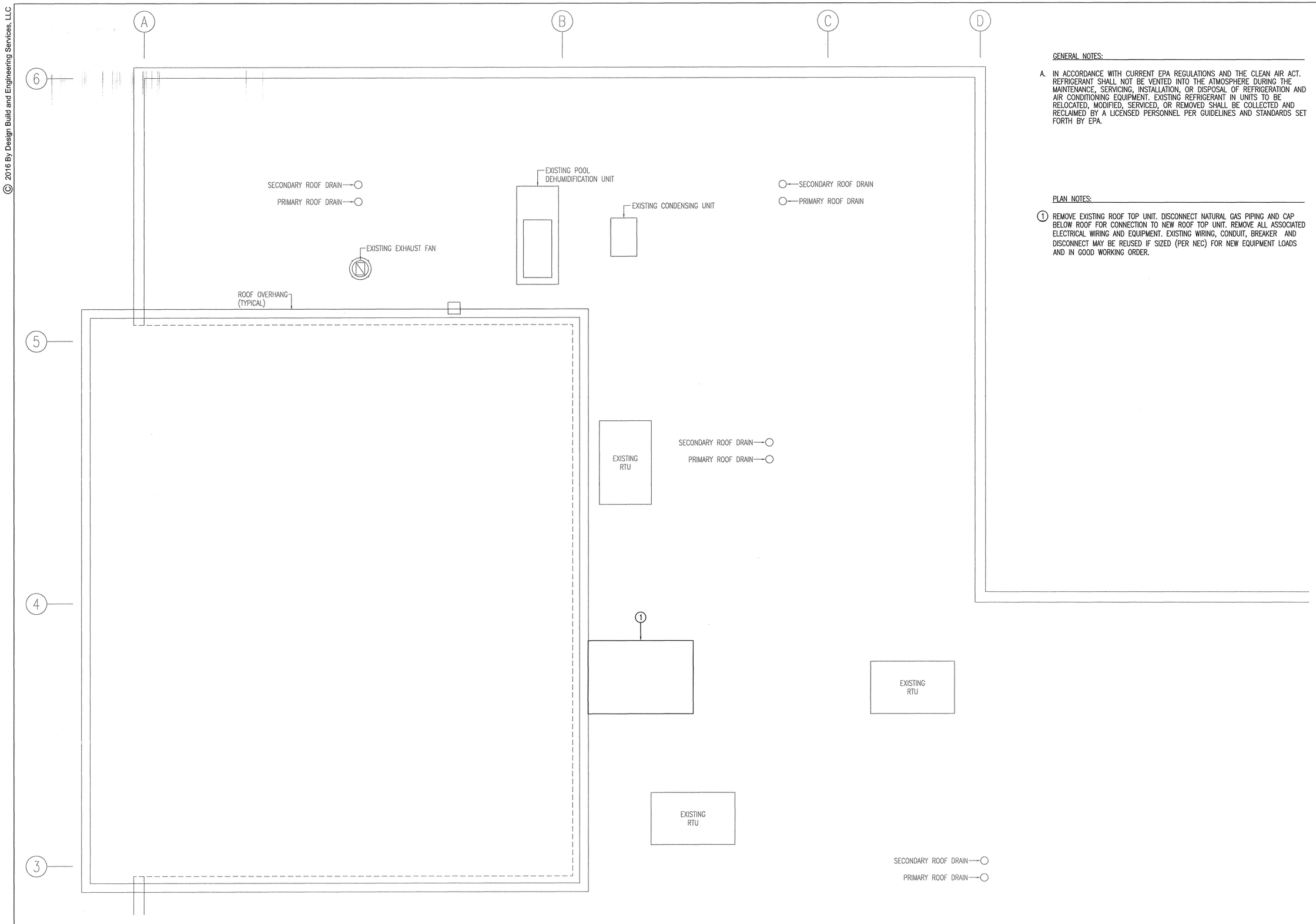


1 HVAC ROOF PLAN - DEMOLITION
SCALE 1/4" = 1'-0"

NORTH

GENERAL NOTES:

A. IN ACCORDANCE WITH CURRENT EPA REGULATIONS AND THE CLEAN AIR ACT. REFRIGERANT SHALL NOT BE VENTED INTO THE ATMOSPHERE DURING THE MAINTENANCE, SERVICING, INSTALLATION, OR DISPOSAL OF REFRIGERATION AND AIR CONDITIONING EQUIPMENT. EXISTING REFRIGERANT IN UNITS TO BE RELOCATED, MODIFIED, SERVICED, OR REMOVED SHALL BE COLLECTED AND RECLAIMED BY A LICENSED PERSONNEL PER GUIDELINES AND STANDARDS SET FORTH BY EPA.

PLAN NOTES:

1. REMOVE EXISTING ROOF TOP UNIT. DISCONNECT NATURAL GAS PIPING AND CAP BELOW ROOF FOR CONNECTION TO NEW ROOF TOP UNIT. REMOVE ALL ASSOCIATED ELECTRICAL WIRING AND EQUIPMENT. EXISTING WIRING, CONDUIT, BREAKER AND DISCONNECT MAY BE REUSED IF SIZED (PER NEC) FOR NEW EQUIPMENT LOADS AND IN GOOD WORKING ORDER.

DESIGN BUILD AND ENGINEERING SERVICES, LLC

JOSHUA DAVID FOULK
PROFESSIONAL ENGINEER
No. 21-PE-A&EGIT
12/2016
STATE OF MISSISSIPPI

Revisions	
#	Date

Project No. 16-146

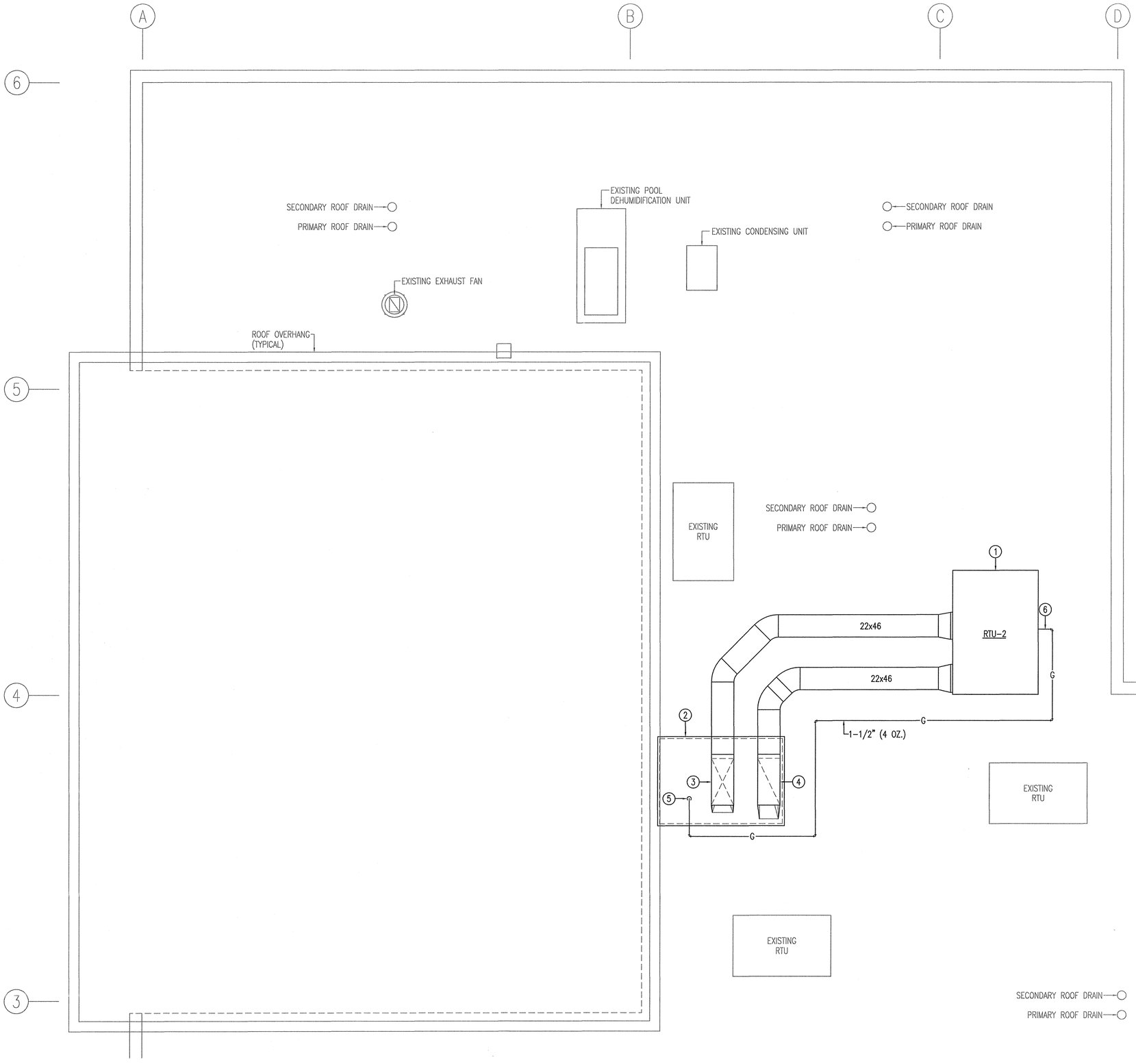
Date 2016-12-07

Drawn by JDF

GREENWOOD LEFLORE HOSPITAL
OUTPATIENT PHYSICAL REHABILITATION CENTER
ROOF TOP UNIT REPLACEMENT
GREENWOOD, MISSISSIPPI

HVAC ROOF PLAN - DEMOLITION

M1.1



1 HVAC ROOF PLAN - NEW
SCALE 1/4" = 1'-0"

NORTH

GENERAL NOTES:

A. ROUTE CONDENSATE FROM RTU TO NEAREST ROOF DRAIN. TRAP CONDENSATE PER MANUFACTURER RECOMMENDATION.

B. CONTRACTOR SHALL VERIFY EXISTING WIRING, CONDUIT AND BREAKERS ARE SIZED (PER NEC) TO SUPPORT THE ELECTRICAL REQUIREMENTS FOR THE ROOF TOP UNIT. PROVIDE NEW WIRING, CONDUIT AND BREAKERS AS REQUIRED.

C. UPDATE PANEL SCHEDULES TO IDENTIFY CIRCUITS SERVING NEW EQUIPMENT.

D. UTILIZE LIQUID TIGHT FLEXIBLE CONDUIT FOR FINAL CONNECTIONS TO ALL ROOF MOUNTED EQUIPMENT.

E. BALANCE SYSTEM TO MATCH EXISTING AIRFLOW AS INDICATED ON AS-BUILT DOCUMENTS.

F. PROVIDE ROOF SUPPORTS FOR NATURAL GAS PIPING AND CONDENSATE PIPING. SUPPORTS SHALL BE EQUAL TO PHP SYSTEMS MODEL SS8-CL.

G. PROVIDE ROOF SUPPORTS FOR SUPPLY AND RETURN AIR DUCTWORK. SUPPORTS SHALL BE EQUAL TO PHP SYSTEMS MODEL PHP-D.

H. PROVIDE AND INSTALL NEW DUCT MOUNTED SMOKE DETECTOR IN RETURN DUCT. UNIT SHALL SHUT DOWN ON SIGNAL FROM SMOKE DETECTOR.

I. CONNECT NEW ROOF TOP UNIT TO EXISTING ZONE TEMPERATURE CONTROLS.

J. AT EACH POINT WHERE THE NEW CURB FRAME CROSSES A ROOF JOIST, REINFORCE THE JOIST AS SHOWN IN THE JOIST REINFORCEMENT DETAIL ON SHEET M6.1.

PLAN NOTES:

1. PROVIDE AND INSTALL NEW ROOF TOP UNIT (RTU) ON NEW FACTORY SUPPLIED EQUIPMENT SUPPORT CURB. ROOF WORK TO BE PERFORMED BY CONTRACTOR CERTIFIED BY ROOF MANUFACTURER. WORK TO BE IN COMPLIANCE WITH ROOF BOND HOLDER.

2. PROVIDE AND INSTALL INSULATED CAP ON EXISTING CURB. UTILIZE ANGLE IRON BRACING TO PROVIDE ADDITIONAL SUPPORT FOR CURB CAP. EXISTING CURB SHALL BE UTILIZED FOR CONNECTION TO EXISTING DUCTWORK AND NATURAL GAS PIPING BELOW THE ROOF. SEAL CURB PENETRATIONS WATER AND AIR TIGHT.

3. ROUTE NEW 22x46 SUPPLY AIR DUCT THROUGH INSULATED CURB CAP AND CONNECT TO EXISTING SUPPLY AIR DUCT.

4. ROUTE NEW 22x46 RETURN AIR DUCT THROUGH INSULATED CURB CAP AND CONNECT TO EXISTING SUPPLY AIR DUCT. SEAL PENETRATION AIR AND WATER TIGHT.

5. ROUTE 1-1/2" NATURAL GAS PIPING DOWN THROUGH INSULATED CURB CAP AND CONNECT TO EXISTING NATURAL GAS BELOW ROOF. SEAL PENETRATION AIR AND WATER TIGHT.

6. CONNECT 1-1/2" NATURAL GAS PIPING TO RTU-2 AT APPROXIMATE LOCATION INDICATED. INSTALL DRIP LEG AND GAS COCK AT CONNECTION TO UNIT.

DESIGN BUILD AND ENGINEERING SERVICES, LLC

JOSHUA DAVID FAULKNER
LICENSED PROFESSIONAL ENGINEER
PE # 19391
12/2016
STATE OF MISSISSIPPI

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GREENWOOD LEFLORE HOSPITAL
OUTPATIENT PHYSICAL REHABILITATION CENTER
ROOF TOP UNIT REPLACEMENT
GREENWOOD, MISSISSIPPI

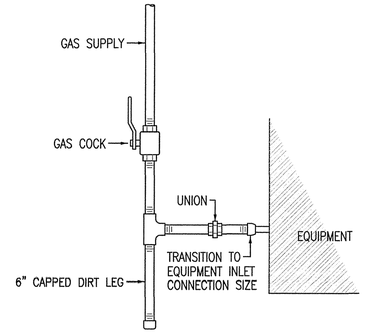
HVAC ROOF PLAN - NEW

M1.2

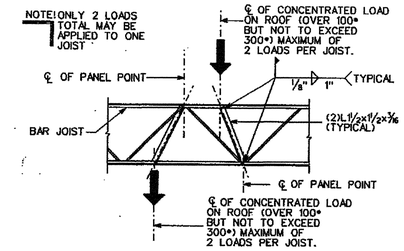
ROOF TOP UNIT SCHEDULE

MARK	TOTAL CFM	O.A. CFM	E.S.P. IN. W.G.	FAN DATA		ELECTRICAL SERVICE		FILTER	DX COOLING COIL (R-410A)					NATURAL GAS REHEAT					MANUFACTURER AND MODEL	REMARKS
				RPM	H.P.	V-PH	MCA/MOCP		TOTAL (MBH)	SENS. (MBH)	EAT (°F)	LAT (°F)	ROWS	INPUT (MBH)	OUTPUT (MBH)	EAT (°F)	LAT (°F)	STAGES		
RTU-2	10,000	1,000	0.9	937	10.0	208-3	124.0/150	2" MERV 8	255.9	194.1	77.1/64.3	56.6/54.7	4	400.0	320.0	64.7	94.2	2	TRANE YSH300	1,2,3,4,5

NOTES:
1. PROVIDE UNIT WITH MOTORIZED OUTSIDE AIR AND RETURN AIR DAMPERS.
2. PROVIDE UNIT WITH PREMIUM EFFICIENCY MOTORS.
3. PROVIDE UNIT WITH SINGLE POINT POWER CONNECTION.
4. PROVIDE UNIT WITH OUTSIDE AIR WEATHERHOOD AND HAIL GUARDS.
5. PROVIDE UNIT WITH FACTORY SUPPLIED ROOF CURB.



TYPICAL GAS CONNECTION TO EQUIPMENT
NOT TO SCALE



TYPICAL JOIST REINFORCEMENT
FOR CONCENTRATED LOADS
NTS

FACILITY NATURAL GAS PIPING

1. NATURAL GAS PIPING, ABOVE GRADE
   A. STEEL PIPE: ASTM A53/A53M SCHEDULE 40 BLACK.
      1. FITTINGS: ASME B16.3, MALLEABLE IRON, OR ASTM A234/A234M FORGED STEEL WELDING TYPE.
      2. JOINTS: THREADED FOR PIPE 2 INCH AND SMALLER; WELDED FOR PIPE 2-1/2 INCHES AND LARGER.

2. REGULATOR VENT PIPING, ABOVE GRADE
   A. INDOORS: SAME AS NATURAL GAS PIPING, ABOVE GRADE.
   B. OUTDOORS: PVC PIPE, TUBING, AND FITTINGS, UL 651.

3. UNIONS AND FLANGES
   A. UNIONS FOR PIPE 2 INCHES AND SMALLER:
      1. FERROUS PIPING: CLASS 150, MALLEABLE IRON, THREADED.
      2. COPPER PIPING: CLASS 150, BRONZE UNIONS WITH BRAZED JOINTS.
      3. DIELECTRIC CONNECTIONS: UNION WITH GALVANIZED OR PLATED STEEL THREADED END, COPPER SOLDER END, WATER IMPERVIOUS ISOLATION BARRIER.
   B. FLANGES FOR PIPE 2-1/2 INCHES AND LARGER:
      1. FERROUS PIPING: CLASS 150, FORGED STEEL, SLIP-ON FLANGES.
      2. COPPER PIPING: CLASS 150, SLIP-ON BRONZE FLANGES.
      3. GASKETS: 1/16 INCH THICK PREFORMED NEOPRENE GASKETS.

4. BALL VALVES
   A. 1/4 INCH TO 1 INCH: MSS SP 110, CLASS 125, TWO PIECE, THREADED ENDS, BRONZE BODY, CHROME PLATED BRONZE BALL, REINFORCED TEFLON SEATS, BLOW-OUT PROOF STEM, LEVER HANDLE, UL 842 LISTED FOR FLAMMABLE LIQUIDS AND LPG, FULL PORT. EQUAL TO APOLLO 80-100 SERIES.
   B. 1-1/4 INCH TO 3 INCH: MSS SP 110, CLASS 125, TWO PIECE, THREADED ENDS, BRONZE BODY, CHROME PLATED BRONZE BALL, REINFORCED TEFLON SEATS, BLOW-OUT PROOF STEM, LEVER HANDLE, UL 842 LISTED FOR FLAMMABLE LIQUIDS AND LPG, CONVENTIONAL PORT. EQUAL TO APOLLO 80-100 SERIES.

5. PLUG VALVES
   A. VALVES SHALL BE IRON-BODY (SEMI-STEEL) LUBRICATED, WITH TEFLON COATED PLUG. FLANGED VALVES SHALL BE INSTALLED BETWEEN 150# ASA STEEL FLAT FACED SLIP-ON WELD FLANGES. VALVES OVER 1" SIZE SHALL BE WRENCH OPERATED AND WRENCH SHALL BE FURNISHED WITH EACH SIZE VALVE. EACH PLUG VALVE SHALL BE SERVICED WITH THE SEALANT RECOMMENDED BY THE VALVE MANUFACTURER.
      1. VALVES 2" AND SMALLER SHALL BE SHORT-PATTERN TYPE WITH THREADED END CONNECTIONS. VALVES SHALL BE RATED AT 175# WOG.
      2. VALVES 2-1/2" THROUGH 4" SHALL BE SHORT-PATTERN TYPE WITH FLANGED END CONNECTIONS. VALVES SHALL BE RATED AT 175# WOG.

6. STRAINERS
   A. 2 INCH AND SMALLER: SCREWED BRASS OR IRON BODY FOR 175 PSIG WORKING PRESSURE, Y PATTERN WITH 1/32 INCH STAINLESS STEEL PERFORATED SCREEN. EQUAL TO APOLLO 59 SERIES.
   B. 2-1/2 INCH TO 4 INCH: FLANGED IRON BODY FOR 175 PSIG WORKING PRESSURE, Y PATTERN WITH 3/64 INCH STAINLESS STEEL PERFORATED SCREEN. EQUAL TO APOLLO 125YF SERIES.
   C. 5 INCH AND LARGER: FLANGED IRON BODY FOR 175 PSIG WORKING PRESSURE, BASKET PATTERN WITH 1/8 INCH STAINLESS STEEL PERFORATED SCREEN.

7. NATURAL GAS PRESSURE REGULATORS
   A. PRODUCT DESCRIPTION: SPRING LOADED, GENERAL PURPOSE, SELF-OPERATING SERVICE REGULATOR INCLUDING INTERNAL RELIEF TYPE DIAPHRAGM ASSEMBLY AND VENT VALVE. DIAPHRAGM CASE CAN BE ROTATED 360 DEGREES IN RELATION TO BODY.
      1. COMPLY WITH ANSI Z21.80.
      2. TEMPERATURES: MINUS 20 DEGREES F TO 150 DEGREES F.
      3. BODY: AS SPECIFIED BY ENGINEER.
      4. SPRING CASE, LOWER DIAPHRAGM CASING, UNION RING, SEAT RING AND DISK HOLDER: ALUMINUM.
      5. DISK, DIAPHRAGM, AND O-RING: NITRILE.
      6. MAXIMUM INLET PRESSURE: 150 PSIG.
      7. FURNISH SIZES 2 INCHES AND SMALLER WITH THREADED ENDS. FURNISH SIZES 2-1/2 INCHES AND LARGER WITH FLANGED ENDS.

8. NATURAL GAS PRESSURE RELIEF VALVES
   A. PRODUCT DESCRIPTION: SPRING LOADED TYPE RELIEF VALVE.
      1. BODY: ALUMINUM.
      2. DIAPHRAGM: NITRILE
      3. ORIFICE: BRASS.
      4. MAXIMUM OPERATING TEMPERATURE: 150 DEGREES F.
      5. INLET CONNECTIONS: THREADED.
      6. OUTLET OR VENT CONNECTION: SAME SIZE AS INLET CONNECTION.

HVAC INSULATION

1. DUCTWORK INSULATION
   A. TYPE D-2: ASTM C612, TYPE IA OR IB, RIGID GLASS FIBER, WITH FACTORY APPLIED REINFORCED ALUMINUM FOIL FACING MEETING ASTM C1136, TYPE II.
      1. THERMAL CONDUCTIVITY: 0.23 AT 75 DEGREES F.
      2. DENSITY: 3.0 POUND PER CUBIC FOOT.

2. DUCTWORK INSULATION JACKETS
   A. ALUMINUM DUCT JACKET:
      1. ASTM B209.
      2. THICKNESS: 0.025 INCH THICK SHEET.
      3. FINISH: SMOOTH.
      4. JOINING: LONGITUDINAL SLIP JOINTS AND 2 INCH LAPS.
      5. FITTINGS: 0.016 INCH THICK DIE SHAPED FITTING COVERS WITH FACTORY ATTACHED PROTECTIVE LINER.
      6. METAL JACKET BANDS: 3/8 INCH WIDE; 0.015 INCH THICK ALUMINUM.

3. DUCTWORK SYSTEM
   A. SUPPLY DUCTS
      1. INSULATION TYPE: D-2
      2. INSULATION THICKNESS: 2 INCH
   B. RETURN/EXHAUST DUCTS
      1. INSULATION TYPE: D-2
      2. INSULATION THICKNESS: 2 INCH

4. DUCTWORK INSTALLATION
   A. DUCTS EXTERIOR TO BUILDING:
      1. PROVIDE EXTERNAL INSULATION WITH VAPOR RETARDER JACKET. COVER WITH OUTDOOR JACKET FINISHED AS SPECIFIED IN SECTION WITH CAULKED ALUMINUM JACKET WITH SEAMS LOCATED ON BOTTOM SIDE OF HORIZONTAL DUCT SECTION.
      2. FINISH WITH ALUMINUM DUCT JACKET.
      3. CALK SEAMS AT FLANGES AND JOINTS. LOCATED MAJOR LONGITUDINAL SEAMS ON BOTTOM SIDE OF HORIZONTAL DUCT SECTIONS.

HVAC DUCTS AND CASINGS

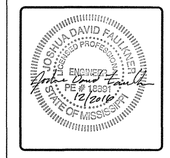
1. DUCT MATERIALS
   A. GALVANIZED STEEL DUCTS: ASTM A653/A653M GALVANIZED STEEL SHEET, LOCK-FORMING QUALITY, HAVING G60 (ZINC COATING OF IN CONFORMANCE WITH ASTM A90/A90M.

6. DUCTWORK FABRICATION
   A. FABRICATE AND SUPPORT RECTANGULAR DUCTS IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE AND AS INDICATED ON DRAWINGS. PROVIDE DUCT MATERIAL, GAGES, REINFORCING, AND SEALING FOR OPERATING PRESSURES INDICATED.
   B. FABRICATE AND SUPPORT ROUND DUCTS WITH LONGITUDINAL SEAMS IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE (ROUND DUCT CONSTRUCTION STANDARDS) AND AS INDICATED ON DRAWINGS. PROVIDE DUCT MATERIAL, GAGES, REINFORCING, AND SEALING FOR OPERATING PRESSURES INDICATED.
   C. CONSTRUCT T'S, BENDS, AND ELBOWS WITH MINIMUM RADIUS 1-1/2 TIMES CENTERLINE DUCT WIDTH. WHERE NOT POSSIBLE AND WHERE RECTANGULAR ELBOWS ARE USED, PROVIDE AIRFOIL TURNING VANES. WHERE ACOUSTICAL LINING IS INDICATED, FURNISH TURNING VANES OF PERFORATED METAL WITH GLASS FIBER INSULATION.
   D. INCREASE DUCT SIZES GRADUALLY, NOT EXCEEDING 15 DEGREES DIVERGENCE WHEREVER POSSIBLE; MAXIMUM 30 DEGREES DIVERGENCE UPSTREAM OF EQUIPMENT AND 45 DEGREES CONVERGENCE DOWNSTREAM.
   E. FABRICATE CONTINUOUSLY WELDED ROUND AND OVAL DUCT FITTINGS TWO GAGES HEAVIER THAN DUCT GAGES INDICATED IN SMACNA STANDARD. MINIMUM 4 INCH CEMENTED SLIP JOINT, BRAZED OR ELECTRIC WELDED. PRIME COAT WELDED JOINTS.
   F. PROVIDE STANDARD 45-DEGREE LATERAL WYE TAKEOFFS. WHEN SPACE DOES NOT ALLOW 45-DEGREE LATERAL WYE TAKEOFF, USE 90-DEGREE CONICAL TEE CONNECTIONS.
   G. SEAL JOINTS BETWEEN DUCT SECTIONS AND DUCT SEAMS WITH WELDS, GASKETS, MASTIC ADHESIVES, MASTIC PLUS EMBEDDED FABRIC SYSTEMS, OR TAPE.
      1. SEALANTS, MASTICS AND TAPES: CONFORM TO UL 181A. PROVIDE PRODUCTS BEARING APPROPRIATE UL 181A MARKINGS.
      2. DO NOT PROVIDE SEALING PRODUCTS NOT BEARING UL APPROVAL MARKINGS.

7. INSTALLATION
   A. INSTALL AND SEAL DUCTS IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE.

8. CLEANING
   A. CLEAN DUCT SYSTEM AND FORCE AIR AT HIGH VELOCITY THROUGH DUCT TO REMOVE ACCUMULATED DUST. TO OBTAIN SUFFICIENT AIR FLOW, CLEAN ONE HALF OF SYSTEM COMPLETELY BEFORE PROCEEDING TO OTHER HALF. PROTECT EQUIPMENT WITH POTENTIAL TO BE HARMED BY EXCESSIVE DIRT WITH TEMPORARY FILTERS, OR BYPASS DURING CLEANING.

DESIGN BUILD AND ENGINEERING SERVICES, LLC



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MECHANICAL SCHEDULES AND SPECIFICATIONS

M6.1