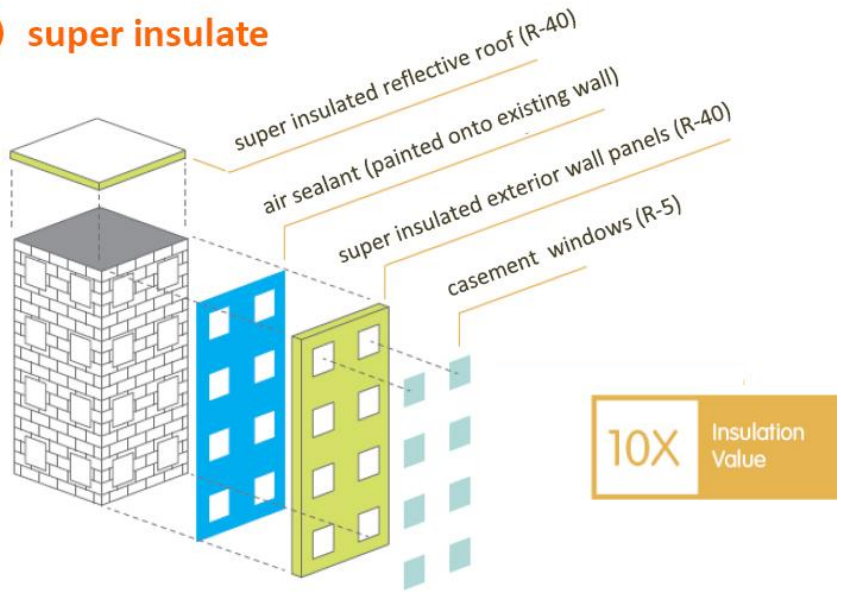
Deep Energy Retrofit Steps

Castle Square Deep Energy Retrofit is expected to reduce total building energy consumption by 73%, drastically decreasing the building's carbon footprint. Here's how:

1 super insulate



The key difference between a Deep Energy Retrofit & standard energy efficiency renovations is insulation, which at Castle Square will be located on the outside of the building.

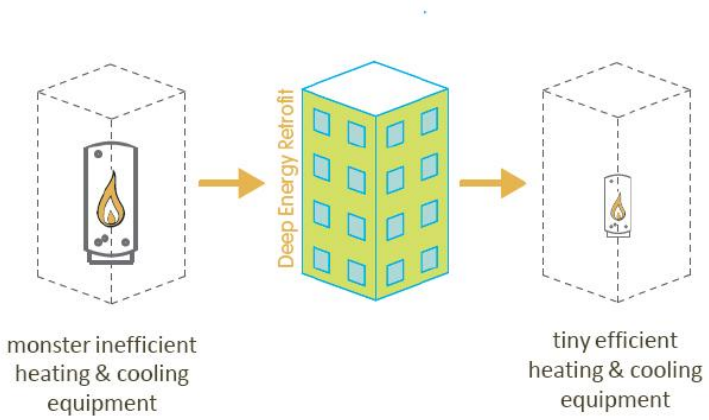
A new super insulated shell (which visually transforms the dated property), combined with a super insulated reflective roof, high efficiency windows & extensive air sealing, will increase the insulation value of the building by a factor of ten.

2 air seal

Without air sealing to stop leaks, insulation doesn't work very well. Air sealing is as simple as caulking cracks & holes to the outdoors & between apartments. Not air sealing is like only wearing a sweater (insulation) outdoors on a cold day. You're cold until you put on a wind breaker (air sealing). Air sealing makes the super insulated shell work. It also limits the stack effect, reduces pests & improves indoor air.

The super insulated shell & air sealing is expected to drop heating by 61% & cooling by 68%

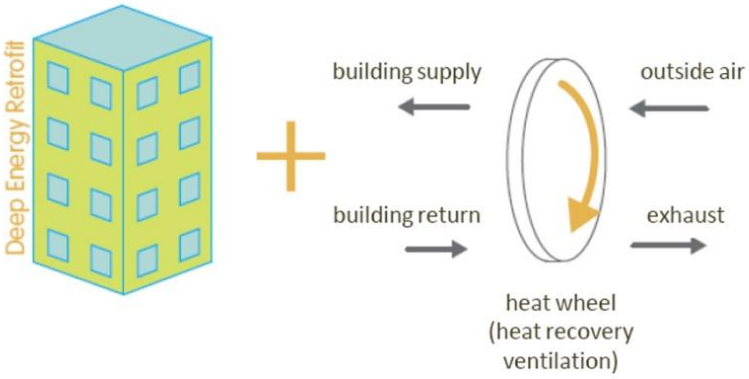
3 scale down heating & cooling equipment



In typical leaky & poorly insulated buildings, big inefficient heating & cooling equipment generally compensates to make residents more comfortable. In contrast, a super insulated & air sealed building requires only a fraction of the energy to heat & cool.

The high efficiency heating equipment drops the building's heating needs by another 10%. Insulating the pipes & high efficiency boilers with indirect hot water heaters drop hot water energy usage by 41%.

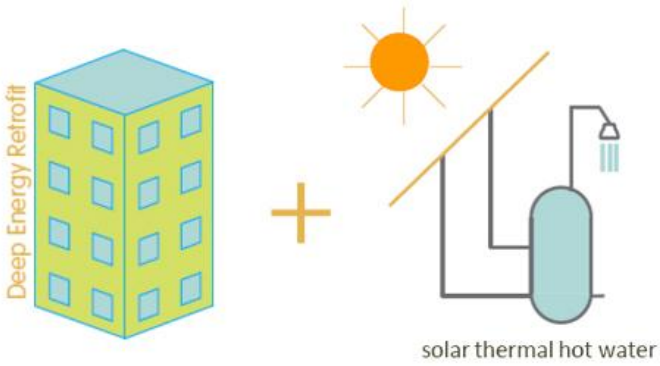
4 improve indoor air quality



For deeper savings, heat recovery ventilation (HRV) pre-heats or pre-cools incoming fresh air with ventilation air leaving the building (without cross contaminating it). At Castle Square, we were not able to use HRV due to layout constraints & cost issues. Instead, we're using fresh air trickle vents & renovating the existing ventilation system with Aeroseal & CAR dampers

Indoor air quality is anticipated to increase substantially at Castle Square. Heating & cooling needs are also expected to decrease by 3%.

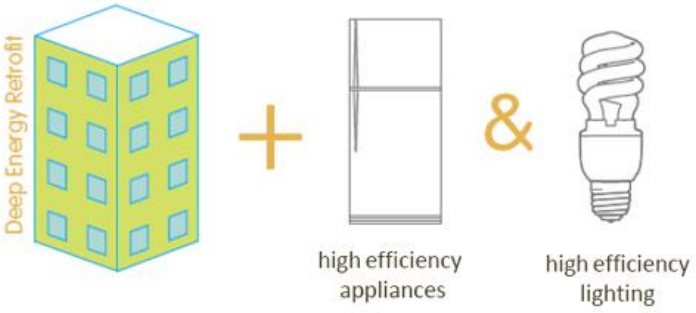
5 harness the sun



Solar thermal for hot water can reduce a building's energy usage still further.

At Castle Square, hot water energy use is expected to drop by 37% due to the solar hot water system.

6 reduce plug load



Using Energy Star appliances & also fluorescent & LED lighting fixtures can further decrease an existing building's energy usage.

At Castle Square, energy used by refrigerators & lighting is expected to be reduced by 53%.