Calculating Areas

As long as our floor plan drawing has enough detail, calculating the various areas that are needed for this audit is not too difficult. The picture at the left is the floor plan that we had on the previous page, with exterior measurements of the wall specified in greater detail (for the measurements of the windows, please refer back to previous page). The wall measurements that are in red are those for the surfaces that are wood sided with 3 1/2" of fiberglass insulation and 1" of foam; the measurements in blue are for those measurements that are sheetrock with 3 1/2" of fiberglass insulation. The area in green is the downstairs floor area; it has no exterior ceiling since the upstairs rooms are above it. The area in yellow and blue is the upstairs ceiling area, while the blue area is also the upstairs floor area (6" fiberglass over an unheated enclosed space); the yellow area has no exterior floor since the downstairs rooms are below it.

The calculation of the floor and ceiling areas are quite simple and straightforward. The area of floor that is concrete slab is that of the green area (25'x35' = 875 sq. ft.). The area of floor that is 6" fiberglass over an unheated enclosed space is that of the blue area (15'x25' = 375 sq. ft.). The area of the ceiling is the sum of the yellow and blue areas (25'x35' + 15'x25' = 1250 sq. ft.).

The calculation of the areas of the doors and windows is similarly straightforward. There are 8 double pane windows that are 3'x5' and 3 double pane windows that are 6'x5'. Thus, the area of windows is 8x3'x5' + 3x6'x5' = 210 sq. ft. There are 3 steel doors with 1 3/4" foam insulation that go to the exterior of the house that are all 3'x7'. Thus, the area of the doors is 3x3'x7' = 63 sq. ft.

The hardest calculations are for the walls. The reason for this is that the doors and the windows also reside in the walls. Thus, we cannot just multiply the height of the walls times the length of the walls; we must subtract the area of the doors and windows from this result. For the wood siding with 3 1/2" fiberglass and 1" foam insulation, we notice that all of the windows and two of the doors reside within this surface. Thus, we have:

Upstairs: 15'x8' + 60'x8' + 25'x8' + 35'x8' = 1080 sq. ft.
Downstairs: 35'x8' + 25'x8' + 35'x8' = 760 sq. ft.

Wall area = Upstairs + Downstairs - All windows - area of 2 doors = 1080 sq. ft. + 760 sq. ft. - 210 sq. ft. - 42 sq. ft. = 1588 sq. ft.

For the sheetrock with 3 1/2" fiberglass insulation, we note that only one exterior door resides in this surface. Thus:

Upstairs: 10'x8' + 25'x8' = 280 sq. ft.
Downstairs: 25'x8' = 200 sq. ft.

Wall area = Upstairs + Downstairs - area of one door = 280 sq. ft. + 200 sq. ft. - 21 sq. ft. = 459 sq. ft.