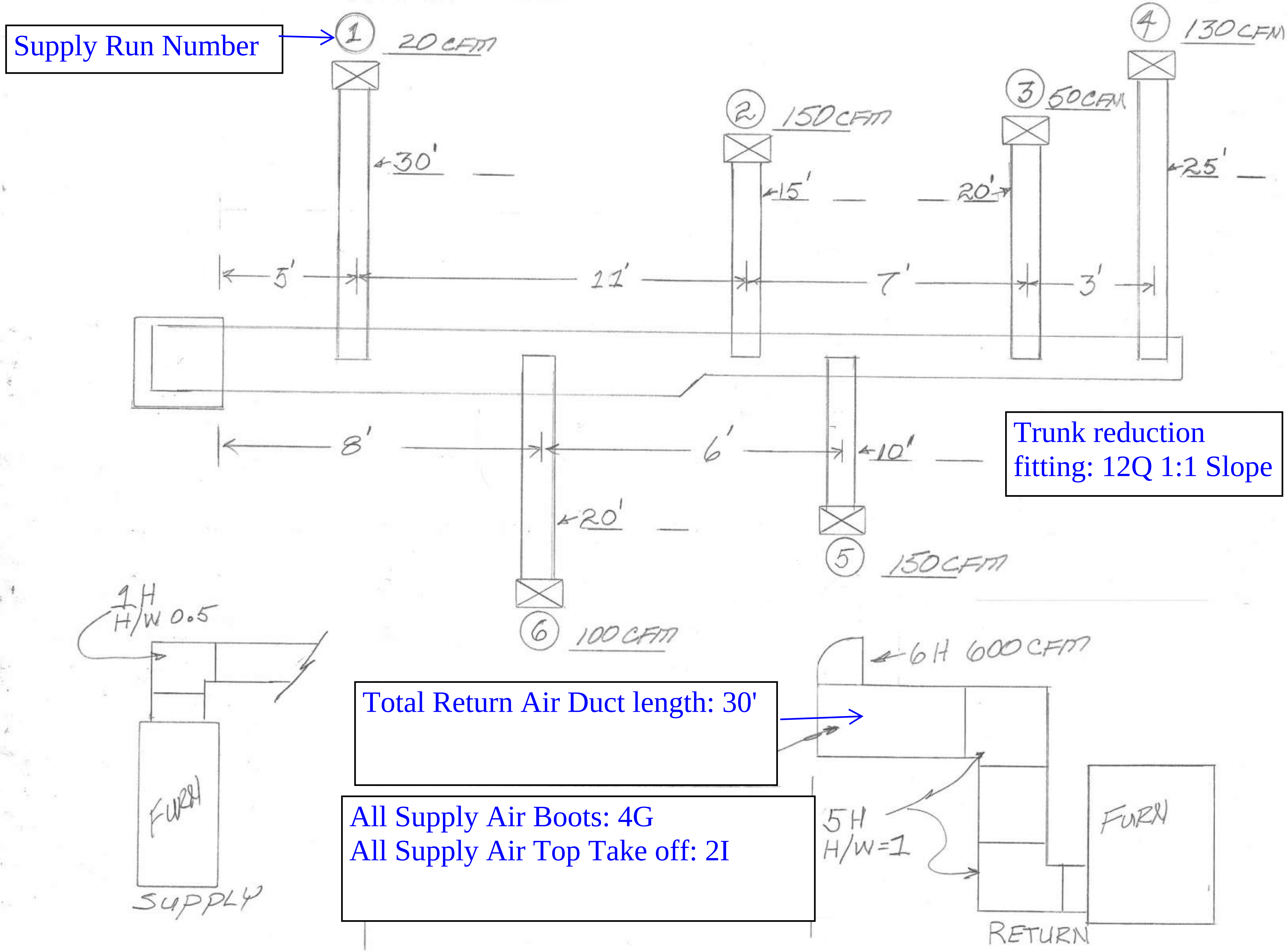
Supply Run Number
1
20 CFM
30'
2
150 CFM
15'
3
50 CFM
20'
4
130 CFM
25'
5'
11'
7'
3'
8'
6'
10'
20'
5
150 CFM
6
100 CFM
Trunk reduction fitting: 12Q 1:1 Slope
1H
H/W 0.5
FURN
SUPPLY
Total Return Air Duct length: 30'
All Supply Air Boots: 4G
All Supply Air Top Take off: 2I
6H 600 CFM
5H
H/W=1
FURN
RETURN

- Use *Manual J* to calculate the room heating and cooling loads.
- If two or more supply outlets are used for a room, split the room heating load and room cooling load into parts.
- Enter the heating and cooling loads for all supply outlets on the worksheet (correlate with outlet identification numbers).
- Multiply the heating loads by the heating factor to find heating Cfms and enter these values on the worksheet.
- Multiply the cooling loads by the cooling factor to find cooling Cfms and enter these values on the worksheet.
- For each supply outlet, select the larger of the heating Cfm value or cooling Cfm value and enter the design Cfm values on the worksheet.
- Use a duct slide rule or friction chart to find the round duct runout size (the sizing tool must be for the actual airway material), and enter the preliminary sizes on the worksheet.
- Use a duct slide rule or friction chart to check airway velocity and enter the velocity values on the worksheet.
- If one or more velocities are too high, resize the duct for an acceptable velocity, and enter the final sizes on the worksheet.
- Correlate trunk sections with downstream branch sections and calculate heating and cooling Cfm for each unique section of trunk duct, then enter these values on the worksheet (see Sections 6-12 through 6-16).
- Use the heating and cooling factors to determine heating and cooling Cfm and the design Cfm (larger of the two values).
- Use a duct slide rule or friction chart to find the round duct runout size (the sizing tool must be for the actual airway material), and enter the preliminary sizes on the worksheet.
- Use a duct slide rule or friction chart to check airway velocity and enter the velocity values on the worksheet.
- If one or more velocities are too high, resize the duct for an acceptable velocity, and enter the final sizes on the worksheet.
- Assign Cfm values to each return grille and repeat the process for the return-side of the system.

Effective Length Worksheet

Element	Supply Run ID Number				Element	Return Run ID Number			
Trunk Length					Trunk Length				
Trunk Length					Trunk Length				
Trunk Length					Trunk Length				
Runout Length					Runout Length				
Group 1					Group 5				
Group 2					Group 6				
Group 3					Group 7				
Group 4					Group 8				
Group 8					Group 10				
Group 9					Group 11				
Group 11					Group 12				
Group 12					Group 13				
Group 13					Other				
Other					Other				
Total Length					Total Length				

Friction Rate Worksheet

Step 1) Manufacturer's Blower Data

External static pressure (ESP) = ______ IWC Cfm = __________

Step 2) Component Pressure Losses (CPL)

Direct expansion refrigerant coil	______
Electric resistance heating coil	______
Hot water coil	______
Heat exchanger	______
Low efficiency filter	______
High or mid-efficiency filter	______
Electronic filter	______
Humidifier	______
Supply outlet	______
Return grille	______
Balancing damper	______
UV lights or other component	______
Total component losses (CPL)	______ IWC

Step 3) Available Static Pressure (ASP)

ASP = (ESP - CPL) = (______ - ______) = ______ IWC

Step 4) Total Effective Length (TEL)

Supply-side TEL + Return-side TEL = (______ + ______) = ______ Feet

Step 5) Friction Rate Design Value (FR)

FR value from friction rate chart = ______ IWC/100

$$FR = \frac{ASP \times 100}{TEL}$$

Friction Rate Chart