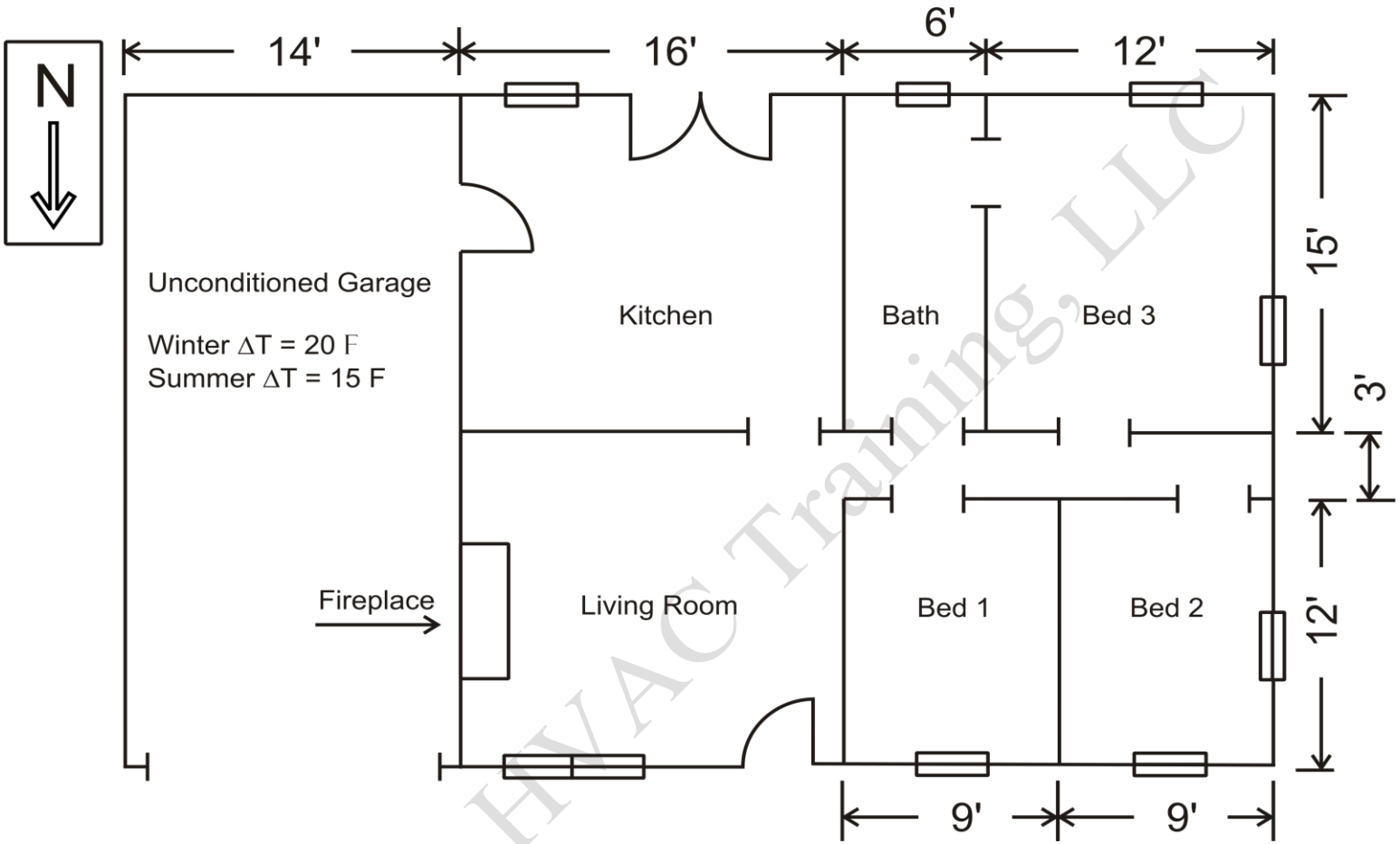


Figure 1: Single Family Dwelling in Durham, N.C.
Inside design temperature is 70˚ F in the winter and 77˚ in the summer with 50% R.H.
Walls are wood frame, R-13 insulation with brick veneer and 0.5 inch gypsum board.
Windows are double pane, clear glass, with wood frames measuring 3’ x 3’ each, except bath which is 2’ x 3’.
Window tops are 1 foot below overhang.
Doors are solid wood (3’ x 7’). Except French door in the kitchen, which is double pane, (.40) low emittance with wood frame. (6’ X 7’).
Floor is concrete slab on grade with R-5 edge insulation (light, moist soil).
Ceilings are 9’ high under a ventilated attic with R-30 insulation. Roof is dark and overhangs walls by 18”.
Infiltration is average. Ducts are insulated R-4 in the attic with gas furnace.

Figure 2

Raleigh, N.C.
Medium Construction
Summer I.D.= 72˚ F
50% R.H.
Winter I.D.= 70˚ F

Walls: dark colored, wood frame with face brick, R-11, plywood sheathing and drywall. Except warehouse walls which are 12” light weight, hollow block with face brick tight on the block.

Windows: 8’ x 6’ double pane, clear with ½” airspace and unimproved metal frames. Except that reception room windows are 2’ x 6’.

Doors: 4’ x 7’ hinged, double pane with clear glass (same as windows).

Roof: flat, dark colored on steel deck, 3” insulation (R-15) above decking with no interior ceiling. All ceilings are 10’ high, unless otherwise noted.

Floor: slab on grade with 2” edge insulation (R-10).

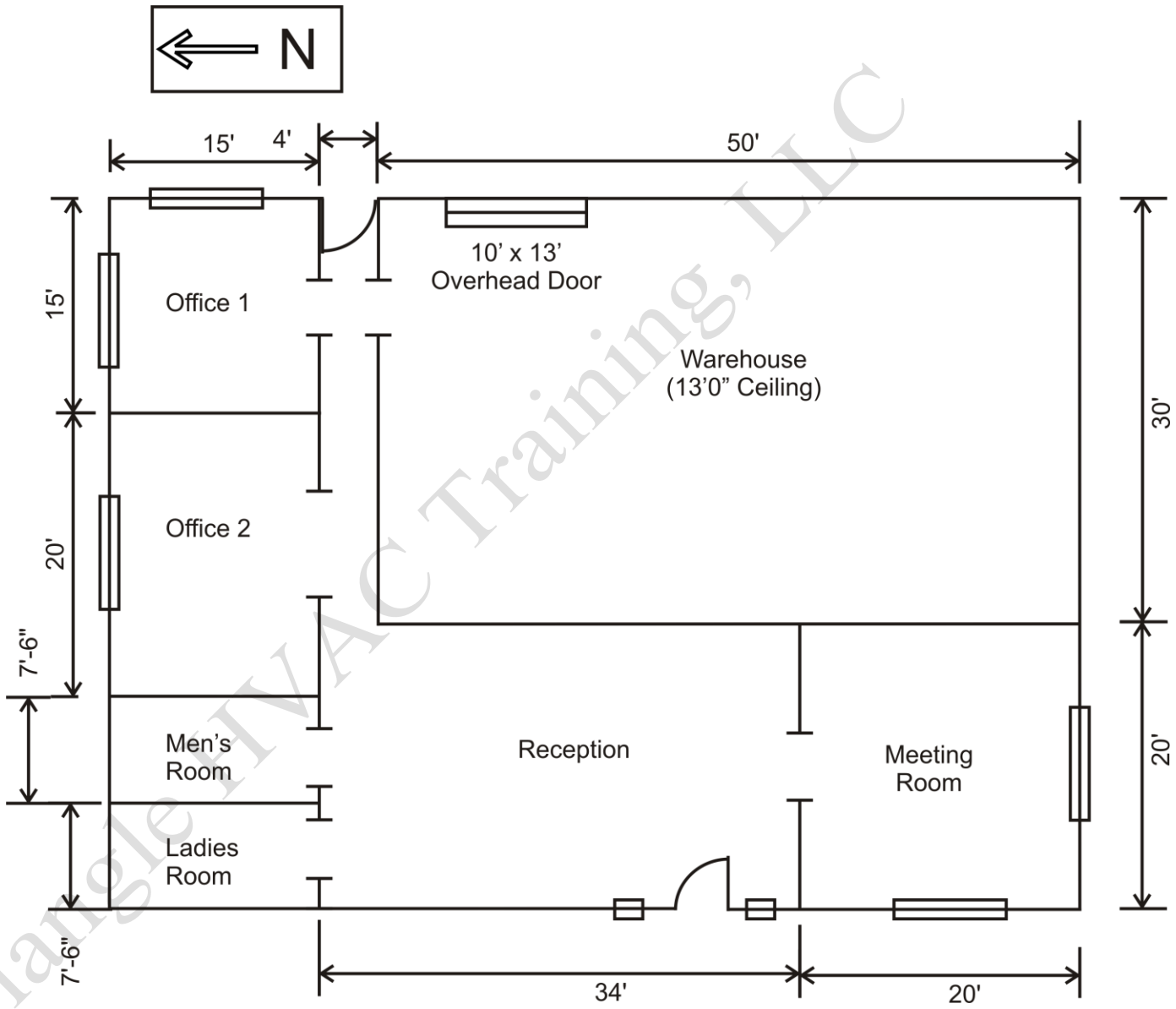
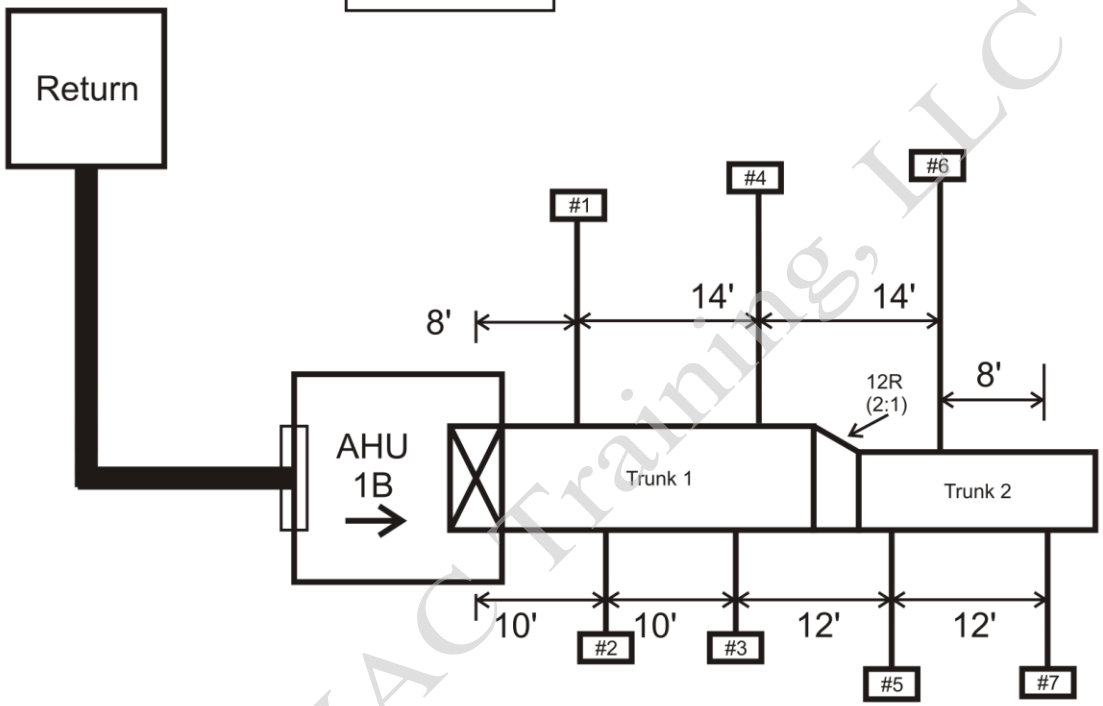


Figure 3



Return		
Length	AHU	Floor
25’	5E	6F

Blower: 1,100 cfm @ 0.57 I.W.C. Includes wet coil, but does not Include 0.18 I.W.C. Loss for air filter.

Note: All supply branch take off fittings have manual balancing dampers installed. All grilles have a 0.03 I.W.C. Device loss.

TEL = 257’

Supply					
Run #	Length	Boot	Takeoff	Heat Loss	Heat Gain
1	16’	4I	2A	7,500	4,160
2	8’	4I	2A	8,100	3,750
3	8’	4I	2A	5,000	3,050
4	18’	4G	2A	9,000	5,000
5	10’	4I	2A	2,100	1,100
6	21’	4G	2A	3,500	2,680
7	10’	4I	2A	2,000	1,050
House Total =				37,200	20,790

Figure 5

Raleigh, N.C.
Inside = 75˚ F/ 50% R.H. in summer
70˚ F in winter

Walls: R-13 with 1” insulation board (R-5).

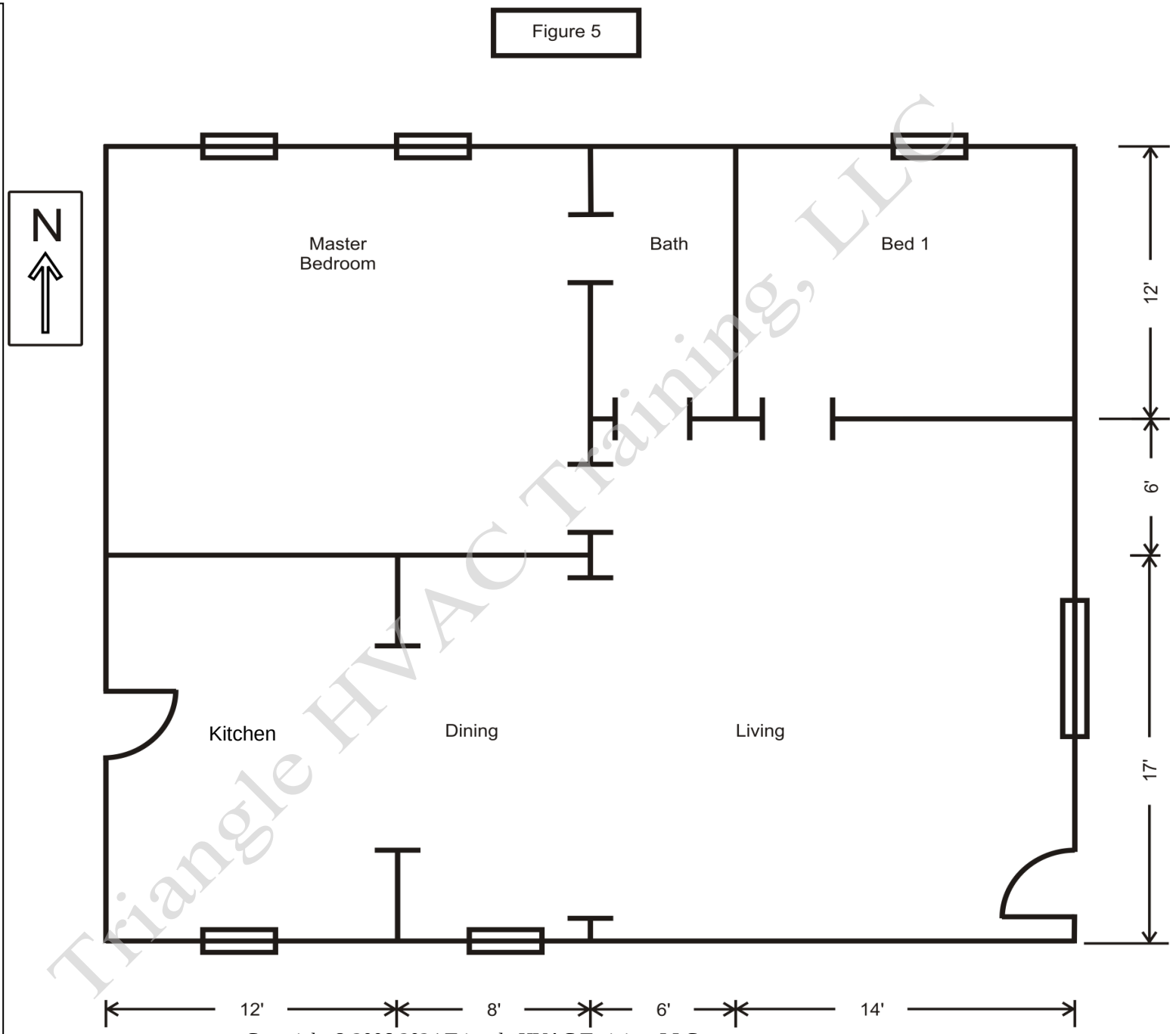
Windows: Double pane with wood frame. Adjustable blinds between panes. 3’ x 4’ each, except living room is 6’x 6’. 1’ down from overhang.

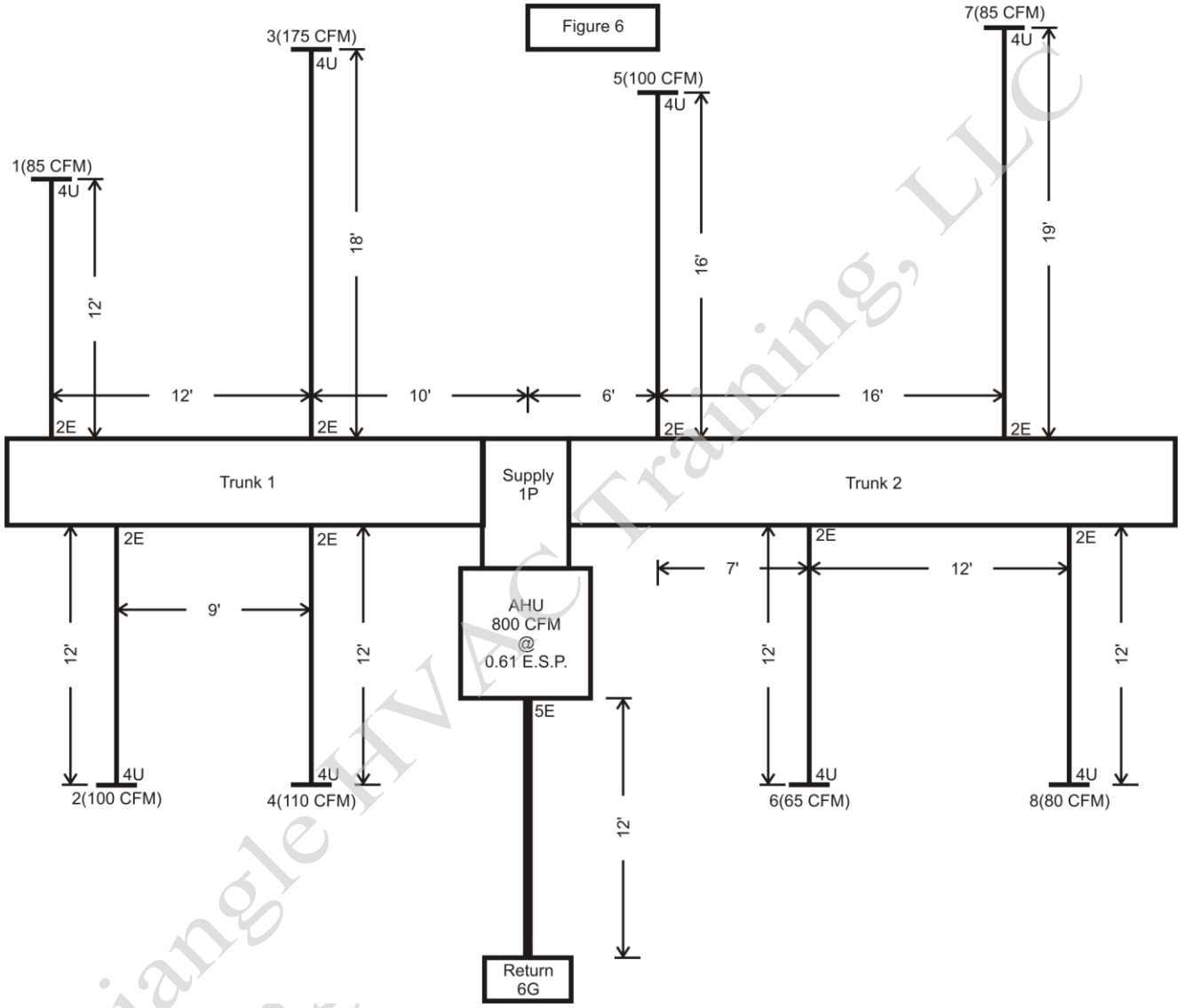
Doors: Wood, solid core with metal storm door. (3’0” x 6’8”)

Ceiling: R-30 under a ventilated attic. Light-colored roof. 8’ high.

Floor: Hardwood with R-19 insulation. Over an enclosed crawl space.

Overhang: 1’0” on N & S sides.





Air handler ESP is .61 @ 800 cfm.
Does not include balancing dampers, grilles, or cooling coil, which have a total resistance of 0.37 I.W.C.
Total effective length is 163 feet.

Figure 7

Medium Construction
Raleigh, N.C.
Inside: 72˚ F/ 50% R.H. in summer
70˚ F in winter

Walls: Dark color, hollow core, 8” block (sand & gravel) with a common brick finish. (Airspace between the brick & block). Sheetrock finish on R-7.5 sheathing.

Windows: 8’ x 4’ fixed double pane, ¼” clear plate glass with ½” air gap and unimproved metal frames. Unless otherwise noted.

Doors: 3’ x 7’ each. Double pane, clear glass.

Roof: Flat, dark color, 1.5” wood with 2” insulation (R-10) above deck. Suspended ceiling 9’ high, with R-19 above. Unless otherwise stated.

Floor: Slab on grade with no edge insulation.

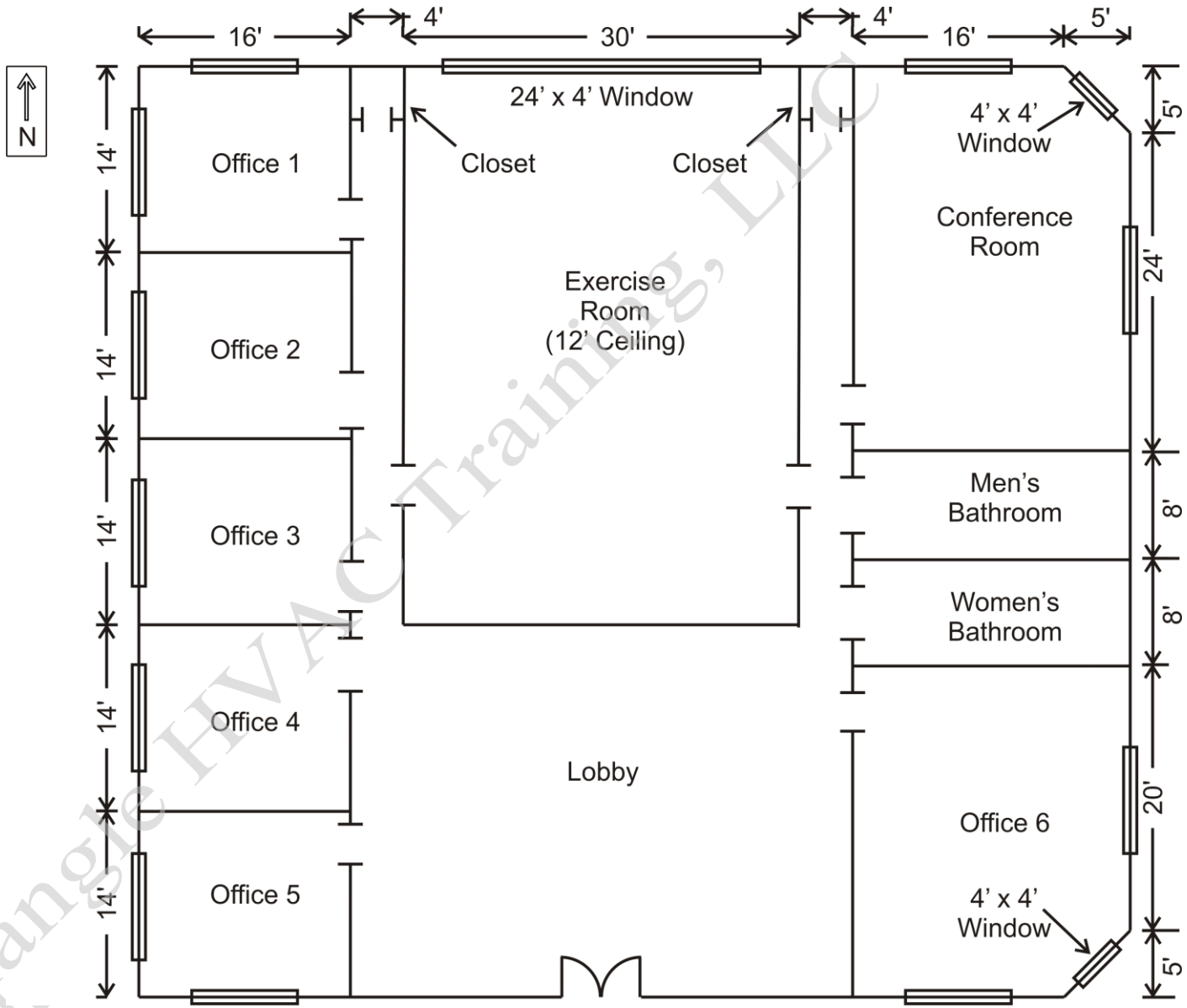


Figure 8

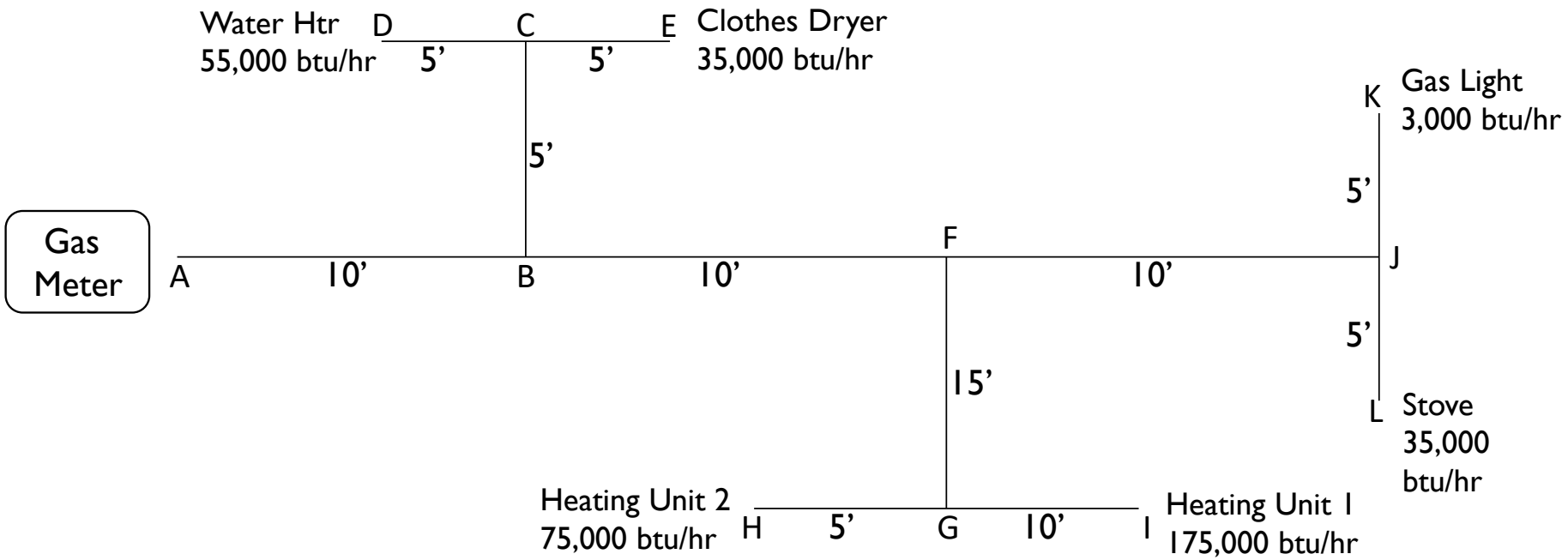
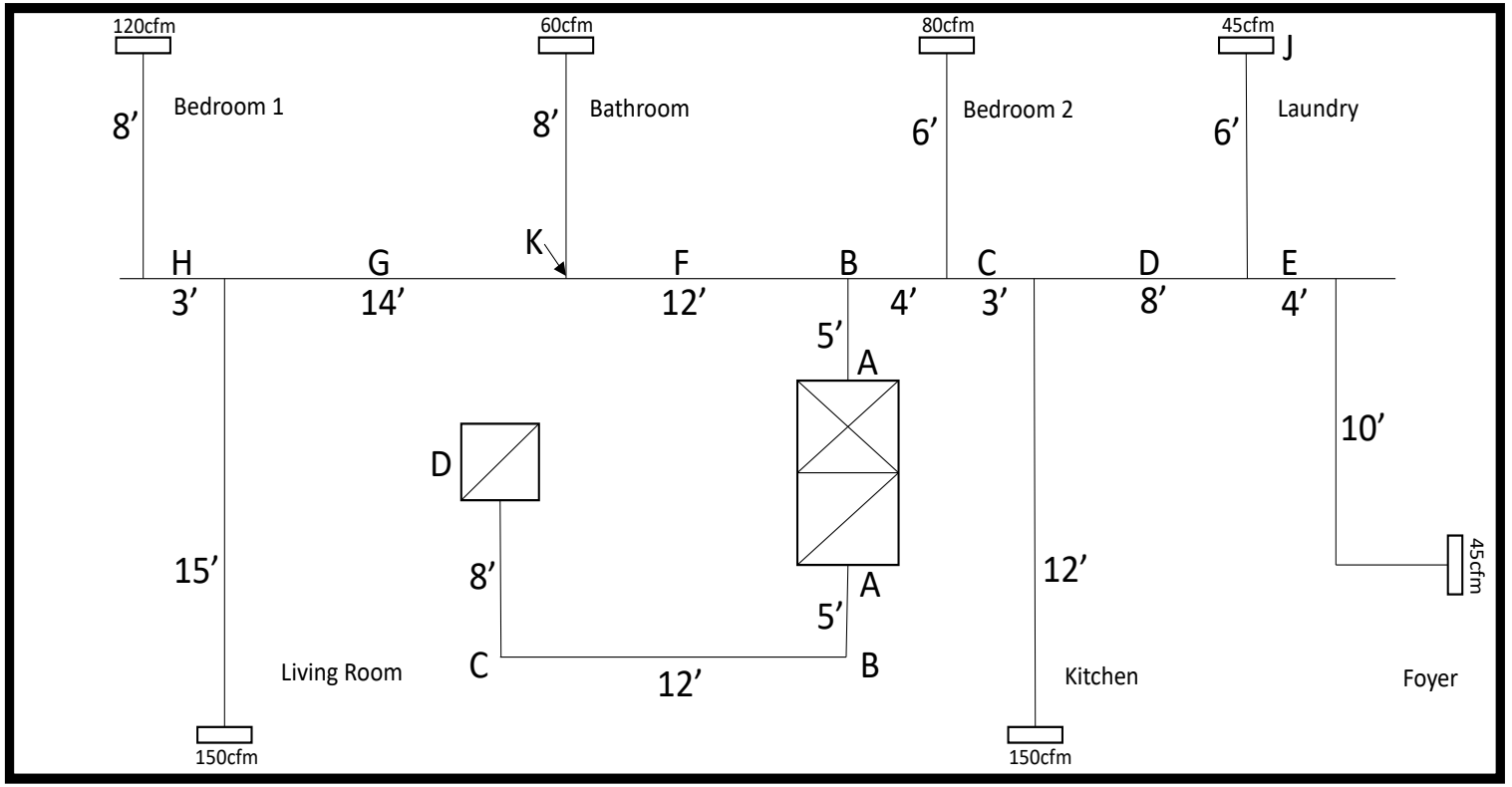


Figure 9



.10	.20	.30	.40	.50	.60	"w.c.
830	790	725	695	650	610	cfm

Return Fittings	
A	5E
B	8D Hard Bend
C	8B Mitered H/W=1
D	6G

Supply Fittings	
A	1B
B	1P with vanes
J	4AD
K	2B