

IPRO 339 INNOVATIVE CONTAINER DESIGN

FALL 2009



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THE HISTORY OF SHIPPING CONTAINERS

1900 Closed boxes used to transport goods between road and rail

1954 American Malcolm McLean, invented standardized shipping containers

1970 Present-day dimensions were set

2008 16-22 million containers in circulation

1 million new units introduced yearly

700,000 units being retired yearly





PRECEDENT





OPPORTUNITY

CSI NO.	ITEM DESCRIPTION	BASE BID COST	DIVISION TOTAL	DIVISION PERCENT
1000	General Requirements	\$3.13	\$4,000.00	5.42%
2000	Sitework	\$2.34	\$3,000.00	4.08%
3000	Concrete	\$7.81	\$10,000.00	13.55%
4000	Masonry	\$6.56	\$7,104.00	9.62%
5000	Metals	\$0.79	\$1,000.00	1.35%
6000	Woods and Plastics	\$7.02	\$8,987.82	12.18%
7000	Weather Protection	\$1.76	\$2,258.00	3.05%
8000	Doors and Windows	\$1.26	\$1,612.00	2.18%
9000	Finishes	\$4.46	\$5,705.97	7.73%
10000	Specialties and Furniture	\$4.93	\$6,315.00	8.56%
13000	Special Construction	\$6.08	\$6,500.00	8.81%
14000	Conveying Systems	\$0.00	\$0.00	0.00%
15000	Mechanical	\$8.92	\$11,413.50	15.46%
16000	Electrical	\$4.62	\$5,916.70	8.02%
Subtotal			\$73,812.99	

SI NO.	ITEM DESCRIPTION	BASE BID	DIVISION TOTAL	DIVISION PERCENT
1000	General Requirements	\$6.25	\$4,000.00	10.22%
2000	Sitework	\$4.69	\$3,000.00	7.66%
3000	Concrete	\$12.50	\$8,000.00	20.44%
4000	Masonry	\$0.00	\$0.00	0.00%
5000	Metals	\$1.56	\$1,000.00	2.55%
6000	Woods and Plastics	\$1.17	\$750.00	1.92%
7000	Weather Protection	\$1.34	\$859.00	2.19%
8000	Doors and Windows	\$1.14	\$728.00	1.86%
9000	Finishes	\$5.24	\$3,356.00	8.57%
0000	Specialties and Furniture	\$1.18	\$756.94	1.93%
3000	Special Construction	\$8.59	\$5,500.00	14.05%
4000	Conveying Systems	\$0.00	\$0.00	0.00%
5000	Mechanical	\$11.34	\$7,260.00	18.55%
6000	Electrical	\$6.15	\$3,935.00	10.05%
Subtotal			\$39,144.94	
Gross Square Foot (Per 2 Bedroom Unit)		640		
Total Cost of 2 Bdrm Units (400 Total Units)			\$15,657,976.00	

\$77.85 per sq Container Construction

vs

\$200 per sq ft Conventional Construction

General Contractor OH&P		\$11,071.95	15%
Contingency		\$7,381.30	10%
Architect		\$7,381.30	10%
Conventional Total Estimated Construction Cost		\$99,647.53	
Total Cost per Sq Ft (1,280 Avg SF)		\$77.85	

SI NO.	ITEM DESCRIPTION	BASE BID	DIVISION TOTAL	DIVISION PERCENT
1000	General Requirements	\$6.25	\$4,000.00	10.07%
2000	Sitework	\$4.69	\$3,000.00	7.56%
3000	Concrete	\$12.50	\$8,000.00	20.15%
4000	Masonry	\$0.00	\$0.00	0.00%
5000	Metals	\$1.56	\$1,000.00	2.52%
6000	Woods and Plastics	\$1.17	\$750.00	1.89%
7000	Weather Protection	\$1.34	\$858.50	2.16%
8000	Doors and Windows	\$1.14	\$728.00	1.83%
9000	Finishes	\$5.24	\$3,355.97	8.45%
0000	Specialties and Furniture	\$1.18	\$756.94	3.31%
3000	Special Construction	\$8.59	\$5,500.00	13.85%
4000	Conveying Systems	\$0.00	\$0.00	0.00%
5000	Mechanical	\$11.34	\$7,259.55	22.62%
6000	Electrical	\$6.15	\$3,934.70	9.91%
Subtotal			\$39,702.94	
Gross Square Foot (Per 4 Bedroom Unit)		640		
Total Cost of 4 Bedroom Units (4050 Total Units)			\$160,796,907.00	

Project	Cost/SF
IPRO 339 - Olympic Housing Proposal	\$65.36
Hotel, 4-7 stories in Chicago - (2009 RS Means)	\$180.89
Hotel, 8 - 24 stories in Chicago - (2009 RS Means)	\$194.54
Motel, 2-3 stories in Chicago - (2009 RS Means)	\$179.40
Apartment Bldg., 4-7 Stories in Chicago - (2009 Rs Means)	\$183.21
IPRO 339 - Permanent Housing Proposal	\$77.85
New Residential, XXX Material in Chicago - (2009 Rs Means)	XXXX
New Residential, XXX Material in Chicago - (2009 Rs Means)	XXXX
New Residential, XXX Material in Chicago - (2009 Rs Means)	XXXX

Total Olympic Construction Cost	
Liflavors	\$9,702,000.00
Total Cost of 2 Bedroom Units	\$15,657,976.00
Total Cost of 4 Bedroom Units	\$160,796,907.00
Total Project Cost	\$186,156,883.00
General Contractor OH&P	\$27,923,532.45
Contingency	\$18,615,688.30
Architect	\$18,615,688.30
Conventional Total Estimated Construction Cost	\$251,311,792.05
Total Cost per Sq Ft	\$65.36



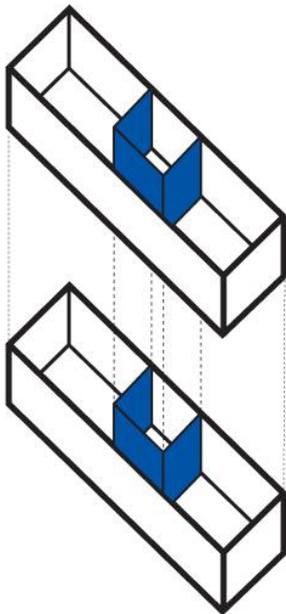
SUSTAINABILITY

- Re-use of existing material
- Modular construction
- Utilizing low-cost energy-efficient lighting and plumbing fixtures

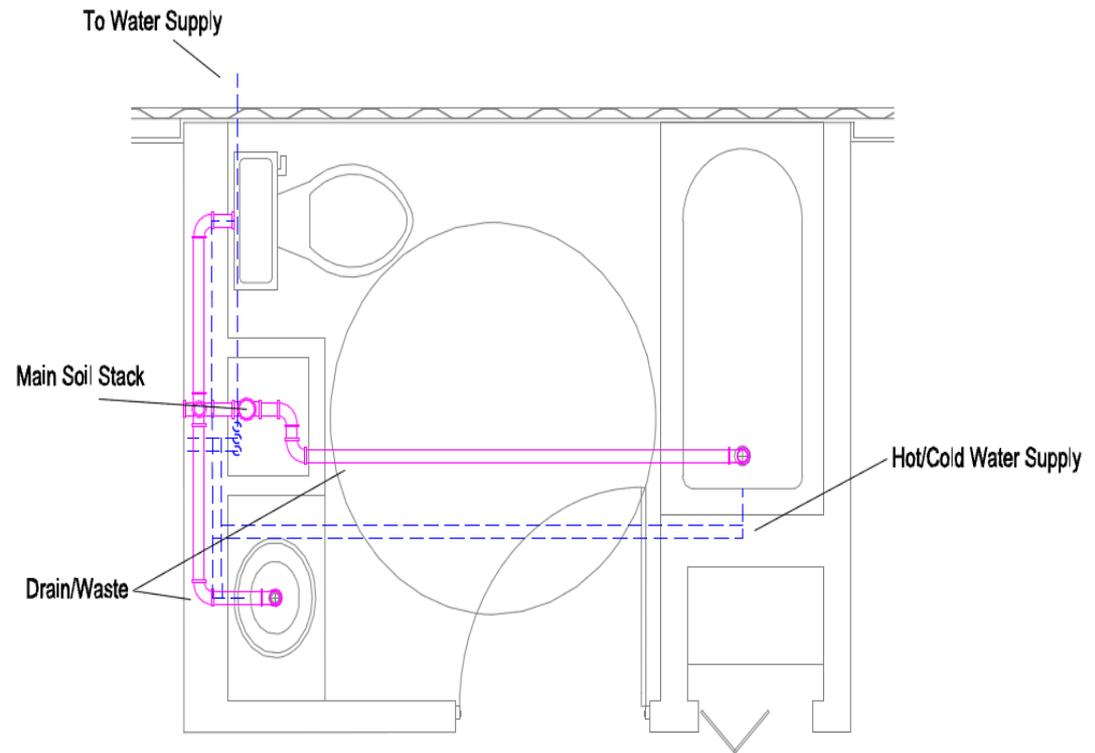


MODULARITY

Ease of assembly



STACKING CONTAINERS /
STACKING PLUMBING



PLUMBING QUICK-CONNECT
DRAWING



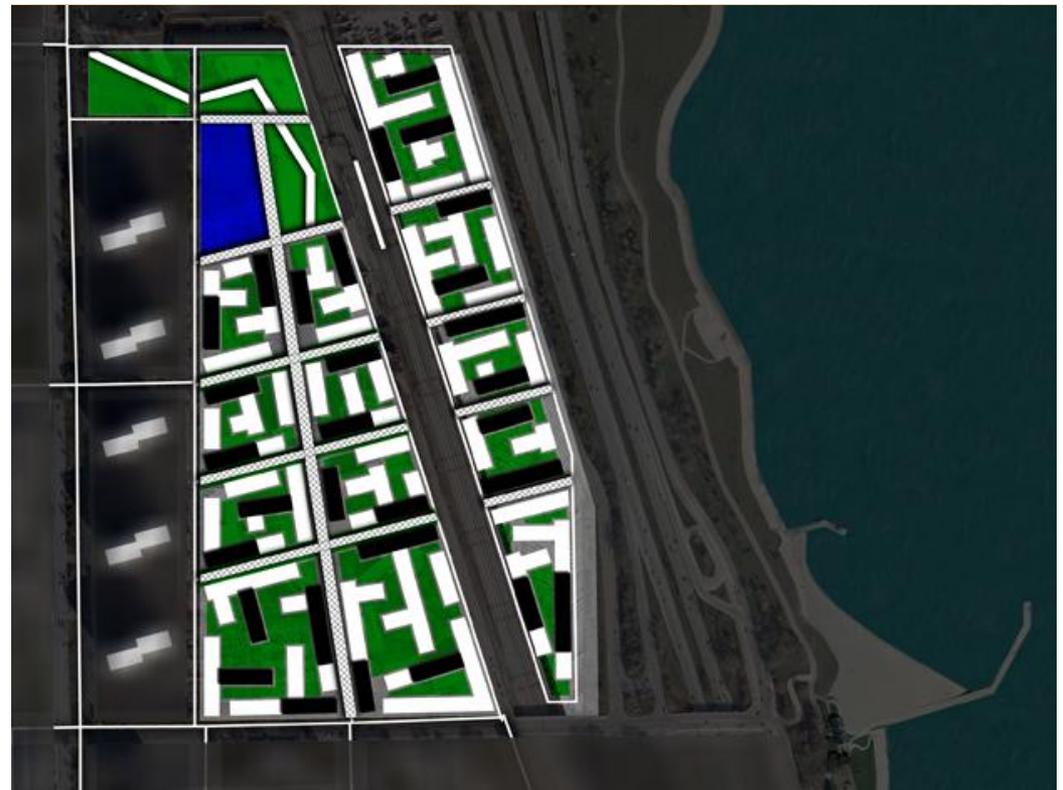
DESIGN & PROJECT DEVELOPMENT

- OLYMPIC VILLAGE
- IIT GRADUATE STUDENT HOUSING
- AFFORDABLE HOUSING



OLYMPIC VILLAGE

- Urban Design
- Landscape
- Graphics
- Budget

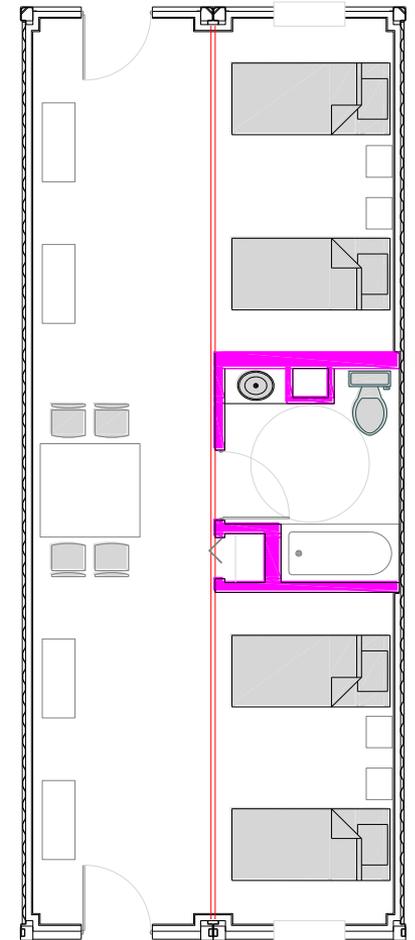




OLYMPIC VILLAGE DESIGN: HOUSING UNIT



OLYMPIC HOUSING FLOOR PLAN



APARTMENT UNIT



OLYMPIC VILLAGE DESIGN



Floor Plan



Section



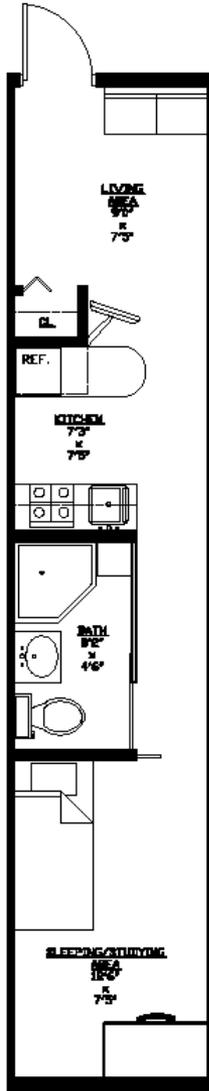
Olympic Village Exterior Rendering



Interior Rendering



GRADUATE STUDENT HOUSING: HOUSING UNIT



IIT GRADUATE HOUSING MODULE

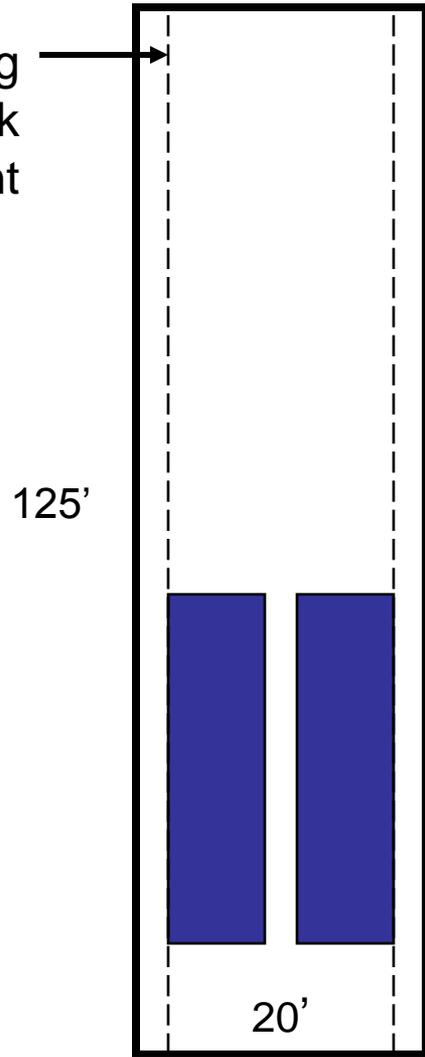


Keetwonen Student Housing, Amsterdam, The Netherlands



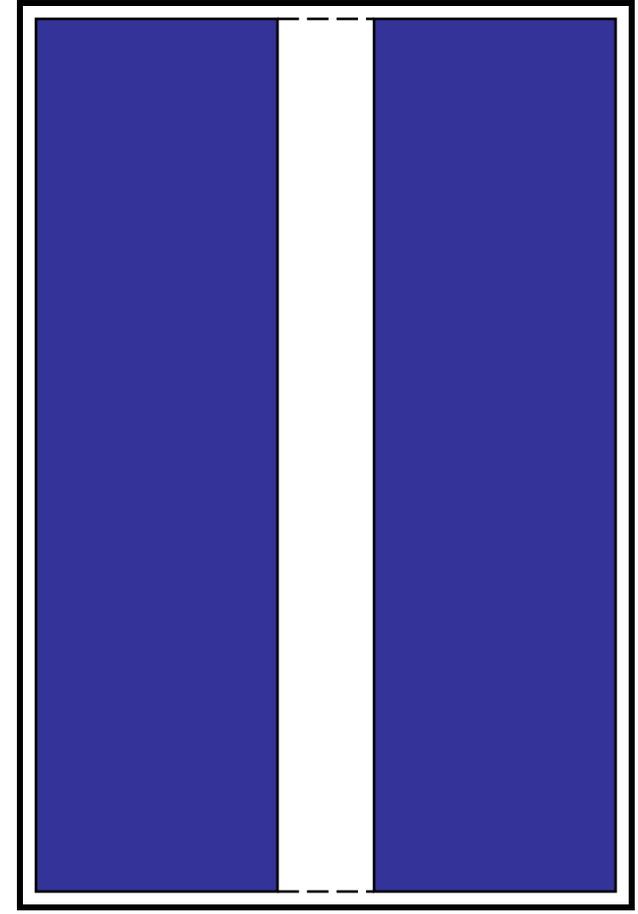
AFFORDABLE HOUSING: SHIPPING CONTAINER LAYOUT

Chicago Zoning
Setback
Requirement



25'
STANDARD CHICAGO LOT

40'



8' 3' 8'

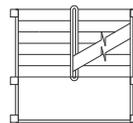
20'



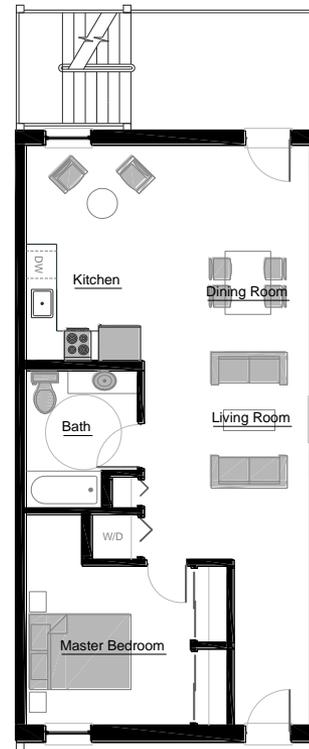
CONTAINER HOUSING: MULTI-FAMILY



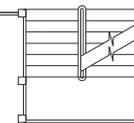
Porch



Two Bedroom



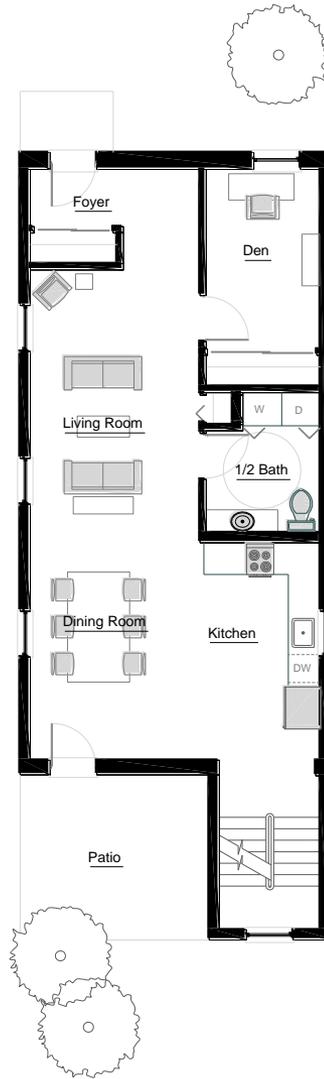
Porch



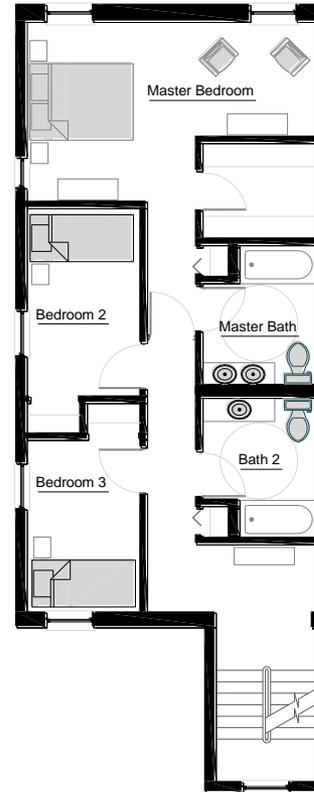
One Bedroom



CONTAINER HOUSING: SINGLE FAMILY



First Level



Second Level



CONTAINER HOUSING: SINGLE FAMILY



Exterior Rendering



First Level



Second Level: Master Bedroom

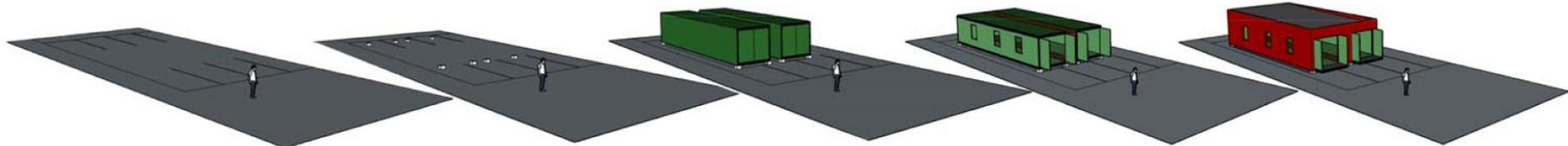
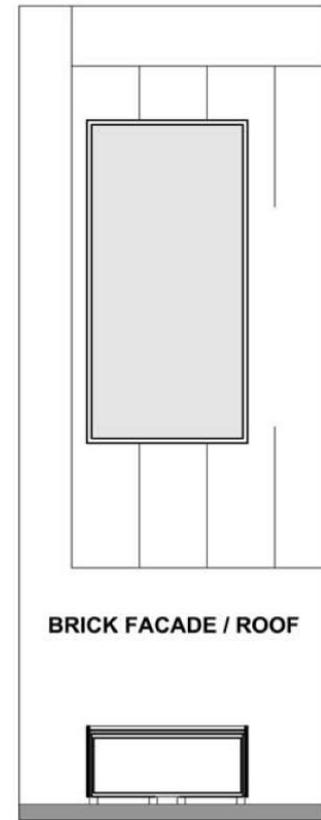
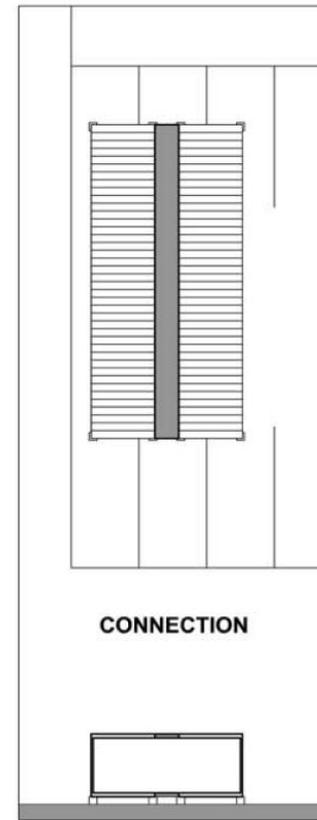
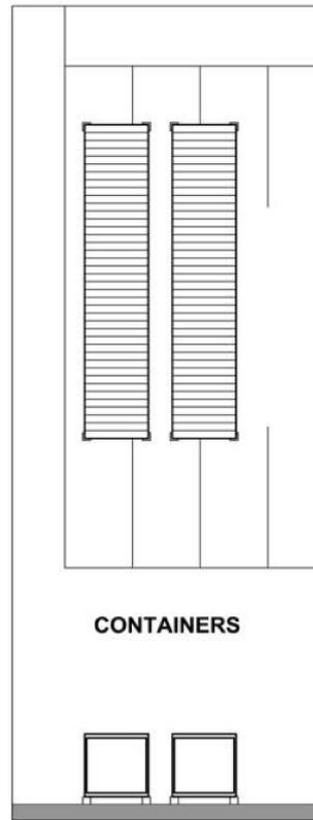
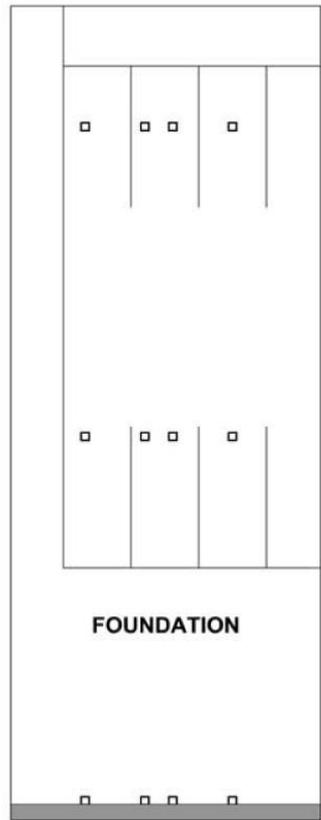
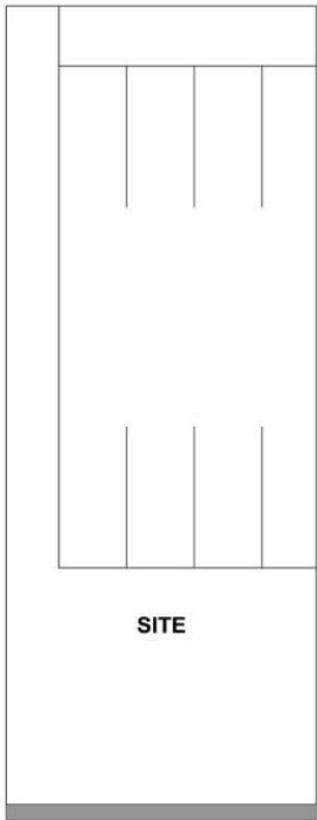


FULL SCALE MODEL

- PLANNING PROCESS
- CHALLENGES
- PROGRESS TO DATE



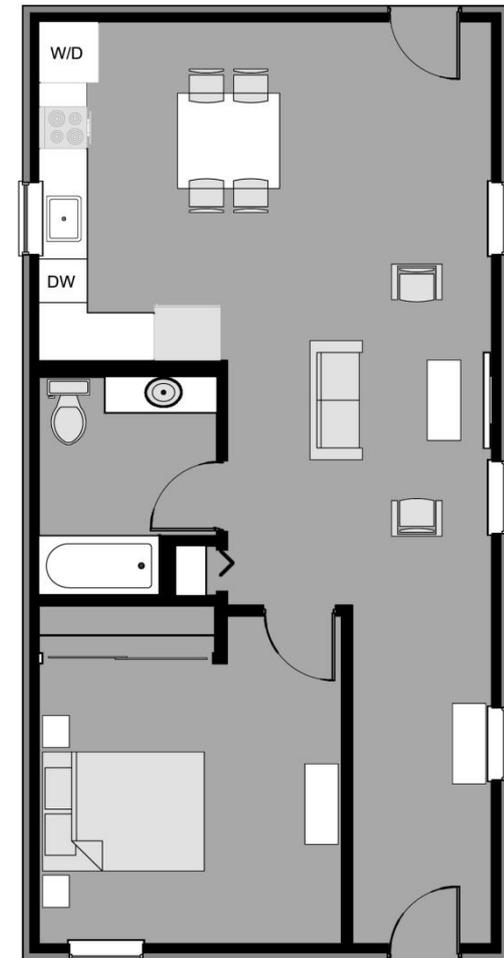
PROCESS: FULL SCALE MODEL





PROGRESS: FULL SCALE MODEL

- Progress
 - Foundations
 - Containers/Donations
 - Interest/Enthusiasm





MAJOR OBSTACLES & RESOLUTIONS

- We did not get the 2016 Olympic bid- project restarted in October
- Finding containers for the full scale model
- Communication between groups and donors
- Acquisition of materials





- Rebranded logo and slogan
- Published articles to raise awareness
- Cultivated involvement within the IIT community
- Website (<http://www.iit.edu/~ipro339f09/>)
- Created Facebook page to keep supporters updated
- Sought out and brought in donations



Olympic Village 2016



43 fans to date!



“Redefining Chicago Housing”



IPRO 339 - Innovative Container Design

- Home
- About
- Housing
- Models
- Gallery
- Developer
- Contact

- Us
- Our Goal
- Press
- IPRO
- Related Links

About

Why shipping containers? Since the United States is an importing rather than exporting country, there is a big overstock of shipping containers. So the problem is that these large solid steel boxes are cluttering up shipping yards, and it makes no economical sense to ship them back empty. The price of making new containers is cheaper than the fuel cost.

So what can we do about these roughly 700,000 abandoned containers? Make them habitable. These containers are made out of solid, marine-grade steel, and are well-suited to withstand harsh environments. It would be a perfect housing material; better yet - it comes in almost the right shape already.

Their thick steel walls are good for insulation. The sturdy body can support a lot of weight. The rectangular shape allows for superb versatility in design. And most importantly, using these containers as the frame significantly reduces the cost of construction.





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- Home
- About
- Housing**
- Models
- Gallery
- Developer
- Contact

- Floor Plans**
- Amenities**
- IIT Housing**
- Community**
- Lifestyles**
- Location**

Housing

Housing

Buying a home is exciting; especially one that's affordable, so that brand new big-screen TV you've dreamed about can be a reality. By saving on the real estate cost, you now have the budget to plan where to put that piano, talk to the car dealer about that nice ride, or reserve your rare wine collection.

See, a container house can really bring some happiness to you and your family. A nice, warm and cozy place of your own, along with all the other dreams you've had, can come true without the heavy financial pressure. That's what we call "home

Plus, your new home would be extra sturdy against the dynamic weather, more environmentally friendly (since it's made from a reused resource), and cutting-edge!

Start exploring your new home now. Check out some of the great features offered using the navigation panel on the left.





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Interior
Full Scale Model





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Home About Housing Models **Gallery** Developer Contact

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Model Progress

Photo Gallery





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- Home
- About
- Housing
- Models
- Gallery
- Developer**
- Contact

- Contact Us**
- Wish List

Dear developers and helpers,

We are always looking for some help from the professional community, be it an idea, a donation, or a connection. As a matter of fact, we have a list of things that we need to start up our model; if you can donate or provide a source for donations, we will greatly appreciate your assistance.

Please use the [contact us](#) link on the left to send us a message. We thank you in advance.

I PRO Team 339

Please take a look at our [Brochure](#) and [Donation letter](#)





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Contact

We are always happy to hear what you have to say. If you have any ideas or comments for us, just use the message us button on the left. If you would like to check out what IPRO is all about, click on the IPRO link on the left. If you would like to know more about Illinois Institute of Technology, hit the IIT link on the left.

Check out our facebook page, become a fan.





LOOKING FORWARD

- Experiment with cladding materials
- Complete the full scale model
- Exploring other opportunities with container construction
 - Suburban homes
 - Emergency housing
 - Student Housing





THANK YOU!!!

SUSTAINABIL**II**TY

ARCH**II**TECTURE

OPPORTUN**II**TY

USABIL**II**TY

ABIL**II**TY

CONTAINABIL**II**TY

CREATIV**II**TY

COMMUN**II**TY

MOBIL**II**TY

CHANGEABIL**II**TY

AMB**II**TION

COMM**II**TMENT