

GDI ENGINEERING



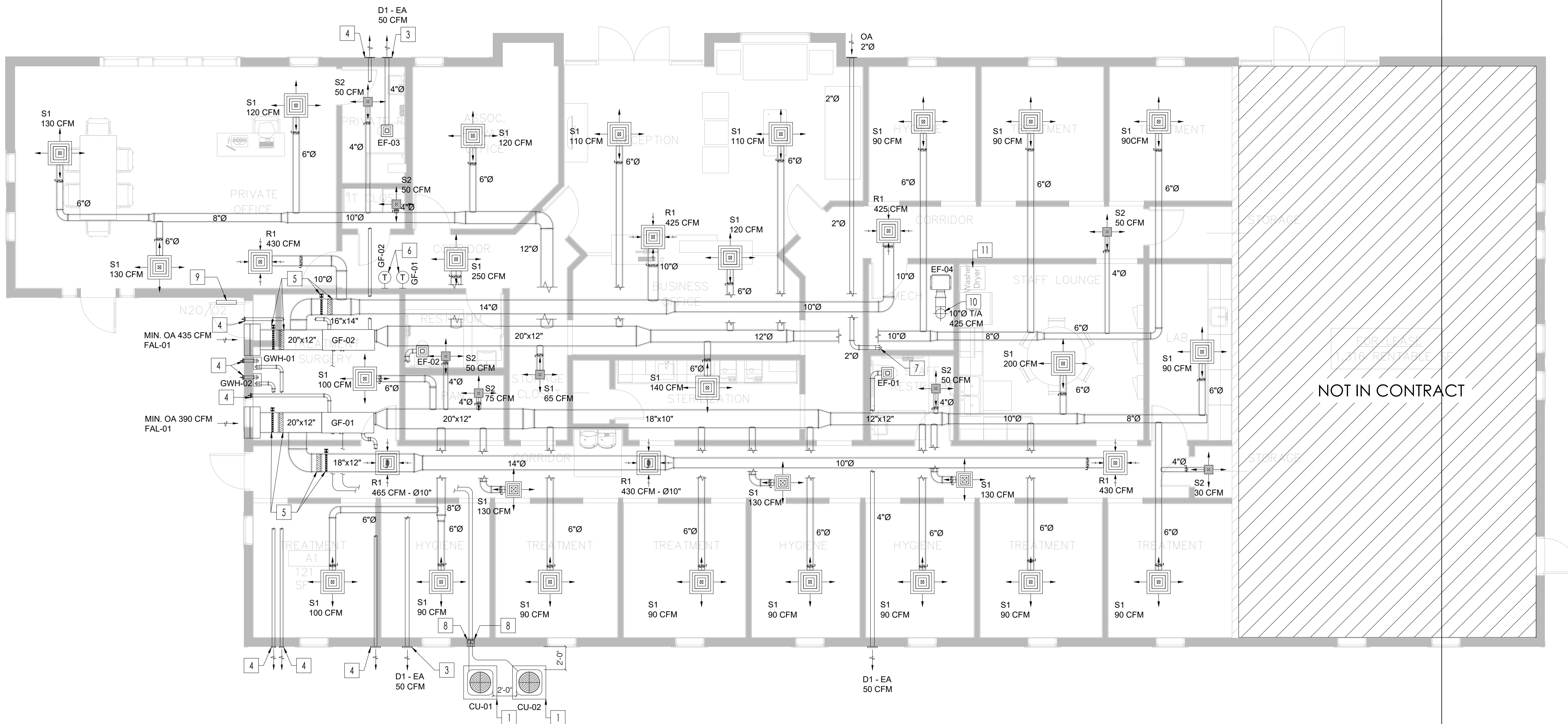
Bemis Family Dental Office

Healthcare

Lake Worth- Texas

MECHANICAL KEYED NOTES:

- 1 → OUTDOOR CONDENSING UNIT CONCRETE HOUSEKEEPING SLAB - INSTALL UNIT ON VIBRATION ISOLATORS.
- 2 → WALL MOUNTED GRILLE FOR FRESH AIR
- 3 → EXHAUST DUCT TERMINATION TO OUTDOORS TO BE SPACED FROM ANY OPERABLE WINDOW BY >3'. THE LOCATIONS PROVIDED ARE WITHIN THE 3' LIMIT FROM THE PROPERTY LINE.
- 4 → GAS VENT FROM / TO OUTDOORS TO BE LOCATED AWAY FROM DOORS & OPERABLE WINDOWS AS SPECIFIED BY THE INTERNATIONAL FUEL GAS CODE APPENDIX C - EXIT TERMINALS OF MECHANICAL DRAFT & DIRECT VENTING SYSTEMS.
- 5 → MODULATING MOTORIZED DAMPER + LOW LEAKAGE CLASS BACKDRAFT DAMPER TO PROVIDE ECONOMIZER OPERATION - PROVIDE COMPLETE WITH NECESSARY CONTROLS, INSTRUMENTS & SEQUENCE OF OPERATION AS RECOMMENDED BY THE MANUFACTURER'S AND ENERGY CODE.
- 6 → PROVIDE A/C THERMOSTATS AT MIN. +48" ABOVE FLOOR LEVEL, COORDINATE WITH THE ARCHITECT FOR FINAL INSTALLATION POSITION PRIOR TO CABLE PULLING AND FIXATION.
- 7 → 2"Ø OUTDOOR AIR CONNECTION TO COMPRESSOR AIR INLET FROM OUTDOORS - SEE MEDICAL EQUIPMENT SUBMITTAL FOR CONNECTION DETAILS.
- 8 → EXTERIOR WALL SEAL PENETRATION OUTLET WITH ELASTOMETRIC LINE-SET COMPRESSION SLEEVE TYPE "TITAN GS30" BY AIREX MANUFACTURING INC. & REFRIGERANT PIPE LINES TO ABOVE IN WALL.
- 9 → PROVIDE DOOR TRANSFER GRILL, COORDINATE WITH DENTAL EQUIPMENT SUPPLIER AND GENERAL CONTRACTOR FOR FINAL SIZE OF OPENING AND FOR INSTALLATION DETAIL. TRANSFER GRILL TO PROVIDE 72 in² OPENING AREA.
- 10 → EXHAUST DUCT UP TO ROOF, COORDINATE WITH THE GENERAL CONTRACTOR AND THE ARCHITECT FOR THE FINAL POSITION AND FOR THE WATERPROOFING DETAILS. RISE ABOVE ROOF SHOULD COMPLY WITH THE MECHANICAL CODE REQUIREMENTS.
- 11 → HEAT PUMP TYPE VENTLESS DRYER.



BEMIS FAMILY DENTAL CLINIC

6617 CHARBONNEAU RD
CITY OF LAKE WORTH , TEXAS

LOT 1, BLOCK A-BEMIS
FAMILY DENTAL ADDITION

MECHANICAL
FLOOR PLAN

Drawn By: O.K Scale: 3/16" = 1'-0"

Date: 08.18.2023 PROJ.NO.:

M200

2/6 SHEET NO.

Project Name: 2.2.2019 Jinn Barwa District Office
Prepared by: T.T.O

Zone Listing Summary for 01.AHU-01

06/04/2020
17:02AM

Air System Information

Alt System Name	01.AHU-01	Number of zones	6
Equipment Code	SPLT-AHU	Floor Area	26458.97
Air System Type	SCAF	Design Temp.	

Listing Calculation Information

Calculation Month	Jan to Dec	Zone CFM Staging	Sum of space airflow rates
Staging Date	Calculated	Space CFM Staging	Individual peak space loads

Zone Terminal Staging Data

Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM ¹	Reheat Coil Water Flow (GPM)	Zone High Unit Coil Load (MBH)	Zone High Unit Water Coil Load (MBH)	Moving Air Unit Airflow (CFM)
Zone Name	1442	1442	0.17	0.0	0.0	

Zone Peak Sensible Loads

Zone Cooking Sensible Load (MBH)	Zone Time of Peak Sensible Cooling Load (MBH)	Zone Heating Load (MBH)	Zone Floor Area (SQ-F)
Zone Name	20.9	Dep 1400	11.3
			2045.97

Space Loads and Airflows

Zone Name / Space Name	Max	Time of Peak Sensible Load (MBH)	Air Flow (CFM)	Heating Load (MBH)	Floor Area (SQ-F)	Space CFM ²
Zone 1	1	20.9	Dep 1400	1442	11.3	2045.97
1. ZONE-1	1	20.9	Dep 1400	1442	11.3	2045.97

Hourly Analysis Program 5.10

Page 2 of 2

Project Name: 2-2880 Barrio Barrio Dental Office						08/04/2020			
Prepared By: TLO						17/04/20			
Air Conditioning Data, 1900									
TABLE 1 : SYSTEM DATA									
Component	Location	Dry-Bulb Temp. (°F)	Specific Humidity (lb/lb)	Airflow (CFM)	CO2 Level (ppm)	Sensible Heat (BTU/hr)	Latent Heat (BTU/hr)		
Ventilation Air	Inside	100.0	0.0104	360	400	964	182		
Over-Exhaust Mixing	Outside	85.0	0.0136	142	633	-	-		
Conditioning Coil	Outside	61.3	0.0100	142	633	3004	527		
Conditioning Coil	Outside	61.3	0.0100	142	633	-	-		
Supply Fan	Outside	61.3	0.0100	142	633	118	-		
Coil Energy Input	Outside	61.3	0.0100	142	633	-	-		
Fume Air	Inside	77.2	0.0136	142	993	2403	312		
Exhaust Return	Outside	77.2	0.0136	142	993	-	-		
Air Density / Free Capacity / Conversion Factor: At sea level = 1.093, At sea altitude = 1.057 (STU/hr-CFM-F)									
Air Density / Heat of Vaporization / Conversion Factor: At sea level = 0.075, At sea altitude = 0.063 (BTU/hr-CFM-F)									
Air Attenuation = 0.87 ± 0									
TABLE 2 : ZONE DATA									
Zone Name	Zone Schedule (Hrs/Day)	Total Heat (kW)	Zone Demand (kW)	Zone Airflow (CFM)	CO2 Level (ppm)	Terminal Heating Coil (kW)	Zone Heating Coil (kW)		
Zone Name	20372	20372	4000	17.7	142	993	87110		

Hourly Analyses Program, V.15

Page 4 of 7

Project Name: 2.2 650 John Barrie Dental Office
Prepared by: ELO

09/04/2002
12:20AM

Location: Dallas, Texas
Altitude: 597.0 ft.
Data for: WINTER DESIGN HEATING

Heating Air
Heating Coil Outlet
Room Air

Humidity Ratio (lb/lb)

Temperature (°F)

Psychrometric chart showing the relationship between Temperature (°F) and Humidity Ratio (lb/lb) for winter design heating. The chart includes a saturation curve and various psychrometric lines. The process is indicated by a horizontal arrow from the initial state (Room Air) to the final state (Heating Air).

Zone Sizing Summary for 02AHU-02

Project Name: 2.000 John Deere Dental Office

05/04/2022

12:34PM

Air System Information

Design Airflow: 1000 CFM

Number of zones: 1

Equipment Case: SPLT ACO

Floor Area: 2389.00 SF

Air System Type: SDOAP

Location: Dallas, Texas

Sizing Calculation Information

Calculation Month: June to Dec

Zone CFM Sizing: Sum of space airflow rates

History Days: Calculated

Space CFM Sizing: Individual peak space loads

Zone Terminal Sizing Data

Zone Name	Design Supply (CFM)	Minimum Supply (CFM)	Zone CFM ¹	Reheat Coil Load (BTU/hr)	Reheat Coil Sens. Load (BTU/hr)	Zone Heating Coil Load (BTU/hr)	Zone Hg Unit Water Sens. (GPM)	Moving Room Fan CFM
Zone 1	1410	1410	0.00	0.00	0.00	0.00	0.00	0.00

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (BTU/hr)	Time of Peak Sensible Cooling Load	Zone Heating Sensible (BTU/hr)	Zone Floor Area (SF)
Zone 1	29.51	Jul 1900	11.6	2389.00

Space Sizing Summary

Zone Name / Space Name	Mark	Cooling Sensible (BTU/hr)	Time of Peak Sensible Cooling Load	Air Flow (L/min)	Heating Load (BTU/hr)	Floor Area (SF)	Zone CFM ²
Zone 1							
02-ZONE-2	1	29.51	Jul 1900	1410	11.6	2389.00	0.00

Hourly Analysis Program V.5.0

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System Psychrometrics for 02AHU-02																							
Project Name: 12-880, John Brown Dental Office		09/03/2008		17:20:08																			
Prepared by: J.L.O.																							
July System Cooling Load, 1900																							
TABLE 1: SYSTEM DATA																							
Component	Location	Dry-Bulb Temp (°F)	Specific Humidity (lb/lb)	Airflow (CFM)	CO2 Level (ppm)	Sensible Heat (BTU/hr)	Latent Heat (BTU/hr)																
Ventilation Air	Roof	57.0	0.0104	500	400	1084	2900																
Zone Return Mixing	Outside	84.0	0.0170	1410	800																		
Central Cooling Coil	Outside	60.0	0.0106	1410	800	3000	6670																
Central Heating Coil	Outside	60.0	0.0106	1410	800																		
Puppy Fan	Outside	60.0	0.0106	1410	800																		
Cold Supply Unit	Outside	60.0	0.0106	1410	800																		
Zone Air	Outside	77.0	0.0129	1410	800	2400	4200																
Return Pumps	Outside	77.0	0.0129	1410	800																		
Air Density & Heat Capacity < Conversion Factor: At sea level & 1.056; At slab altitude & 1.057 (BTU/hr-CFM) Air Density & Heat Capacity < Conversion Factor: At sea level & 0.046; At slab altitude & 0.046 (BTU/hr-CFM) SIA Abbrev = 387.0																							
TABLE 2: ZONE DATA																							
Zone Name	Zone Sensible Load (BTU/hr)	Total Heat Gaining Cooling	Zone Cooling Temp (°F)	Zone Airflow (CFM)	Zone Airflow (CFM)	CO2 Level (ppm)	Terminal Heating Coil (BTU/hr)	Zone Heating Load (BTU/hr)															
Zone 1	20100		24.0	1410	1410	1000	0																

Hourly Analysis Program, E.10

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Project Name: 2.2.650 John Barria Dental Office
 Prepared for: TLO

System Psychrometrics for 02.AHU-02

06/04/2021
12:23:08

Location: Dallas, Texas
 Altitude: 557.0 ft.
 Data for: July DESIGN COOLING DAY, 1300

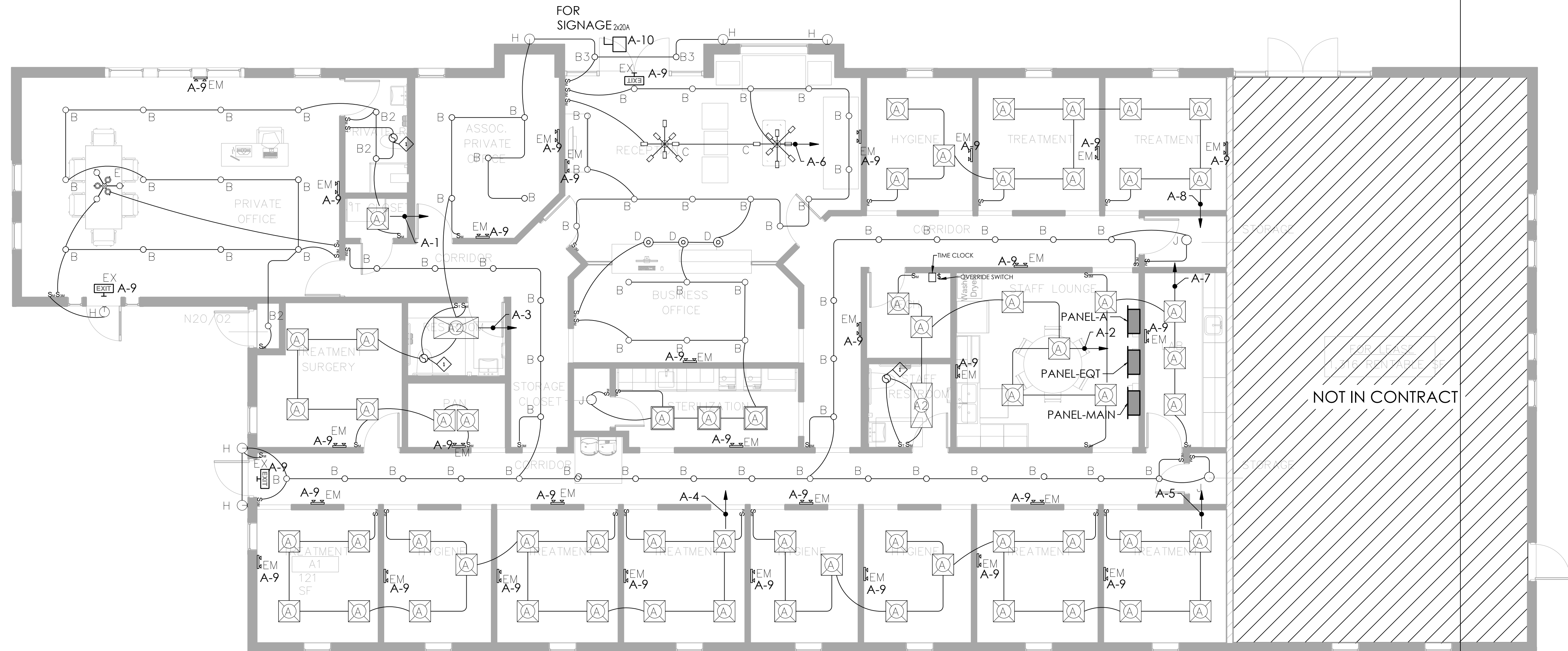
Legend:

- 1. Outdoor Air
- 2. Mixed Air
- 3. Cooling Coil Outlet
- 4. Supply Air

Psychrometric Chart Data (Approximate):

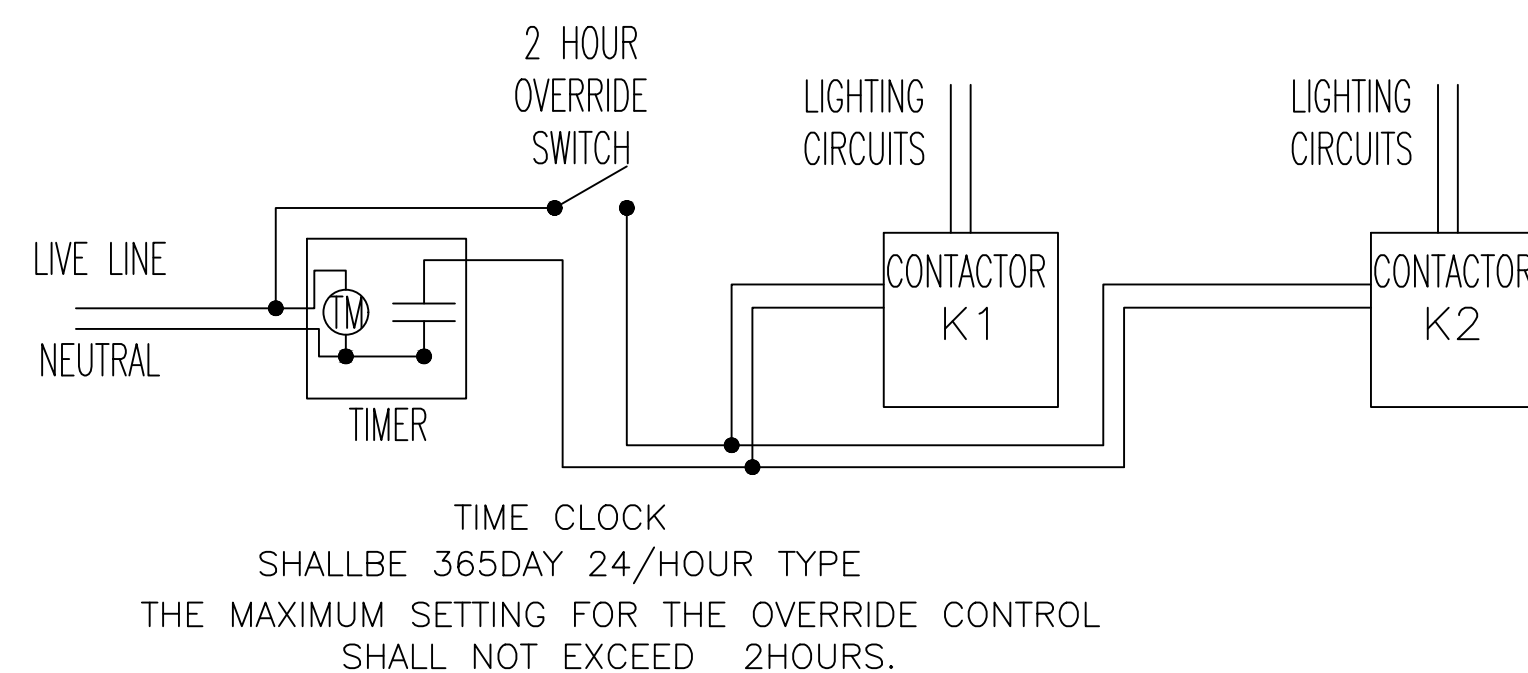
Point	State	Temperature (°F)	Specific Humidity (lb/lb)
1	Outdoor Air	95	0.011
2	Mixed Air	75	0.011
3	Cooling Coil Outlet	80	0.011
4	Supply Air	60	0.011

BEMIS FAMILY DENTAL CLINIC
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CITY OF LAKE WORTH , TEXAS



TAG	MOUNT	DESCRIPTION	MANUF.	QTY	SUPPLIED BY	INSTALLED BY	WATTAGE
A	LAY-IN	2' X 2' LED EDGE-LIT FLAT PANEL	LITHONIA	59	GC	GC	33W
A2	LAY-IN	2' X 4' LED EDGE-LIT FLAT PANEL (WET LOCATION)	LITHONIA	2	GC	GC	33W
B	CEILING	6" OPEN LED DOWNLIGHT WF6 ADJ	LITHONIA	67	GC	GC	13W
B2	CEILING	6" OPEN LED DOWNLIGHT (WET LOCATION)		3	GC	GC	13W
B3	CEILING	6" OPEN LED DOWNLIGHT (EXTERIOR)		2	GC	GC	13W
C	CEILING (PENDANT)	MOLLIS CHANDELIER (OR SIMILAR MODERN DECORATIVE)	MAYTONI	2	GC	GC	75W
D	CEILING (PENDANT)	BLACK & GOLD PENDANT (OR SIMILAR MODERN DECORATIVE)	LITHONIA	3	GC	GC	20W
E	CEILING (PENDANT)	NOSTALGIA PENDANT LAMP (6) (OR SIMILAR MODERN DECORATIVE)	MAYTONI	1	GC	GC	50W
EX	MULTI	THERMOPLASTIC EXIT SIGN W/ STENCIL FACE	LITHONIA		GC	GC	10W
G	WALL	AFFINITY THERMOPLASTIC NORMALLY-OFF EMERGENCY LIGHTING UNIT	LITHONIA		GC	GC	20W
H	WALL	DECORATIVE WALL SCONCE (EXTERIOR)	TBD	9	GC	GC	20W
I	WALL	LITHONIA WDG3 WALL PACK, FULL CUT-OFF	LITHONIA		GC	GC	20W
J	CEILING	SURFACE MOUNT LED	TBD	4	GC	GC	20W

"AS Per Section 3-20-1.B of the Zoning Ordinance, screening shall be provided so that materials stored in any outdoor storage area and/or equipment at grade or on the roof area screened from adjacent streets, no matter the street grade, and all properties at the same grade."



RCP GENERAL NOTES

1. CEILING GRID TO BE SUSPENDED FROM STRUCTURE ABOVE. IF GRID SUPPORTS ARE BLOCKED BY UTILITIES ABOVE, TRAPEZE-TYPE SUPPORTS TO BE CONSTRUCTED FROM UNISTRUT TO SPAN BLOCKAGES.
2. LIGHT FIXTURES LOCATED WITHIN CEILING GRID TO BE SUPPORTED FROM THE STRUCTURE ABOVE, INDEPENDENTLY OF THE CEILING GRID.
3. CEILING GRIDS TO BE CENTERED WITHIN INDIVIDUAL SPACES.

ELECTRICAL LEGEND

- JUNCTION BOX FOR EXHAUST FANS
- DIMMER
- OCCUPANCY SENSOR
- ONE WAY LIGHTING SWITCH
- TWO WAYS LIGHTING SWITCH
- EMERGENCY LIGHTING WALL MOUNTED WITH INTERNAL BACK UP BATTERY WITH MINIMUM 90 MINS AUTONOMY
- EXIT SIGN WALL MOUNTED WITH INTERNAL BACK UP BATTERY WITH MINIMUM 90 MINS AUTONOMY
- SELF CONTAINED SMOKE/CARBON MONOXIDE (120 W/BATTERY BACKUP) - CEILING MOUNTED

BEMIS FAMILY DENTAL CLINIC
6617 CHARBONNEAU RD
CITY OF LAKE WORTH, TEXAS

LOT 1, BLOCK A-BEMIS
FAMILY DENTAL ADDITION

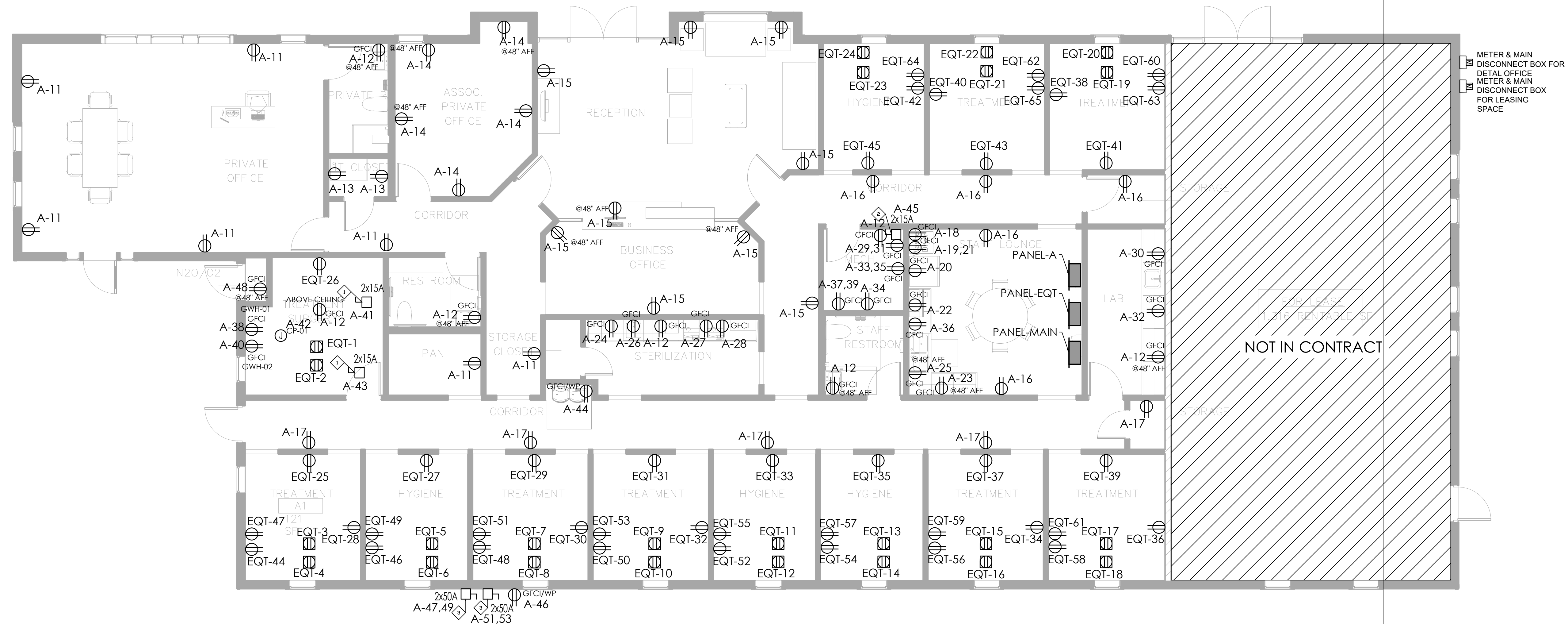
LIGHTING LAYOUT

Drawn By: A.B Scale: 3/16" = 1'-0"

Date: 08.03.2023 PROJ.NO.:

E200

3/8 SHEET NO.



ELECTRICAL LEGEND	
	DUPLEX RECEPTACLE - WALL MOUNTED @ +18" AFF UNLESS NOTED GFCI DENOTES: GROUND FAULT PROTECTION
	DUPLEX RECEPTACLE - FLOOR MOUNTED IG DENOTES: IG TYPE
	QUADRIPLEX RECEPTACLE - WALL MOUNTED @ +18" AFF UNLESS NOTED GFCI DENOTES: GROUND FAULT PROTECTION
	NON-FUSED DISCONNECT SWITCH - SIZE AS INDICATED
	DAYLIGHT SENSOR TO CONTROL LUMINARIES IN DAYLIGHT ZONE
	FLOOR DATA OUTLET WITH CAT5 CONNECTION
	WALL MOUNTED ELECTRIC JUNCTION BOX
	FLOOR MOUNTED ELECTRIC JUNCTION BOX

SHEET NOTES:	
	PROVIDE NEMA 3R DISCONNECT SWITCH FOR GF
	PROVIDE NEMA 3R DISCONNECT SWITCH FOR EXHAUST FAN
	PROVIDE NEMA 3R DISCONNECT SWITCH FOR CU

BEMIS FAMILY DENTAL CLINIC

6617 CHARBONNEAU RD
CITY OF LAKE WORTH , TEXAS

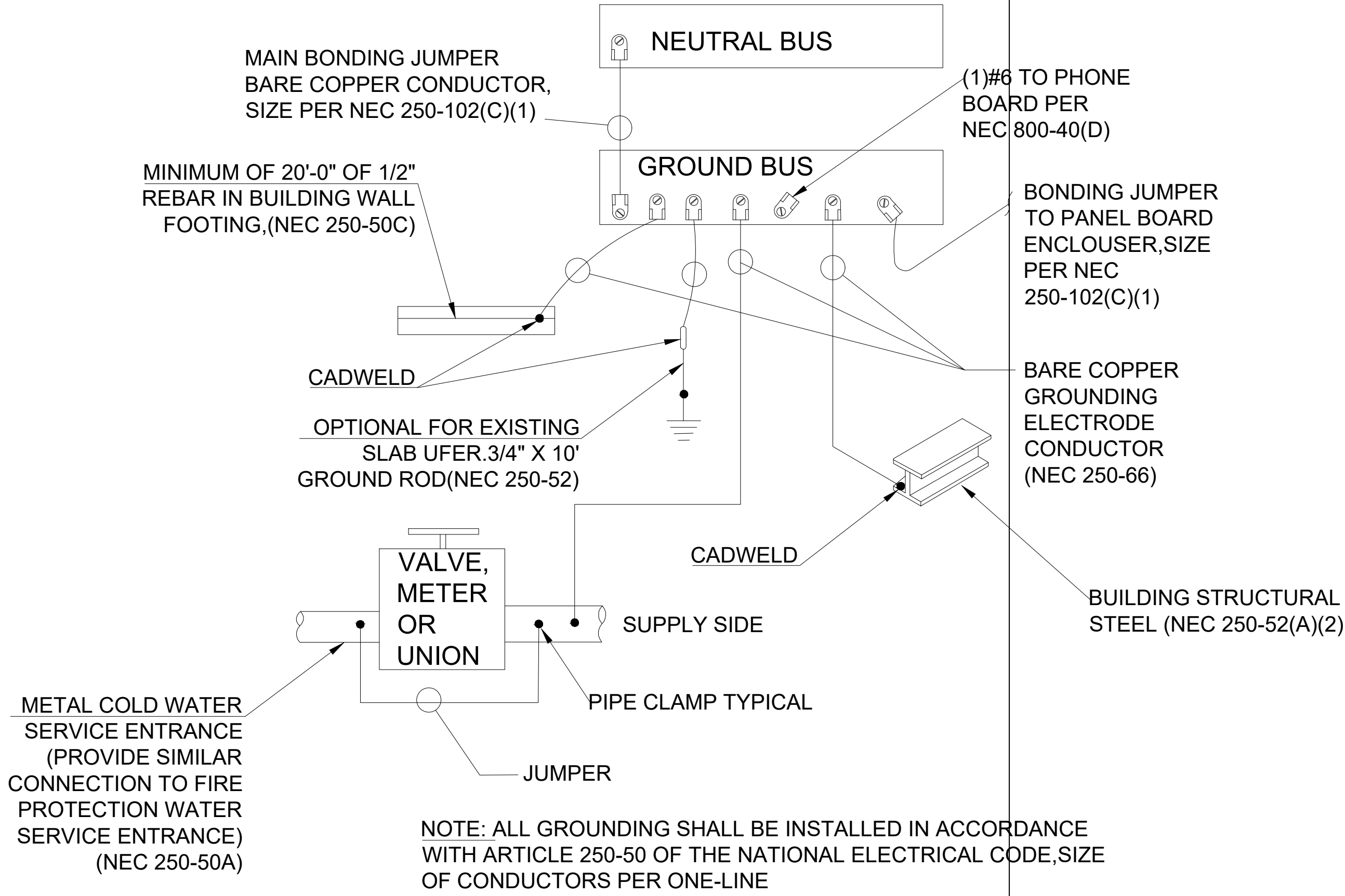
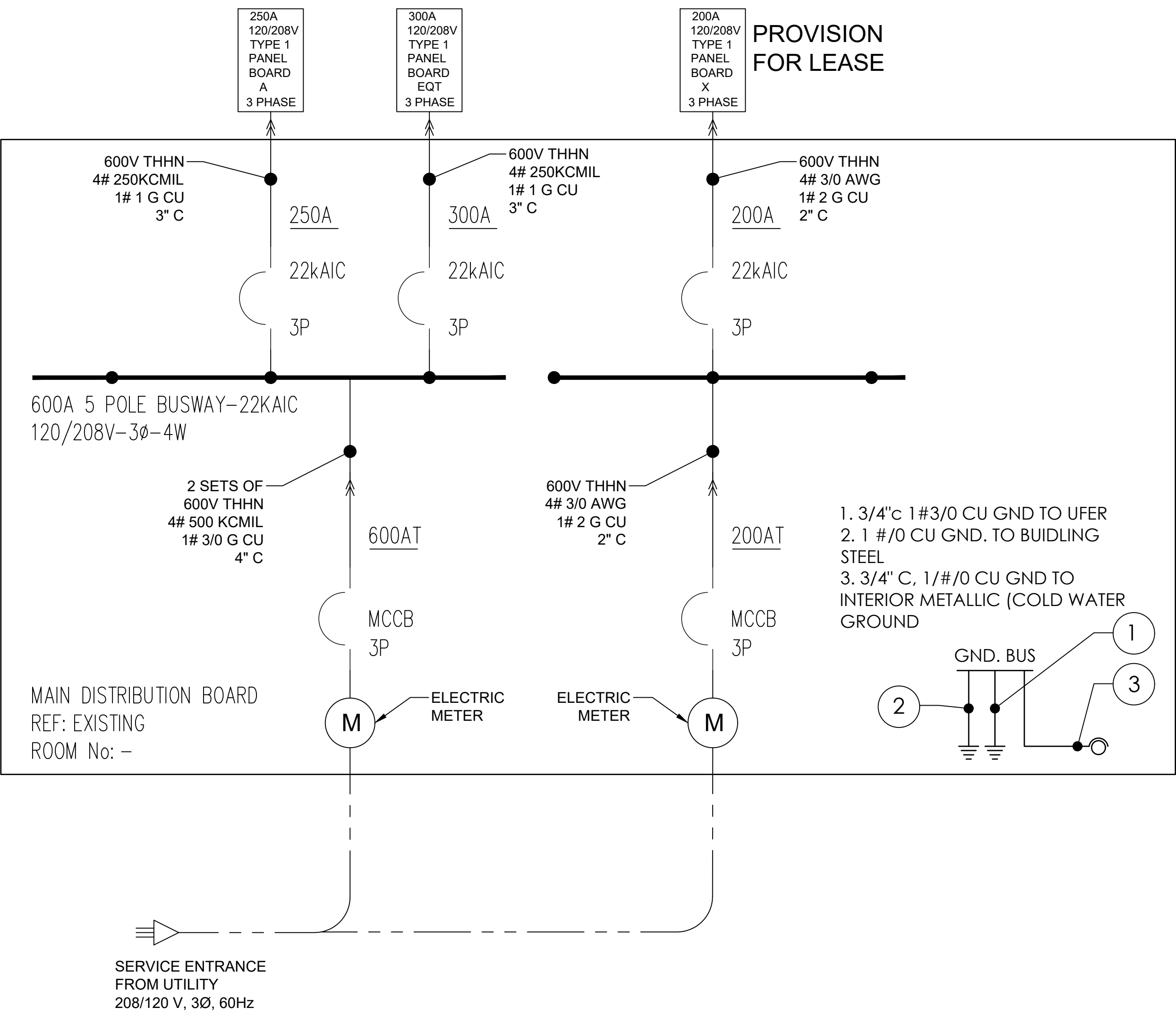
LOT 1, BLOCK A-BEMIS
FAMILY DENTAL ADDITION

POWER LAYOUT

Drawn By: A.B Scale: 3/16" = 1'-0"
Date: 08.03.2023 PROJ.NO.:

E300

4/8 SHEET NO.



GROUNDING DETAIL

BEMIS FAMILY DENTAL CLINIC

6617 CHARBONNEAU RD

CITY OF LAKE WORTH , TEXAS

LOT 1, BLOCK A-BEMIS FAMILY DENTAL ADDITION

SINGLE LINE DIAGRAM & GROUNDING DETAILS

Drawn By: A.B Scale: NTS

Date: 08.03.2023 PROJ.NO.:

E400

5/8 SHEET NO.

- DRAINAGE KEYED NOTES:
- 1 → 2" WALL CLEAN-OUT.
 - 2 → 4" FLOOR CLEAN-OUT.
 - 3 → 3" VENT STACK TO ABOVE.
 - 4 → 1 1/2" DRAIN PIPE FROM ATTIC HUB DRAIN TO CONNECT THE INDIRECT WASTE DRAINS OF THE WATER HEATER, T&P VALVES, BACK-FLOW PREVENTER AND THE AC EVAPORATORS CONDENSATE.
 - 5 → 1 1/2" INDIRECT WASTE CONNECTION FOR DRINKING FOUNTAIN WITH VENT RISE.
 - 6 → 1 1/2" INDIRECT WASTE CONNECTION FOR VACUUM TANKS AND COMPRESSOR TOWARDS TO THE FLOOR DRAIN.
 - 7 → 3" FLOOR DRAIN WITH TRAP PRIMER.
 - 8 → WASTE DROP & 2" VENT RISE.
 - 9 → WASHING MACHINE TRAPPED & VENTED INDIRECT WASTER CONNECTION.

FROM IPC - TABLE 709.1:
DRAINAGE FIXTURE UNIT VALUES (DFU)

FIXTURE	D.F.U	QTY.	TOTAL D.F.U
WATER CLOSET	4.0	3	12
LAVATORY	1.0	3	3.0
DRINKING FOUNTAIN	0.5	1	0.5
SHOWER	2.0	1	2.0
KITCHEN SINK	2.0	1	2.0
WASHING MACHINE	2.0	1	2.0
FLOOR DRAIN	2.0	5	10.0
SERVICE SINK	2.0	1	2.0
DENTAL LAVATORY	1.0	12	12.0
TOTAL DFU =			45.5

AS PER IPC - TABLE 710.1(1):
- MAIN SEWER PIPE: 4"Ø



BEMIS FAMILY DENTAL CLINIC

6617 CHARBONNEAU RD
CITY OF LAKE WORTH , TEXAS

LOT 1, BLOCK A-BEMIS
FAMILY DENTAL ADDITION

DRAINAGE FLOOR
PLAN

Drawn By: O.K Scale: 3/16" = 1'-0"

Date: 08.18.2023 PROJ.NO.:

P200

FROM IPC - TABLE E 103.3 (2):
WATER SUPPLY FIXTURE UNITS LOADS:

FIXTURE	OCCUPANCY	W.S.F.U	QTY.	TOTAL W.S.F.U
WATER CLOSET - FLUSHOMETER TANK	PUBLIC	2	1	2.0
LAVATORY	PUBLIC	2.0	1	2.0
WATER CLOSET - FLUSHOMETER TANK	PRIVATE	2	2	4.0
LAVATORY	PRIVATE	0.7	2	1.4
KITCHEN SINK	PRIVATE	1.4	1	1.4
SHOWER HEAD	PRIVATE	1.4	1	1.4
DRINKING FOUNTAIN	OFFICES, ETC.	0.25	1	0.25
WASHING MACHINE (8lb)	PRIVATE	1.4	1	1.4
DENTAL LAVATORY	PRIVATE	0.7	12	8.4
CLINICAL FAUCET	-	3.0	2	6.0
SERVICE SINK	OFFICES, ETC.	3.0	1	3.0
TOTAL = 31.25 W.F.U				
EQUIVALENT FLOW (IPC TABLE E103.3(3)) = 23.6 GPM				
SELECT Ø1-1/2" MAIN PIPE AT < 5 FT/s				

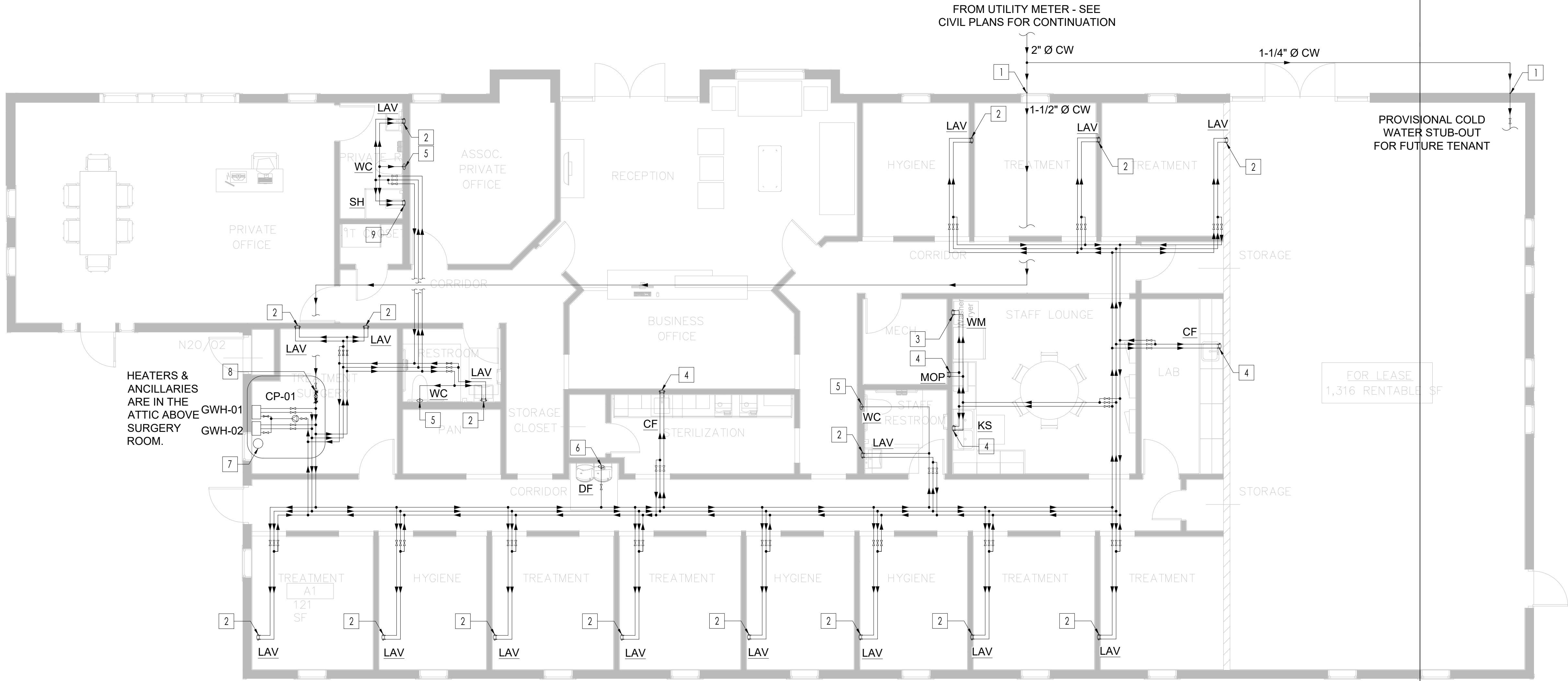
SCHEDULE No. 1
ELECTRIC WATER HEATER SCHEDULE

TAG	GWH-01	GWH-02
LOCATION	ATTIC	ATTIC
MANUFACTURER	A.O SMITH	A.O SMITH
MODEL	ACT-199I-N	ACT-199I-N
TYPE	TANKLESS NATURAL GAS	TANKLESS NATURAL GAS
MAXIMUM FLOW (GPM)	10	10
GAS INPUT MIN. / MAX. (BTU/hr)	15,000 / 199,000	15,000 / 199,000
UNIFORM ENERGY FACTOR (UEF)	0.93	0.93
APPROX. WEIGHT (lbs)	71	71
DIMENSIONS WxHxD	17.75" x 24.9" x 11.25"	17.75" x 24.9" x 11.25"
HOT & COLD WATER CONX. SIZE	3/4" & 3/4"	3/4" & 3/4"
GAS CONX. SIZE	3/4"	3/4"

- NOTES:
1. PROVIDE ASME APPROVED T&P RELIEF VALVE WITH DRAIN.
 2. PROVIDE ISOLATION VALVES ON BOTH THE COLD-WATER SUPPLY AND THE HOT-WATER PIPE LEAVING THE INSTANTANEOUS WATER HEATERS, AND PROVIDE HOSE BIB OR OTHER FITTINGS ON EACH VALVE FOR FLUSHING.
 3. PROVIDE 110V RECEPTACLE W/WATER-RESISTANT ENCLOSURE/COVER FOR TANKLESS W/H.
 4. PROVIDE EXTERNAL RE-CIRCULATION PUMP.
 5. FOR POWER SUPPLY, SEE ELECTRICAL SHEETS.

WATER SUPPLY KEYED NOTES:

1. DCW ENTRY TO BUILDING - SEE WATER ENTRY DETAIL.
2. DCW & DHW DROP IN WALL TO LAVATORY WITH THERMOSTATIC MIXING VALVE.
3. DCW & DHW DROP IN WALL FOR WASHING MACHINE TERMINALS - PROVIDE WATER HAMMER ARRESTORS & AUTOMATIC AIR VENTS AT THE TOP OF RISER.
4. DCW & DHW DROP IN WALL TO FIXTURE TERMINAL.
5. DCW DROP IN WALL TO TOILET TANK TERMINAL.
6. DCW DROP IN WALL WITH VACUUM BREAKER & BACKFLOW PREVENTER FOR DRINKING FOUNTAIN.
7. EXPANSION TANK WATTS PLT-12 OR EQUAL NEAR GAS WATER HEATER IN ATTIC - SEE SCHEDULE FOR DETAILS.
8. BACKFLOW PREVENTER - WATTS 009 OR EQUAL.
9. DCW & DHW DROP IN WALL TO SHOWER - PROVIDE PRESSURE / TEMPERATURE BALANCE ANTI-SCALDING VALVE.



BEMIS FAMILY DENTAL CLINIC
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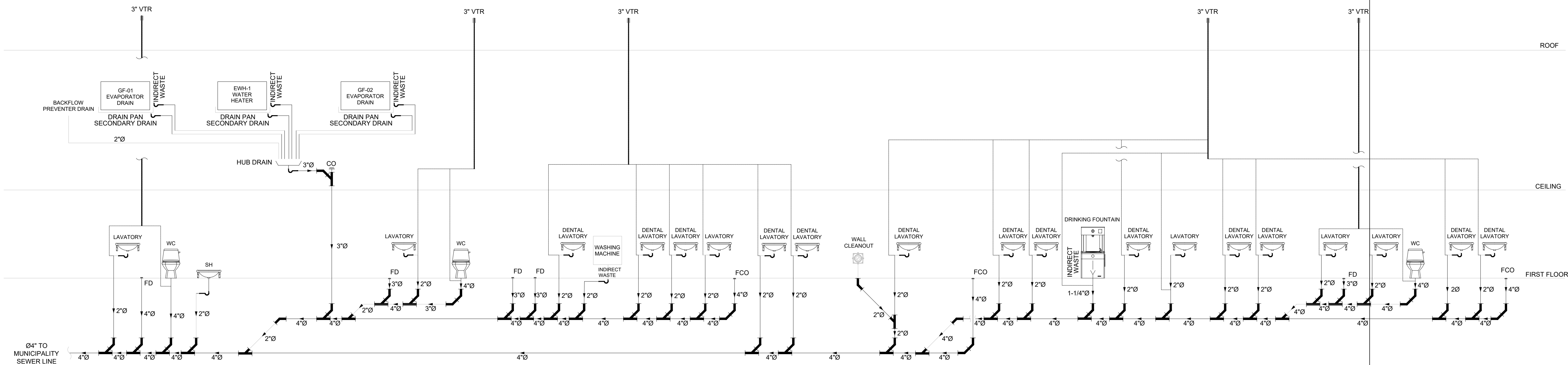
LOT 1, BLOCK A-BEMIS
FAMILY DENTAL ADDITION

WATER SUPPLY
FLOOR PLAN

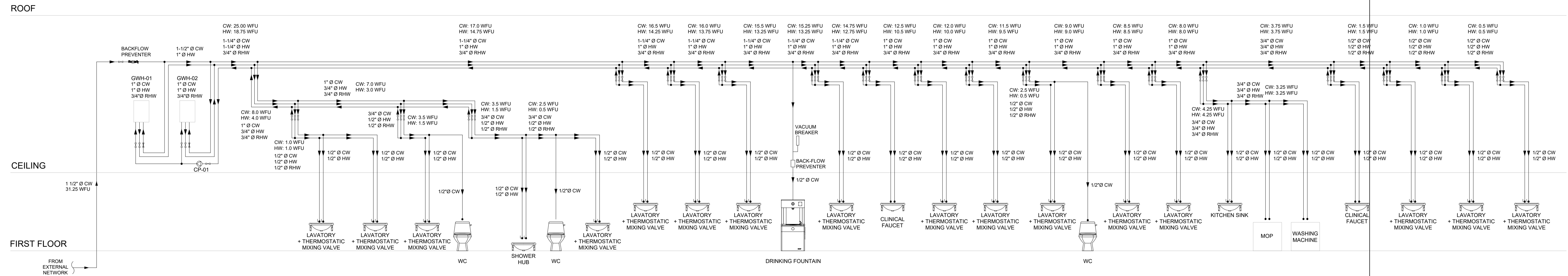
Drawn By: O.K Scale: 3/16" = 1'-0"

Date: 08.18.2023 PROJ.NO.:

P300



DRAINAGE RISER DIAGRAM
Scale: NTS



WATER SUPPLY RISER DIAGRAM
SCALE : NTS

BEMIS FAMILY DENTAL CLINIC
6617 CHARBONNEAU RD
CITY OF LAKE WORTH , TEXAS

LOT 1, BLOCK A-BEMIS
FAMILY DENTAL ADDITION

DRAINAGE &
WATER SUPPLY
RISER DIAGRAMS

Drawn By: O.K

Scale: NTS

Date: 08.18.2023

PROJ.NO.:

P500

5/7 SHEET NO.

2018 INTERNATIONAL FUEL GAS CODE CHECK:

CLEARANCES RULES

305.1 General

Equipment and appliances shall be installed as required by the terms of their approval, in accordance with the conditions of listing, the manufacturer's instructions and this code. Manufacturers' installation instructions shall be available on the job site at the time of inspection. Where a code provision is less restrictive than the conditions of the listing of the equipment or appliance or the manufacturer's installation instructions, the conditions of the listing and the manufacturer's installation instructions shall apply. Unlisted appliances approved in accordance with Section 301.3 shall be limited to uses recommended by the manufacturer and shall be installed in accordance with the manufacturer's instructions, the provisions of this code and the requirements determined by the code official.

305.2 Hazardous Area

Equipment and appliances having an ignition source shall not be installed in Group H occupancies or control areas where open use, handling or dispensing of combustible, flammable or explosive materials occurs.

306.5 Equipment and Appliances on Roofs or Elevated Structures

Where equipment requiring access or appliances are located on an elevated structure or the roof of a building such that personnel will have to climb higher than 16 feet (4877 mm) above grade to access such equipment or appliances, an interior or exterior means of access shall be provided. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) in height or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope). Such access shall not require the use of portable ladders.

415.1 Interval of Support

Piping shall be supported at intervals not exceeding the spacing specified in Table 415.1. Spacing of supports for CSST shall be in accordance with the CSST manufacturer's instructions.

Clearances Requirements:

308.4 Central-Heating Boilers and Furnaces

Clearance requirements for central-heating boilers and furnaces shall comply with Sections 308.4.1 through 308.4.5. The clearance to these appliances shall not interfere with combustion air; draft hood clearance and relief; and accessibility for servicing.

308.4.1 Appliance Clearances:

Central-heating furnaces and low-pressure boilers shall be installed with clearances in accordance with the manufacturer's instructions.

308.4.2 Clearance Reduction:

Central-heating furnaces and low-pressure boilers shall be permitted to be installed with reduced clearances to combustible material provided that the combustible material or appliance is protected as described in Table 308.2 and such reduction is allowed by the manufacturer's instructions.

308.4.3 Clearance for Servicing Appliances:

Front clearance shall be sufficient for servicing the burner and the furnace or boiler.

308.4.4 Plenum Clearances:

Where the furnace plenum is adjacent to plaster on metal lath or noncombustible material attached to combustible material, the clearance shall be measured to the surface of the plaster or other noncombustible finish where the clearance specified is 2 inches (51 mm) or less.

308.4.5 Clearance From Supply Ducts:

Supply air ducts connecting to listed central heating furnaces shall have the same minimum clearance to combustibles as required for the furnace supply plenum for a distance of not less than 3 feet (914 mm) from the supply plenum. Clearance is not required beyond the 3-foot (914 mm) distance.

Section 401 (IFGC) General

401.1 Scope

This chapter shall govern the design, installation, modification and maintenance of piping systems. The applicability of this code to piping systems extends from the point of delivery to the connections with the appliances and includes the design, materials, components, fabrication, assembly, installation, testing, inspection, operation and maintenance of such piping systems.

401.1.1 Utility Piping Systems Located Within Buildings

Utility service piping located within buildings shall be installed in accordance with the structural safety and fire protection provisions of the International Building Code.

401.5 Identification

For other than steel pipe, exposed piping shall be identified by a yellow label marked "Gas" in black letters. The marking shall be spaced at intervals not exceeding 5 feet (1524 mm). The marking shall not be required on pipe located in the same room as the appliance served.

401.6 Interconnections

Where two or more meters are installed on the same premises but supply separate consumers, the piping systems shall not be interconnected on the outlet side of the meters.

401.7 Piping Meter Identification

Piping from multiple meter installations shall be marked with an approved permanent identification by the installer so that the piping system supplied by each meter is readily identifiable.

401.8 Minimum Sizes

Pipe utilized for the installation, extension and alteration of any piping system shall be sized to supply the full number of outlets for the intended purpose and shall be sized in accordance with Section 402.

401.9 Identification

Each length of pipe and tubing and each pipe fitting, utilized in a fuel gas system, shall bear the identification of the manufacturer.

Exceptions:

- Steel pipe sections that are 2 feet (610 mm) and less in length and are cut from longer sections of pipe.
- Steel pipe fittings 2 inches and less in size.
- Where identification is provided on the product packaging or crating.
- Where other approved documentation is provided.

GAS PIPES SIZING:

ITEM	INPUT - MBH	PIPE SIZE
GF-01 / FURNACE	100	3/4"
GF-02 / FURNACE	100	3/4"
GWH-01 / TANKLESS WATER HEATER	199	1"
GWH-02 / TANKLESS WATER HEATER	199	1"
TOTAL =	598	1 1/2"

GAS: NATURAL
INLET PRESSURE: LESS THAN 2 PSI
PRESSURE DROP: 0.5" W.C.
PIPE: SCHEDULE 40 / METALLIC
AS PER IFGC 2018 TABLE 402.4(2)
FOR PIPE LENGTH OF 50', BELOW ARE THE PIPE SIZES LIMITS:
3/4" = 151 CFH
1" = 284 CFH
1-1/4" = 583 CFH
1-1/2" = 873 CFH

GAS PIPING MATERIAL

403.4 Metallic Pipe

Metallic pipe shall comply with Sections 403.4.1 through 403.4.4.

403.4.1 Cast Iron

Cast-iron pipe shall not be used.

403.4.2 Steel

Steel, stainless steel and wrought-iron pipe shall be not lighter than Schedule 10 and shall comply with the dimensional standards of ASME B36.10M and one of the following standards:

- ASTM A53/A53M.
- ASTM A106.
- ASTM A312.

403.4.3 Copper and Copper Alloy

Copper and copper alloy pipe shall not be used if the gas contains more than an average of 0.3 grains of hydrogen sulfide per 100 standard cubic feet of gas (0.7 milligrams per 100 liters). Threaded copper, copper alloy and aluminum-alloy pipe shall not be used with gases corrosive to such materials.

403.4.4 Aluminum

Aluminum-alloy pipe shall comply with ASTM B241 except that the use of alloy 5456 is prohibited. Aluminum-alloy pipe shall be marked at each end of each length indicating compliance. Aluminum-alloy pipe shall be coated to protect against external corrosion where it is in contact with masonry, plaster or insulation, or is subject to repeated wettings by such liquids as water, detergents or sewage. Aluminum-alloy pipe shall not be used in exterior locations or underground.

403.5 Metallic Tubing

Tubing shall not be used with gases corrosive to the tubing material.

403.5.1 Steel Tubing

Steel tubing shall comply with ASTM A254.

403.5.2 Stainless Steel

Stainless steel tubing shall comply with ASTM A268 or ASTM A269.

403.5.3 Copper and Copper Alloy Tubing

Copper tubing shall comply with Standard Type K or L of ASTM B88 or ASTM B280. Copper and copper alloy tubing shall not be used if the gas contains more than an average of 0.3 grains of hydrogen sulfide per 100 standard cubic feet of gas (0.7 milligrams per 100 liters).

403.5.4 Aluminum Tubing

Aluminum-alloy tubing shall comply with ASTM B210 or ASTM B241. Aluminum alloy tubing shall be coated to protect against external corrosion where it is in contact with masonry, plaster or insulation, or is subject to repeated wettings by such liquids as water, detergent or sewage. Aluminum-alloy tubing shall not be used in exterior locations or underground.

403.5.5 Corrugated Stainless Steel Tubing

Corrugated stainless steel tubing shall be listed in accordance with ANSI LC 1/CSA 6.26.

403.6 Plastic Pipe, Tubing and Fittings

Polyethylene plastic pipe, tubing and fittings used to supply fuel gas shall conform to ASTM D2513. Such pipe shall be marked "Gas" and "ASTM D2513." Polyamide pipe, tubing and fittings shall be identified and conform to ASTM F2945. Such pipe shall be marked "Gas" and "ASTM F2945." Polyvinyl chloride (PVC) and chlorinated polyvinyl chloride (CPVC) plastic pipe, tubing and fittings shall not be used to supply fuel gas.

403.6.1 Anodeless Risers

Plastic pipe, tubing and anodeless risers shall comply with the following: Factory-assembled anodeless risers shall be recommended by the manufacturer for the gas used and shall be leak tested by the manufacturer in accordance with written procedures. Service head adapters and field-assembled anodeless risers incorporating service head adapters shall be recommended by the manufacturer for the gas used, and shall be designed and certified to meet the requirements of Category I of ASTM D2513, and U.S. Department of Transportation, Code of Federal Regulations, Title 49, Part 192.281(e). The manufacturer shall provide the user with qualified installation instructions as prescribed by the U.S. Department of Transportation, Code of Federal Regulations, Title 49, Part 192.283(b).

403.6.2 LP-Gas Systems

The use of plastic pipe, tubing and fittings in undiluted liquefied petroleum gas piping systems shall be in accordance with NFPA 58.

403.6.3 Regulator Vent Piping

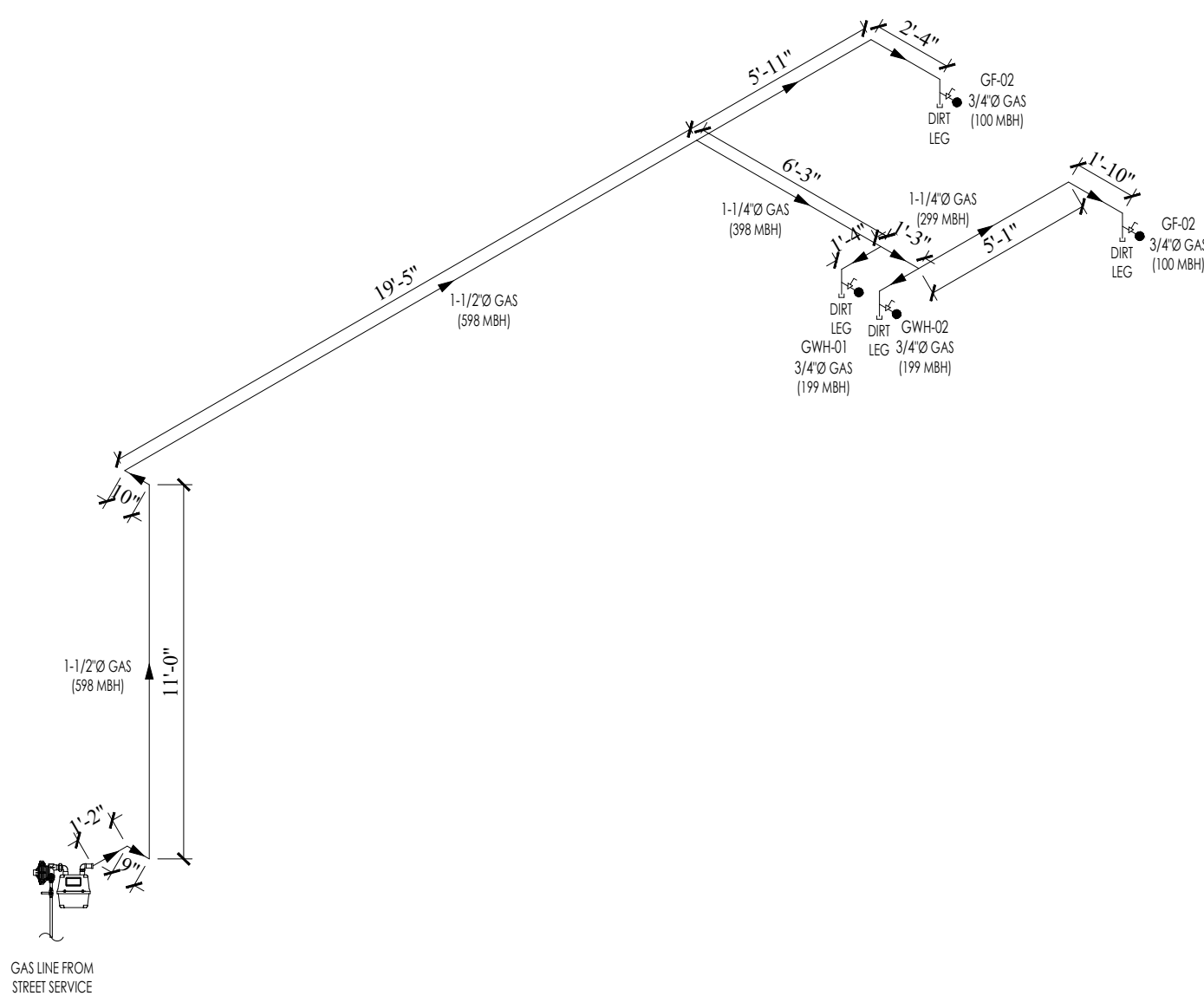
Plastic pipe and fittings used to connect regulator vents to remote vent terminations shall be PVC conforming to ANSI/UL 651. PVC vent piping shall not be installed indoors.

TABLE 415.1 / SUPPORT OF PIPING

STEEL PIPE, NOMINAL SIZE OF PIPE (INCHES)	SPACING OF SUPPROTS (FEET)	NOMINAL SIZE OF TUBING (SMOOTH-WALL) (inch O.D.)	SPACING OF SUPPROTS (FEET)
1/2	6	1/2	4
3/4 OR 1	8	3/4 OR 1	6
1 1/4 OR LARGER HORIZONTAL	10	1 1/4 OR LARGER HORIZONTAL	8
1 1/4 OR LARGER VERTICAL	EVERY FLOOR LEVEL	1 1/4 OR LARGER VERTICAL	EVERY FLOOR LEVEL

GAS PIPES MATERIAL:

- ABOVE GROUND GAS PIPES IN SCHEDULE 40 STEEL.
- TERMINATION TO APPLIANCES / EQUIPMENT IN CORRUGATED STAINLESS STEEL PIPES.
- PROVIDE GROUNDING / BONDING AS REQUIRED BY THE CODE.
- PIPING MATERIAL MUST COMPLY TO THE ONES SPECIFIED IN CODE / SEE CODE CHECK FOR DETAILS.



GAS NETWORK ISOMETRIC VIEW
N.T.S

BEMIS FAMILY DENTAL CLINIC

6617 CHARBONNEAU RD
CITY OF LAKE WORTH , TEXAS

LOT 1, BLOCK A-BEMIS
FAMILY DENTAL ADDITION

GAS CODE
CHECK,
ISOMETRIC VIEW
& PIPE SIZING

Drawn By: O.K

Scale: NTS

Date: 08.18.2023

PROJ.NO.:

P600