

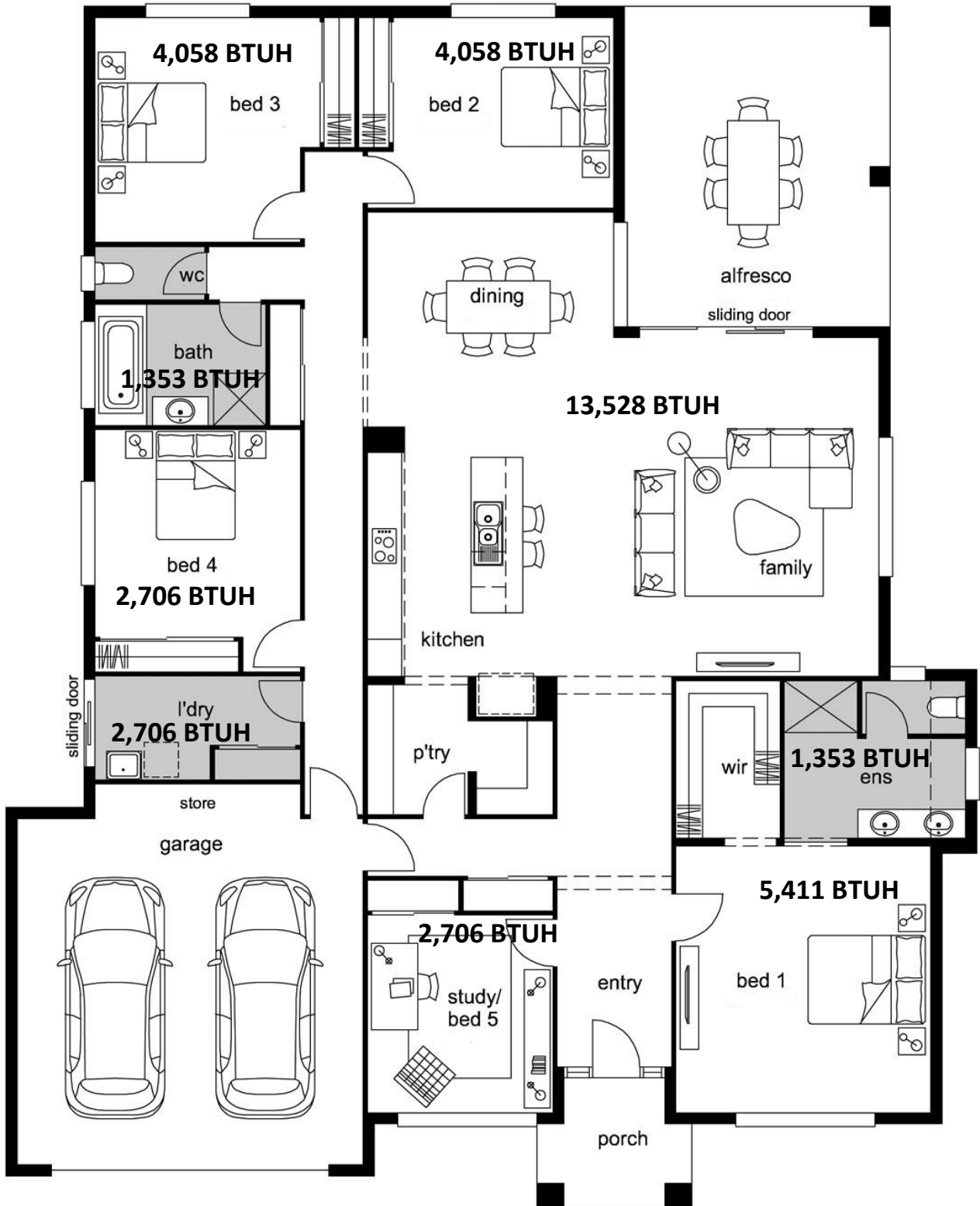
Homework #7 – Air Distribution Systems Design - ACCA Manual D

Show all work for full credit.

Due: 9/15

20 points

Name: **Solution**



The Room-By-Room Cooling Load calculation has been completed for the home used in HW#5 and the room loads are shown on the plan on the previous page.

**Size of HVAC Unit Required**

To calculate the required equipment size, divide the HVAC load for the entire home by 12,000. One ton equals 12,000 BTUs, so if a house or office needs 24,000 BTUs, it will take a 2-ton HVAC unit. If you get an uneven number, such as 2.33 for a 28,000 BTU load capacity, round up to a 2.5-ton unit.

From HW#5

Peak Cooling Load = 37,878 BTUH

HVAC Unit Size = 37,878 BTUH / 12,000 = 3.16 tons      Round to 3.5 tons

- Using the industry standard of 400 CFM per ton determine the required Total Ventilation Rate (CFM)

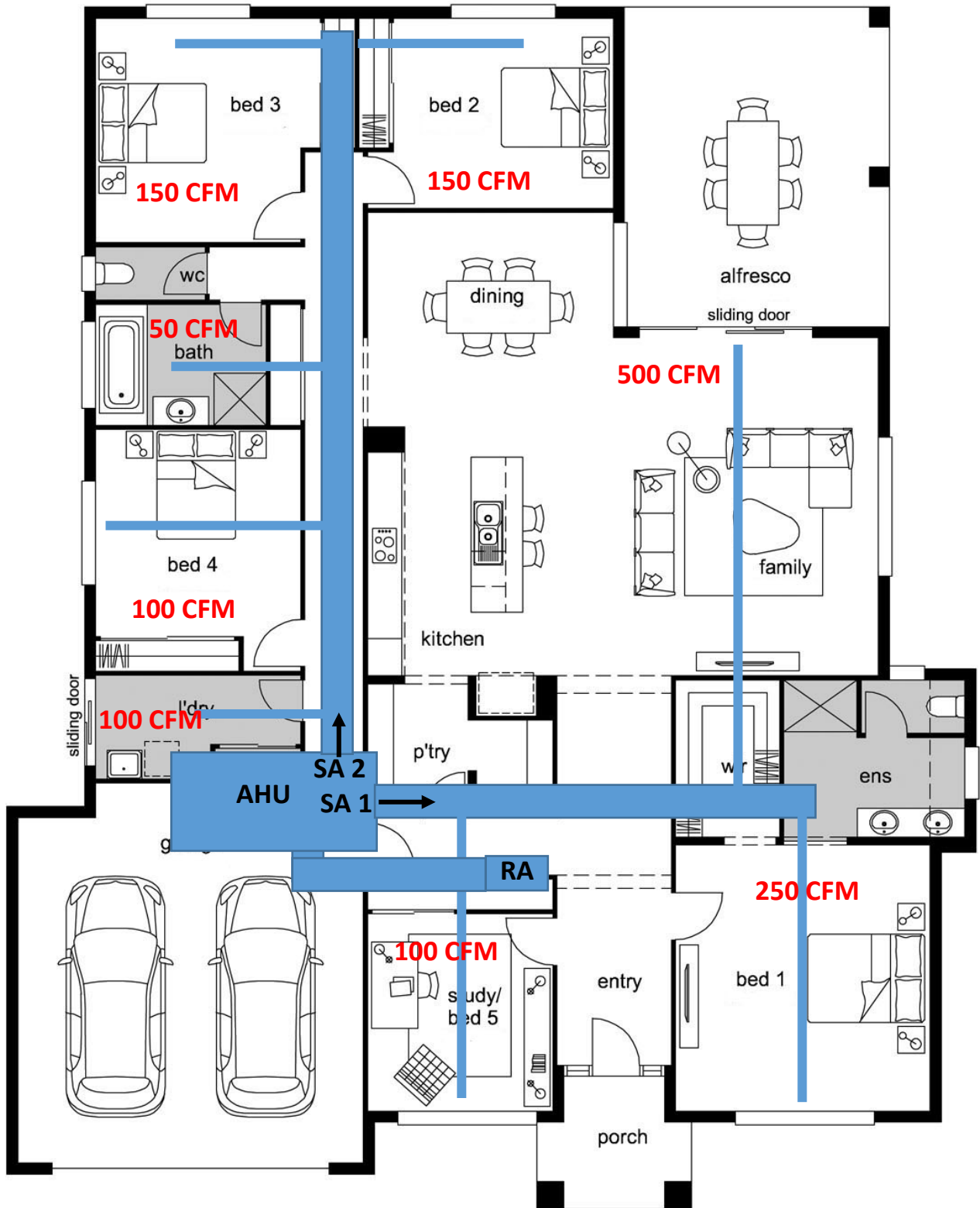
Ventilation Rate = 3.5 tons X 400 CFM /ton = 1400 CFM

- Using the equation shown below, calculate the required CFM per room and complete the table shown below. Round CFM to whole number (No Decimal Values).

Room Ventilation (CFM) = [Room Heat Gain (Btuh) / Total Heat Gain (Btuh)] X Total Ventilation Rate (CFM)

Room	Heat Gain (BTUH)	Required CFM
Family, dining, kitchen	13,528	500
bed 1 / ens	5,411	250
bed 2	4,058	150
bed 3	4,058	150
bath	1,353	50
bed 4	2,706	100
l'dry	2,706	100
study/bed 5	2,706	100
Totals	33,878	1400

- Write the required CFM for each room on the plan shown on the next page in the corresponding room.



4. Determine the total CFM as shown below (Show All Calculations):

Duct	Total CFM
Supply Air Duct (SA 1)	850
Supply Air Duct (SA 2)	550
Return Air Duct (RA)	1400