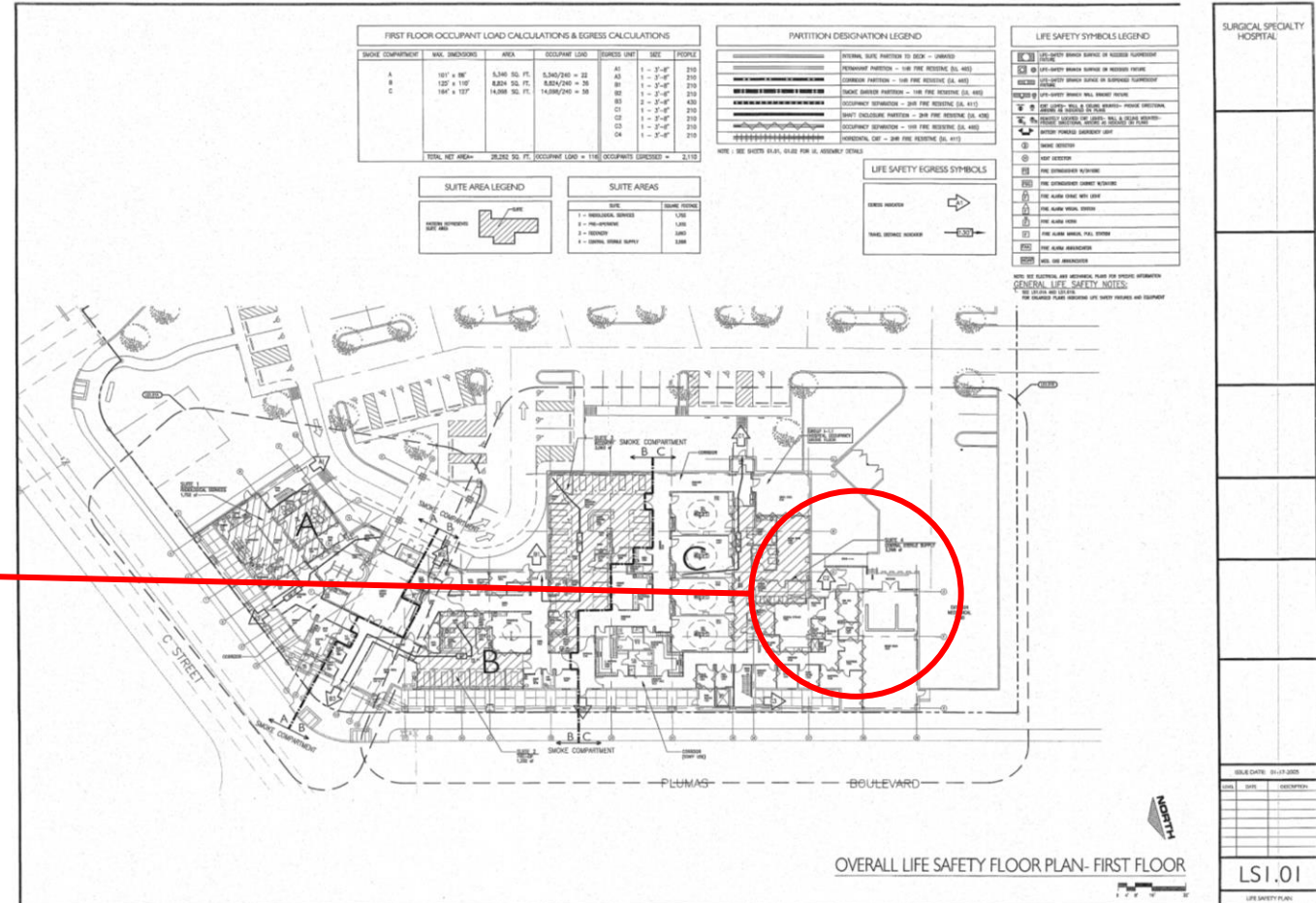
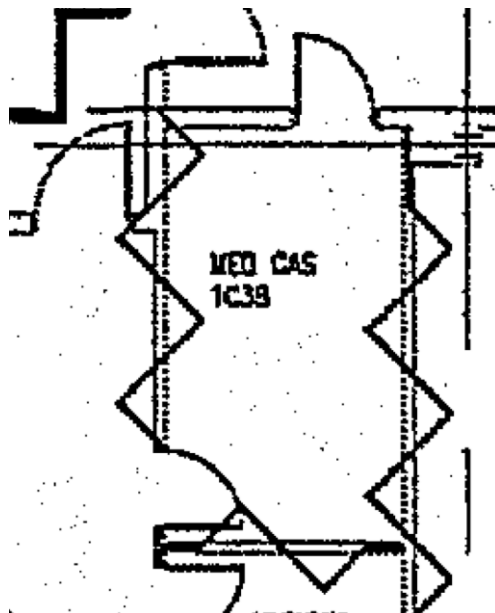
First you need to know the symbol used for Nitrogen line

MEDICAL GAS LEGEND	
SYMBOL	DESCRIPTION
A	COMPRESSED AIR
V	VACUUM
O ₂	OXYGEN
N ₂	NITROGEN
N ₂ O	NITROUS OXIDE
VE	VACUUM PUMP EXHAUST LINE
AI	AIR COMPRESSOR INTAKE LINE
EVAC	EVACUATION (OUTLET IN O.R.'s CONNECTED TO VACUUM PIPING SYSTEM)
S	MEDICAL VACUUM SLIDE BRACKET
	MEDICAL GAS OUTLET (SEE MED. GAS SCHED.)

MAIN WATER SIZING SCHEDULE									
COLD WATER SYSTEM					HOT WATER SYSTEM				
FEATURE TYPE	NUMBER OF FEATURES	SUPPLY FUTURE DATES	TOTAL SUPPLY FUTURE DATES	CHARTED IN GALLONS PER MINUTE	NUMBER OF FEATURES	FUTURE UNIT CALCULATION	ACTUAL F.U.	OPN DEMAND	
WATER CLOSET (PRIVATE)	21	5.0	105						
WATER CLOSET (PUBLIC)	6	8.0	48						
URINAL	2	4.0	8						
SINKS	18	2.0	36		18	18 X 2.25% =	27		
LAVATORY	12	1.0	12		12	12 X 1.15% =	24		
SINK/STOVE	3	3.0	9		3	3 X 3.35% =	6.75		
STANDARD SINK	4	0.5	2						
CLINICAL SINK	1	8.0	8		1	1 X 10.35% =	5		
WALL FOUNTAIN	6	2.0	12						
SINK	48	2.0	96		48	48 X 2.25% =	108		
EMERGENCY SINK	2	4.0	8						
SUB-TOTAL			308	125 PER CHART A-2					
COMMERCIAL DOWNSHOWER			25						
3 COMPARTMENT POST SINK	1	6	6		1	1 X 6.35% =	4.5		
SINK	2	2	4		2	2 X 2.25% =	3		
LAVATORY	3	1	3		3	3 X 1.15% =	2.25		
RECEIVE SINK	3	3	9		3	3 X 3.35% =	6.75		
SUB-TOTAL			47						
METACOMM EQUIPMENT			50						
SUB-TOTAL			405	140 PER CHART A-2					
ESTIMATE - FUTURE									
WATER CLOSET (PRIVATE)	14	5.0	70						
SINK	14	2.0	28		14	14 X 2.25% =	21		
LAVATORY	14	1.0	14		14	14 X 1.15% =	25.5		
SINK	18	2.0	36		18	18 X 2.25% =	27		
SUB-TOTAL			148						
NOT TOTAL DEMAND			2465						
TOTAL			1055	200 PER CHART A-2					
BUILDING SYSTEM PRESSURE									
COLD WATER SYSTEM					HOT WATER SYSTEM				
30 PS BUILDING DESIGN PRESSURE					PER CHART A-2				
FLOW TEST RECORD (GPM @ 5 PSI)					PER CHART A-4				
BUILDING DEMAND: 1000 GPM @ 5 PSI					300 GPM @ 5 PSI				
TOTAL PRESSURE LOSS: 30 PSI FROM CITY MAIN TO BUILDING					300 GPM @ 5 PSI				
INCLUDES FUTURE SCHEDULE, FUTURE ELEVATION					300 GPM @ 5 PSI				
TOTAL BUILDING DEMAND IN GALLONS PER MINUTE: 200					300 GPM @ 5 PSI				
30 PS BUILDING DESIGN PRESSURE					PER CHART A-2				
10 PS BUILDING DESIGN PRESSURE					300 GPM @ 5 PSI				
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10 PS BUILDING DESIGN PRESSURE					300 GPM @ 5 PSI				

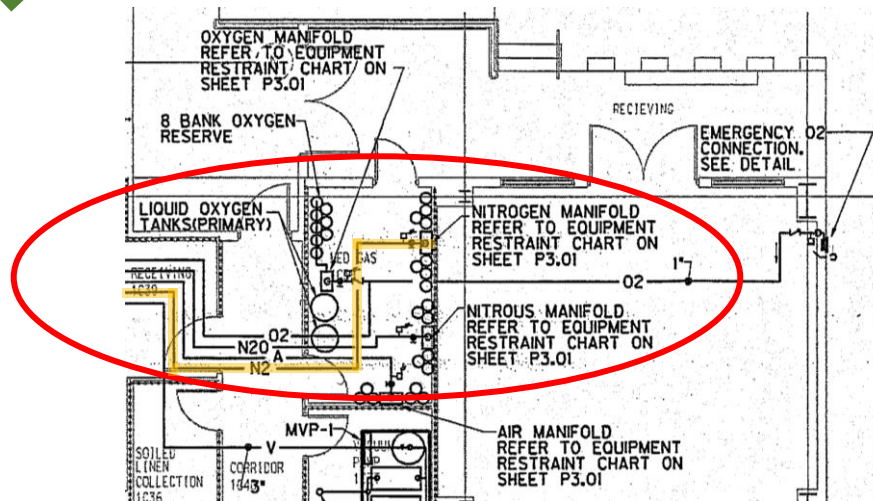
The source valve for the nitrogen system is located in room _____.

Then you need to think where the location would be. Typically, it is in the MedGas Room

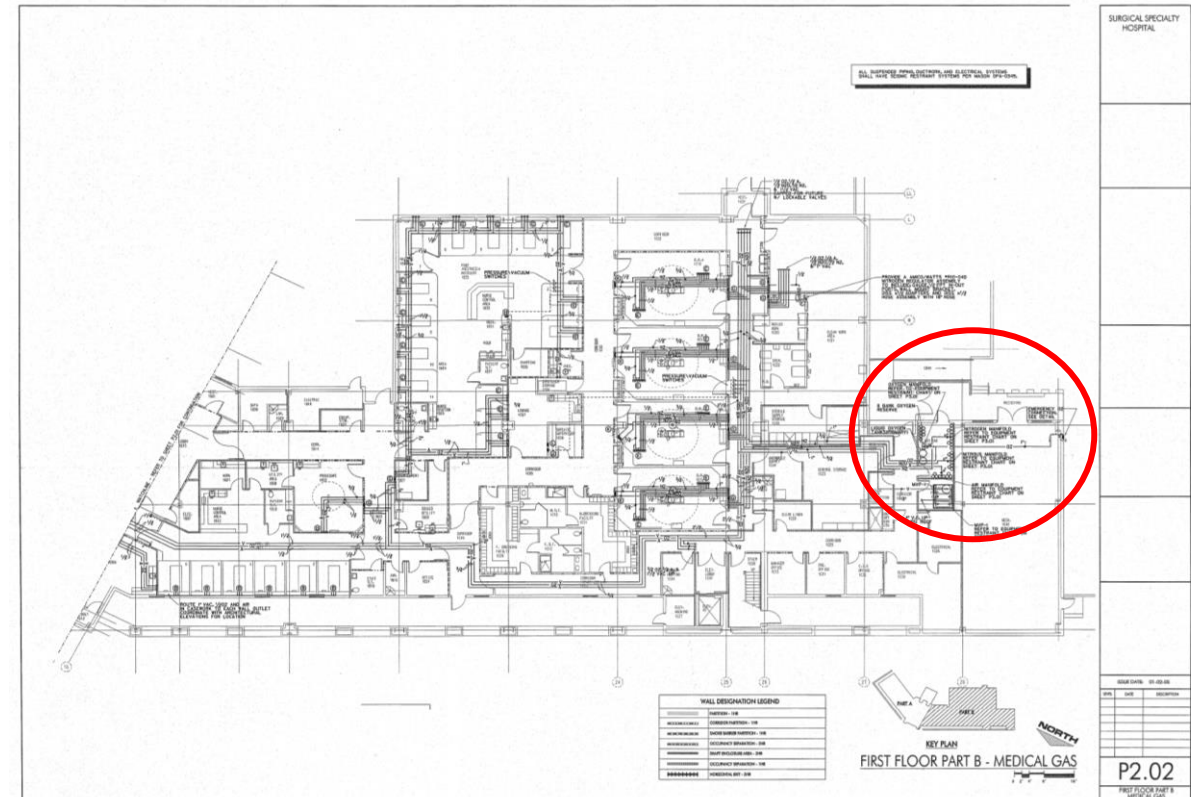


The source valve for the nitrogen system is located in room _____.

- A. **1C38**
- B. 1C37
- C. 1C03
- D. 1C25



Now, go to the MedGas Plan for that location

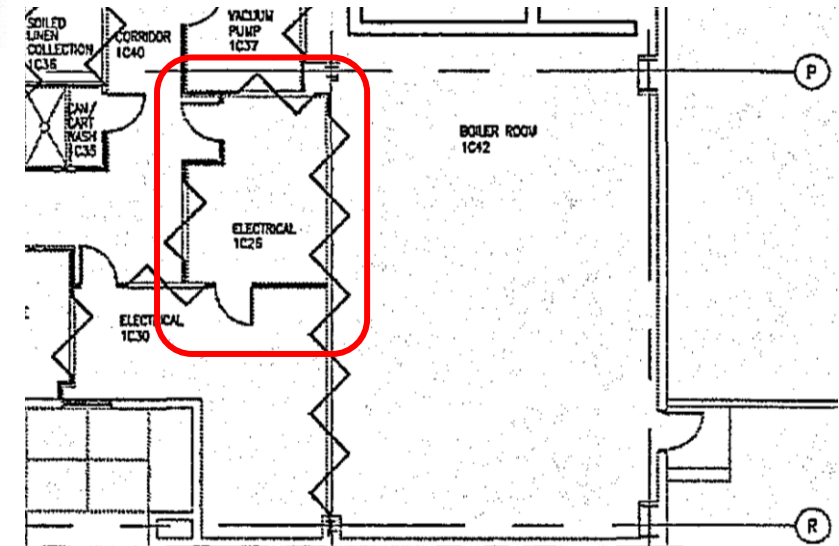
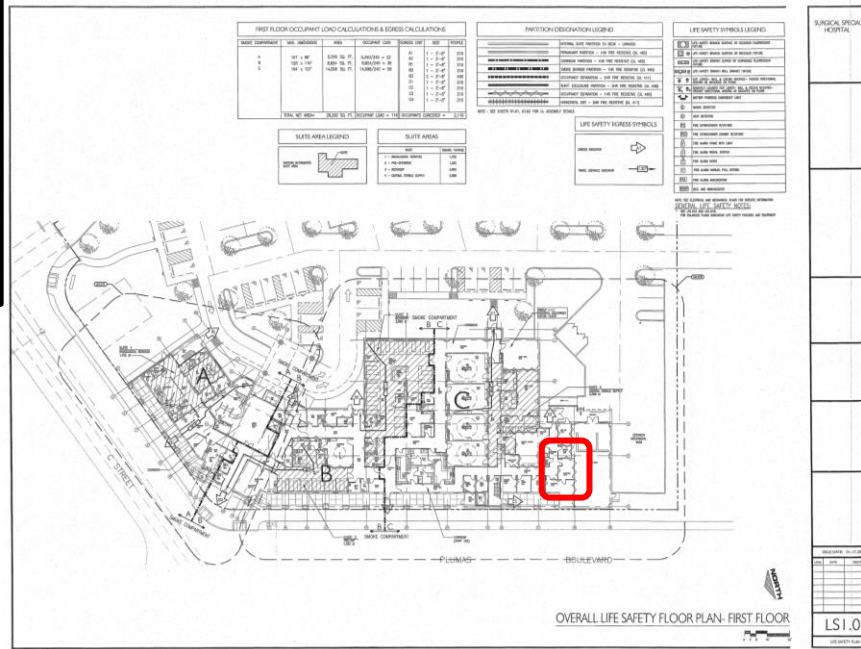


Example #3



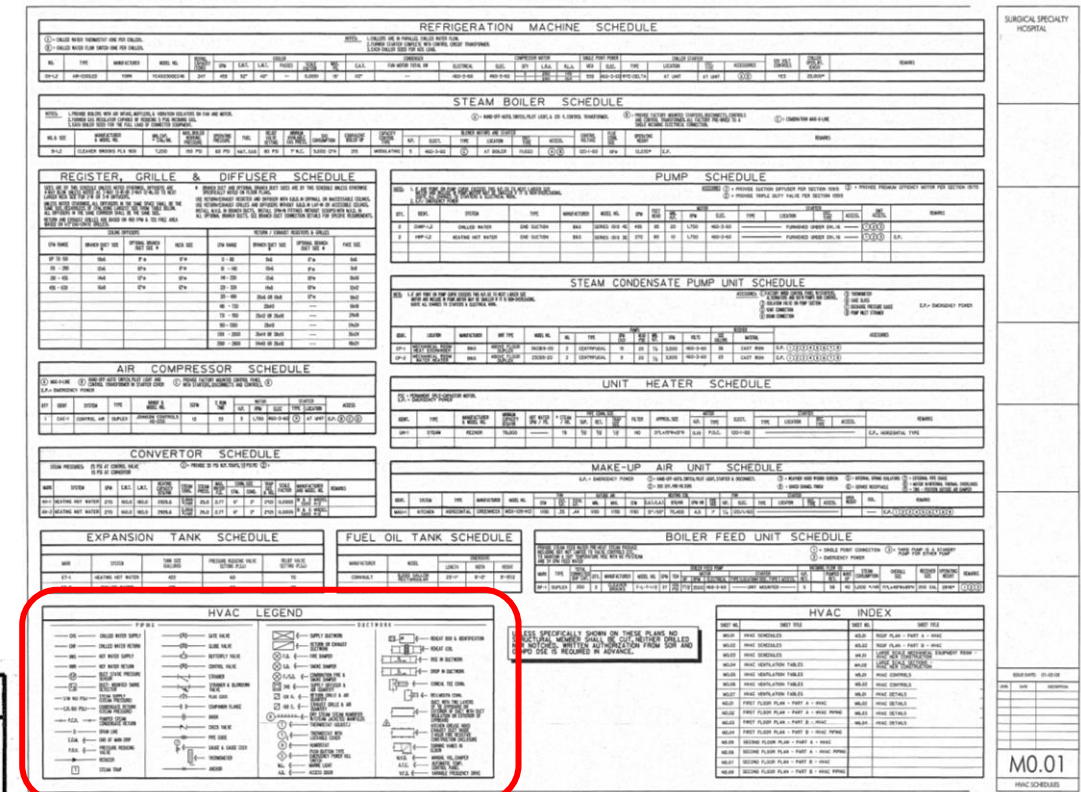
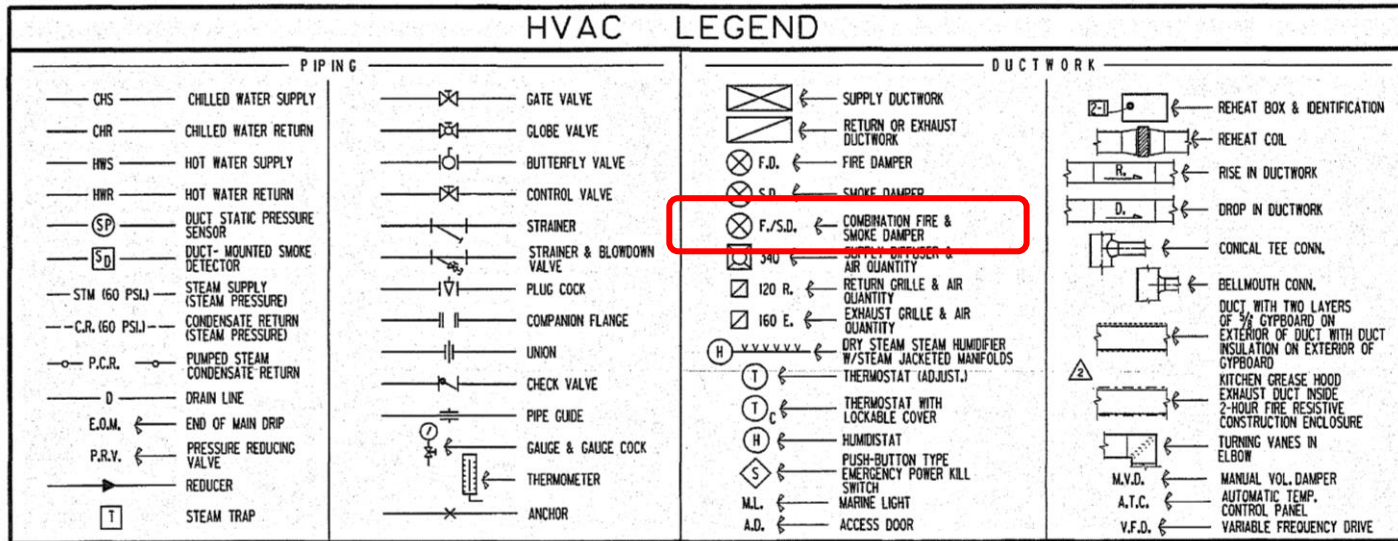
Combination fire and smoke dampers are installed in the supply and return air duct penetrations through the wall of Electrical Room 1C26.

What do you have to look for?
Look for 1C26.
If you cannot find in the HVAC sheets, because the drawings are too busy.... Look in a different place, like LS1.01



Combination fire and smoke dampers are installed in the supply and return air duct penetrations through the wall of Electrical Room 1C26.

Then, you need to look the symbol about Fire and Smoke Dampers

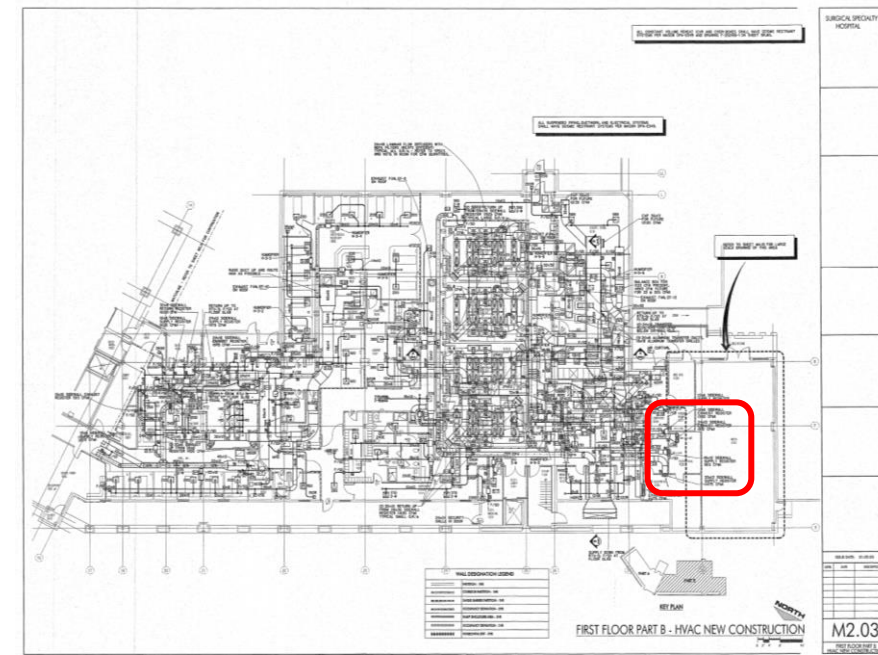
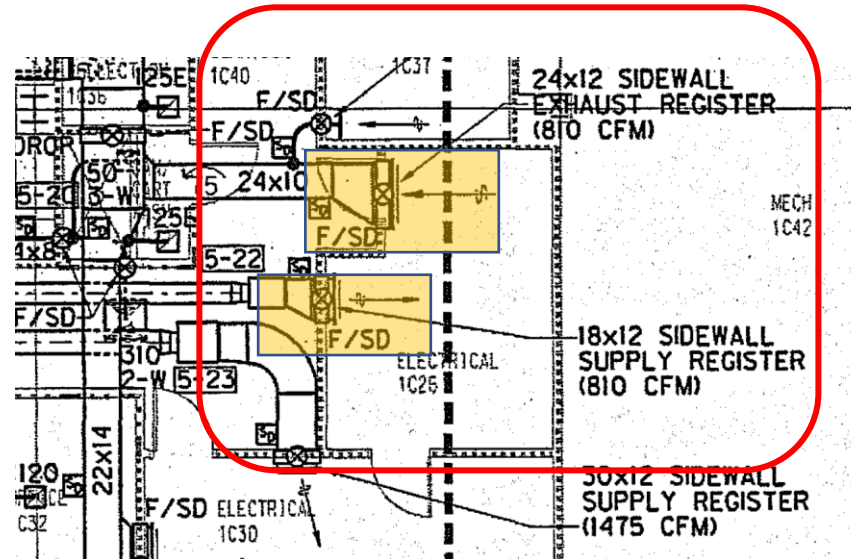


Combination fire and smoke dampers are installed in the supply and return air duct penetrations through the wall of Electrical Room 1C26.

- A. True
- B. False



And now, go to the HVAC plan



Example #4



What is the specified flow at CHWP-1?

- A. 270 GPM
- B. 400 GPM
- C. 495 GPM
- D. 1750 GPM

To find the flow for the chilled water, CHWP-1, look into the pump schedule



	GPM	FEET HEAD
4E	495	85
3E	270	80

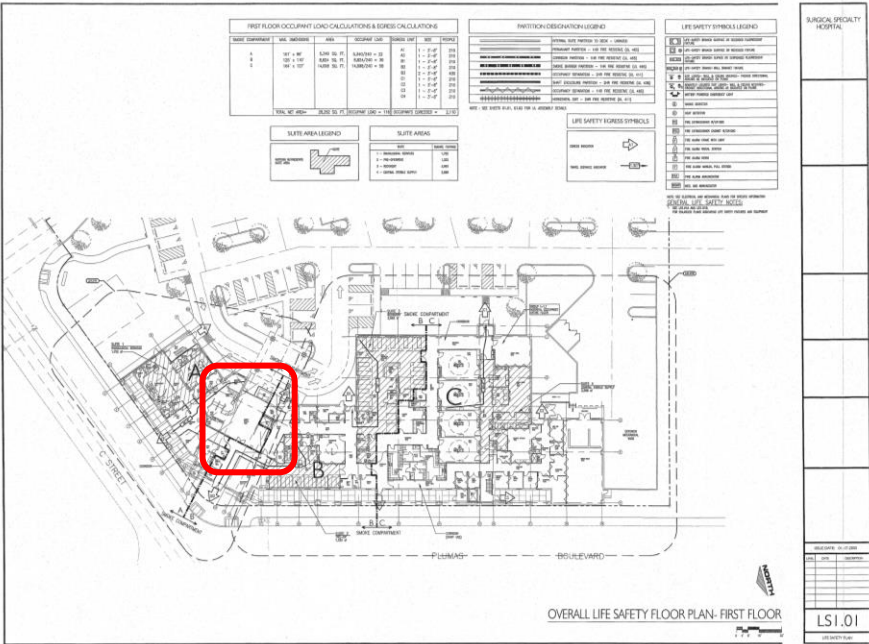
PUMP SCHEDULE																
NOTE: 1. IF ANY POINT ON PUMP CURVE EXCEEDS THIS H.P. GO TO NEXT LARGER SIZE MOTOR AND INCLUDE PUMP MOTOR MAY BE SMALLER IF IT IS NON-OVERLOADING. QUOTE ALL CHANGES TO STARTER & ELECTRICAL WORK. 2. E.P.= EMERGENCY POWER ACCESSORIES ① = PROVIDE SUCTION DIFFUSER PER SECTION 15515 ③ = PROVIDE PREMIUM EFFICIENCY MOTOR PER SECTION 15170 ② = PROVIDE TRIPLE DUTY VALVE PER SECTION 15515																
QTY.	IDENT.	SYSTEM	TYPE	MANUFACTURER	MODEL NO.	GPM	FEET HEAD	MOTOR			STARTER				UNIT ACCESS.	REMARKS
								MIN. H.P.	RPM	ELEC.	TYPE	LOCATION	DISC. TYPE	ACCESS.		
2	CHWP-1,2	CHILLED WATER	END SUCTION	B&G	SERIES 1510	495	85	20	1,750	460-3-60		FURNISHED UNDER DIV. 16		①②③		
2	HRP-1,2	HEATING HOT WATER	END SUCTION	B&G	SERIES 1510	270	80	10	1,750	460-3-60		FURNISHED UNDER DIV. 16		①②③	E.P.	



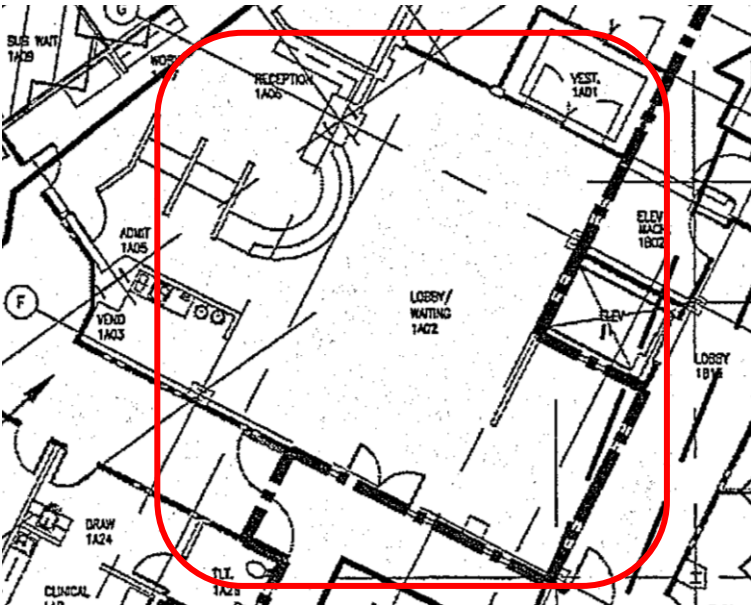
Example #5



Supply air in lobby / waiting room 1A02 is _____ CFM.

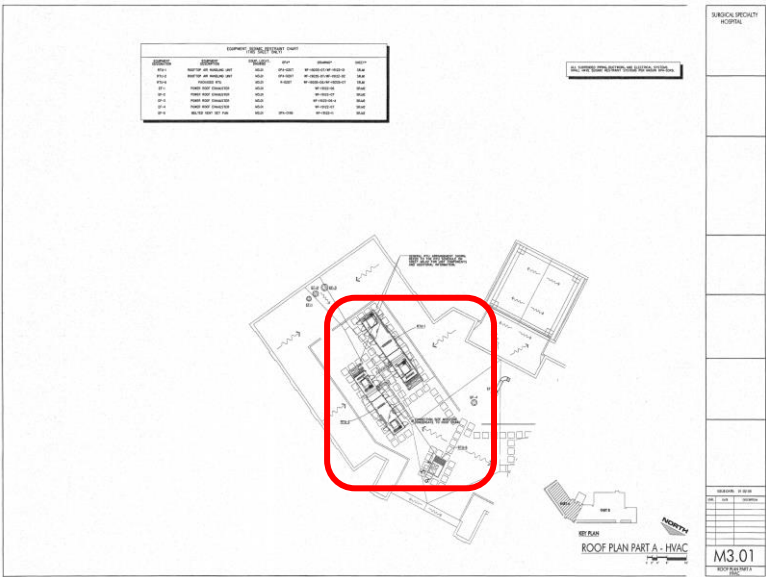
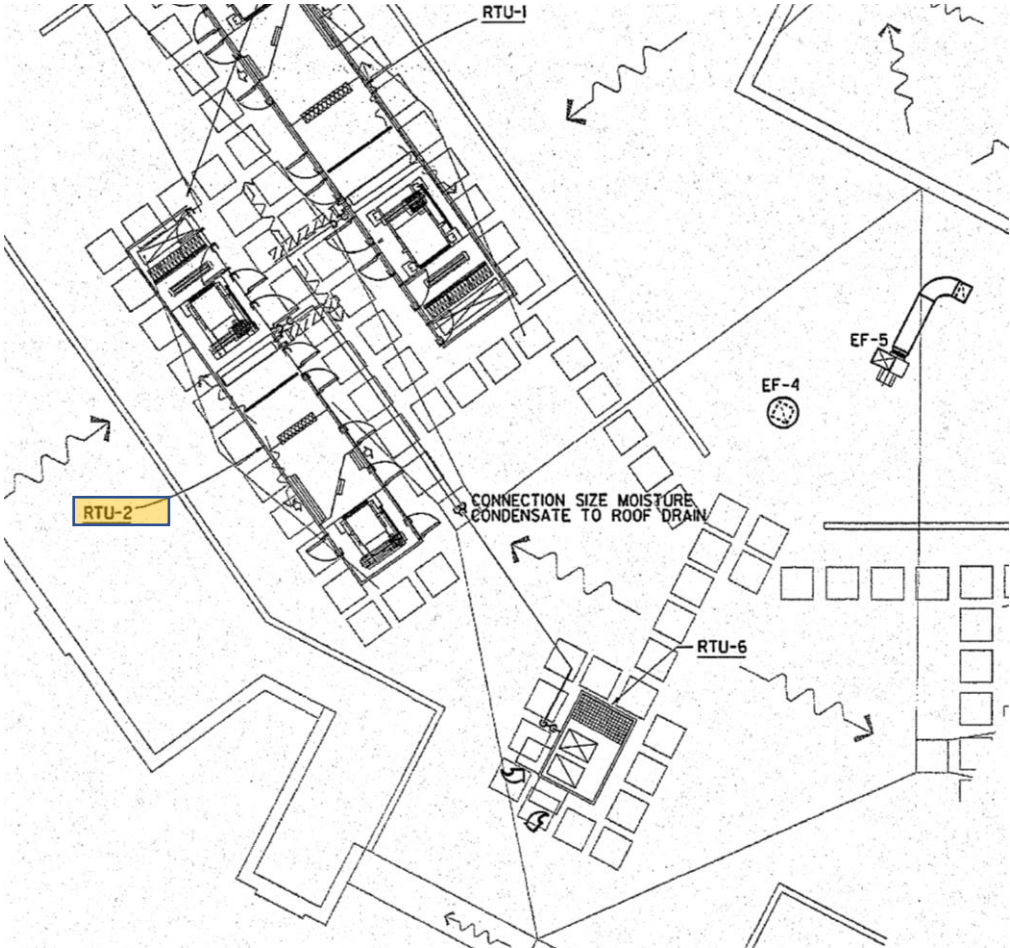


What do you have to look for?
Look for 1A02.
If you cannot find in the Mechanical sheets, because the drawings are too busy.... Look in a different place, like LS1.01



Supply air in lobby / waiting room 1A02 is _____ CFM.

Now that you know where the room is, go to the HVAC Roof Plan.



Supply air in lobby / waiting room 1A02 is _____ CFM.

A. 0
 B. 448
 C. **1,400**
 D. 8,397



Knowing it is RTU-2 the unit for 1A02, go to the RTU-2 schedule, and find the Supply Air CFM information for 1A02

RTU-2 VENTILATION TABLES																	
(REFER TO SCHEDULE ON SHEET M0.02 FOR MINIMUM OUTSIDE AIR FOR UNIT)																	
ROOM NUMBER	ROOM NAME	EQUIVALENT CMC TABLE 4-A DESIGNATION	CMC MINIMUM REQUIREMENTS				DESIGN										
			AIR BALANCE RELATIONSHIP TO ADJACENT AREAS	MINIMUM AIR CHANGES OF OUTSIDE AIR PER HOUR	MINIMUM TOTAL AIR CHANGES PER HOUR	ALL AIR EXHAUSTED DIRECTLY OUTDOORS	SPACE VOLUME (CUBIC FEET)	SUPPLY CFM	OUTSIDE AIR CFM	RETURN CFM	EXHAUST CFM	TRANSFER CFM (1-POS+1-NEG)	TRANSFER ROOM NUMBER	AIR BALANCE RELATIONSHIP TO ADJACENT AREAS	AIR CHANGES OF OUTSIDE AIR PER HOUR	TOTAL SUPPLY AIR CHANGES PER HOUR	ALL AIR EXHAUSTED DIRECTLY OUTDOORS
1A01	VESTIBULE	CORRIDOR	E	2	4	N	130	130	48	130	0	0		E	3.2	12.0	N
1A02	LOBBY/WAITING	CORRIDOR	E	2	4	N	8397	1400	448	0	0	1400	100 OUTSIDE; 1300 VENDING (OPEN AREA)	E	3.2	10.0	N

Homework

Homework #1

Room 1A24 will transfer
100 CFM from _____.

- A. Corridor 1A28
- B. Draw 1A24
- C. None of the above
- D. Both A and B

Homework #2

What type of plumbing fixture is shown
in room 1C04?

- A. Lavatory wall hung
- B. Lavatory drop in
- C. Sink SS photo eye (staff)
- D. Sink SS (staff)



See you at Part 2

Send your Homework Responses to:

OSHDP.fddisu@oshpd.ca.gov



Q&A

