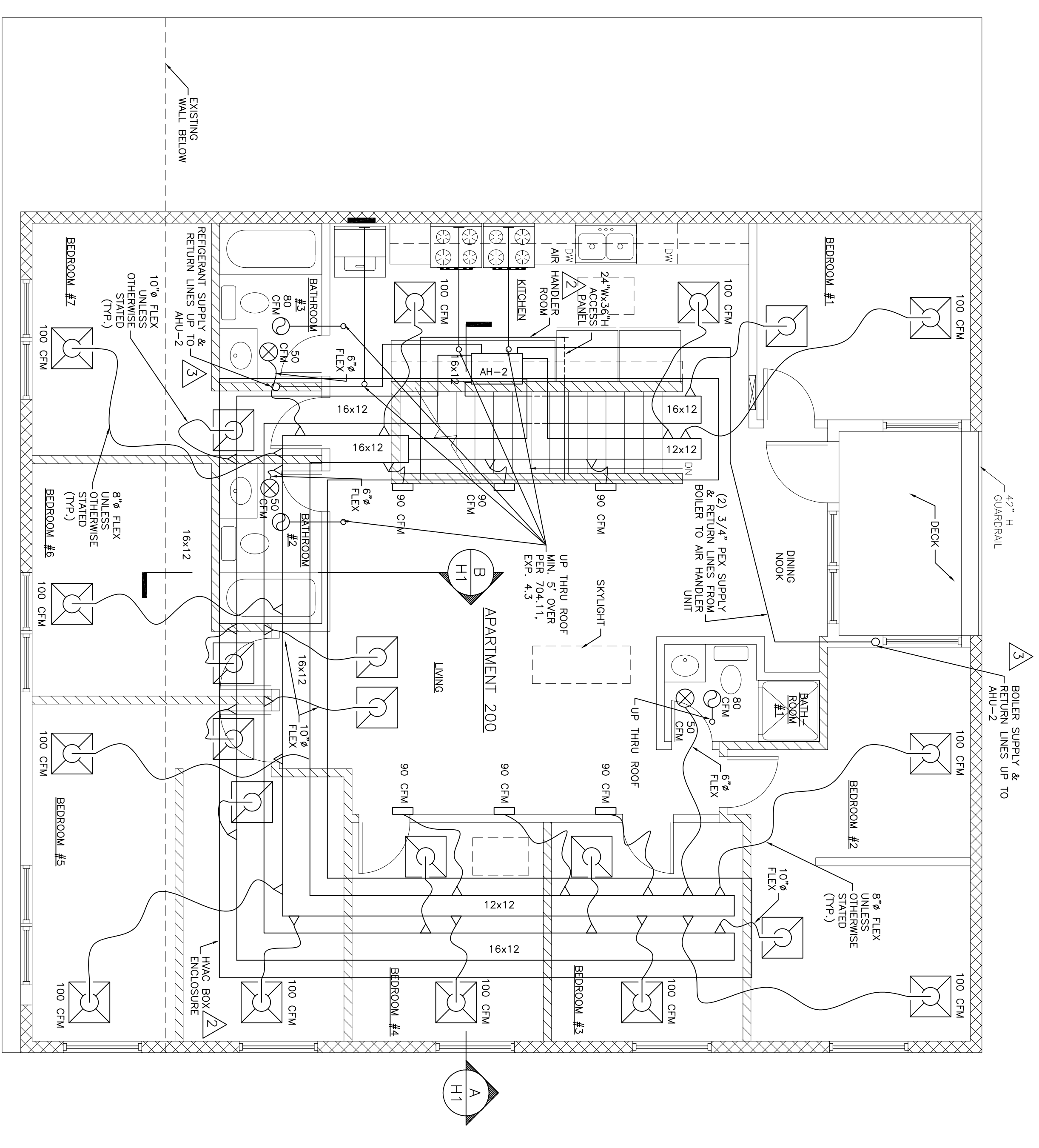
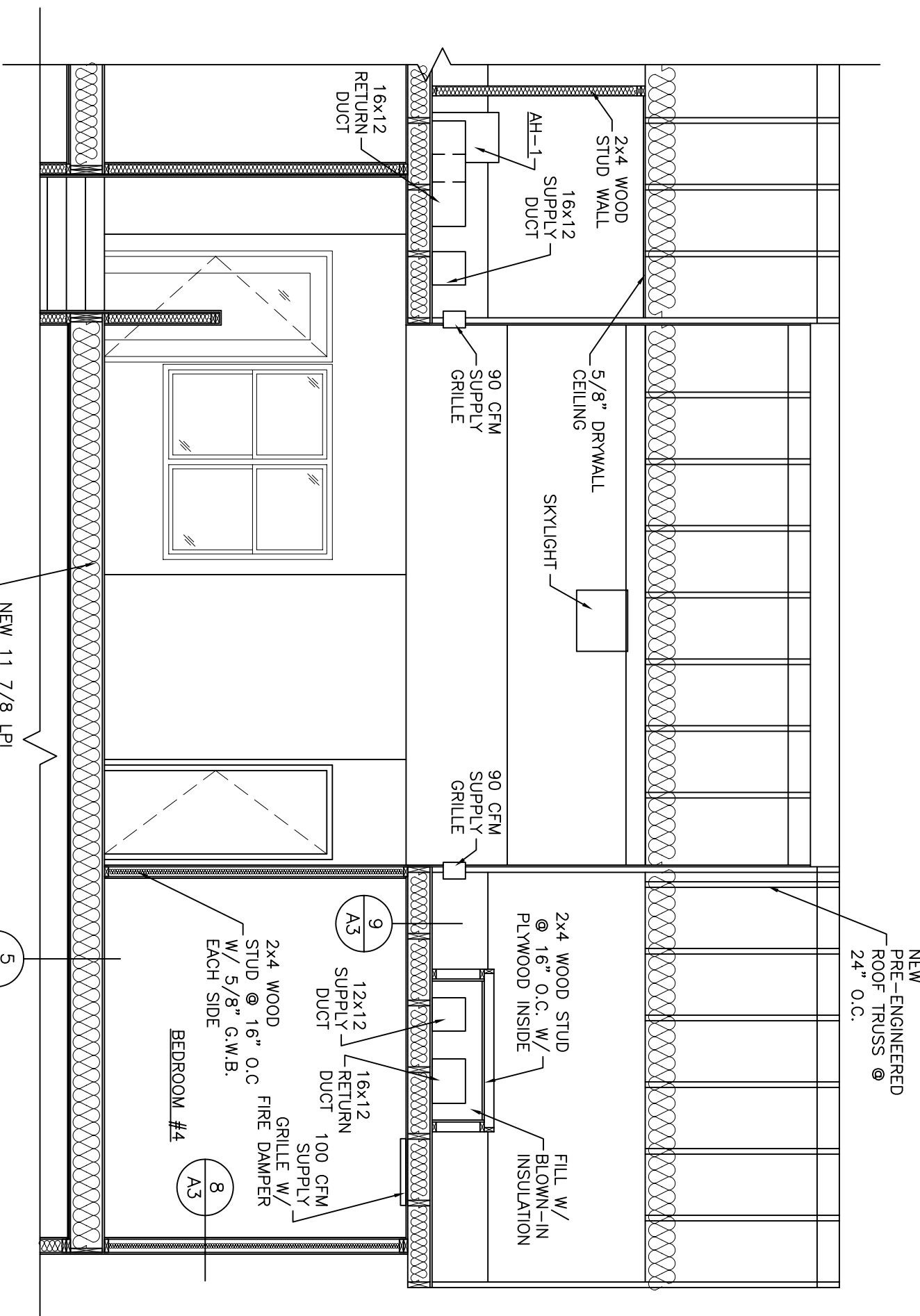


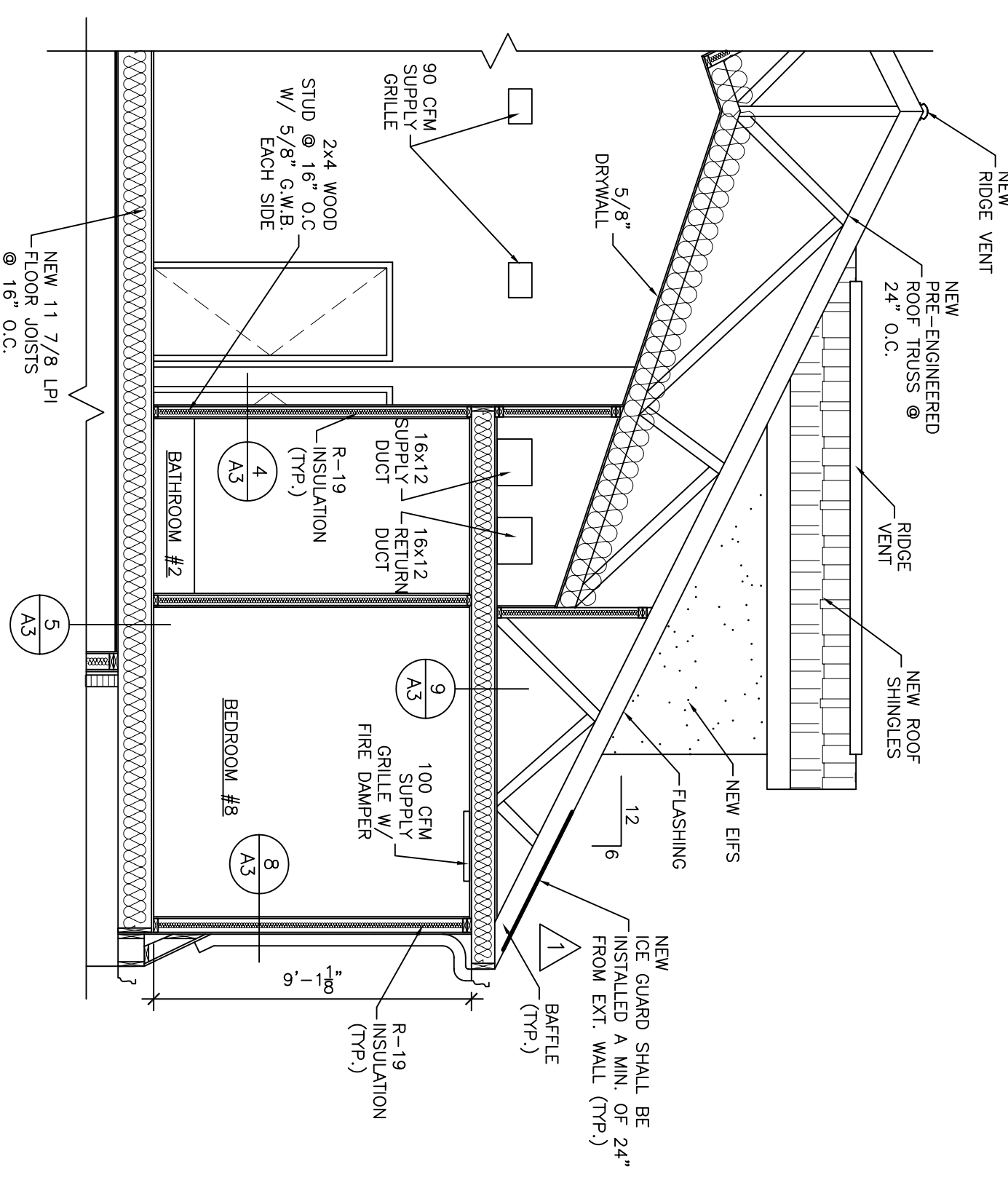
GROUND FLOOR PLAN - HVAC
SCALE: 1/4" = 1'-0"



SECOND FLOOR PLAN - HVAC
SCALE: 1/4" = 1'-0"

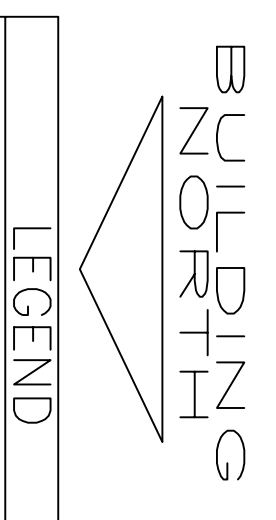


A PROPOSED SECTION
H1 SCALE: 1/4" = 1'-0"



B PROPOSED SECTION
H1 SCALE: 1/4" = 1'-0"

GENERAL NOTE:
PROVIDE FIRE DAMPERS ON
DUCT WORK / GRILLES THAT
PENETRATE THRU CEILINGS.



- RESTROOM EXHAUST
- HVAC SUPPLY GRILLE
- HVAC RETURN GRILLE
- BACK DRAFT DAMPER
- FIRE DAMPER

PART 1 – GENERAL

- 1.1 THE SCOPE OF MECHANICAL WORK SHALL INCLUDE THE FURNISHING AND INSTALLATION OF ALL LABOR, MATERIAL, EQUIPMENT AND SERVICES AND IN PERFORMING ALL OPERATIONS NECESSARY FOR AND INCLUDING THE INSTALLATION OF ALL MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS AND SPECIFIED HEREIN.
- 1.2 THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS AND EQUIPMENT. PIPING AND DUCTWORK PLANS ARE INTENDED TO SHOW SIZE, CAPACITY AND APPROXIMATE LOCATION, DIRECTION AND GENERAL RELATIONSHIP OF ONE WORK PHASE TO ANOTHER, BUT NOT NECESSARY EXACT DETAILS OR ARRANGEMENT.
- 1.3 THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE SITE. THE CONTRACTOR SHALL VERIFY THE CONNECTION REQUIREMENTS AND CONFIGURATION OF MECHANICAL EQUIPMENT BEFORE INSTALLATION.
- 1.4 ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LATEST EDITION OF THE INTERNATIONAL MECHANICAL CODE (IMC) AND THE INTERNATIONAL PLUMBING CODE (IPC) AND ALL APPLICABLE STATE AND LOCAL CODES AND REGULATIONS.

PART II – PRODUCTS

- 2.1 HEATING AND COOLING EQUIPMENT
- A). HEAT PUMP W/ ELECTRIC BACKUP

- A). UNITS SHALL BE COMPLETELY FACTORY ASSEMBLED AND TESTED.
- B). PROVIDE A COMPLETE SYSTEM OF REFRIGERANT PIPING AS RECOMMENDED BY THE A/C MANUFACTURER.
- C). PROVIDE VIBRATION ISOLATION FOR INDOOR UNIT.

2.2 DUCTWORK

- A). SQUARE AND RECTANGLE DUCT

DUCT 18" OR LESS SHALL BE CONSTRUCTED WITH 26-GAGE MINIMUM.
 DUCT 19"-20" SHALL BE CONSTRUCTED WITH 24-GAGE MINIMUM.
 DUCT 21"-24" SHALL BE CONSTRUCTED WITH 22-GAGE MINIMUM.
 DUCT 25"-28" SHALL BE CONSTRUCTED WITH 20-GAGE MINIMUM.
 DUCT 27"-30" SHALL BE CONSTRUCTED WITH 18-GAGE MINIMUM.
 DUCT 31"-36" SHALL BE CONSTRUCTED WITH 16-GAGE MINIMUM.
 DUCT 37" OR GREATER SHALL BE REINFORCED CONSTRUCTED AS PER SMACNA HVAC DUCT CONSTRUCTION STANDARDS. TRANSVERSE JOINTS SHALL BE A T-1, DRIVE SLIP OR EQUIVALENT.
 LONGITUDINAL JOINTS SHALL BE A L-1, PITTSBURGH LOCK OR EQUIVALENT.
 ALL FITTINGS TO BE EQUIVALENT TO TRUNK GAGE.
 SUPPORTS SHALL BE 1" X 20-GAGE MINIMUM AT 8' MAXIMUM CENTERS.
 HORIZONTAL DUCT SHALL HAVE A SUPPORT WITHIN FOUR FEET OF EACH BRANCH INTERSECTION.
 HORIZONTAL DUCT SHALL HAVE A SUPPORT WITHIN FOUR FEET OF EACH BRANCH INTERSECTION.
 ALL JOINTS TO BE SEALED AS PER SMACNA AND INTERNATIONAL MECHANICAL CODE REQUIREMENTS.

- B). SQUARE AND RECTANGLE DUCT ALTERNATIVE
 ENDURA GOLD DUCT BOARD MAY BE USED AS AN ALTERNATE TO METAL DUCT WORK.

C). ROUND DUCT

ROUND DUCT 8" OR LESS SHALL BE CONSTRUCTED WITH 26-GAGE MINIMUM.
 ROUND DUCT 10"-14" SHALL BE CONSTRUCTED WITH 24-GAGE MINIMUM.
 ROUND DUCT 15"-26" SHALL BE CONSTRUCTED WITH 22-GAGE MINIMUM.
 ROUND DUCT 27"-36" SHALL BE CONSTRUCTED WITH 20-GAGE MINIMUM.
 ROUND DUCT 37"-50" SHALL BE CONSTRUCTED WITH 18-GAGE MINIMUM.
 ROUND DUCT 51"-60" SHALL BE CONSTRUCTED WITH 16-GAGE MINIMUM.
 ROUND DUCT 61"-84" SHALL BE CONSTRUCTED WITH 14-GAGE MINIMUM.
 ROUND DUCT 85" AND GREATER SHALL BE REINFORCED CONSTRUCTED AS PER SMACNA HVAC DUCT CONSTRUCTION STANDARDS. TRANSVERSE JOINTS SHALL BE A T-1 OR EQUIVALENT.
 LONGITUDINAL JOINTS SHALL BE A L-1 OR EQUIVALENT.
 ALL FITTINGS TO BE EQUIVALENT TO TRUNK GAGE.
 SUPPORTS SHALL BE 1" X 22-GAGE MINIMUM AT 10' MAXIMUM CENTERS.
 HORIZONTAL DUCT SHALL HAVE A SUPPORT WITHIN TWO FEET OF EACH ELBOW.
 HORIZONTAL DUCT SHALL HAVE A SUPPORT WITHIN FOUR FEET OF EACH BRANCH INTERSECTION.
 ALL JOINTS TO BE SEALED AS PER SMACNA AND INTERNATIONAL MECHANICAL CODE REQUIREMENTS

D). FLEXIBLE DUCT

BENDS SHALL BE MADE WITH NOT LESS THAN 1 DUCT DIAMETER CENTERLINE RADIUS. DUCTS SHALL EXTEND A FEW INCHES BEYOND THE END OF A SHEET METAL CONNECTION BEFORE BENDING.

DUCTS SHALL NOT BE COMPRESSED.

COLLARS TO WHICH FLEXIBLE DUCT IS ATTACHED SHALL BE A MINIMUM OF 2" IN LENGTH. SLEEVES USED FOR JOINING TWO SECTIONS SHALL BE A MINIMUM OF 4" IN LENGTH.
 METALIC FLEXIBLE DUCT SHALL BE ATTACHED WITH AT LEAST THREE #8 SHEET METAL SCREWS EQUALLY SPACED AROUND THE DUCT'S CIRCUMFERENCE. DUCTS LARGER THAN 12" IN DIAMETER SHALL HAVE AT LEAST FIVE #8 SHEET METAL SCREWS. SCREWS SHALL BE LOCATED AT LEAST 1/2" FROM THE DUCT END.
 NON-METALLIC FLEXIBLE DUCT SHALL BE SECURED TO THE SLEEVE OR COLLAR WITH A DRAW BAND. IF THE DUCT COLLAR EXCEEDS 12" IN DIAMETER THE DRAW BAND MUST BE POSITIONED BEHIND A DRAW BAND ON THE METAL COLLAR.
 INSULATION AND VAPOR BARRIERS ON FACTORY-FABRICATED DUCTS SHALL BE FITTED OVER THE CORE CONNECTION AND SHALL ALSO BE SECURED WITH A DRAW BAND.

FLEXIBLE DUCT SHALL BE SUPPORTED AT THE MANUFACTURER'S RECOMMENDED INTERVALS BUT AT LEAST EVERY 4'. MAXIMUM PERMISSIBLE SAG IS A 1/2" FOR FOOT OF SPACING BETWEEN SUPPORTS.

HANGERS SUPPORTING FLEXIBLE DUCT SHALL BE AT LEAST 1" WIDE.
 MAXIMUM LENGTH SHALL BE TWENTY-FIVE FEET.

2.3 DIFFUSERS/REGISTERS/GRILLES

- A). SUPPLY AIR REGISTERS – HART & COOLEY
- B). RETURN/EXHAUST AIR REGISTER – HART & COOLEY

2.4 PIPING

- A). REFRIGERANT PIPING – TYPE L (ACR) HARD OR SOFT DRAWN COPPER TUBING, WROUGHT COPPER SOLDER FITTINGS.
- B). AIR-CONDITIONING CONDENSATE PIPING – SCHEDULE 40 PVC, SOLVENT WELDED FITTINGS.
- C). FURMACE CONDENSATE PIPING – SCHEDULE 40 PVC, SOLVENT WELDED FITTINGS.

2.5 INSULATION

A). ALL SUPPLY AND RETURN AIR DUCTS AND PLENUMS SHALL BE INSULATED WITH A MINIMUM OF R-5 INSULATION WHEN LOCATED IN UNCONDITIONED SPACES AND WITH A MINIMUM OF R-8 INSULATION WHEN LOCATED IN CONDITIONED SPACES. INSULATION SHALL BE SEPARATED FROM THE BUILDING ENVELOPE ASSEMBLY. THE DUCT OR PLENUM SHALL BE SEPARATED FROM THE BUILDING EXTERIOR OR UNCONDITIONED OR EXEMPT SPACES BY A MINIMUM OF R-8 INSULATION.

EXCEPTIONS:

- 1. WHEN LOCATED WITHIN EQUIPMENT.
- 2. WHEN THE DESIGN TEMPERATURE DIFFERENCE BETWEEN THE INTERIOR AND EXTERIOR OF THE DUCT OR PLENUM DOES NOT EXCEED 15°F.
- B). PROVIDE ALL REFRIGERANT PIPING WITH CLOSED CELL ELASTOMERIC TYPE PIPE INSULATION, 3/8" THICK, EQUAL TO ARMASTRONG ARMAFLEX II.

2.6 BALANCING

- A). A QUALIFIED REPRESENTATIVE OF THE MECHANICAL CONTRACTOR SHALL PERFORM ALL TESTING AND BALANCING. BALANCE REPORT SHALL BE PROVIDED BY EVANKO-RENNICK ENGINEERING
- B). BALANCE ALL SUPPLY, RETURN AND EXHAUST DEVICES.
- C). DAMPERS SHALL BE INSTALLED IN EACH BRANCH LINE AT THE TAKEOFF FROM THE MAIN TRUNK LINE FOR BALANCING.
- 2.7 RESTROOM EXHAUST FANS:
 - A). EXHAUST FANS SHALL TERMINATE AT THE EXTERIOR WALL.
 - B). EXHAUST FANS SHALL HAVE THE CAPACITY AS SHOWN ON THE PLANS.
 - C). EXHAUST FANS SHALL HAVE A BACKDRAFT DAMPER.
 - D). EXHAUST DUCT SHALL BE 4" DIAMETER OR AS SHOWN ON THE PLANS, 0.016" RIGID METAL DUCT, SMOOTH INTERIOR SURFACE.
 - E). WALL TERMINATION SHALL BE OF NON-CORROSIVE MATERIALS; WEATHER PROTECTED AND PREVENT INSECTS OR ANIMALS FROM PENETRATION
- 2.8 FIRE DAMPERS:
 - A). FIRE DAMPERS FOR RATED WALL PENETRATIONS SHALL BE RUSKIN FDR25 COMBINATION FIRE SMOKE DAMPER, UL555 & UL555S LEAKAGE CLASS I CLASSIFIED FOR USE IN DYNAMIC & STATIC SYSTEMS, OR EQUAL.
 - B). FIRE DAMPERS FOR RATED CEILING PENETRATIONS SHALL BE RUSKIN CFD(R)2W & CFD(R)3W CEILING DAMPERS, OR EQUAL.

Table I: Natural Ventilation Requirement - Café

Room	Ventilation Type	Area or Unit ft ² or No.	Required Ventilation ft ²	Window & Door Area ft ²	Opening ft ²	Total Area ft ²	Pass/Fail
Room	Natural	357	14.3	21.0	27.0	21.0	Fail
Dining Area	Adjacent	270	21.6			27.0	Pass

440 W College

IMC Table 403.3				Total
Estimated Max. Occupant Load Person/1000 sf	Outdoor Air cfm/person	Outdoor Air cfm/sf or cfm/no.	Occupant Load people	Required Outdoor Ventilation Air cfm
Room	1	75		75
Restroom	1	75		75
Total				150