

Raising Hope While Lowering Costs

Queens County, New York

LONG ISLAND CITY, NY – Tom Paino is an architect with a New York City agency. He is also the owner of two side-by-side brownstones in the Queens neighborhood of Long Island City. Built in 1903, the three-story brownstones are located two blocks from the East River in the middle of a densely populated residential neighborhood.

Paino has lived in one of the brownstones since purchasing it in 1995. The other unit was purchased in 2010 and has remained unoccupied, as the previous tenants left the unit in extremely poor condition. To make the unit livable, Paino knew it would require a significant refurbishment. Approximately five years ago, however, the flood hazard maps for the area were revised by the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP) and Paino's neighborhood was then determined to be located within the regulatory floodplain. With the revision of the maps, the lowest floor of the brownstone sat two feet below the Base Flood Elevation (BFE), which is determined to be the calculated height to which potential floodwaters could rise.

"When we originally filed the plans to do the renovation, the building department told us that because the lowest level was below the BFE, we wouldn't be able to use that level for anything but parking or storage," said Paino. "So, our first thought of how to deal with the floodplain issue was to sell the brownstone. As we thought more about it, though, we knew that we loved the neighborhood and wanted to find a way to adapt to the situation so we wouldn't have to leave."

NFIP regulations require that when a structure in the floodplain is either damaged or renovated with a cost of 50 percent or more of its fair market value, that structure must be brought into compliance with local floodplain management ordinances. This meant that because of the new mapping, to undergo any substantial renovation, Paino would have to cease using the lowest floor for anything other than parking or storage, or find a way to elevate the structure. Though Paino's current residence also sat below the BFE, it would not require the same improvements to that unit because it was not damaged and was not in need of renovation.

Paino brought his problem to a structural engineer, who quickly identified a potential solution. As the brownstone in need of renovation was a middle unit, it would be impossible to elevate the entire existing structure. The brownstones were designed incorporating a party wall system, which meant that the walls on either side of the brownstone supported the structure of the units equally, and according to the law, are equally owned by the respective tenants. Though Paino owned the brownstone on one side of the unit to be renovated, the other brownstone was owned by a neighbor who was worried that the renovation would negatively impact their unit.

"The structural engineer came to look at the brownstones, and saw we had the party walls," said Paino. "He told us it was no problem. We could use the same walls to maintain the structure, and just remove the joists and raise the floors to a higher level (without damaging the neighbor's property)."

It quickly became obvious that the work the brownstone would require entailed much more than a mere renovation. Despite utilizing the still-standing walls, raising the floors would essentially constitute new construction, which meant acquiring a whole series of permits from the various New York City offices involved in development. To facilitate the redesign of the brownstone, Paino not only

hired the structural engineer, but also an energy efficiency expert, another architect, and a general contractor who specializes in “green”, or ecologically conscious, construction.

They decided to raise the floors of the brownstone approximately three feet. This allowed them to get the lowest floor one foot above the required elevation level, giving them some extra room in the case of future flooding. The high ceilings allowed them to raise the floors without significantly altering the original design of the brownstone. When removing the original wooden joists, Paino chose to replace them with steel joists to offer greater strength. Though a practical decision, it was not without its difficulties.

“When you see lumber from 1903, in perfect condition, and you have to take it out, that hurts,” said Paino. “It was just beautiful wood. We were able to recycle it, however. There’s a man who makes furniture out of it around the corner from us, so we did manage to preserve it all, thankfully.”

In addition to the structural work of raising the floors above the BFE, Paino decided to incorporate a series of environmentally conscious features into the brownstone. Utilizing a technique called Passive House building, the design process is intended to reduce a structure’s ecological footprint. The Passive House model originated in Germany, spreading throughout Europe, and is now gaining attention in America. Passive techniques involve the installation of cost-saving materials such as super-insulation, triple paned windows with high IR/UV ratings, solar technologies, and lighting fixtures. Combined, the elements utilized in Passive House design can provide a substantial reduction in overall energy use and costs.

“The system insulates the house so well, you don’t even need to put a furnace in,” said Paino. “Whatever heat gets generated, whether from sunlight coming into the house, or activity within the house, the air constantly circulates from room to room, maintaining an even temperature. With the current party walls, there was no insulation, but with the Passive House there’s an entire envelope of it, running from under the floor, through the walls, and up through the roof.”

With the installation of solar panels to provide hot water, Passive House building also eliminates the need for a water heater. While the other units in the row of brownstones depend on gas for their heating and cooking, there will be no gas line to Paino’s unit. Everything will be powered through electricity. It is estimated that with a properly constructed and functioning Passive House system, energy use can be reduced by as much as 75 percent.

To complete the brownstone’s eco-friendly design, they are installing a greenhouse on the roof to grow vegetables, in the spirit of reducing the environmental impact associated with growing and transporting such produce. They are also seeding the rooftop with sedums, a type of garden plant with water-storing leaves. The presence of the sedums adds to the overall insulation from the roof and reduces water runoff during rain events.

When Hurricane Sandy made landfall in New York City in October 2012, it was as a Category One storm. The powerful hurricane caused numerous fatalities and injuries, destroyed hundreds of buildings, and did an incredible amount of damage to the city and its boroughs. Estimated financial losses attributed to Sandy are in the \$60 billion range, and climbing.

While neither of Paino’s brownstone units was impacted by Sandy, the possibility was certainly there. Only a block away, several buildings, including the New York Blood Center, were significantly

damaged by the storm, losing walls and taking in as much as three feet of water. Had Sandy struck the city as a Category Two storm or higher, the possibility of water threatening Paino's property would have been much more likely.

Michael Miceli, the contractor overseeing the brownstone reconstruction, is seeing more and more building of this nature. While he has been involved in the construction of Passive House homes prior to Paino's, he has never seen one incorporating all the features Paino is using. Nor has he seen the structural elevation of the floor joists performed in a brownstone unit before.

"It makes perfect sense, especially in light of Hurricane Sandy," said Miceli. "A lot of people who got flooded have been put in a situation where they're either going to have to knock their home down and raise it up, or they can renovate, but in the long run, risk the same thing happening with the next big storm. It makes sense to make this an industry norm, because if they're going to spend the investment to do a gut renovation, they're going to be doing this work regardless."

Miceli's business has been notably augmented by the public's growing interest in "green" building. As the idea of environmentally sound construction techniques continues to gain attention, Miceli has begun to incorporate more and more aspects of this style of building into his operation.

"Green construction went from being zero part of my business three years ago to being over 50 percent of my business now," said Miceli. "People are asking questions about where things are coming from and what they are made of more than ever before. When I present these options to people, their interest is piqued right from the start."

While the costs associated with Paino's brownstone refurbishment are considerable, it is because they chose to incorporate so many different elements into the project. Miceli maintains that every aspect of Paino's design can be found at local building supply retailers, and that even adding only a few of these measures into a remodeling or new construction can have a significant impact on long-term costs.