14th Shared Growth Seminar

The Urban-Rural Gap and Sustainable Shared Growth

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Potential of Container Housing in the Philippines

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In order to understand the concept of Container Housing in the Philippines, the concept must be broken down to its components, namely:

- ***Container Housing***
- ***Local Context (i.e. Philippine Setting)***

- ***Reasons for recycling used shipping container as a livable space:***
  - *reduce the sources of pollution / eyesore that abound in local ports*
  - *shipping containers are structurally sound especially when provided with a good foundation*
  - *walls, floor, and ceiling are already provided*
  - *may be purchased at a relatively low price*

- ***Shortcomings of shipping container as a livable space:***
  - *material*
  - *cost*

- ***Possible Reasons for Incompatibility with Local Setting***
  - *ventilation issues*
  - *typhoon issues*

Establishment of Parameters for the Study

- **Parameters Studied:**
  - *Engineering Details*
  - *Thermal Comfort*
  - *Alteration Issues*
  - *Tentative Construction Cost*

Establishment of Parameters for the Study

Creation of a Conceptual Container Housing Unit based from Documentary Analysis and Interviews

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Establishment of Parameters for the Study

Creation of a Conceptual Container Housing Unit based from Documentary Analysis and Interviews

Comparison of Conventional MRH with the Conceptual Container Housing Unit

Drawing of Conclusions

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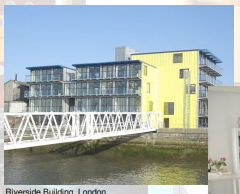
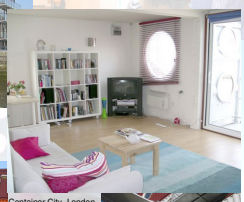


Riverside Building, London



Container City, London

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Student Housing Project, Keetwoven, Amsterdam by Tempo Housing

Container Homes, Amsterdam

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Gloucester Green : Renew Recycle Rejoice by Fox and Fowle Architects

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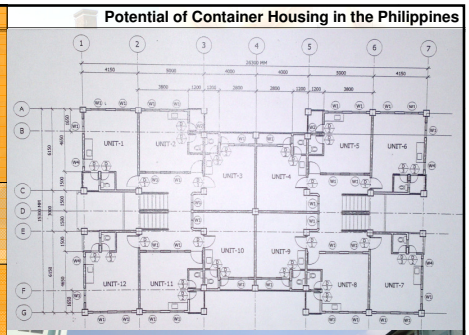

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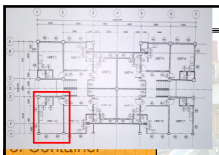

Housing

Conventional MRH in the Philippines

Conceptual Container Housing Unit

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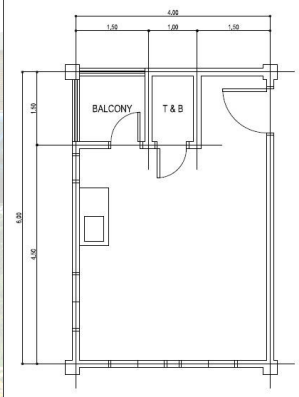

CONVENTIONAL MEDIUM-RISE HOUSING UNIT

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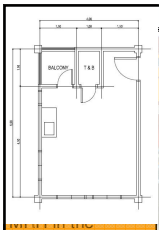
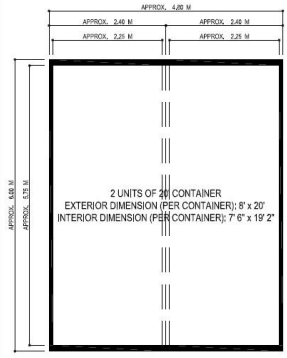


Philippines

Conceptual Container Housing Unit

Comparative Analysis

Conclusions and Recommendations



PROTOTYPE CONTAINER HOUSING UNIT

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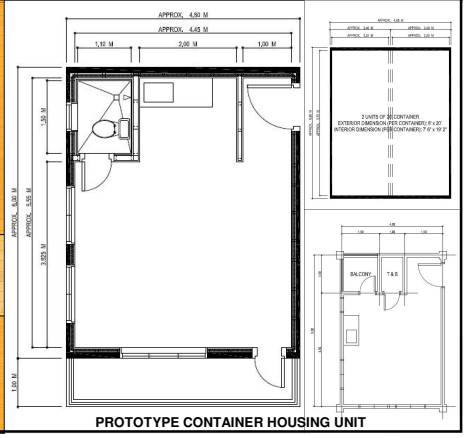

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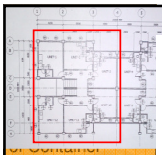

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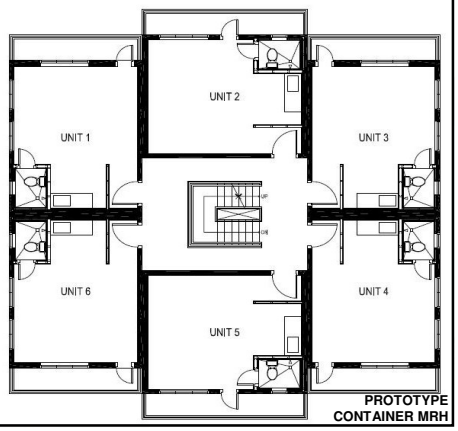

PROTOTYPE CONTAINER MRH

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To better gauge the performance of the conceptual container housing unit in comparison with the conventional MRH unit, a color-coding system is used wherein:

GREEN shall signify that the conceptual unit performs better in that category than that of the conventional unit;

YELLOW shall mean that their performance are relatively equal; and

RED shall mean that the container housing unit has a lower performance or requires additional intervention in order to perform as well as that of the conventional unit.

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CATEGORY: ENGINEERING DETAILS	CONVENTIONAL MEDIUM-RISE HOUSING UNIT	CONTAINER HOUSING UNIT
Structural Components	• requires sound structural design	• requires good footing • needs to keep the posts and beams of the container intact
Floor Levels	• 5 stories high	• may be stacked up to 8 or 9 livable stories • usually stacked 4 or 5 stories high
Incorporation of Utilities	• pipelines are concealed beneath floor and wall finishes	• pipelines are either concealed by double walls or segregated to the exterior
Response to Natural Disasters		• performs well in hurricane and earthquake prone areas • designed for harsh environments or circumstances brought by sea voyage • does not respond well with ground moisture hence the need to be elevated

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CATEGORY: THERMAL COMFORT	CONVENTIONAL MEDIUM-RISE HOUSING UNIT	CONTAINER HOUSING UNIT
Insulation Methods	• no insulation applied	• requires insulation applied on walls • foreign contractors (Tampa Armature Works) sprayed Supertherm Insulative Coating to handle both heating and cooling loads • for local contractors, ODD Cubes Inc. used double walls with fiberglass insulation while the apartment owned by Mr. Alfonso used double walls with foam insulation
Natural Ventilation Issues	• promotes cross-ventilation	• in the case of the apartment of Mr. Alfonso, units on the 2nd floor are usually ventilated naturally. • possible reasons could be the intervention done on the site (i.e.vegetation)

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CATEGORY: ALTERATION ISSUES	CONVENTIONAL MEDIUM-RISE HOUSING UNIT	CONTAINER HOUSING UNIT
		• pre-cutting or initial alteration of units may be done in a factory for a faster, more exact, and cheaper (for mass production) option • if done on site, oxygen-acetylene welding and cutting were done • ODD Cubes Inc., have priced each cut in the shipping container at Php 10,000.00

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CATEGORY: TENTATIVE CONSTRUCTION COST	CONVENTIONAL MEDIUM-RISE HOUSING UNIT	CONTAINER HOUSING UNIT
	• as of May 31, 2004, units are priced at Php 227,000.00 to Php 469,350.00	• ODD Cubes Inc. sells a livable unit at Php360,000 • *For on-site construction:* • Mr. Alfonso bought 20' Class C containers for Php 39,000.00 • therefore, the 2-20' container for the prototype unit would cost **Php 78,000.00** • As priced by ODD Cubes Inc., each fenestration on the unit would cost Php 10,000.00 • therefore the prototype unit with 4 window and 2 doors would cost **Php 60,000.00** • That would leave **Php 89,000-Php 331,350** for all the other alterations (i.e. double walls, utilities, insulation, finishes, etc.)

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Engineering Details	•for a 5-storey building, the 2 housing types exhibit similar characteristics • Container housing units need to be elevated above ground not only for flood reasons but also to keep ground moisture from corroding the material
Thermal Comfort	• while both may be insulated by the same means (i.e. foam insulation), the conventional unit do not actually need this insulation while the container housing unit requires it
Alteration Issues	• the container housing unit have the option to be pre-fabricated for a faster, more exact, and cheaper construction (for mass production)
Tentative Construction Cost	• the container housing unit may be constructed for the same cost as that of the conventional housing unit

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Based on the parameters used, Container Housing is feasible for Low-Cost Housing in the Philippines or at least, it performs as well as a Conventional MRH.

However, it is recommended that further studies be made, particularly in gauging the actual performance of the unit through the construction of a prototype unit.

Also, further studies are needed with regards to how receptive local regulations are to this type of construction as well as to what rules and regulations are needed for this particular type of construction.