

Final Project Report: IPRO 339/Shipping Container Housing

Abstract

Overview:

Chicago's southside neighborhood is suffering from gentrification and high property taxes, forcing the original residents out of the area. This IPRO addresses this issue by bringing affordable, sustainable housing made from shipping containers to those affected regions, allowing the current residents an opportunity to stay in their respective neighborhoods. The idea of the IPRO is to design temporary housing for the 2016 Summer Olympics and then transport those same containers into the southside for permanent housing units.

Approach:

The IPRO semester was divided into two parts: design of permanent housing for the southside of Chicago and design of temporary Olympic housing. The Olympic and Paralympics housing was designed to take advantage of Chicago's natural wind patterns to reduce the use of electricity for air conditioning and to optimize the use of natural light.

Background

- A. The target market for the project includes the southside of Chicago and 2016 Olympic temporary housing for athletes.
- B. This IPRO is addressing many issues. One main issue is the lack of affordable housing in the southside community. Also we faced the problem of permanent housing that the city is proposing for the 2016 Olympics. We proposed a temporary housing solution instead that can later be transported into the more needed neighborhoods of Chicago. We also faced many challenges when it came to designing the housing to meet both Chicago Building Code and the International Olympic Committee requirements
- C. This particular IPRO has been ongoing for 6 semesters now and we face many of the same issues in terms of building technology with shipping containers. A great deal of research into building with shipping containers has happened each semester and many technical problems are encountered each semester. Most of those deal with how to tackle the mechanical, plumbing, and electrical systems.

Objectives

I PRO 339 Objectives:

1. Design housing for the athletes of the 2016 Summer Olympics and Paralympics
 - Minimize the carbon footprint of the Olympic and Paralympics housing project by using existing shipping containers located at storage sites in the city
 - Design the Olympic and Paralympics housing to be environmentally sensitive
2. Transform the Olympic housing into permanent affordable housing
 - At the completion of the Olympics and Paralympics, transport the housing containers to various sites in Chicago to be used as the structural support for the building of affordable townhome
 - Incorporate equipment such as the electrical and plumbing equipment used in the Olympic and Paralympics housing into the affordable townhome project

Methodology

We kept the same groups as proposed in the Project Plan. The I PRO was divided in two parts during the semester. In the first part we tackled the permanent housing solution. During the last part of the semester we designed for the Olympic housing. We split up into two large groups and came up with two different designs. Some parts of each design were considered for the final solution proposed.

Obstacles:

The main obstacle that we encountered as a group was communication. We were a rather large I PRO group of 20. With many different sub groups and then those groups being broken up furthered it proved difficult to divide work and to promptly get all needed information.

We also ran into a problem of too many people being on the project with conflicting design ideas and after the midterm it seemed as though the groups and the progress was digressing and by the time of the final report the group seemed to be less and less informed and very few people were able to talk about the project during I PRO day.

Recommendations

This housing solution can be used to solve many other world problems. For instance, a natural disaster housing solution can be used at home and abroad. It is very possible that not all of the Olympic units are kept in the city because we do not believe there is a need for 12,000 units in the city, but the units can be sold and shipped anywhere around the world and the money used to benefit the community just as the units themselves would.

References

PEMEX website: www.pemex.com

- Solargenix Chicago: www.solargenixchicago.com
- Honda MCHP: <http://www.hondanews.com/categories/1052>
- Climate Energy Freewatt system:
<http://www.freewatt.com/Products/wasystem.asp>
- Equest: www.doe2.com/equest/
- Ground Source Heat Pumps:
- Internation Ground Source Heat Pump association:
<http://www.igshpa.okstate.edu/>
- Dept of Energy:
http://apps1.eere.energy.gov/consumer/your_home/space_heating_cooling/index.cfm/mytopic=12640

http://www.energystar.gov/index.cfm?c=geo_heat.pr_geo_heat_pumps
- Toolbase: <http://www.toolbase.org/Technology-Inventory/HVAC/geothermal-heat-pumps>
- Popular Mechanicals:
http://www.popularmechanics.com/how_to_central/home_clinic/1274631.html
 - Solar Hot water:
 - Dept of Energy:
http://apps1.eere.energy.gov/consumer/your_home/water_heating/index.cfm/mytopic=12850
- Solargenix: <http://www.solargenixchicago.com/solarthermalproducts.cfm>
- LEED Certification
USGBC usgbc.org

Resources

Team Member	Total Time Spent (Hr)
Ana Untiveros	56
Dung Luu	46

Krzysztof Olszowy	47.5
Ludmila Georgieva	31.5
Yu Cheung	48
Haim Eliyahu	58.5
Christopher Spedale	48

Rosa Villalpando	39.8
Marc Couillais	46
Joe Peroni	35.5
Veronika Bocanova	61.2
Daniel Fanelli	20.5
Micheal Kerrigan	24
Justin Miller	80
Daniel Rankin	39.5

Steven Siwek	32.6
David Snyder	50.5
Aneta Ustupska	32.5
Jennifer Iversen	51
Mladen Prusic	44.5

Total: 893.1 Hr

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