

## Seabrook Resilient House



We researched the impacts of sea level rise on the town of Seabrook, New Hampshire. We decided to design a house right by Seabrook Beach on Tyngsboro Street. This location is vulnerable at around 4 ft of sea level rise and 1.7 ft of sea level rise plus storm surge. There are also four seasons in this location, with hot summers and cold winters. We took these factors into account, and prioritized flood resistance, temperature control, energy efficiency, and green space in our design.

The most defining characteristic of our house is that it is elevated 10 ft by stilts. This elevation not only protects the house from flooding, but also creates space to park cars, meaning a garage is not necessary. The stairs leading up to our house will also be perpendicular to the ocean as well as the marsh, which prevents flood waters and high tides from crashing against the stairs. Another key feature of our house is our permeable driveway and rain garden. This not only decreases the amount of stormwater runoff, but also diverts it into a functional rain garden to be taken up by plants.

A third feature of our house, the rooftop garden, has a similar function. It captures and harnesses rain water and decreases stormwater runoff while also taking in carbon dioxide. Not only that, but the rooftop garden as well as the permeable driveway decrease the overall heat surrounding the building.

A fourth feature of our house is that it harnesses aspects of passive solar heating to control the temperature within the house and maintain energy efficiency. Our house has large windows on all four sides, particularly the back, which is the south facing side. The floor to ceiling windows on the south facing side will take in plenty of sunlight in the winter when the sun is in the southern sky. The windows will be triple-paned to maintain the strong building envelope of the house that traps temperatures inside and keeps them from escaping. There will also be an overhang over these windows so when the sun is high in the sky in the summer, there won't be excess sunlight heating up the house. Of course, our house will have energy efficient HVAC systems to help maintain a comfortable temperature inside, but these features will make sure that energy isn't wasted by these systems.

A fifth feature of our house is the exterior will be constructed from cross-laminated timber. This has less of a carbon footprint than steel and concrete, but also has carbon sequestered in the wood. It also will contribute to the aesthetic of our home, the wood paneling looking very pleasing on the outside.