CO LIVING
A Spontaneous Community
FACING THE REALITY
Vedado Living Condition

- Smashed windows
- Sagging balcony
- Studs to prevent collapsing
- Unmaintained Paint layers
- Cracking Roof
- Water damage due to flooding
- Studs to prevent collapsing
Vedado Living Condition Transformation

1-2 storey buildings
19th-1930

3-4 storey buildings
WWII

skyscrapers
1959

“slums”
2009

emigration
expropriation

upper class

middle class

down class
Vedado Living Condition Transformation

Before Precise Boundary

After Subdivision

After Informal Expansion
Subdivision & Multifunctional Rooms

12 flats / building

3.2 persons / living room

Living room = kitchen = bedroom
Informal Expansion

Before

Precise Boundary

After

Subdivision

Informal Expansion

additional construction on the roof

conversion of inner courtyards
Increasing shortage of houses

60,000 of 560,000 dwellings were beyond repair and should be demolished.

The average cost of building a house in Cuba is $8,000.
Housing shortage

Unaffordable Housing Market

average price range

average salary of a cuban: 30 cuc/month
However, Shortage of building materials

Low Productivity

电能
燃料
运输

售罄
40分钟
However, Shortage of building materials

Expensive price

0.2 CUC/block

30 CUC/month
3.1 buildings/day in Havana
Collapse in Vedado

20%/308 in study area in very bad condition or really for demolish
Collapse in Vedado

Geographic condition

Blast of salt from the sea

Frequent flooding up to Calle Linea
Bottom-up Recycling Building Materials

abandoned building  materials  stealing  reuse
What Can Be Recycled in Havana?
Main Building Materials

## Table 6. Houses and Apartments Occupied by Permanent Residents by Period of Construction and Predominant Wall Material, a 2002 Census of Cuba

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Concrete</td>
<td>75.6</td>
<td>78.9</td>
<td>78.9</td>
<td>84.0</td>
<td>86.0</td>
<td>75.1</td>
<td>76.1</td>
<td>78.4</td>
<td>67.6</td>
<td>72.1</td>
</tr>
<tr>
<td>Wood</td>
<td>19.2</td>
<td>19.5</td>
<td>18.9</td>
<td>15.3</td>
<td>12.3</td>
<td>19.9</td>
<td>18.3</td>
<td>16.1</td>
<td>24.3</td>
<td>22.2</td>
</tr>
<tr>
<td>Palm bark</td>
<td>3.4</td>
<td>0.4</td>
<td>0.9</td>
<td>1.1</td>
<td>1.3</td>
<td>3.8</td>
<td>4.8</td>
<td>4.5</td>
<td>6.3</td>
<td>3.9</td>
</tr>
<tr>
<td>Adobe</td>
<td>1.2</td>
<td>1.2</td>
<td>0.4</td>
<td>0.5</td>
<td>0.3</td>
<td>1.3</td>
<td>1.0</td>
<td>1.0</td>
<td>1.9</td>
<td>1.6</td>
</tr>
</tbody>
</table>


a. Concrete stands for “paredes de hormigón, mampostería”; Wood for “paredes de madera”; Palm bark for “paredes de yagüa o tabla de palma”; and Adobe for “paredes de adobe o embarre u otro material.”
Two On Site Recycling Methods

1. Directly Reuse

- small mobile machines

(Collapses) ➔ (directly reuse) ➔ (Site)
Two On Site Recycling Methods

2. Mobile Machines

small mobile machines

directly reuse

COLLAPSE

SITE

Transport
Reference of Onsite Smallscale Recycling

Low Tech/Informal Way after earthquake in China
Strategy

Make it easier for Cuban to get a home

Professionals

Potential Dwellers

PARTICIPATION

home DIY

[with informal way of recycling materials]
What kind of life should a home offer?
Everyday life in Central Havana
Everyday life in Central Havana
Street Typology in Central Havana

People do expand their daily life to the public space.
Precise fences strictly isolate the private space from the street.
Vedado - Fenced City
Vedado - Fenced City

Street Typology
# Vedado - Fenced City

## Urban Regulation

<table>
<thead>
<tr>
<th>Tipo y Elementos de Fachada</th>
<th>Z-1 Baja</th>
<th>Z-2 Media</th>
<th>Z-3 Alta</th>
<th>Z-4 Borde Costero</th>
<th>Observaciones</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cercados</strong></td>
<td>Obligatorio*</td>
<td>Obligatorio*</td>
<td>Permutable</td>
<td>Prohibido*</td>
<td>*Restringidos en radios. 1. 20 m máximo en frente y laterales hasta la segunda línea de fachada. 2. 10 m máximo en terrazas y fachadas a partir de la segunda línea de fachado y frente.</td>
</tr>
<tr>
<td>Alturas máximas</td>
<td>3 plantas*: 41. 90 m</td>
<td>2 plantas*: 35. 50 m</td>
<td>2 plantas*: 35. 90 m</td>
<td>2 plantas*: 35. 50 m</td>
<td>*Mayor por excepción.</td>
</tr>
<tr>
<td>Puntales mínimos</td>
<td>4. 50 m PPF</td>
<td>4. 50 m PPF</td>
<td>4. 50 m PPF</td>
<td>4. 50 m PPF</td>
<td>*Se deben tener como mínimo 5. 00 m en frentes de plazas, pasos, ascensoradas y vías principales.</td>
</tr>
<tr>
<td>Basamentos</td>
<td>Prohibido</td>
<td>Obligatorio*</td>
<td>Obligatorio*</td>
<td>Prohibido</td>
<td>*Serán de tres plantas, de 12. 00 m máximo, cuando se trate de edificios altos.</td>
</tr>
<tr>
<td>Sótanos y semisótanos</td>
<td>Permutable*</td>
<td>Permutable*</td>
<td>Permutable*</td>
<td>Restringido</td>
<td>*No habitables, restringidos en zona de penetración del mar.</td>
</tr>
<tr>
<td>Salientes</td>
<td>Permutable*</td>
<td>Permutable*</td>
<td>Permutable*</td>
<td>Permutable*</td>
<td>*Prohibido fuera de las dimensiones especificadas.</td>
</tr>
<tr>
<td>Balcones, logias y terrazas</td>
<td>Preferente*</td>
<td>Preferente*</td>
<td>Preferente*</td>
<td>Preferente*</td>
<td>*Sobrepasando hasta 1, 99 del área de jardín.</td>
</tr>
<tr>
<td>Marquesinas y toldos</td>
<td>Permutable</td>
<td>Permutable</td>
<td>Permutable</td>
<td>Permutable</td>
<td>La marquesina ocupará un 30% en la franja de jardín. En el área del 15% de superficie descubierta en veladas hasta 6. 00 m del bordo del camino, las toldos de estructuras o coberturas ligeros serán de 2. 00 m de anchura.</td>
</tr>
<tr>
<td>Vistas Luces</td>
<td>Restringido</td>
<td>Restringido</td>
<td>Restringido</td>
<td>Restringido</td>
<td>Vistas rectas sólo a 0. 00 m del muro. Luces según sus normativas.</td>
</tr>
<tr>
<td>Medianería</td>
<td>Prohibido*</td>
<td>Prohibido*</td>
<td>Prohibido*</td>
<td>Prohibido*</td>
<td>*Permitidas sólo las existentes.</td>
</tr>
</tbody>
</table>
### Zonas de Intensidad Urbana

<table>
<thead>
<tr>
<th>Tipo y Elementos de Fachada</th>
<th>Z - 1 Baja</th>
<th>Z - 2 Media</th>
<th>Z - 3 Alta</th>
<th>Z - 4 Borde Costero</th>
<th>Observaciones</th>
<th>Sub Índices</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cercados</strong></td>
<td>Obligatorio*</td>
<td>Obligatorio*</td>
<td>Permisible</td>
<td>Prohibido*</td>
<td><em>Restringido en radials. 1. 20 m máximo en frente y laterales hasta la segunda línea de fachada. 2. 16 m máximo en radials y fachadas a partir de la segunda línea de fachada y frente.</em></td>
<td>8.4.1.6, 8.4.2, 8.4.3</td>
</tr>
<tr>
<td>Alturas máximas</td>
<td>3 plantas 1. 11. 80 m</td>
<td>3 plantas 1. 25. 00 m</td>
<td>2 plantas 1. 25. 00 m</td>
<td>2 plantas 1. 25. 00 m</td>
<td><em>Margen por excepción.</em></td>
<td>8.4.1.6, 8.4.2, 8.4.3</td>
</tr>
<tr>
<td>Puntales mínimos</td>
<td>4. 55 m² PB 2. 75-3. 00 m de plantas</td>
<td>4. 55 m² PB 2. 75-3. 00 m de plantas</td>
<td>4. 55 m² PB 2. 75-3. 00 m de plantas</td>
<td>4. 55 m² PB 2. 75-3. 00 m de plantas</td>
<td><em>Se requerirá como mínimo 0.50 m en frente de plazas, pasos, avenidas y vías principales.</em></td>
<td>8.4.1.6, 8.4.2, 8.4.3</td>
</tr>
<tr>
<td>Basamentos</td>
<td>Prohibido</td>
<td>Obligatorio*</td>
<td>Obligatorio*</td>
<td>Prohibido</td>
<td><em>Serán de tres plantas, de 12. 08 m mínimo, cuando se trate de edificios altos.</em></td>
<td>8.5.4.1.6, 8.4.2, 8.4.3</td>
</tr>
<tr>
<td>Sótanos y semisótanos</td>
<td>Permisible*</td>
<td>Permisible*</td>
<td>Permisible*</td>
<td>Prohibido*</td>
<td><em>Prohibido en campos de recreación.</em></td>
<td>8.5.4.1.6, 8.4.2, 8.4.3</td>
</tr>
<tr>
<td>Salientes</td>
<td>Permisible*</td>
<td>Permisible*</td>
<td>Permisible*</td>
<td>Prohibido*</td>
<td><em>Prohibido fuera de las dimensiones específicas.</em></td>
<td>8.5.4.1.6, 8.4.2, 8.4.3</td>
</tr>
<tr>
<td>Balcones, logias y terrazas</td>
<td>Preferente*</td>
<td>Preferente*</td>
<td>Preferente*</td>
<td>Preferente*</td>
<td><em>Se limitarán junto a 1/2 del área de jardín.</em></td>
<td>8.5.4.1.6, 8.4.2, 8.4.3</td>
</tr>
<tr>
<td>Marquesinas y toldos</td>
<td>Permisible</td>
<td>Permisible</td>
<td>Permisible</td>
<td>Permisible</td>
<td>La marquesina ocupará un 35% en la franja de jardín. En el área del 15% de superficie descubierta en plantas hasta 3. 28 m del bordo del mar. Las toldas de estructura e cobertura ligeras que no supere 3. 28 m de ancho.</td>
<td>8.5.4.1.6, 8.4.2, 8.4.3</td>
</tr>
<tr>
<td>Vistas</td>
<td>Obligatorio*</td>
<td>Obligatorio*</td>
<td>Obligatorio*</td>
<td>Obligatorio*</td>
<td><em>Vistas rectas sólo a 2. 00 m del muro, Luces según su normativa.</em></td>
<td>8.5.4.1.6, 8.4.2, 8.4.3</td>
</tr>
<tr>
<td>Medianería</td>
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<td><em>Permitidas sólo las existentes.</em></td>
<td>8.5.4.1.6, 8.4.2, 8.4.3</td>
</tr>
</tbody>
</table>
Strategy

HOUSING + COMMUNAL + PUBLIC SPACE
Domestic Space

Privacy at home!
Better living conditions!
No chaos!
What if I can play in my courtyard, not on the road!

A nice place to share knowledge would be perfect!
Public Space

In a professional woodworkshop, I can do better!
Mode of Living

Collaboration of Programs

WORKSHOP

HOUSING

domestic space

making

recycling

SOCIAL

living
doing

sharing
3 main roads link Vedado and other areas of the whole city
Paseo is the central boulevard of Vedado
El Malecon

Touristic strip, with many hotels.
Within the neighborhood, the most risk of collapse because of flood.
Within the neighborhood, deep Vedado residential area.
Accessible for the whole neighborhoods
A RATIONAL AND EFFICIENT GRID
OPPERATION METHOD

grid of unit
OPERATION METHOD

grid of unit

lighting
OPPERATION METHOD

grid of unit

lighting

connection on the upper floors
OPERATION METHOD

grid of unit  lighting  connection on the upper floors  vertical access
OPERATION METHOD

grid of unit | lighting | connection on the upper floors | vertical access | fill in workshop skylight fragment
OPERATION METHOD

grid of unit lighting connection on the upper floors vertical access fill in workshop skylight fragment diversify the configuration
OPPERATION METHOD

grid of unit

lighting

connection on the upper floors

vertical access

fill in workshop skylight fragment

diversify the configuration

the street, workshop, other public functions, access, yard, as
WHY THE GRID

THE ADAPITIBILITY
THE VOID IN BETWEEN

1. make sure easy unit stands on their own, no shared elements causing trouble
2. natural ventilation
THE VOID IN BETWEEN

1. make sure easy unit stands on their own, no shared elements causing trouble
2. natural ventilation

EACH FAMILY STANDS ON HIS OWN
1. make sure easy unit stands on their own, no shared elements causing trouble
2. natural ventilation
THE VOID IN BETWEEN

1. make sure easy unit stands on their own, no shared elements causing trouble
2. natural ventilation
vertical 2-story unit
SANITARY FACILITIES' ZONE

each unit functionally stands on its own
1. wet zone - sewage & water supply
2. dry zone - electricity
3&4. flexible zone for future change
The outside ring in the unit as sanitary space
DETAIL PLAN VIEW 1:10

1. wire mesh
2. sewage pipe connection
3. wooden plate covering the void

Management of the pipes through the inner wall
A plate to cover the holes for easy maintenance

1. wire mesh
2. sewage pipe connection
3. wooden plate covering the void
DETAIL BEAM CONNECTION

1. Electricity
2. Water supply
3. Sewage water
4. metal precast in beam
5. outside wall made by cement block
6. inner wooden wall
PHASING
FROM INTERIOR WORKSHOP TO OUTDOOR VOID

Program composition

Unfinished space
3000 m²

Workshop
3000 m²

Program composition

Unfinished space
1200 m²

Housing
1800 m²

Public functions
1200 m²

Workshop
600 m²

Housing
3000 m²

Public functions
2700 m²

PHASING
FROM INTERIOR WORKSHOP TO OUTDOOR VOID

Program composition

Unfinished space
3000 m²

Workshop
3000 m²

Program composition

Unfinished space
1200 m²

Housing
1800 m²

Public functions
1200 m²

Workshop
600 m²

Housing
3000 m²

Public functions
2700 m²
PHASING
FROM INTERIOR WORKSHOP TO OUTDOOR VOID

A whole free interior space

each unit stands on its own on ground level
PHASING
FROM INTERIOR WORKSHOP TO OUTDOOR VOID

1. precast concrete beam
2. connect main wooden beam
3. connect secondary wooden beam
4. slab
5. workshop skylight

for freestand space
metal bolts precasted along with the concrete beam
PHASING
FROM INTERIOR WORKSHOP TO OUTDOOR VOID
PHASING
FROM VOID TO ARCHITECT'S INTERVENTION

Program composition

6000 m²

- Unfinished space: 600 m² (10%)
- Housing: 2400 m² (40%)
- Public functions: 1800 m² (30%)
- Workshop: 1200 m² (20%)

Program composition

6000 m²

- Housing: 3000 m² (50%)
- Public functions: 2700 m² (45%)
- Workshop: 600 m² (5%)
PHASING
FROM VOID TO ARCHITECT'S INTERVENTION

rigid and static exterior void

stimulate social life through reshaping space
PHASING
FROM VOID TO ARCHITECT’S INTERVENTION
AXO DURING EVOLVING PROCESS
SKELETON of
Housing Units & Public Services
SKELETON of Housing Units & Public Services

GROUND FLOOR LAYOUT
Small pieces

1F
Housing slab & Street for Connection

2F
Housing slab & Street for Connection

1F - 3F
Spontaneous Housing Infillment

EXTERIOR SOCIAL SPACE EMBEDDED

1F
Workshop skylight

EXPLODED AXO OF THE PROJECT DURING EVOLVING
1F
Workshop skylight

1F
Housing slab
&
Street for Connection

Vertical Access
2F
Housing slab
&
Street for Connection

1F
Workshop skylight

1F
Housing slab
&
Street for Connection
SKELETON of Housing Units & Public Services

GROUND FLOOR LAYOUT

Small pieces

Vertical Access

1F - 3F

Spontaneous Housing Infillment

1F

Workshop skylight

2F

Housing slab & Street for Connection

1F

Workshop skylight
SKELETON of Housing Units & Public Services

GROUND FLOOR LAYOUT
Small pieces
Vertical Access
1F
Housing slab & Street for Connection
2F
Housing slab & Street for Connection
1F - 3F
Spontaneous Housing Infillment

EXTERIOR SOCIAL SPACE EMBEDDED

1F
Workshop skylight

EXPLODED AXO OF THE PROJECT DURING EVOLVING
SKELETON of Housing Units & Public Services

GROUND FLOOR LAYOUT
Small pieces
Vertical Access

1F
Housing slab & Street for Connection

2F
Housing slab & Street for Connection

1F - 3F
Spontaneous Housing Infillment

EXTERIOR SOCIAL SPACE EMBEDDED

1F
Workshop skylight

EXPLODED AXO OF THE PROJECT DURING EVOLVING