



Unity Student Passive House: *Transforming the Approach to Student Housing*

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This fall Unity College will be opening what we believe is the first Passive House certified student residence in the country. That's great, but probably most of you are wondering what a Passive House residence is.

For the more detailed definition of Passive House building design I shall direct you to the [Passive House Institute](#). However most of you would probably prefer a lay person's definition which I have gained by serving on Unity College's new building committee and working with the design and landscape architects. As I understand it, the definition of a Passive House uses 90 percent less energy to heat the building than standard buildings, and space heating comes from the passive energy of the sun. The rest of the energy needs for the building would come from other sources like solar photovoltaic, etc. This means that the insulation for the building must be super-efficient and placement of the building is paramount to take the best advantage of sunlight. Basically you could heat the building with the energy equivalent of a hair dryer --- which is pretty amazing considering that we are talking about Maine winters.

Unity's student Passive House residence will be a two-story cottage with ten bed spaces divided into four double rooms and two singles rooms. The first floor will consist of the common areas, which are an open plan with a kitchen/dining/living area in the center with a single bedroom, double bedroom, mud room and bathroom surrounding. The second floor has the remaining three double bedrooms, a single bed room and a bathroom.

The energy specifications of the student Passive House will be pretty impressive. The walls of the building will have a R50 value, roof R80, floor R70 and the windows a R8 (which I have learned is very good, as most windows have a R2 to R4 value). Because of all of this great insulation, the building is designed to use about 186 Btu per hour compared to 11,000 Btu per hour a normal similar size building would use. This comes out to about 14 Btu per square foot per year. After the passive energy gains, the building's remaining heat needs could be met with the equivalent of 56 gallons of oil a year or six solar panels or electric heat with an annual cost of \$335. As I said before, you could heat this building with a hair dryer.

The passive energy for the house is sunlight. The building has huge two-story windows which are situated so that they get the maximum sunlight in the winter. The roof overhang is designed so that the solar gain is much less in the summer, as one of the biggest challenges is that the building gets too hot in the summer. By situating the building to take advantage of the change in the angle of sunlight from summer to winter, the building stays cooler in the summer but still is able to provide nearly all of the heat needed even in the winter.

For me, as Director of Residence Life at Unity College, the student Passive House residence provides some unique challenges because this is definitely not the typical residence hall. Residents of the student Passive House will have to be willing to live a simpler lifestyle and will need to work with the College to fulfill the program goals of the building as a net-zero energy building. The College will be using the building as a show piece for visitors and as a living laboratory for classes, so residents will be expected to maintain the common rooms in a presentable manner. Finally residents of the student Passive House will be expected to be knowledgeable of the systems of the house and be able to explain them to visitors. Currently I am working with our sustainability coordinator to create a housing contract for the house that will meet these demands while still being attractive to students. I am thinking that a special type of RA equipped not only with the normal peer counseling/mediation/community building skills but also skilled in the area of sustainability might be a good idea.

I am excited about our student Passive House residence that will be opening next fall. It may be a prototype of the next generation of residence halls that are both net zero energy use and conducive for building strong residential communities. The student Passive House residence might be a true convergence of sustainability and student affairs where community building and energy performance come together in a synergistic way.

Passive House residence may become the norm in the future for on campus housing!