Right Sizing AC Systems for Profit and Energy Star Certification

RESNET 2007

Dennis J Stroer

CALCS-PLUS

Venice Florida

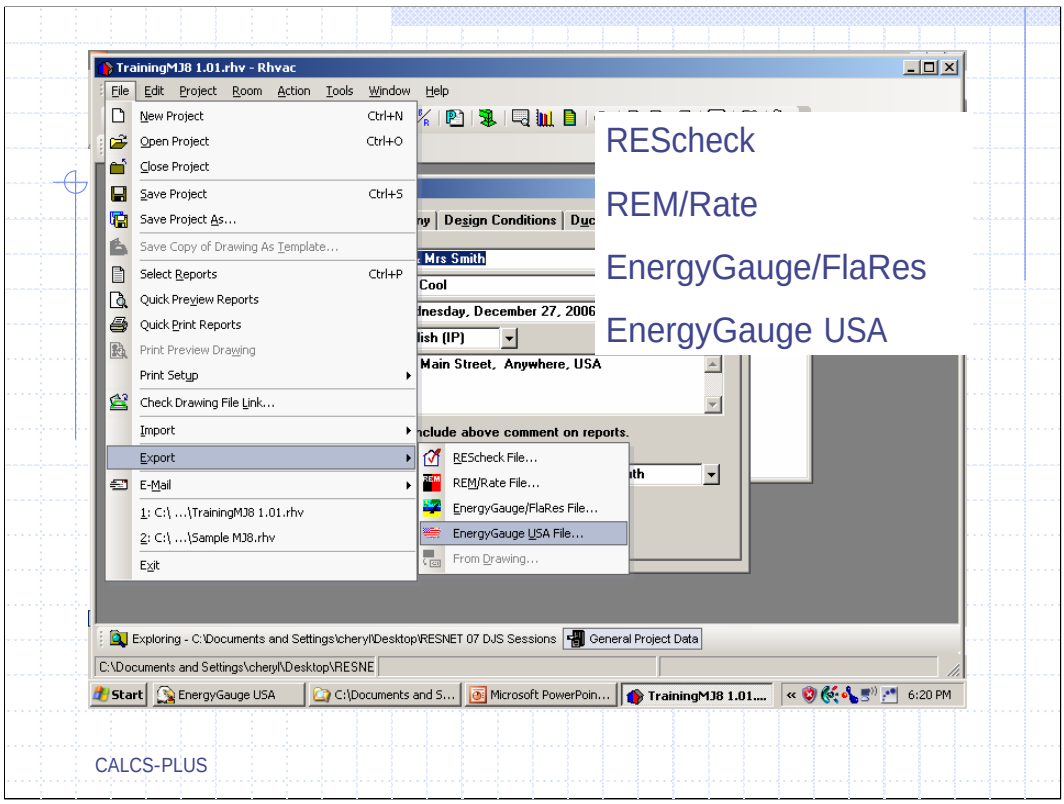
Manual J – Rating Software

Converting the Load Calculation into a rating

Elite Software

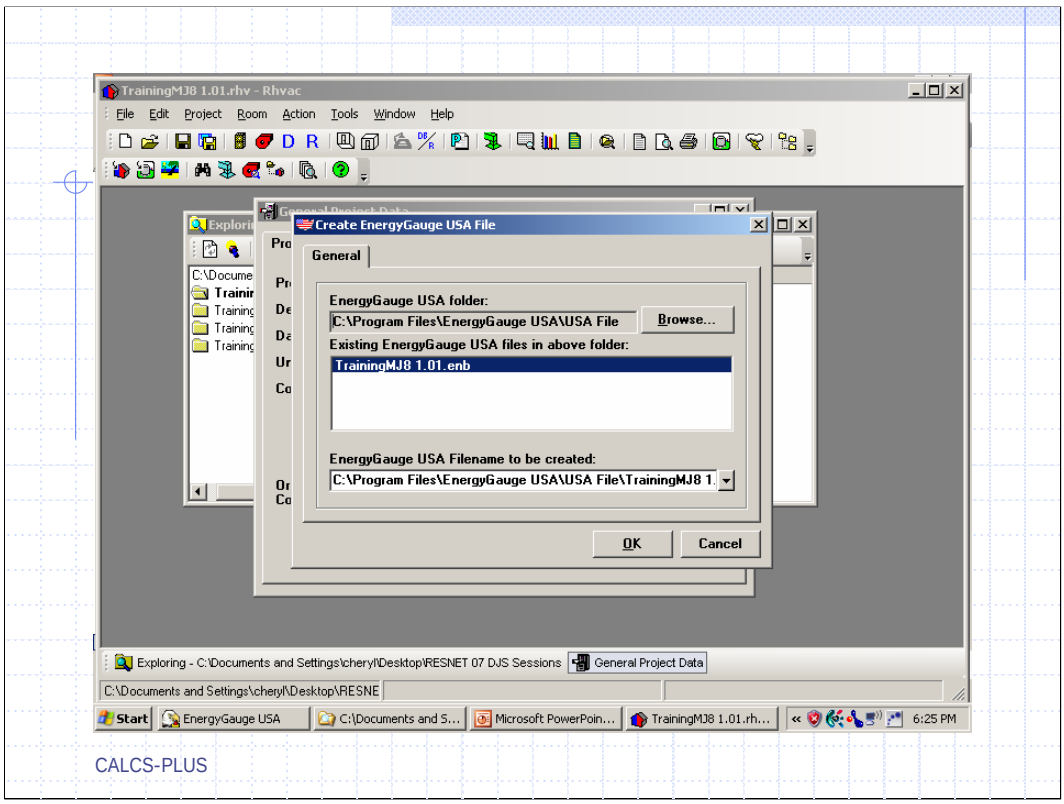
RHVAC Residential HVAC Loads

CALCS-PLUS

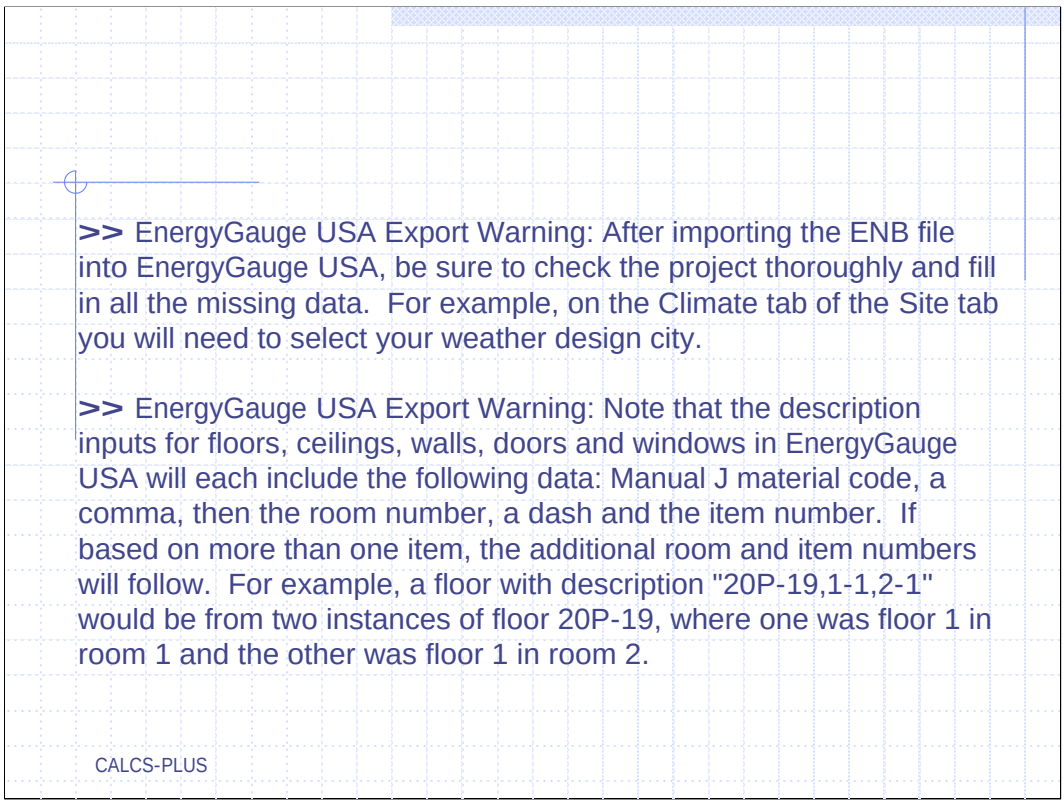


The state of Florida mandates that we use Energy Gauge USA for ratings so we will use this program for our example but as you can see the program also exports files to REScheck, REM/Rate, & Energy Gauge / FlaRes which is the energy code software for Florida.

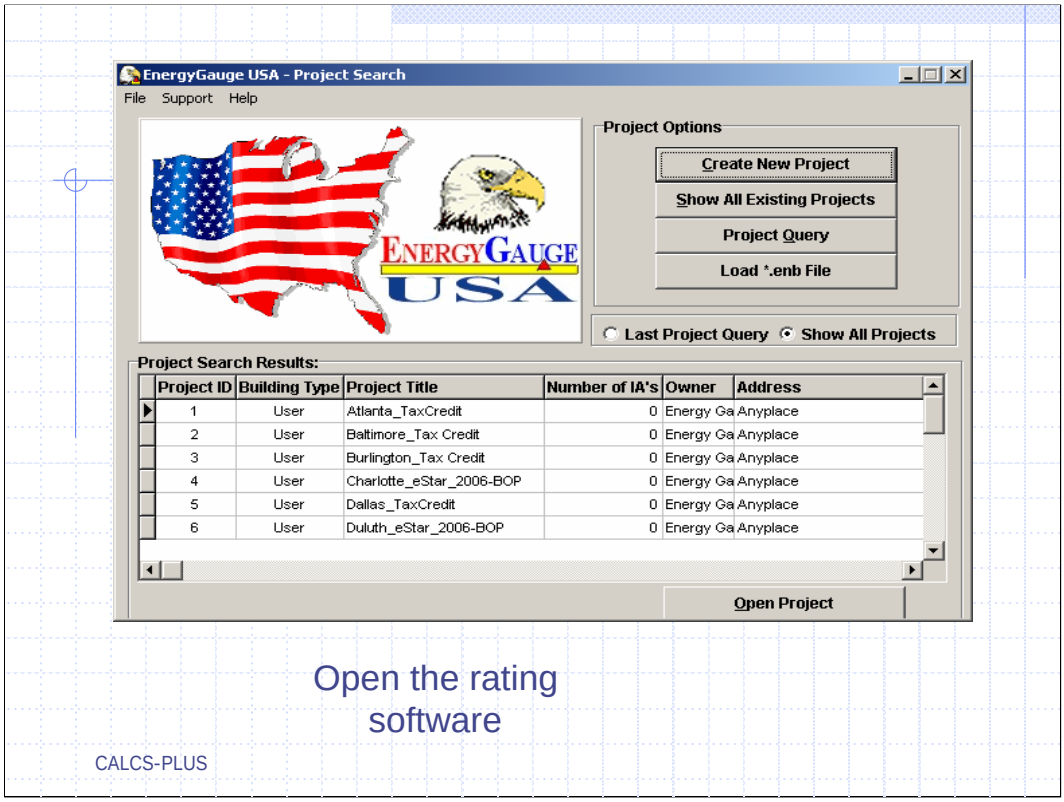
Select Export and then the rating software you are exporting to.



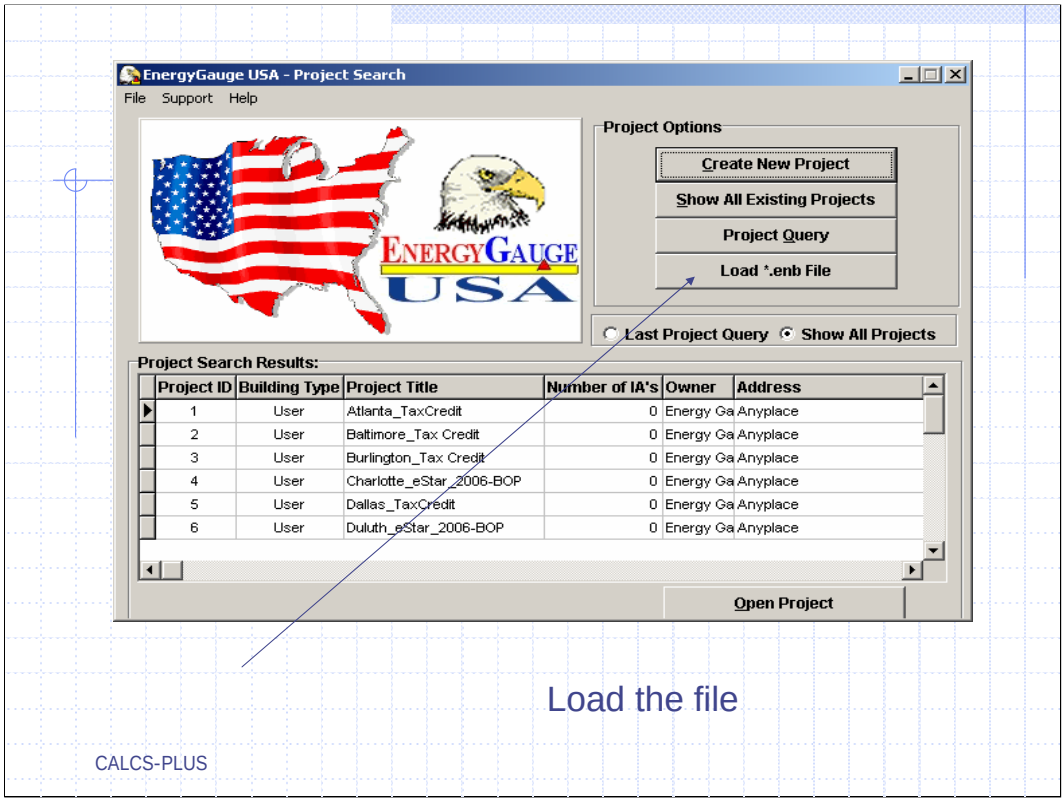
Energy Gauge USA uses a .enb file. We keep these files in a separate folder on our computer and re name them when we open them in our rating software, after the rating is complete we file them in a folder under the builder's name.



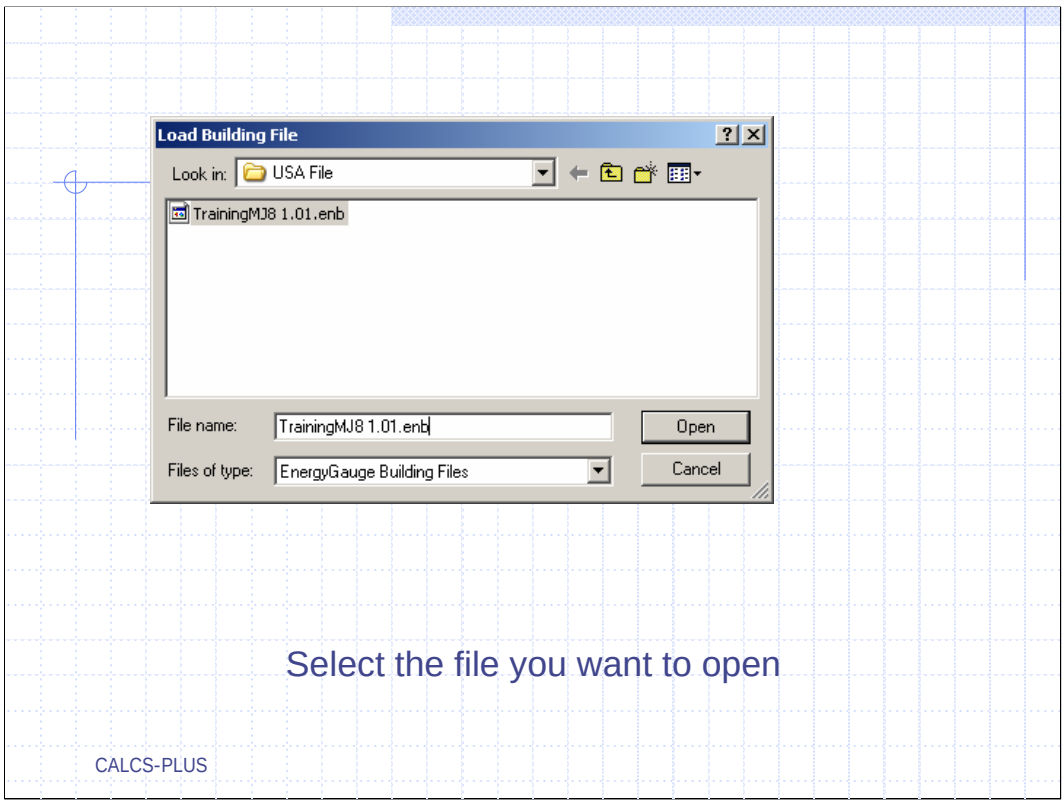
Good information from Elite Software.



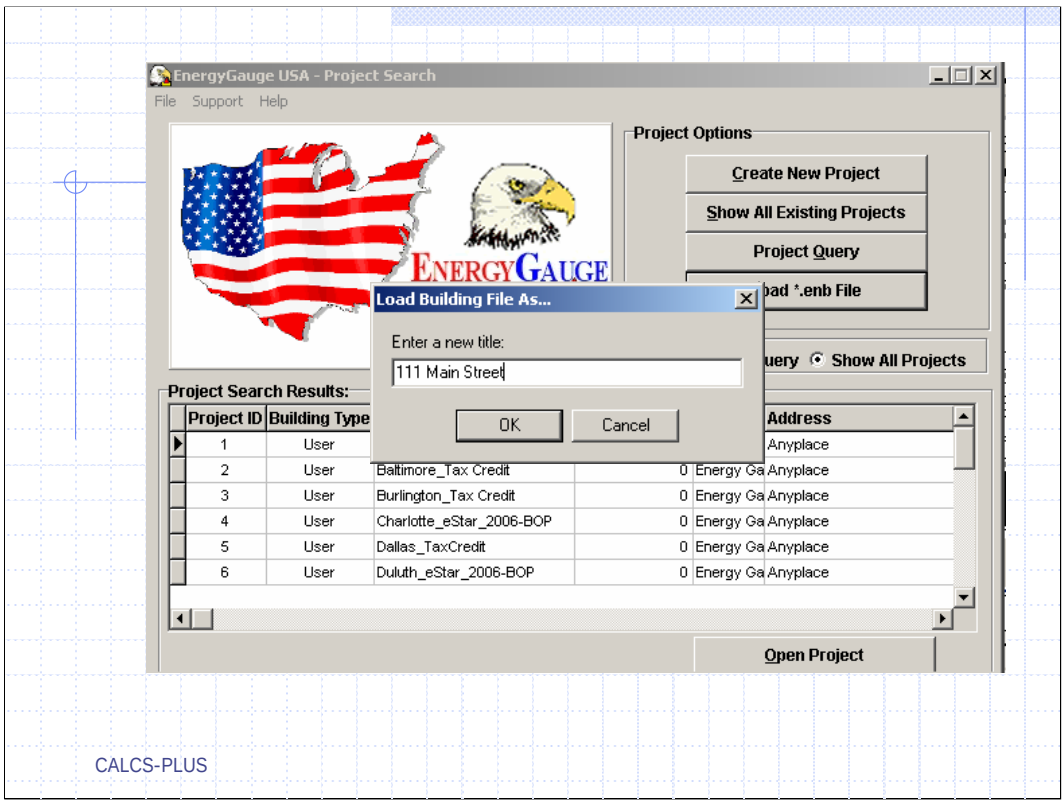
Open EnergyGauge USA.



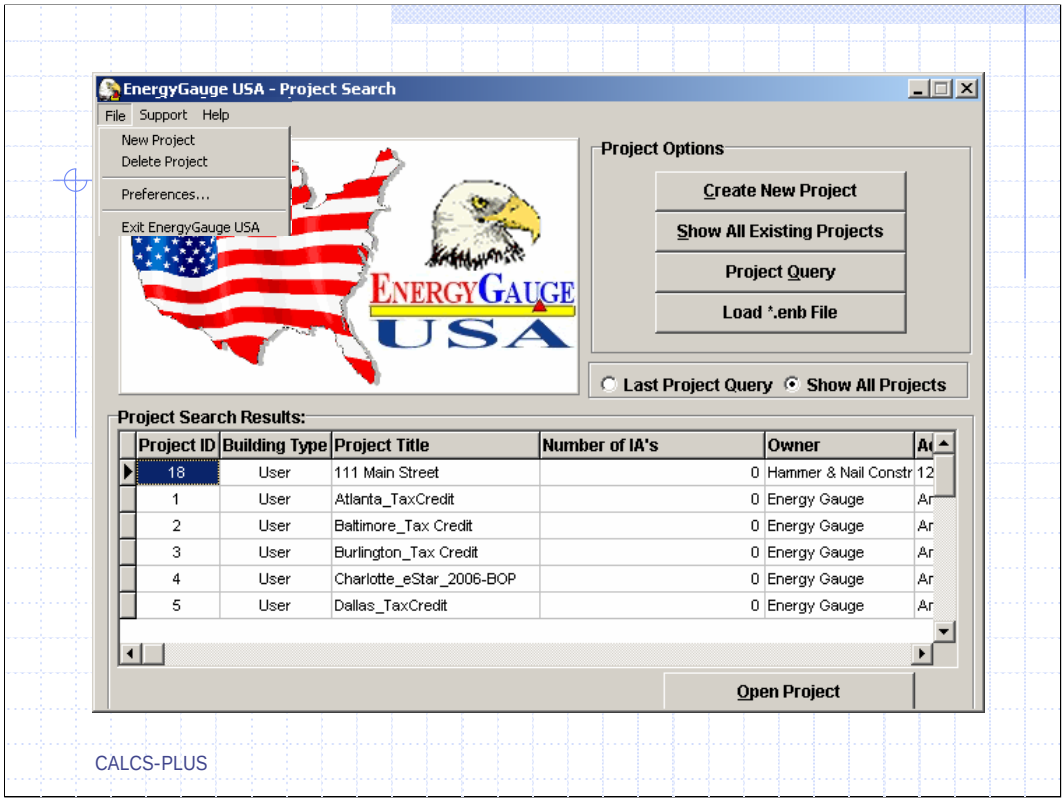
Click the “Load *.enb File”



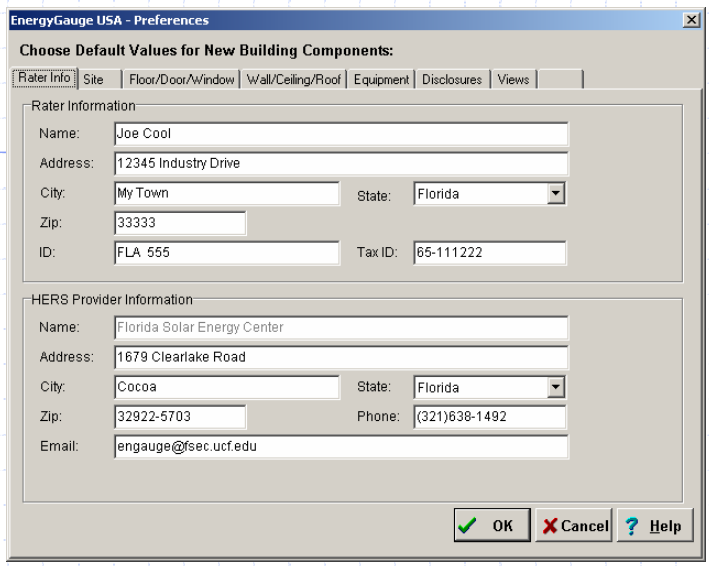
Go to the directory you saved the exported ENB file to; select the file and click OK.



People sell houses and move into new ones so it is not a good idea to save the files under the owners name, a better way to set up your files is to keep them by address. To help us find a builder's house we preface the file name by an identifying prefix usually the initials of the company's name. When we do a rating for an individual we save the file in a folder of miscellaneous homes under the address. We will change this file's name to 111 Main Street.



Our rating software allows us to set up preferences. These are the most common construction practices in our area. Click “File” “Preferences”.



Type in 'your personal information, your providers information comes pre-filled in.

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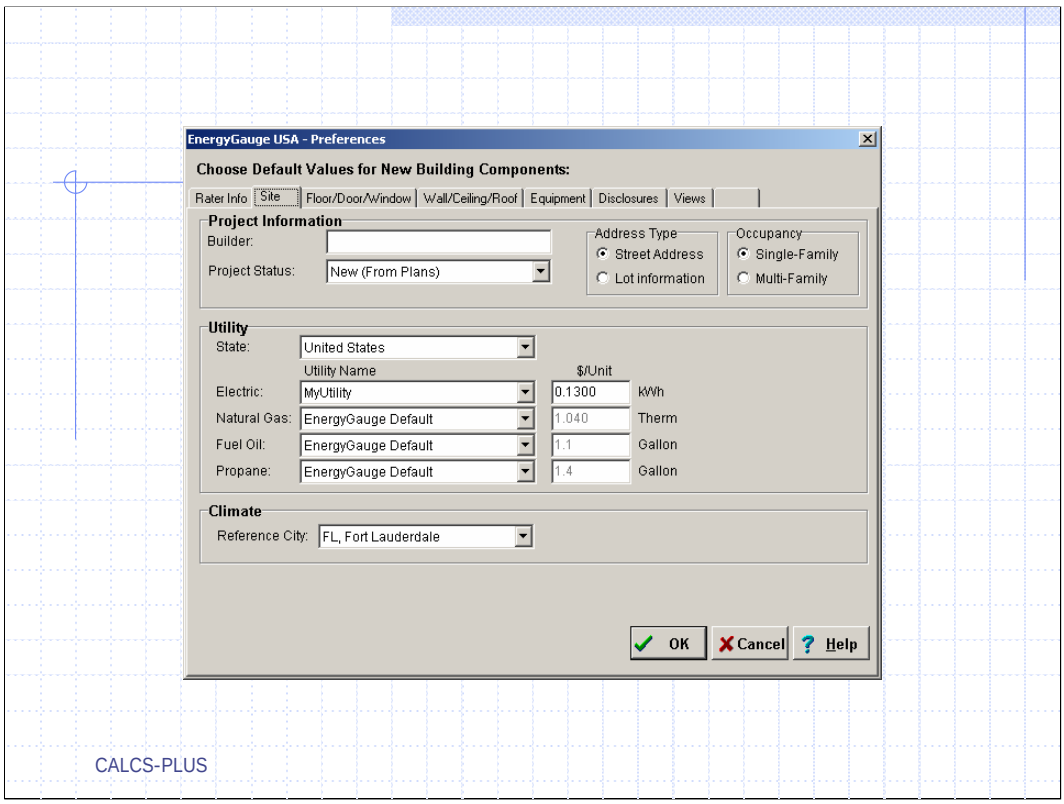
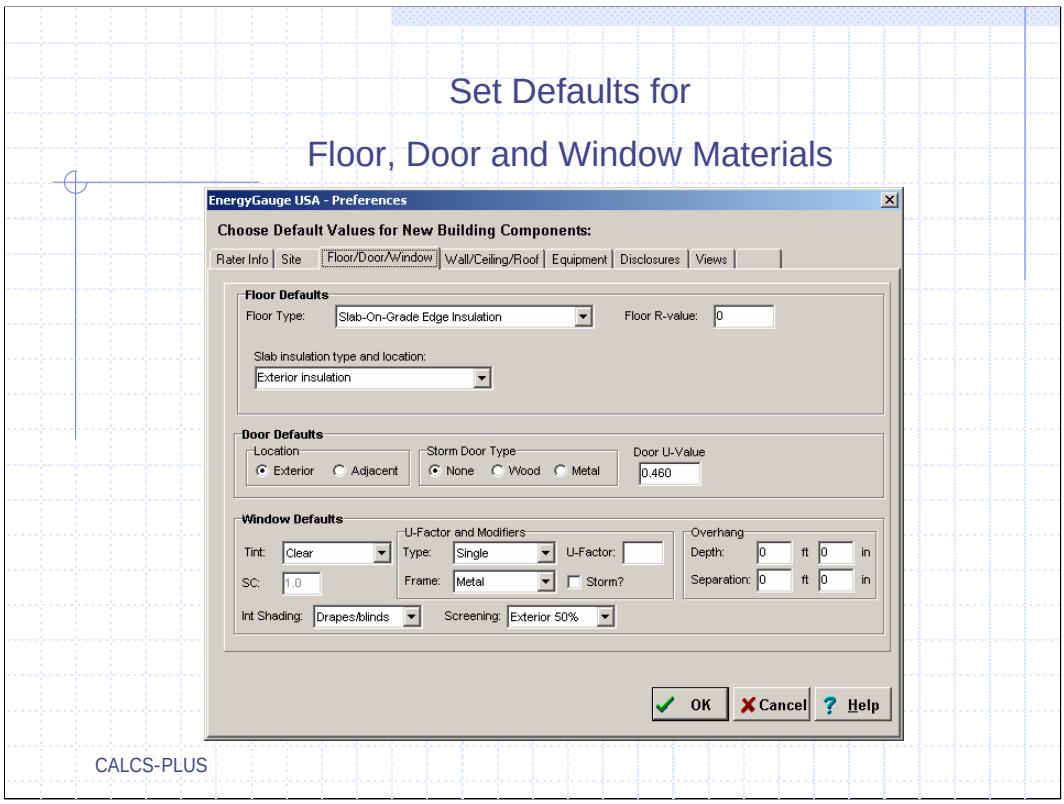
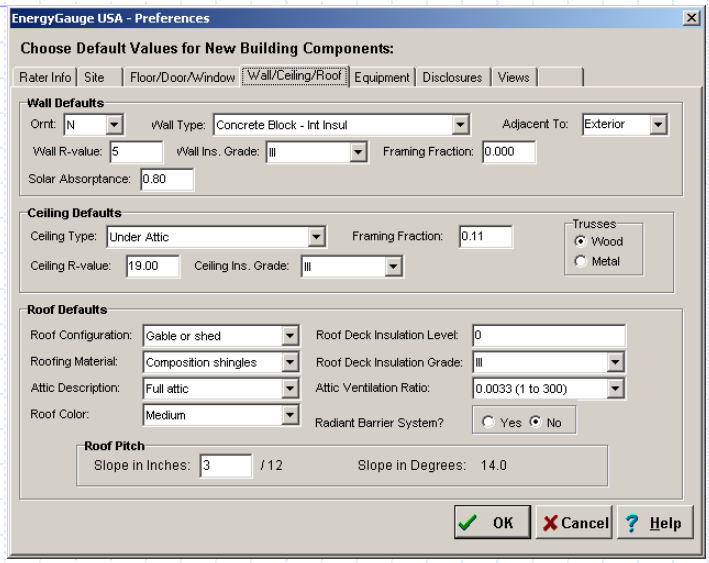


Builder information may be project specific but utility information may be more consistent so it could be filled in as default information.



Select the most common building material information for your area. This will have nothing to do with what RHVAC exports into USA.

Set Defaults for
Wall, Ceiling, and Floor Materials



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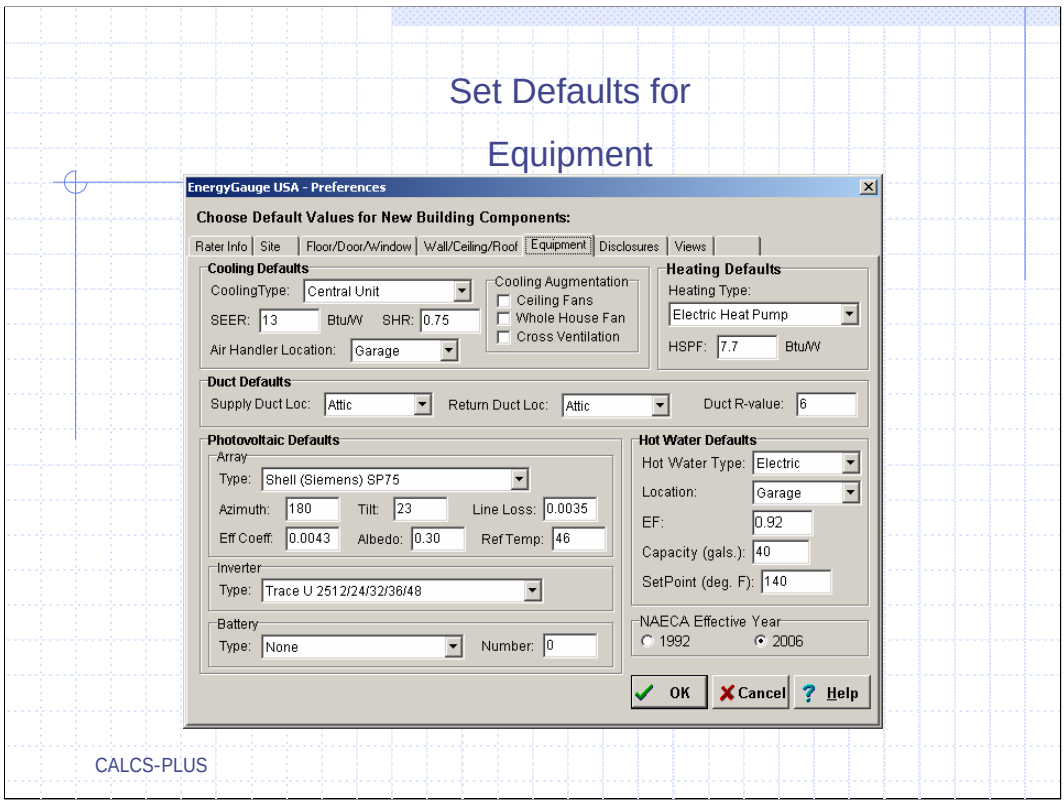
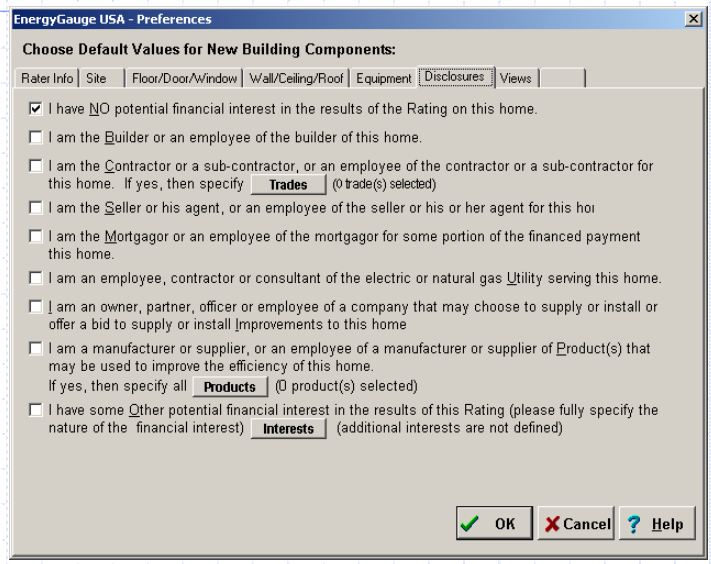


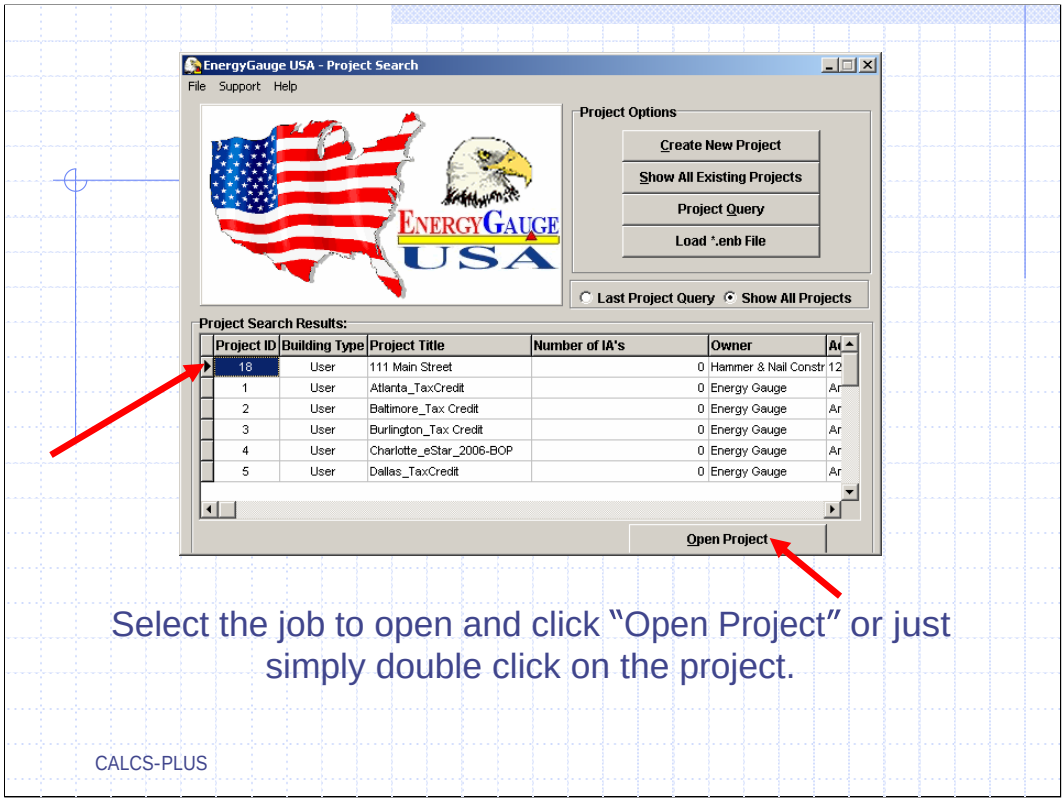
Equipment may be project specific and can change more often than not. But if may be a help to set up default equipment for the most popular systems for your area.

Set Defaults for

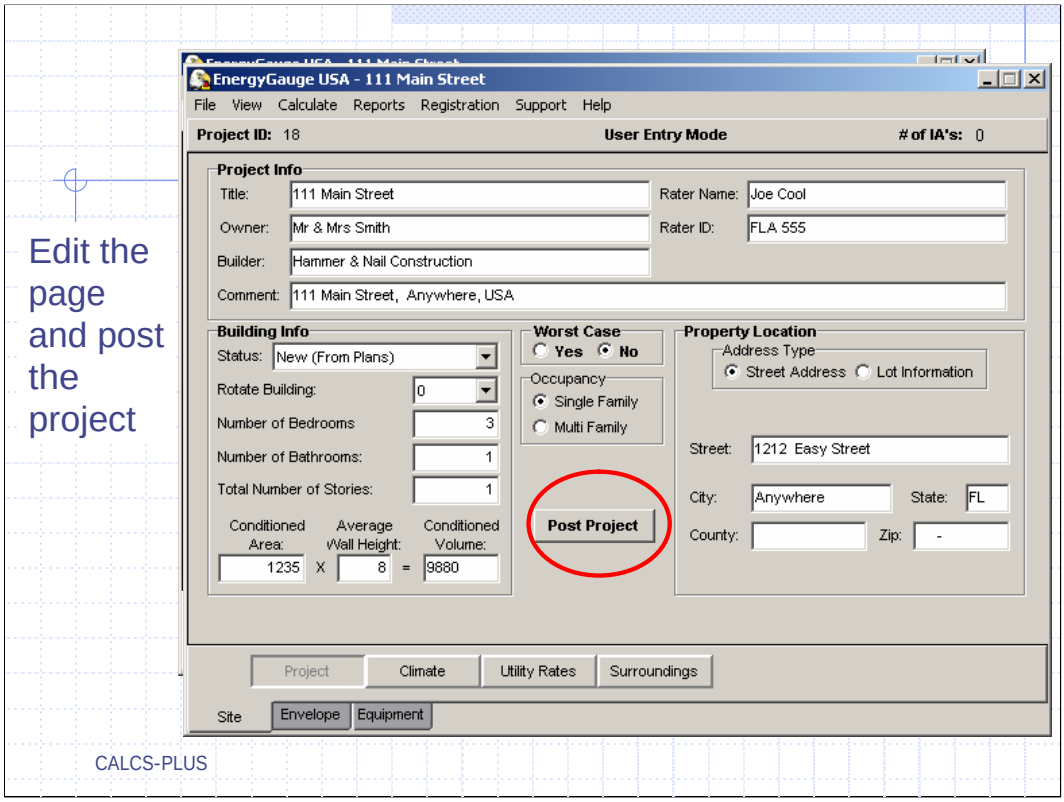
The Disclosure form



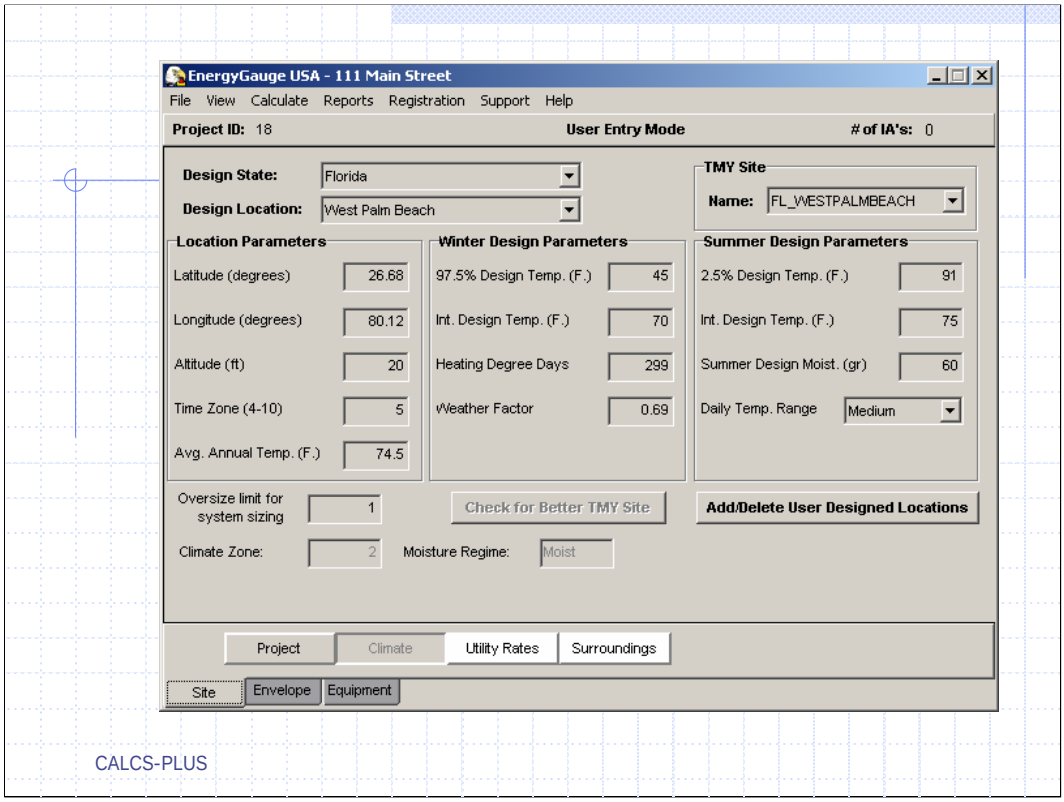
CALCS-PLUS



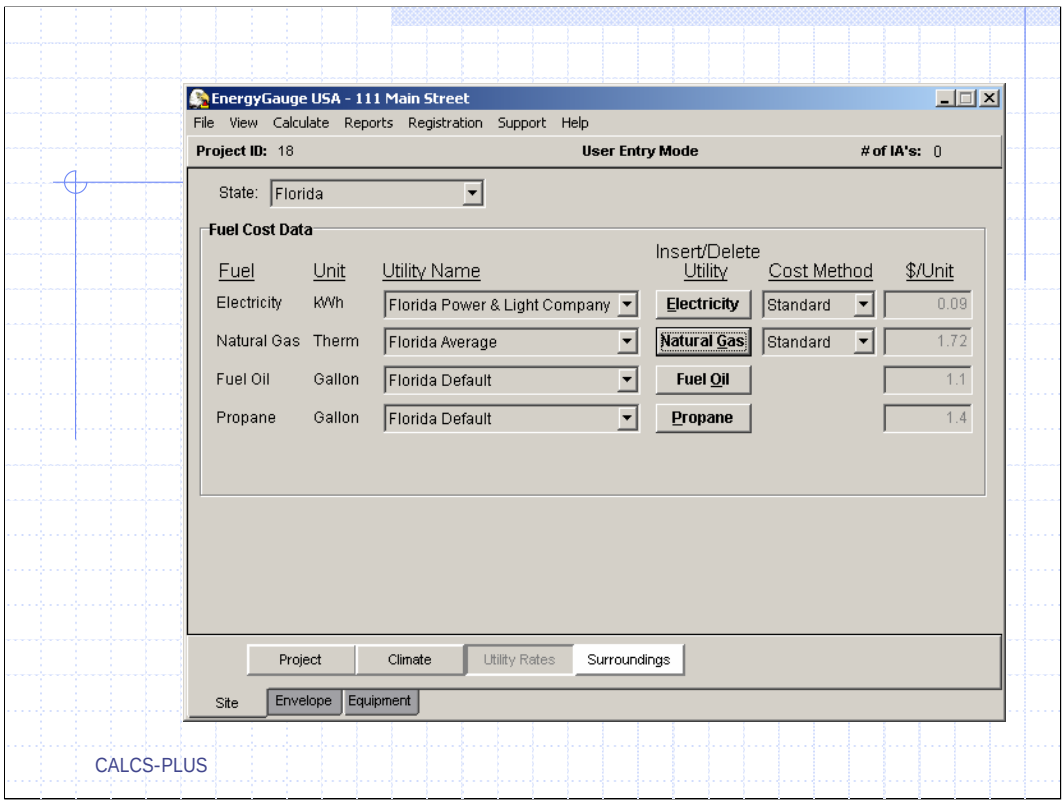
Open the project we just exported from RHVAC into USA by double clicking on the project or by highlighting the project and clicking the "Open Project" Button.



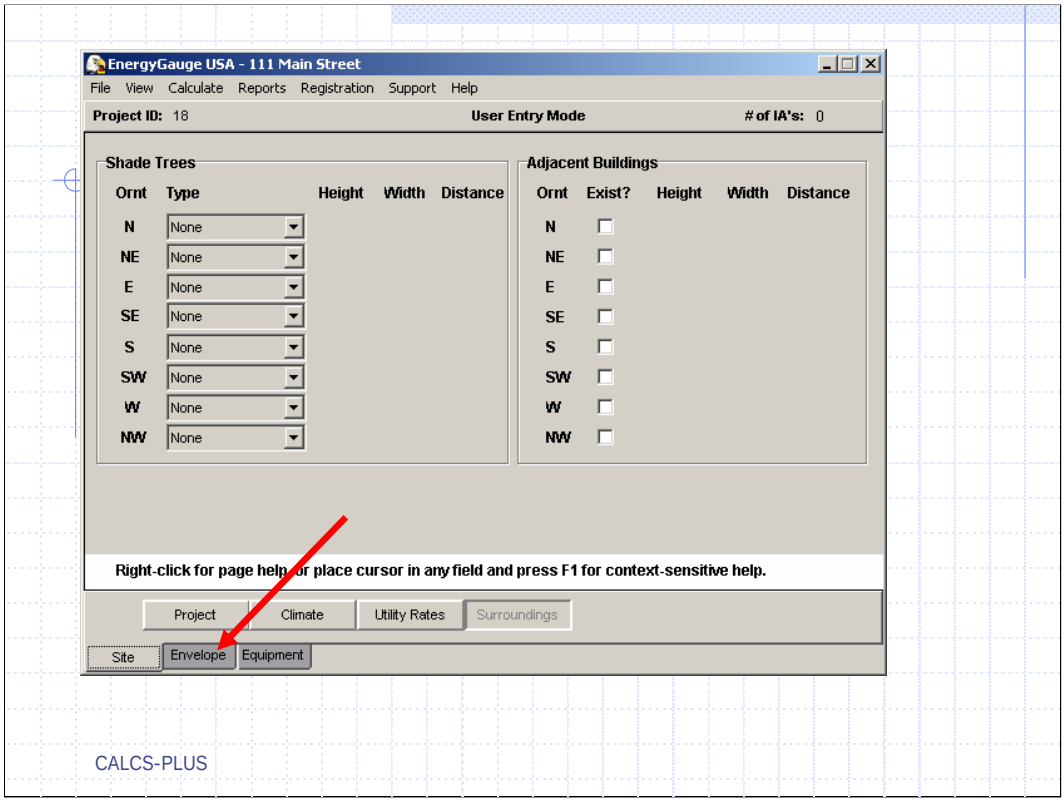
Information on this page will have to be verified and changed. We now know the owner is Mr. & Mrs. Smith, the builder is Hammer & Nail, so we change the items we need to and go to the climate tab. Be sure to post the project before leaving the page.



RHVAC does not transfer climate information so this screen must be edited or you may find your project in Anchorage Alaska. Select the climate for this job. The same data base that was in the Load Calculation program is in the rating software. Return to project page and save.

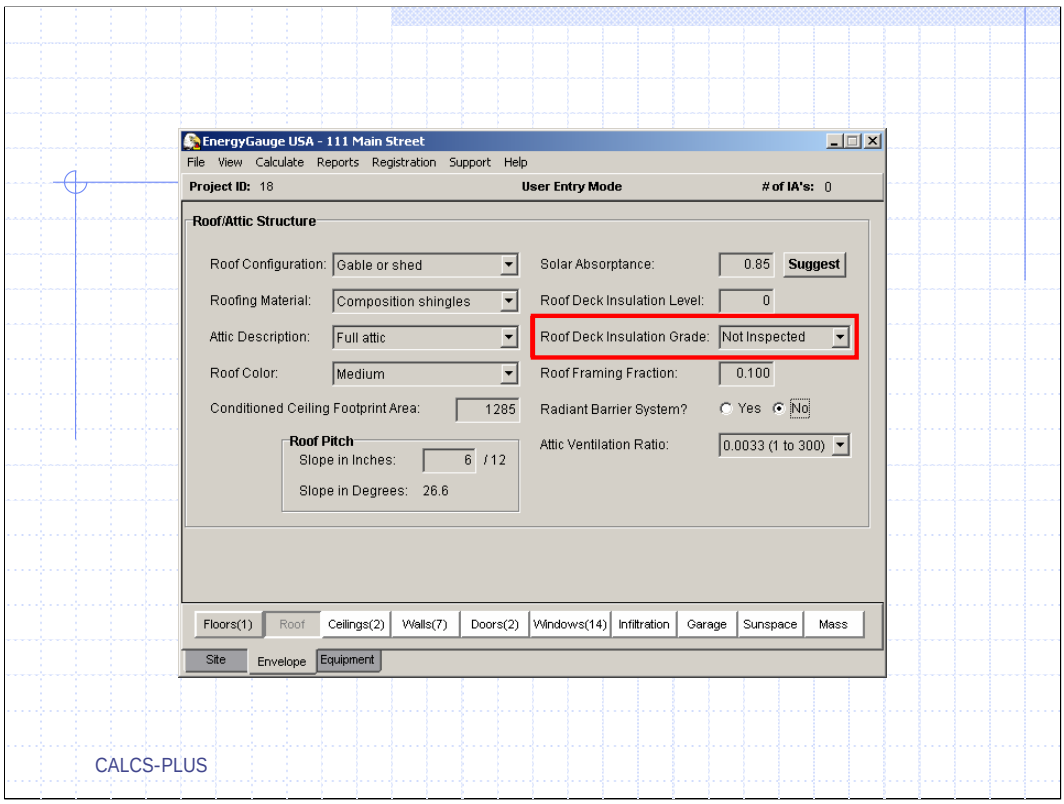


Select your local utility or default for your area.

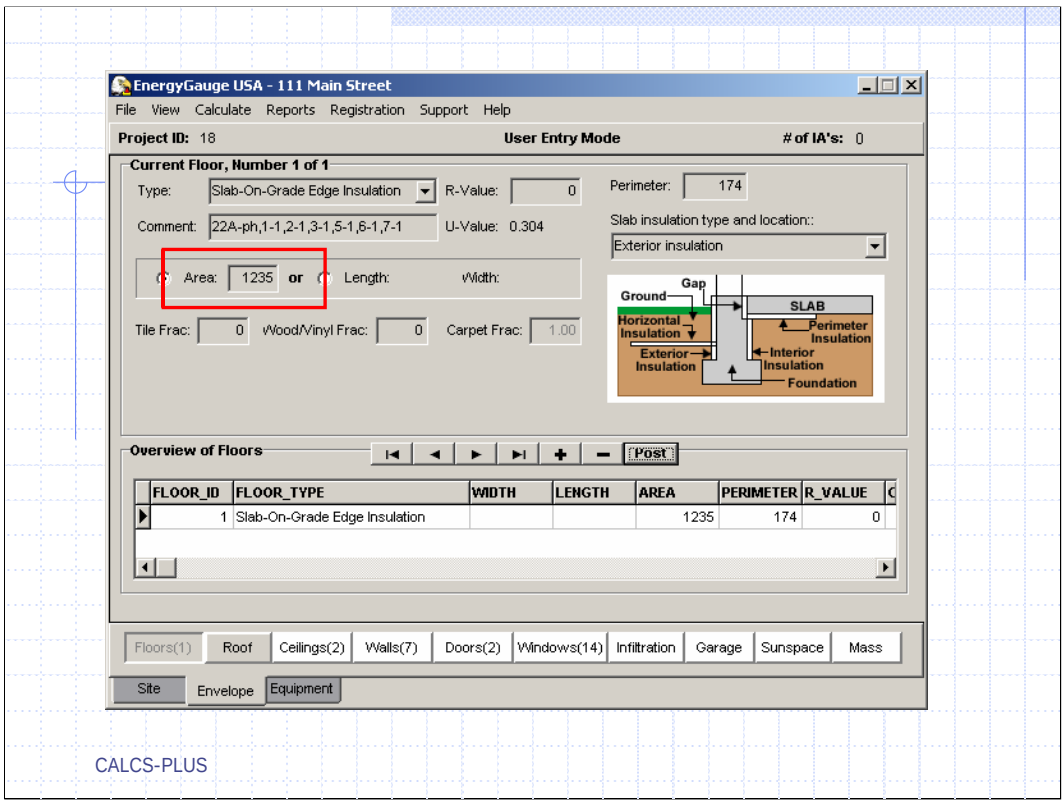


EnergyGauge USA uses shade planes to simulate the energy use impact of shade trees and adjacent buildings surrounding the project. Note that the Surroundings screen is only available when in User Entry Mode. For today's demonstration we will not use this page.

Click the "Envelope" tab to edit the materials that were imported from from RHVAC

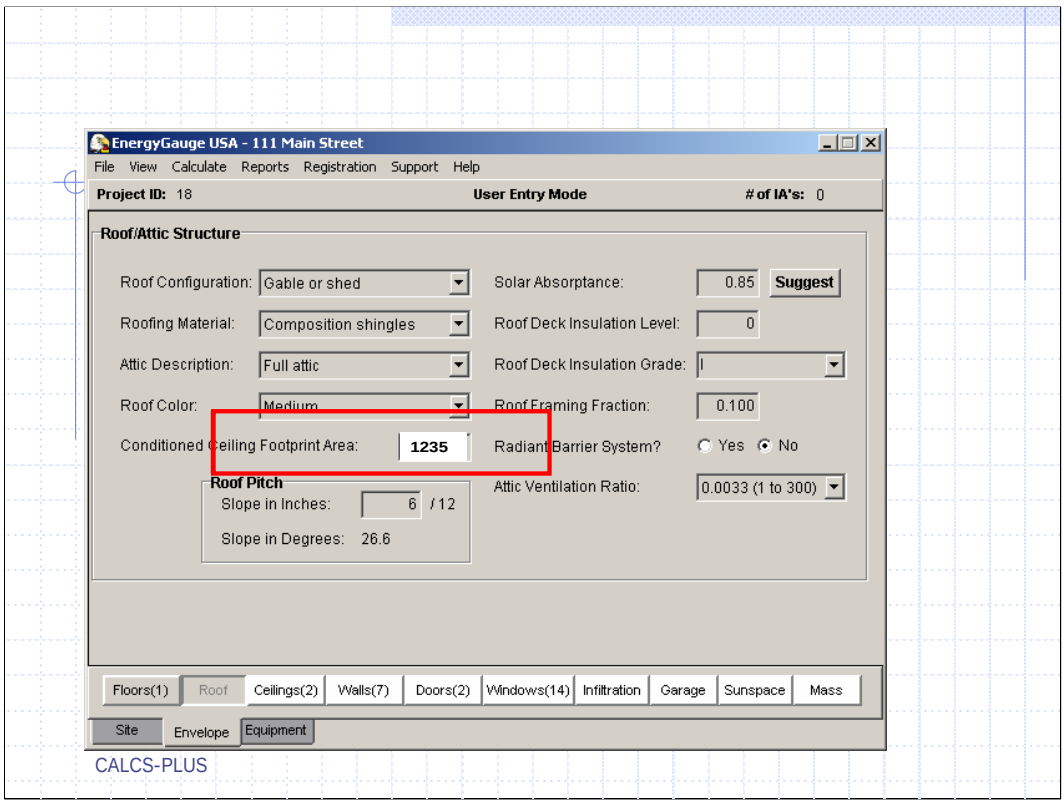


If the roof has insulation on the deck then select the insulation grade, click the down arrow for “Roof Deck Insulation Grade” if this is a projected rating from plans choose “ Not Inspected”. Now is a good time to save your project.

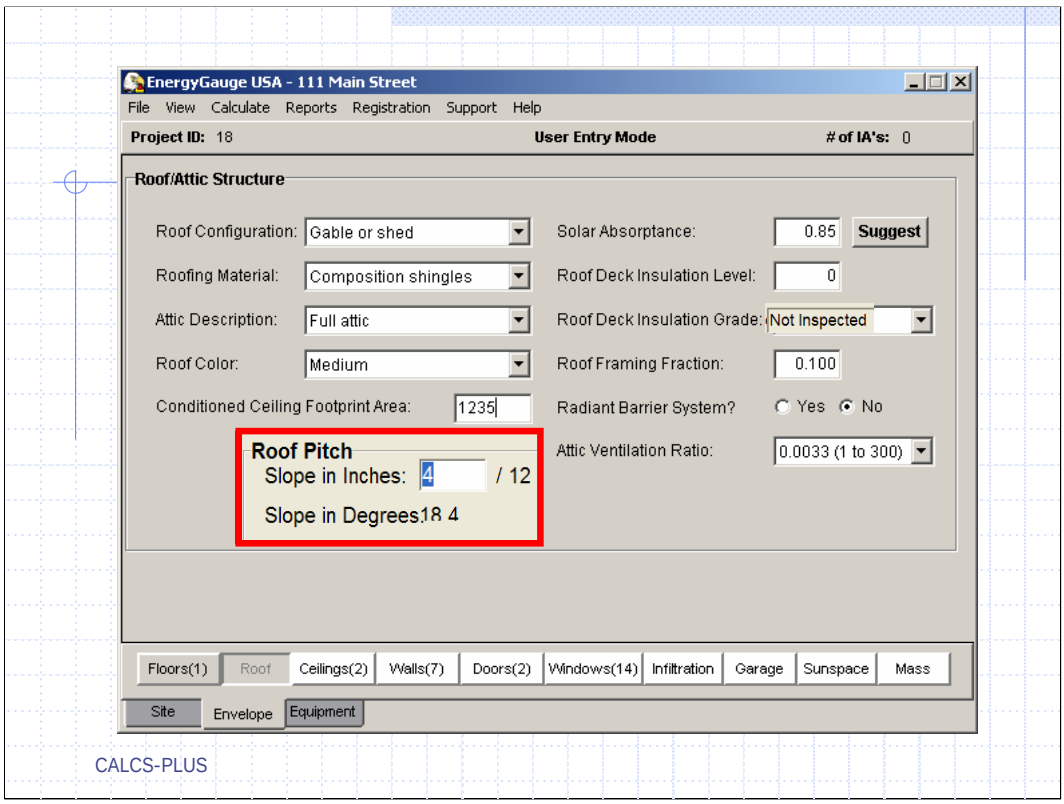


The information we entered into the load calculation program has transferred into the floor tab, this is as we entered it. Remember on the "Site" tab we changed the square foot of living space as recorded on the plans by the builder. On this screen the total floor area should be the same as the "Conditioned Ceiling Footprint Area " under the "Roof" tab.

Remember the helpful hint from RHVAC regarding how they export, here is our first example, each floor is listed by type, room location, and number.

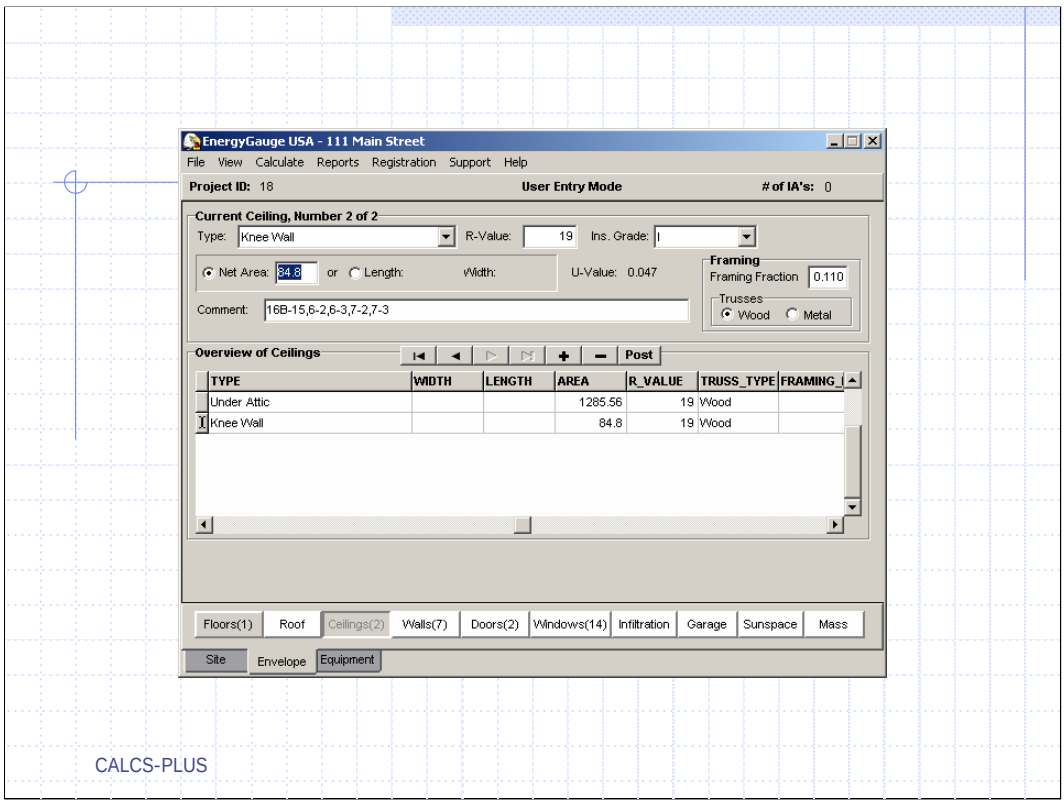


Note: If it is a single story home the floor area under ceiling is the same as the SQ FT of the home. The conditioned ceiling area may be larger, especially if we are dealing with tray or cathedral ceilings. Change the roof configuration, materials, etc to match your building.

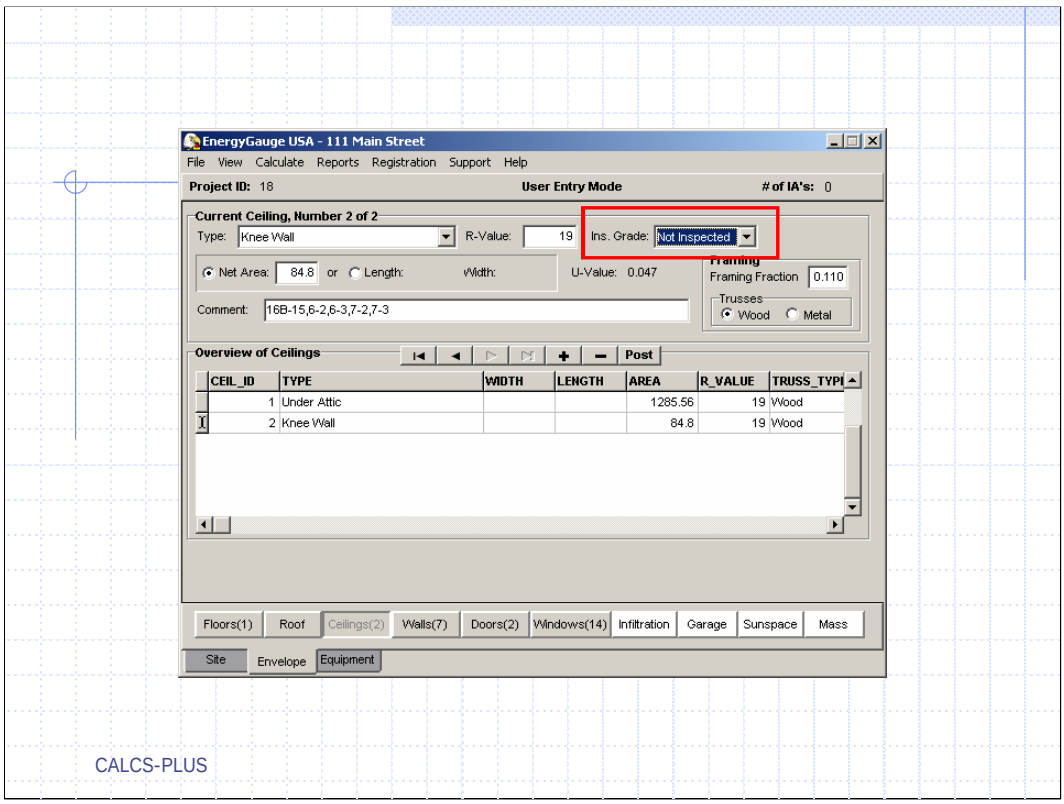


The “Roof Pitch” defaults to 6/12, change the roof pitch to match the home you are working on.

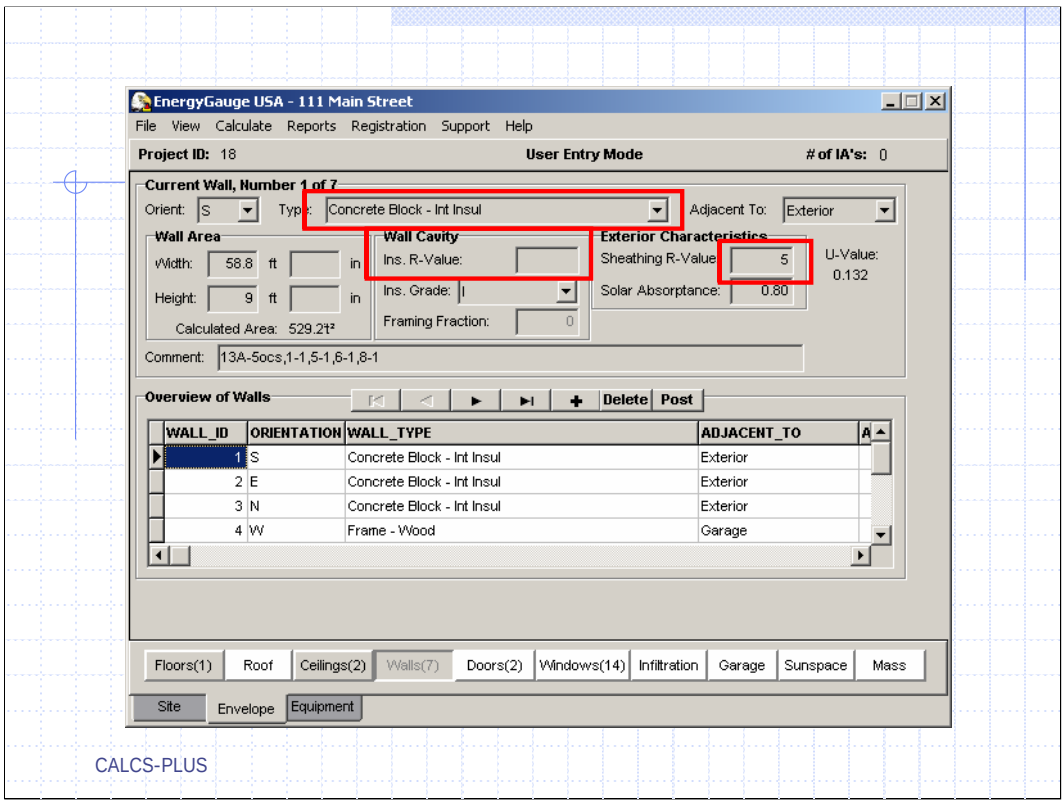
If there is insulation on the roof deck and you have entered a value in the “Roof Deck Insulation Level” then change the ‘Roof Deck Insulation Grade to “Not Inspected”



Our first ceiling “Type” is the ceiling with 19 insulation on top of it. The the second ceiling type is the “Knee Wall”s. EnergyGauge USA wants to keep knee walls separate from ceilings “Under Attic”. RHVAC doesn’t care if the ceilings are horizontal or vertical, if they face the vented attic they are ceilings. In order to separate the knee walls from the rest of the ceilings in RHVAC we gave them a slightly different R-value (15). This way when the ceilings are imported into USA we can identify them and edit the ceiling with the different R-value and identify it as a “Knee Wall”. We can also edit the R-value to the correct insulation if need be.

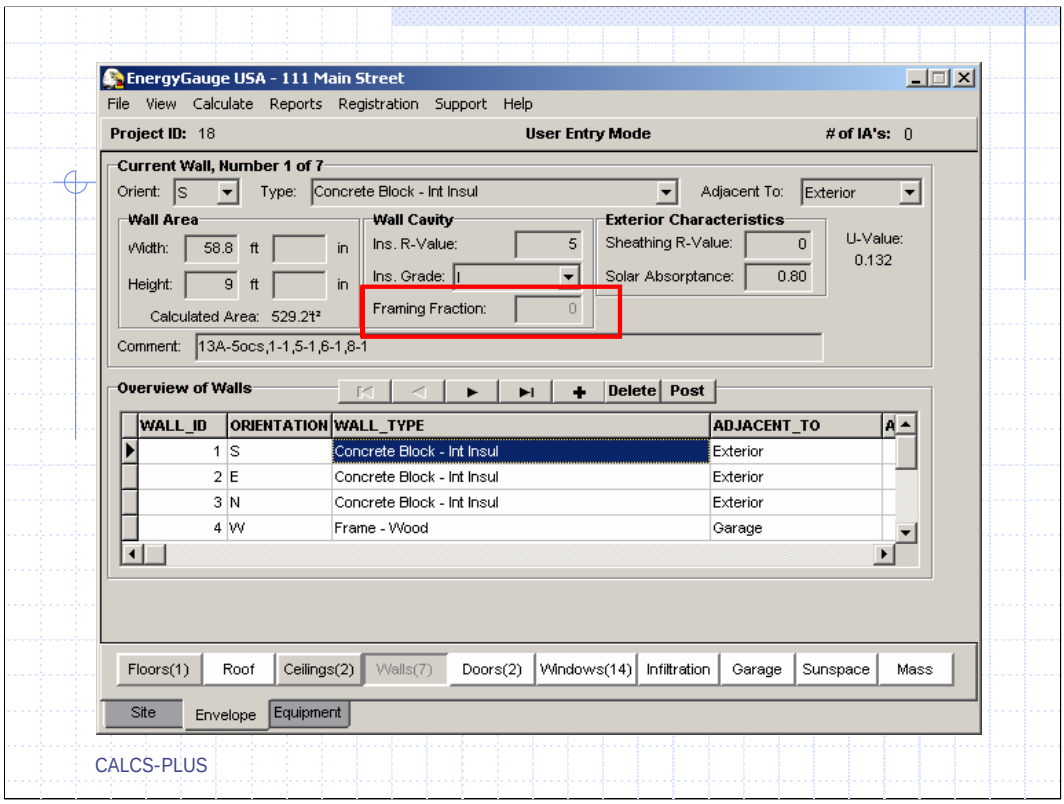


Be sure to indicate the proper grade of insulation, in this case it is not inspected because again this is being done from plans.

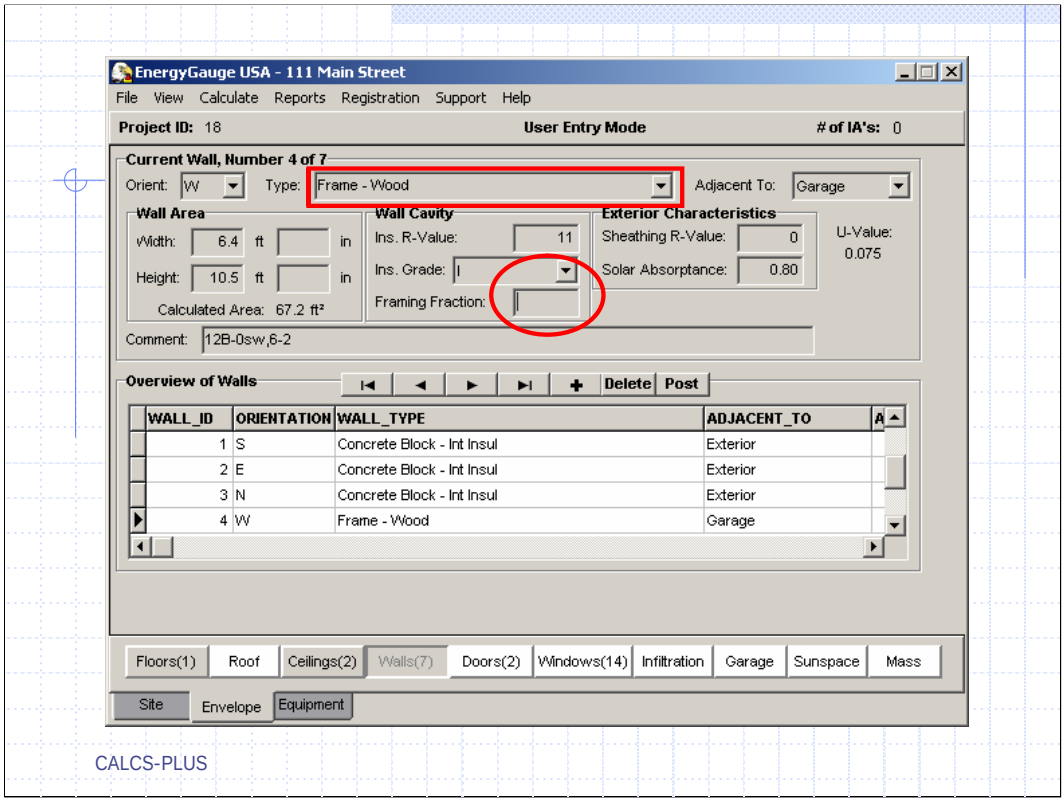


Our wall information comes in correct for direction and SQ FT. This wall transfers over as a “Concrete Block –Internal Insulation”, note that under “Wall Cavity” the “Ins. R-Value” is 0 and under “Exterior Characteristics” the “Sheeting R-Value” is 5, this will need to be reversed to match the construction type of the project we are working on.

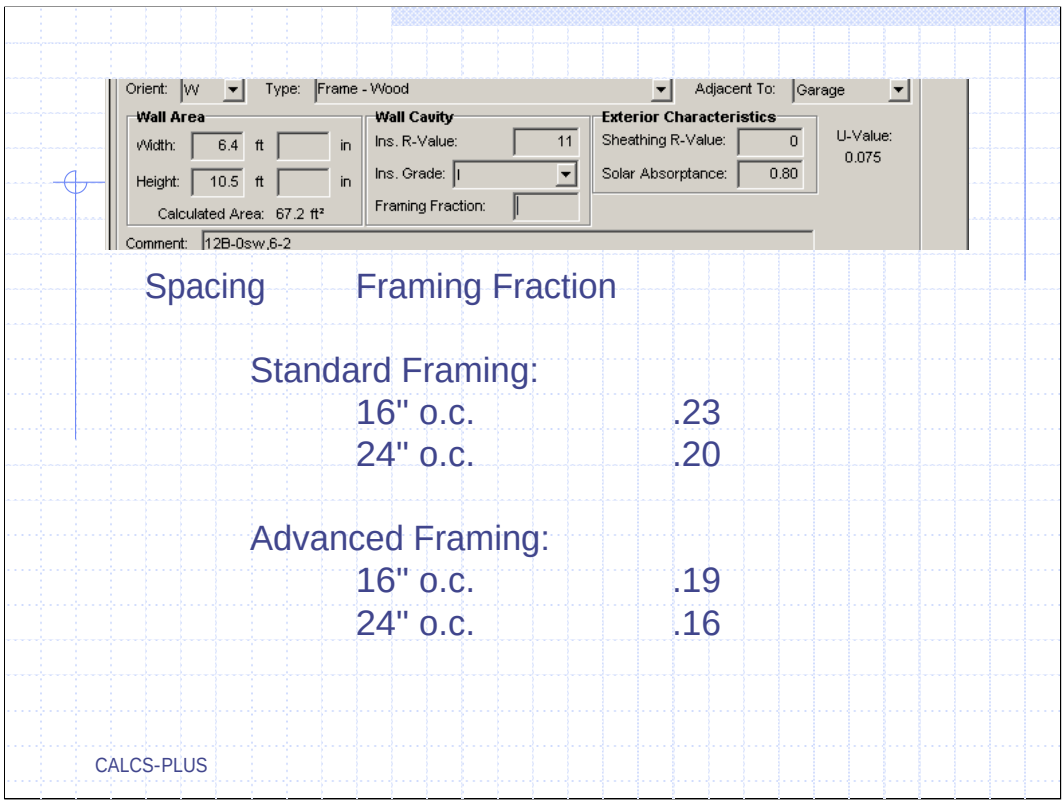
Be sure to look this over carefully and change to match the construction type of the project you are working on. We will change our insulation under “Exterior Characteristics” to 0 and move our R-5 value to “Wall Cavity”. This procedure must be repeated for each wall.



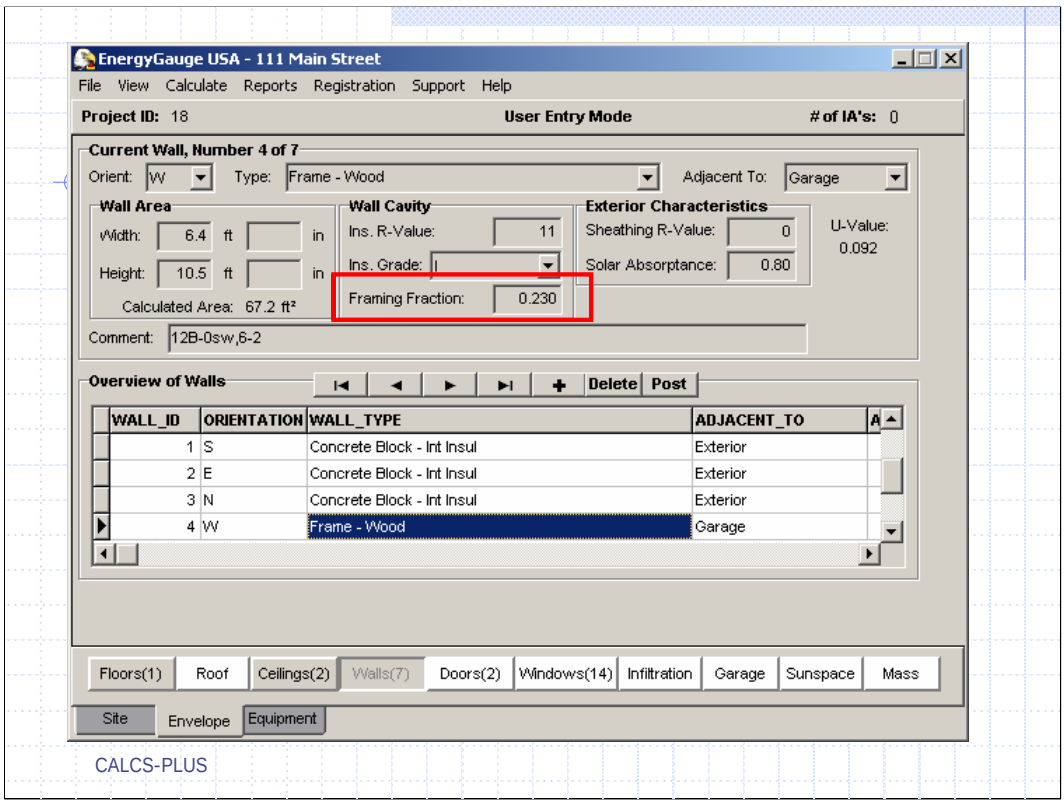
USA looks at “Concrete Block – Int Insul” or “Concrete Block – Ext Insul” walls as having continuous insulation with no framing factor.



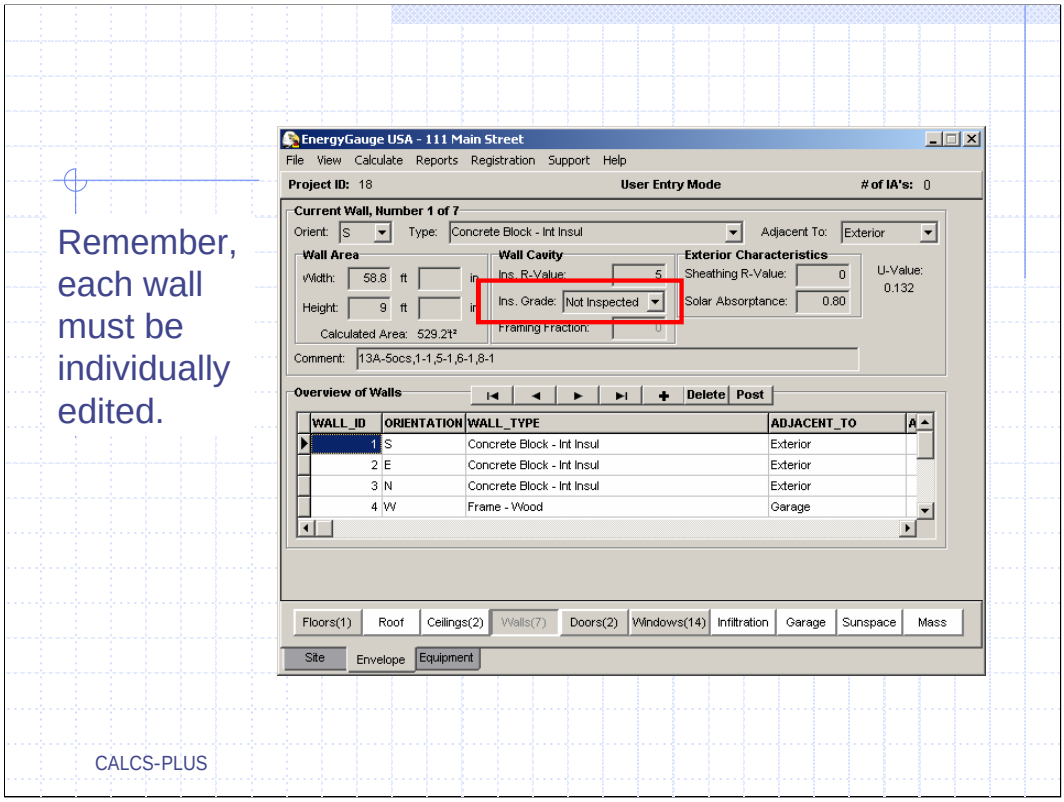
For our frame walls we need to input a framing factor. F1 will bring up the help screen with information to use for this.



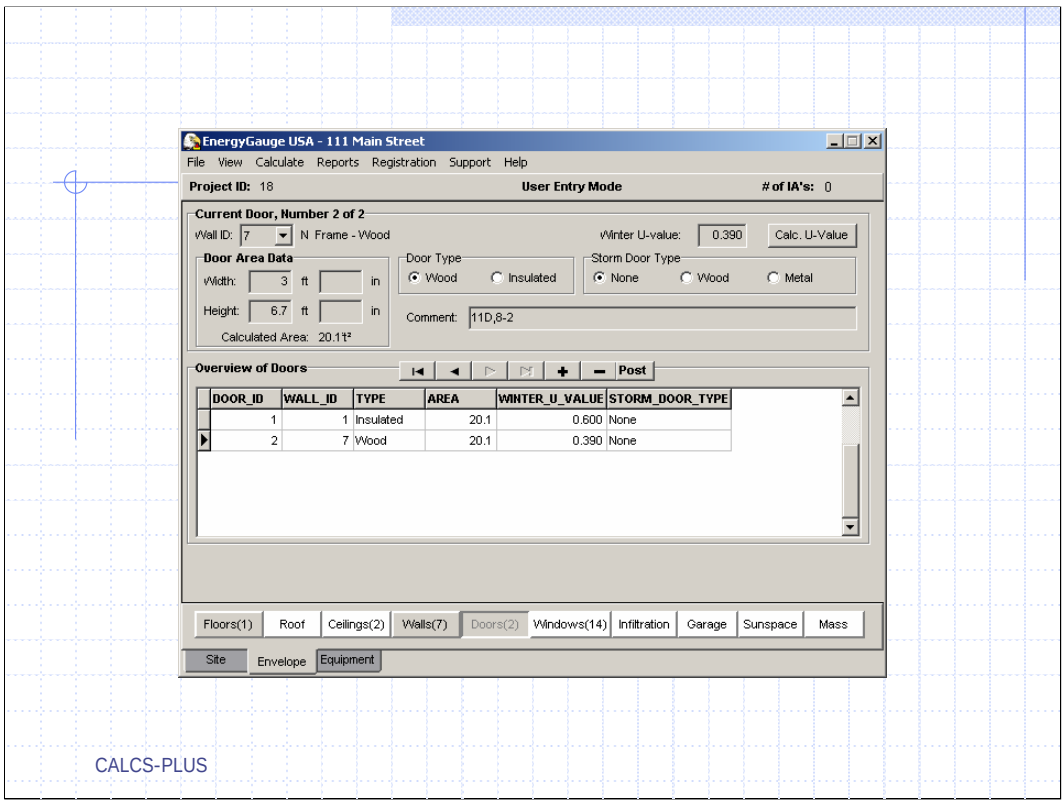
Recommended default factors



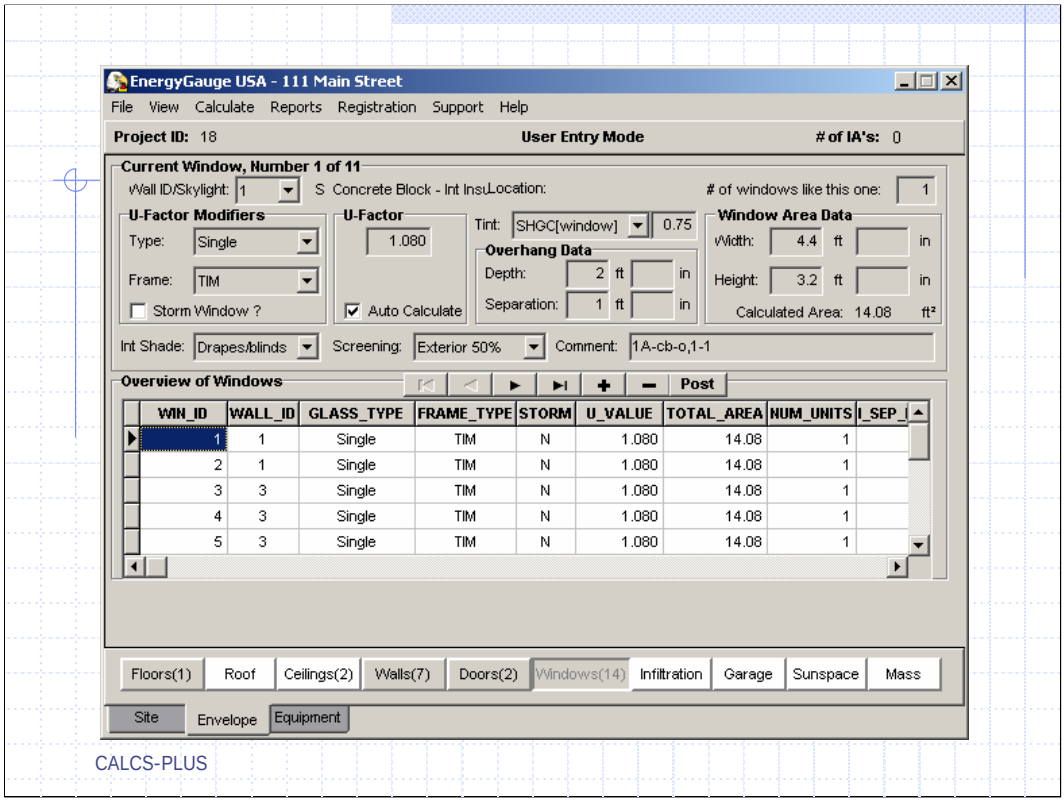
Our building is 16” on center so we will use .23. Again, the framing factor will have to be edited for each frame wall.



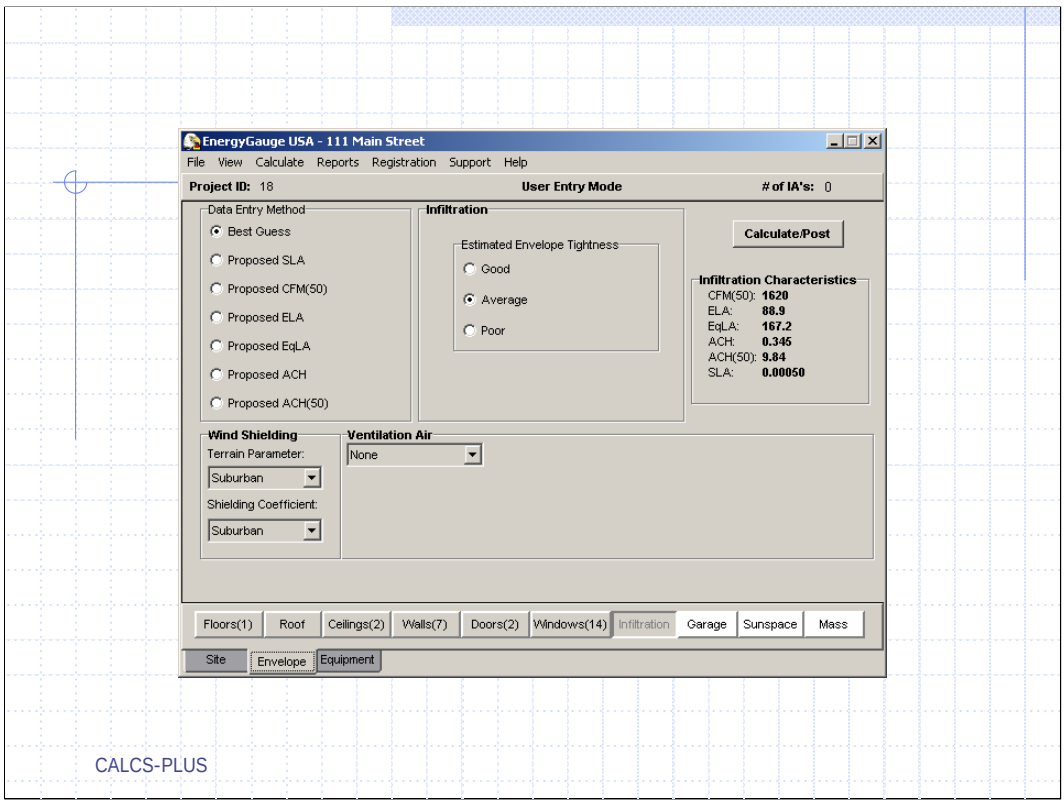
One more quick entry and our wall page will be done. Insulation grade must be rated. In our case it will not be inspected. Click on each wall and enter the appropriate grade.



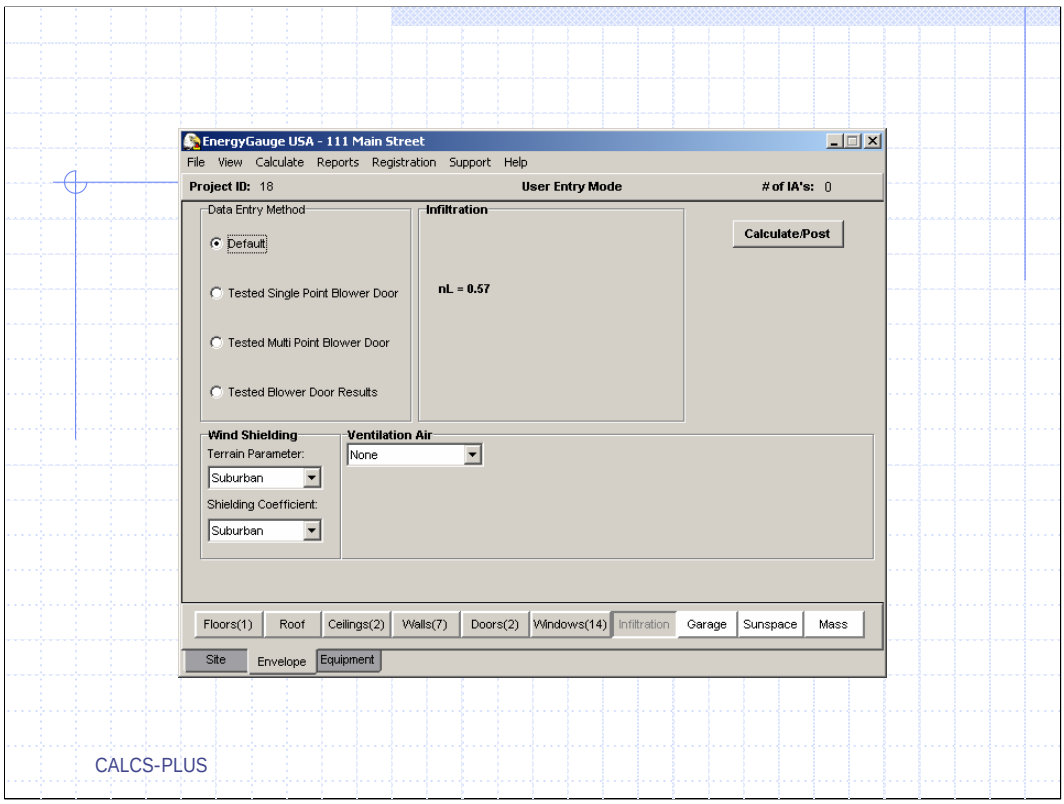
Door information transfers into the rating program correct so nothing needs changing on this page.



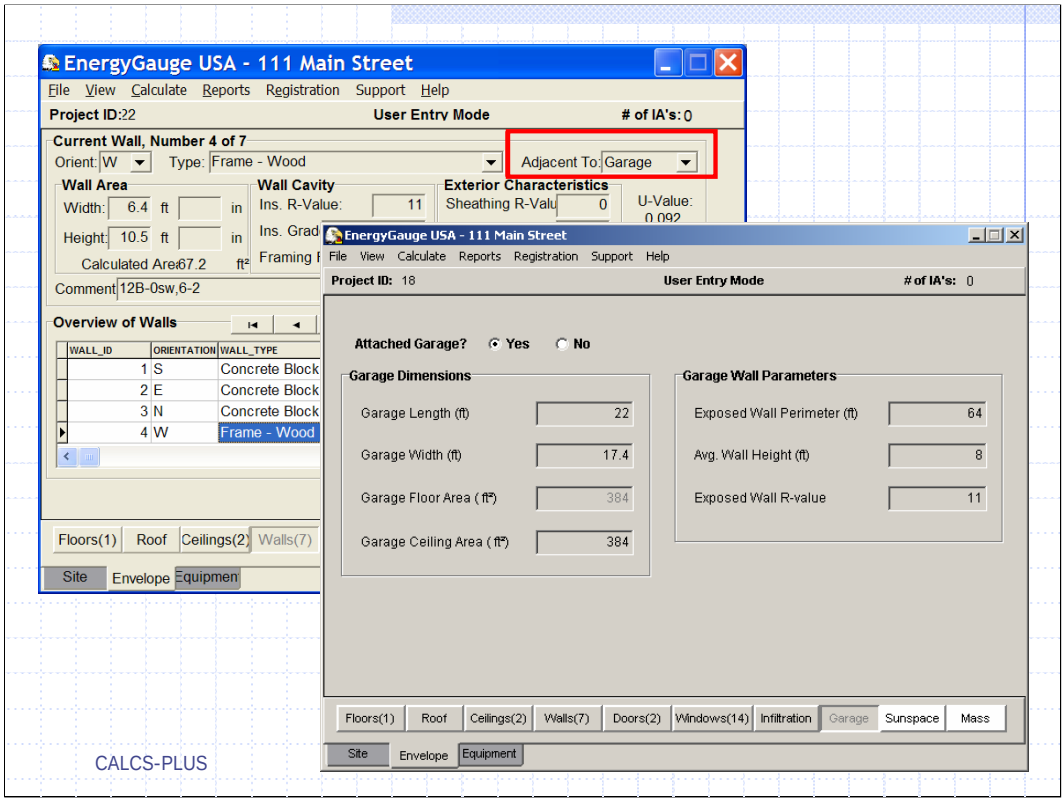
Windows transfer from the load calculation program as they were entered; the window height and width; the overhang depth and separation; interior shading, and screening all come into USA with no editing necessary. As on the wall page, the "Comment" box tells the type of window, room & wall the window is on in RHVAC.



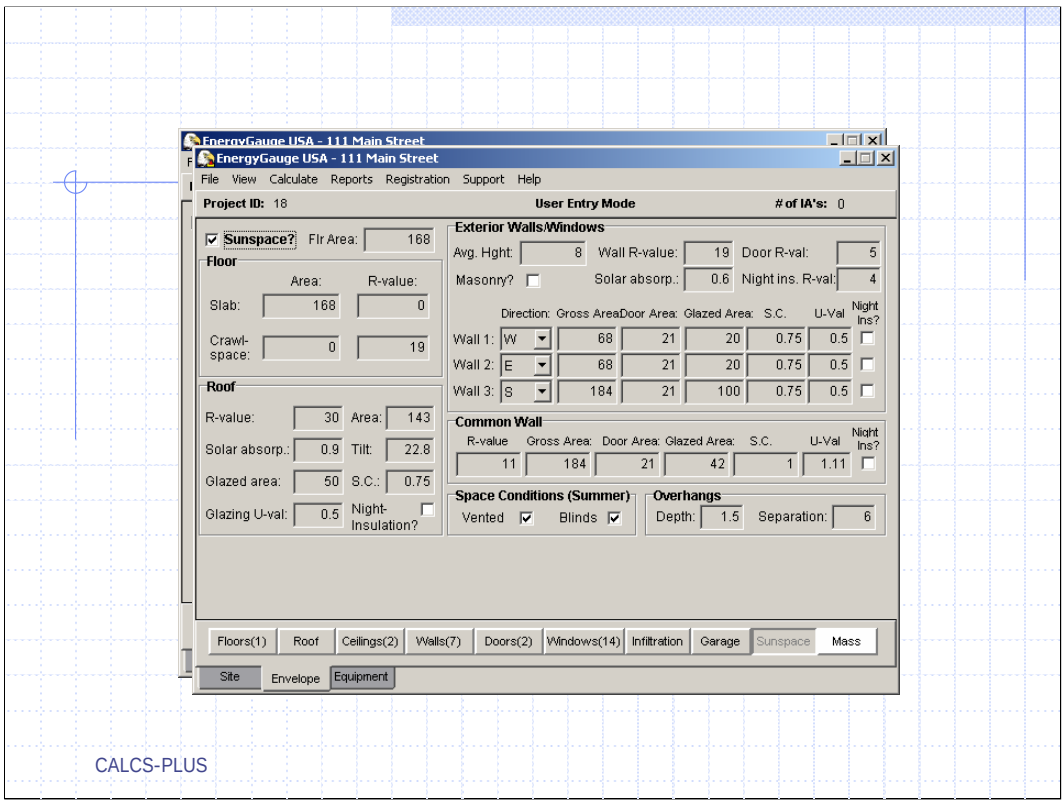
Infiltration. On the site page of USA under building information: Status: we selected new (from plans), because of this our options on the infiltration page are these.



Had we selected new (inspected and tested), our data entry options are changed and here is where we can add our test results.



RHVAC automatically builds a default garage in USA, this is needed because back in the wall section we had some walls that were “Adjacent To” a garage. If all the walls are “Adjacent To” Exterior you can click on “No”. But in this example we have an attached garage and since RHVAC exported a default garage we can edit to the proper dimensions.



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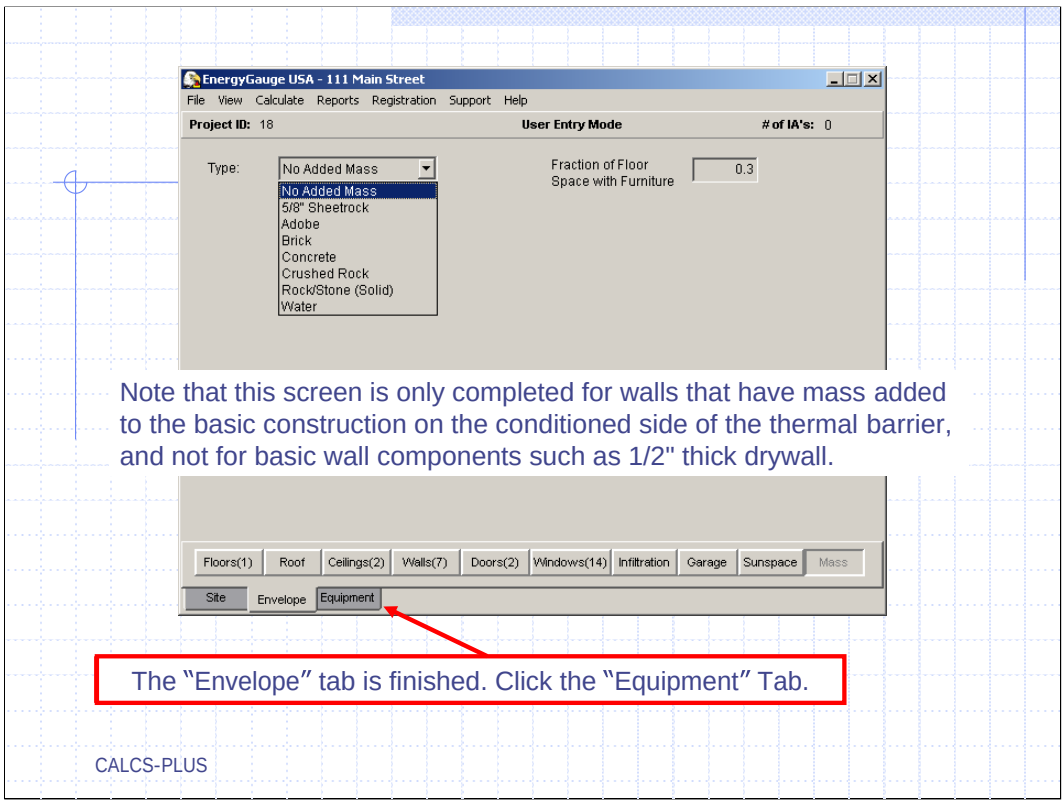
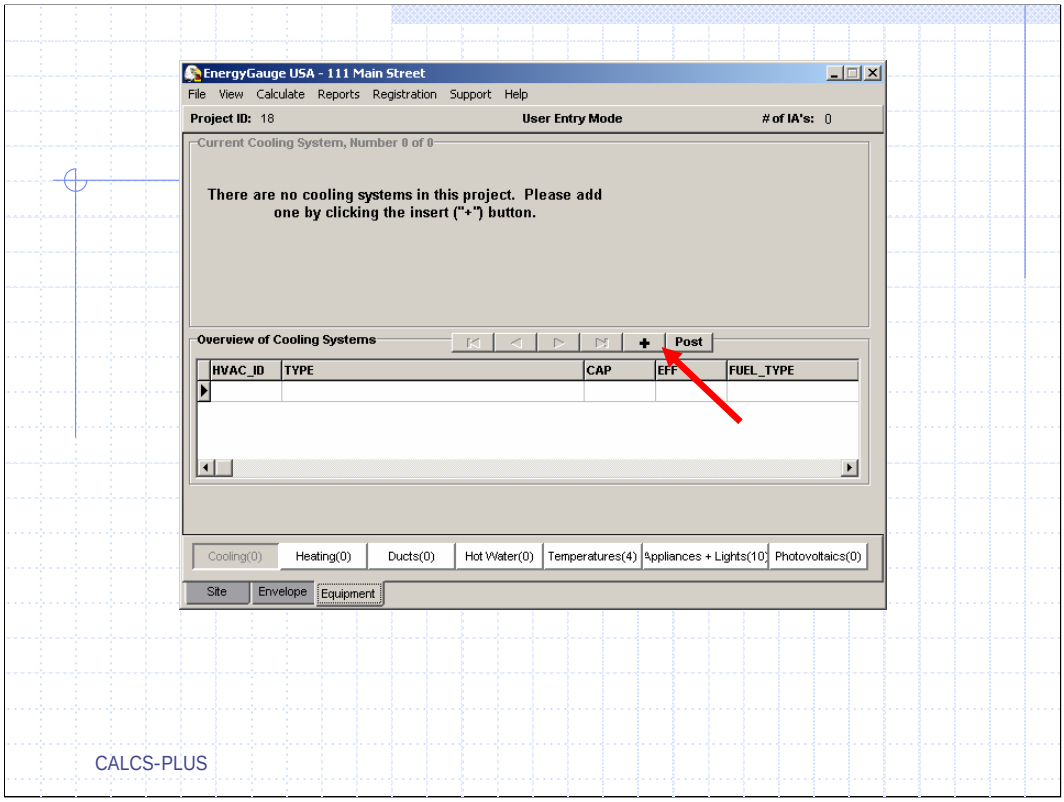
If your building has a sunspace click the box and a new entry box appears, fill in the appropriate data

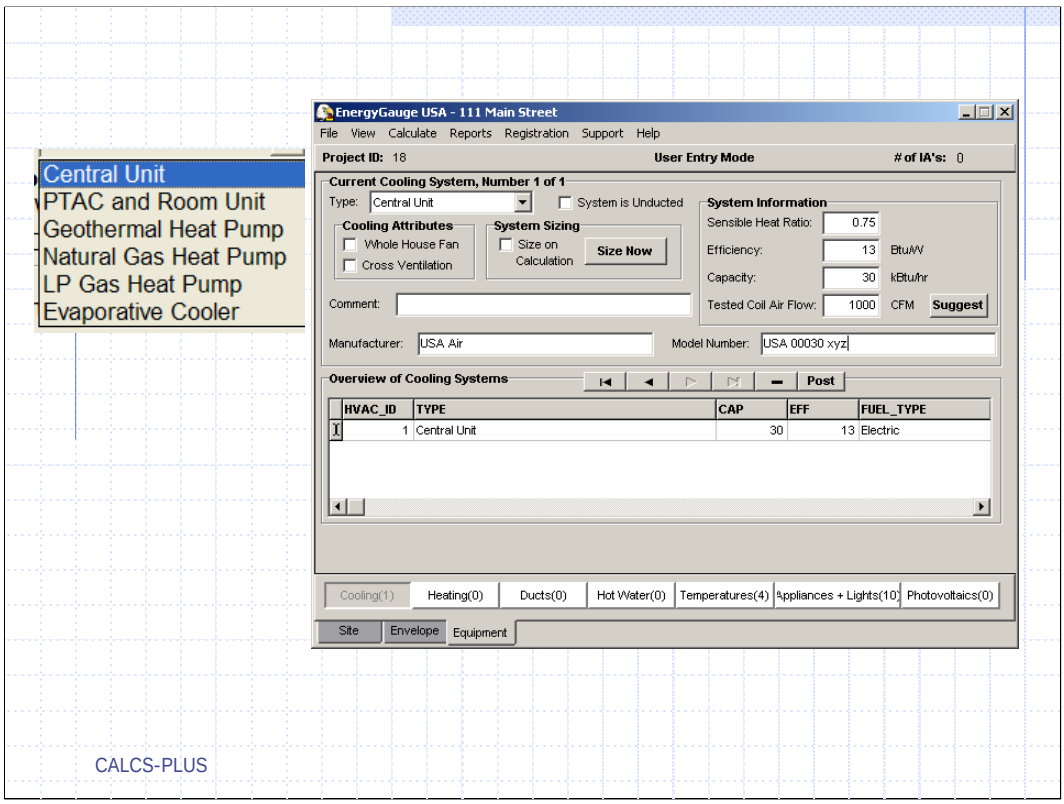


Note that this screen is only completed for walls that have mass added to the basic construction on the conditioned side of the thermal barrier, and not for basic wall components such as 1/2" thick drywall.



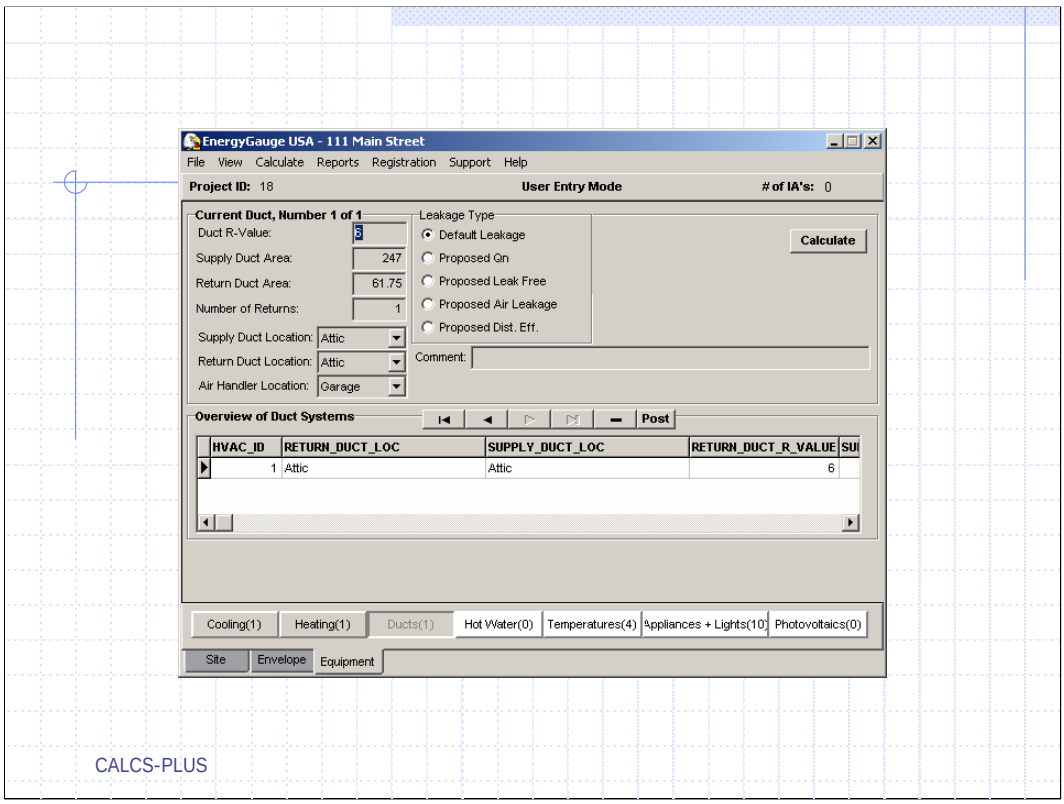
Under the "Equipment" tab we will first fill in the "Cooling" equipment information.

Click the "+" to add the cooling equipment.

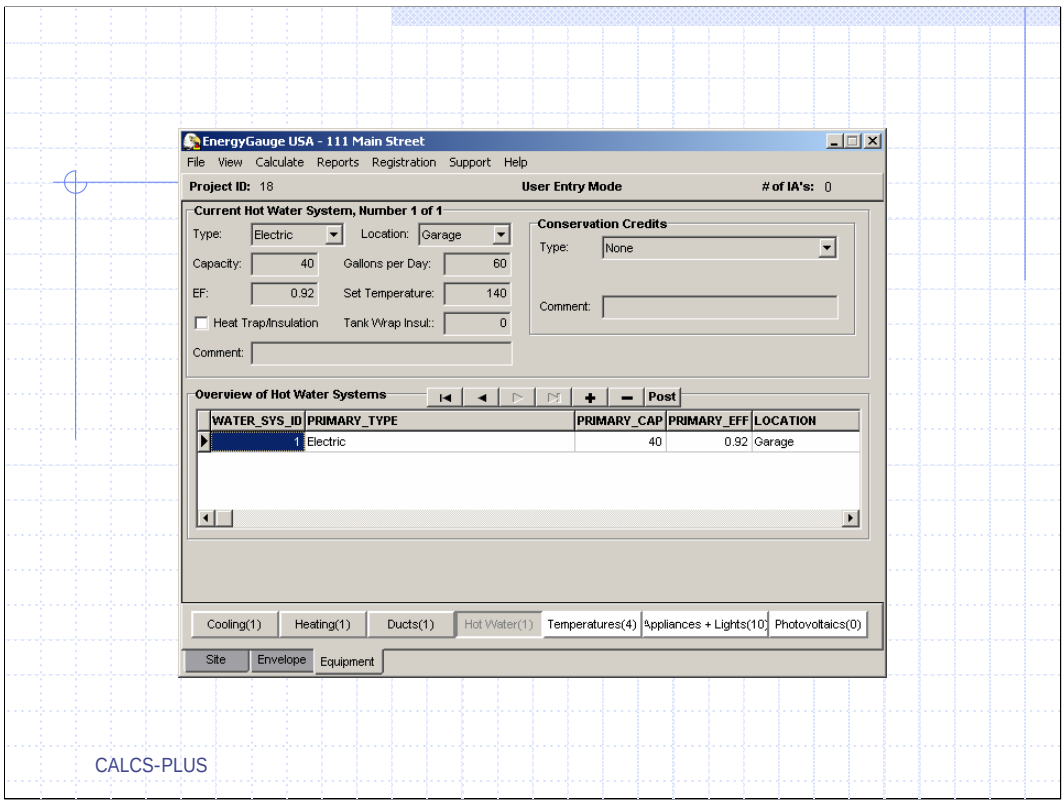


Fill in the cooling system “Type”, if the system is unducted check the box to indicate so, and go to the “System Information” and fill in the “Sensible Heat Ratio”, “Efficiency”, “Capacity”, and “Tested Coil Airflow”.

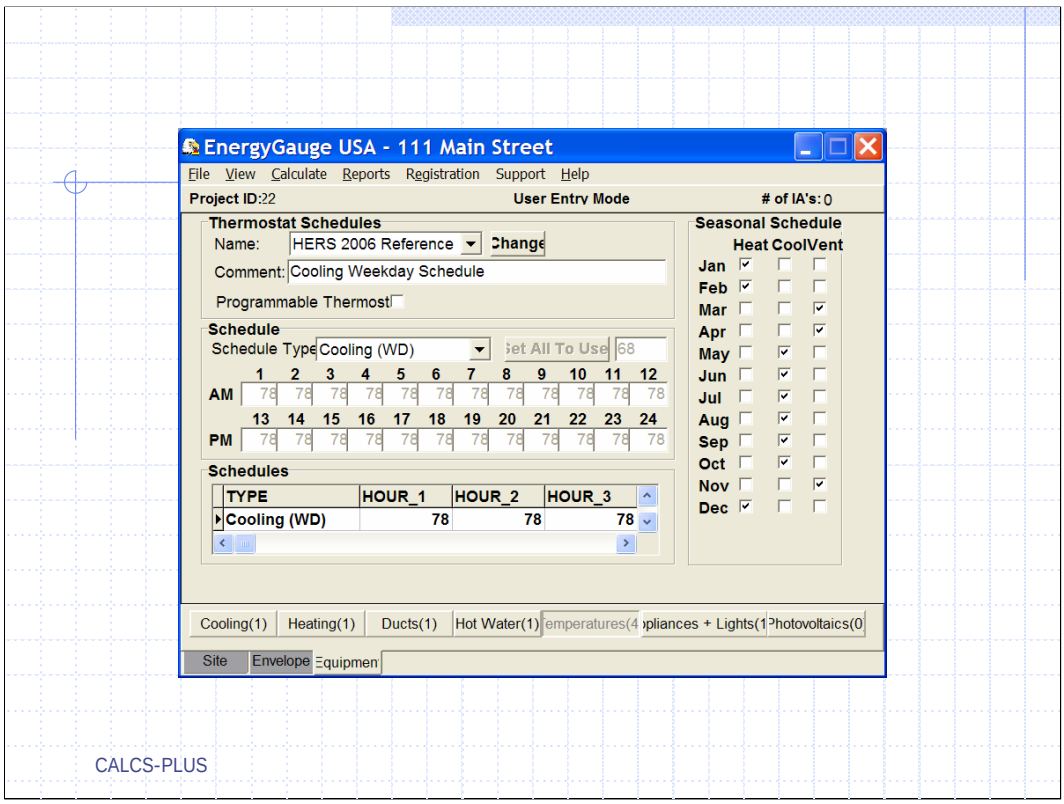
USA doesn’t really have provisions for multiple systems. So if you are working on a project with multiple units you must total up all of the systems and enter them as one unit.



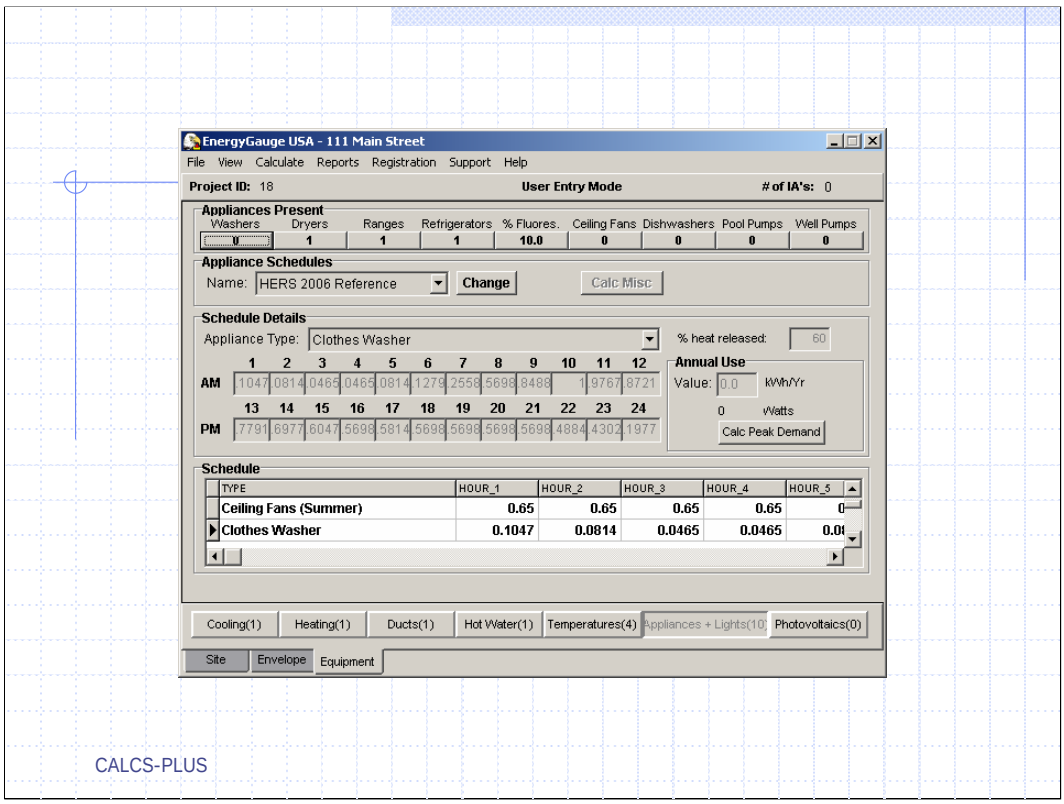
When you select to add a duct system default data appears, change any of the factors that is not correct for your building



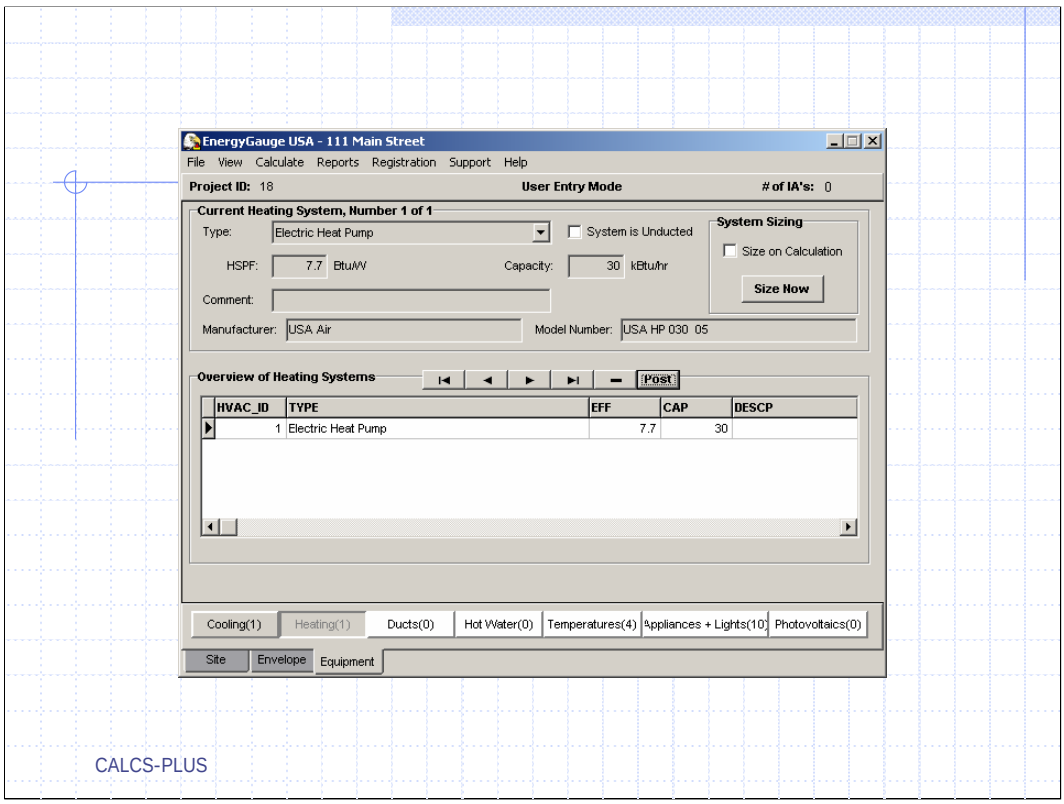
Select the "+" to add hot water components, the default information we entered in our preferences came in as our hot water component. This can be changed to match your building.



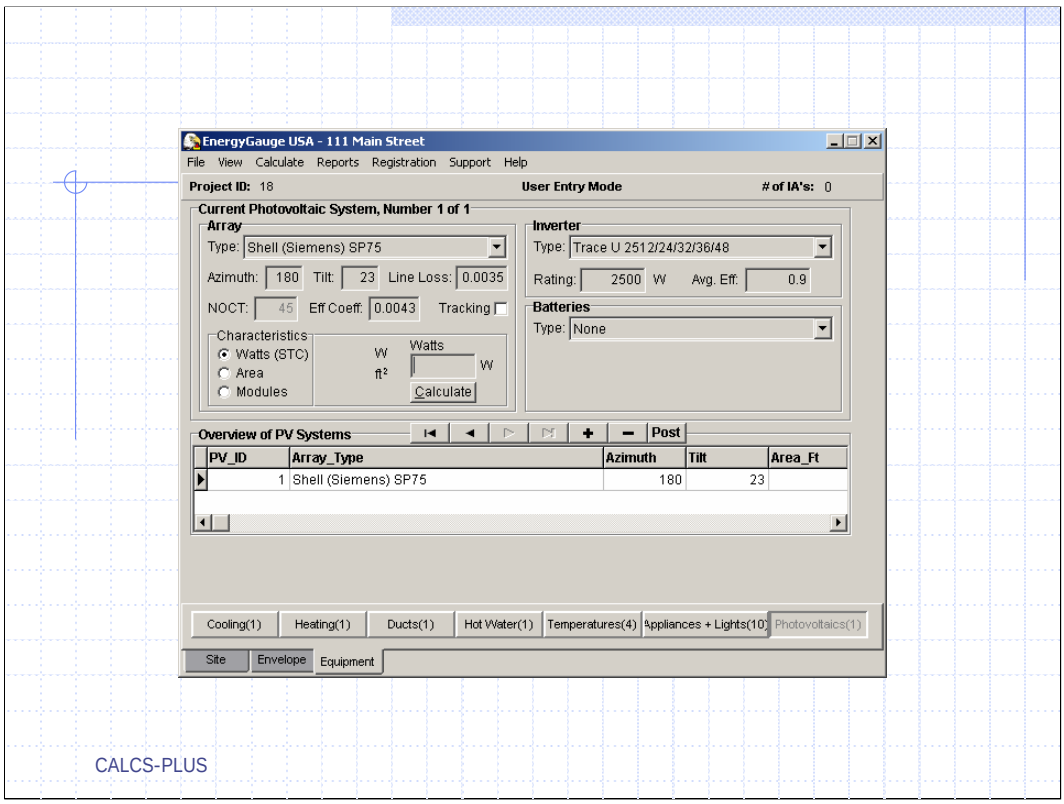
Check the Heat, Cool, or Vent box for each month of the year that space heating, space cooling or natural ventilation will be used. Note that more than one box may be checked for each month, and to obtain ventilation credit, both the Cool and Vent boxes must be checked for each month that applies. Defaults will be scheduled based on your chosen climate location.



Add appliances

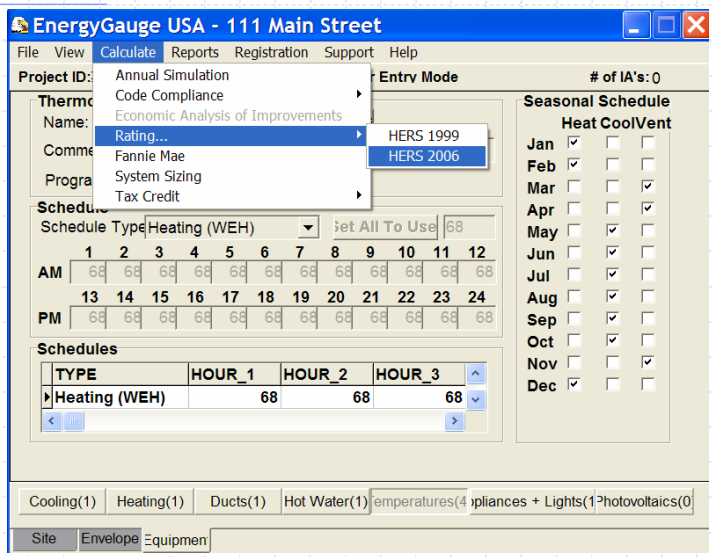


Enter your heating equipment and type.



Photovoltaic Systems can be added here. Verify the information for the system at your building

Calculate a projected HERS Index



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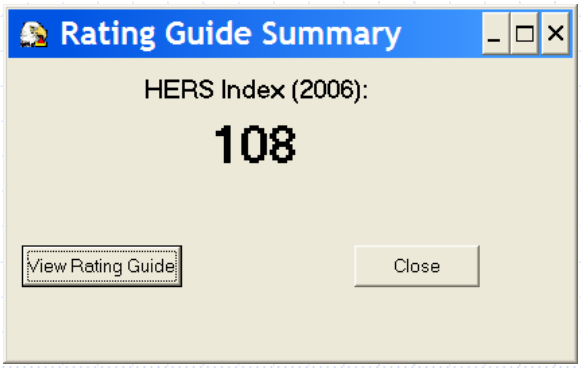
Looks like we need to work with the Owner/Builder to achieve an acceptable HERS Index.



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Thank You

Questions?

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