

I propose a self-sufficient apartment building that is energy efficient, reuses its waste products, has a low impact on its surrounding environment, and improves the wellbeing of those in the building. The exterior of the building is composed of hempcrete with a recycled timber support structure. The building is insulated with cellulose insulation and is painted on the interior with VOC-free milk paint. On the roof, there is a green roof for growing fresh fruits and vegetables. Florist's chrysanthemums can be found on the roof as well as in the apartments. The roof fencing, in addition to the skylights and windows in the apartments, are composed of clear solar panels rather than glass.

This apartment building addresses energy efficiency in two ways: reducing energy usage and producing renewable energy. The temperature within the building is held at a relatively constant and comfortable temperature due to insulation from the green roof, cellulose insulation, and hempcrete, reducing energy needed for heating and cooling. Natural light from the skylights and windows also reduces HVAC usage. The use of hempcrete as the main exterior component of the building reduces construction and transport energy due to its lightness. The building produces its own clean, renewable energy from the clear solar panels that make up its windows, skylights, and roof fencing.

This building's plumbing system ensures that no waste is wasted. Liquid waste is differentiated between grey and clean water, with the clean water undergoing a more thorough filtration process. Grey water is collected from green roof runoff, sinks, baths, showers, washing machines, and dishwashers and is used for washing machines, dryers, and dishwashers. Since it will not be consumed by people, grey water is only filtered with the Grey Flow PS Plug-N-Pay filter. This filter was selected due to its self-cleaning, low maintenance, and ease of installation. Clean water is collected from rainwater and undergoes a thorough filtration process of first flush filtration, pre-tank filtration, in-tank filtration, activated carbon, sediment filtration, and UV sterilization before reaching sinks, baths, and showers. Solid waste is collected from toilet sewage and compost. Sewage is used as fertilizer for nonedible plants and compost is used as fertilizer for edible plants.

This building reduces its environmental footprint by using low-impact materials. Hempcrete reduces the use of fertilizer, weed killer, pesticide, or fungicide as none of these are required in the cultivation of hemp. Recycling timber is the most environmentally friendly form of timber production, and is thus used as the building's structural support, as well as furniture. The crops on the green roof are rotated to maintain soil and plant quality. At all times, one of the plots is not used and allowed to rest until the next planting season. The building's interior is painted with non-toxic and VOC-free milk paint, reducing volatile organic compounds (VOC) emissions.

Finally, the building promotes the wellbeing of people. The green roof supplies fresh shallow-rooted edibles, like lettuce, peppers, and radishes, as well as access to the natural environment, known for being beneficial to both mental and physical health. The many skylights and windows increase the light inside the building, further adding beauty and improving quality of life. In addition, florist' chrysanthemums reduce toxins, such as benzene, formaldehyde, trichloroethylene, and ammonia, on top of adding beauty. Thus, this apartment building is self-sustainable and energy efficient, and ensures that nothing is truly wasted while having minimal impact on its environment and improving the wellbeing of its residents.