PackCity
Maximum Pack = Maximum Pick
Chun Hoi Hui
Learn from the Hong Kong street store
PACK the Activity

Pack as the action of compress the volume by putting stuffs into a storage when the space is not in use by the moment.

7:00pm - 10:00am
PICK the Activity
Pick as the action of choosing the right stuffs to occupy the space for an activity to take place.

11:00am - 6:00pm
Inefficient Use in 24 hours

06.00

Living Room: 00.0/24
Dining Room: 00.0/24
Kitchen: 00.0/24
Bathroom: 00.0/24
Study Space 1: 00.0/24
Study Space 2: 00.0/24
Study Space 3: 00.0/24
Bed Space 1: 00.5/24
Bed Space 2: 00.5/24
Bed Space 3: 00.5/24

82% vacancy
Fixed moment in architecture

89%
vacancy volume of one day
Pick & Pack in architecture?
How can we live with Pick & Pack?
What can we earn from Pick & Pack?
Activities on Pack!
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1. PACK

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1.2 Pack in a Block
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1.1 PACK Calculation
How much can I Pack?
1.1.1 Spaces Used at Home
Space for my activities at home

- Living Room: 16.4m³
- Studying Corner: 7.2m³
- Bathroom: 9.3m³
- Dinning Room: 12.3m³
- Sleeping Corner: 13.3m³
- Kitchen: 12.7m³

[Diagram of the spaces used at home with dimensions indicated for each room]
1.1.2 Pack Calculation

Sleeping Corner

**Furniture:**
- 1x Double Bed
- 2x Pillow
- 1x Quilt

**Total Volume**

13.3m³

**Pack Volume**

1.0m³

7.5%

[Pack volume compares to total volume]
1.1.2 Pack Calculation

*Studying Corner*

**Total Volume**  
7.2m$^3$

**Furniture:**  
1x Table  
1x Office Chair  
1x BookShelf  
1x Laptop  
1x Table Lamp  
Books

**Pack Volume**  
2.0m$^3$

28%  
[Pack volume compares to total volume]
1.1.2 Pack Calculation
*Dinning Room*

Total Volume

**12.3m³**

**Furniture:**
1x Table
5x Chairs
-Dishes
-Food

Pack Volume

**0.8m³**

**6.5%**

[Pack volume compares to total volume]
1.1.2 Pack Calculation

*Living Room*

**Furniture:**
- 1x Coach
- 2x Coffee Table
- 1x Pillow
- 1x Painting

*Total Volume*

**16.4m³**

**Pack Volume**

**1.3m³**

8.0%  

-Pack volume compares to total volume-
1.1.2 Pack Calculation

**Kitchen**

**Furniture:**
- 1x Fridge
- 4x Cabinets
- 1x Kitchen Top
- Dishes
- Food

---

**Total Volume**

**12.7 m³**

**Pack Volume**

**5.5 m³**

43%

[Pack volume compares to total volume]
1.1.2 Pack Calculation

Bathroom

Total Volume
9.3m³

Pack Volume
3.2m³

Furniture:
1x Mirror Cabinet
1x Sink Cabinet
1x Toilet
1x Shower
1x Towel
1x Cleaning Set

34%

[Pack volume compares to total volume]
1.1.3 Furniture Pack Volume

*Volume comparison*

**Total Volume**

$90.2\text{m}^3$

**Furniture**:

- 1x Bed
- 6x Chair
- 1x Office Chair
- 2x Table
- 1x Book Shelf
- 1x Coach
- 2x Coffee Table
- 1x Fridge
- 1x Kitchen Set
- 1x Bathroom Set
- 1x Laptop
- 2x Pillow

**Pack Volume**

$13.8\text{m}^3$

$15.0\%$

[Total pack volume compares to total volume of $90.2\text{m}^3$]
1.1.4 Change to Foldable Furniture

*Challenge the number*

<table>
<thead>
<tr>
<th>Original Furniture</th>
<th>Foldable Furniture</th>
<th>Volume Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair</td>
<td>Foldable Chair</td>
<td>0.14m³ to 0.03m³</td>
</tr>
<tr>
<td>Table</td>
<td>Foldable Table</td>
<td>0.88m³ to 0.05m³</td>
</tr>
<tr>
<td>Coffee Table</td>
<td>Foldable Coffee Table</td>
<td>0.13m³ to 0.02m³</td>
</tr>
<tr>
<td>Coach</td>
<td>Foldable Coach</td>
<td>1.12m³ to 0.74m³</td>
</tr>
</tbody>
</table>

Pack Volume

11.4m³

12.5%

[Total pack volume compared to total volume of 90.2m³]
1.1.5 Consider the Building Services

Challenge the number

Water and Gas Connection

Pack Volume

17.5\text{m}^3

20.5\% 

[Total pack volume compared to total volume of 90.2\text{m}^3]
1.1.6 Fixed Walls and Slabs

*Challenge the number*

Fixed Building Structure

Wall & Floor Volume

\[25.5\text{m}^3\]

\[+25\%\]

[Wall/floor volume compare to total volume of 90.2m³]
Achieve maximum efficient use of space

Maximum PACK
1.2 PACK in a Block
Pack concept to 246 inhabitants
1.2.1 Introduce the Block

The Inhabitant mix of the block

The Berlin Block

Dwelling Floors: 8
Inhabitants: 246
Households: 112
1.2.2 One Dwelling Floor

Calculation on one typical dwelling floor
1.2.3 One Person Household

Furniture pack calculation

Total Volume
\[150\text{m}^3\]

Pack Volume
\[28.4\text{m}^3\]

Furniture:
- 1x Bed
- 4x Chair
- 1x Office Chair
- 2x Table
- 1x Book Shelf
- 1x Couch
- 1x Coffee Table
- 0x Shelf
- 1x Wardrobe
- 1x Fridge
- 1x Kitchen Set
- 1x Bathroom Set

[Pack volume compares to total volume]
1.2.4 Two Person Household

Furniture pack calculation

<table>
<thead>
<tr>
<th>Furniture</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2x Bed</td>
<td></td>
</tr>
<tr>
<td>4x Chair</td>
<td></td>
</tr>
<tr>
<td>2x Office Chair</td>
<td></td>
</tr>
<tr>
<td>3x Table</td>
<td></td>
</tr>
<tr>
<td>2x Book Shelf</td>
<td></td>
</tr>
<tr>
<td>1x Couch</td>
<td></td>
</tr>
<tr>
<td>2x Coffee Table</td>
<td></td>
</tr>
<tr>
<td>1x Shelf</td>
<td></td>
</tr>
<tr>
<td>2x Wardrobe</td>
<td></td>
</tr>
<tr>
<td>1x Fridge</td>
<td></td>
</tr>
<tr>
<td>1x Kitchen Set</td>
<td></td>
</tr>
<tr>
<td>1x Bathroom Set</td>
<td></td>
</tr>
</tbody>
</table>

Total Volume: 300 m$^3$

Pack Volume: 33.2 m$^3$

11.1% [Pack volume compares to total volume]
1.2.5 Three Person Household

Furniture pack calculation

Total Volume

450\(m^3\)

Furniture:
- 3x Bed
- 6x Chair
- 3x Office Chair
- 4x Table
- 3x Book Shelf
- 2x Couch
- 2x Coffee Table
- 2x Shelf
- 3x Wardrobe
- 1x Fridge
- 1x Kitchen Set
- 1x Bathroom Set

Pack Volume

39\(m^3\)

8.7% [Pack volume compares to total volume]
1.2.6 Four Person Household

*Furniture pack calculation*

<table>
<thead>
<tr>
<th>Furniture</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4x Bed</td>
<td></td>
</tr>
<tr>
<td>10x Chair</td>
<td></td>
</tr>
<tr>
<td>4x Office Chair</td>
<td></td>
</tr>
<tr>
<td>5x Table</td>
<td></td>
</tr>
<tr>
<td>4x Book Shelf</td>
<td></td>
</tr>
<tr>
<td>2x Coach</td>
<td></td>
</tr>
<tr>
<td>2x Coffee Table</td>
<td></td>
</tr>
<tr>
<td>3x Shelf</td>
<td></td>
</tr>
<tr>
<td>4x Wardrobe</td>
<td></td>
</tr>
<tr>
<td>1x Fridge</td>
<td></td>
</tr>
<tr>
<td>1x Kitchen Set</td>
<td></td>
</tr>
<tr>
<td>1x Bathroom Set</td>
<td></td>
</tr>
</tbody>
</table>

**Total Volume**

$600m^3$

**Pack Volume**

$44m^3$

**Pack Volume compares to total volume**

$7.3\%$
1.2.7 Furniture Packs of One Floor

Pack of one dwelling floor

Total Volume
4800\text{m}^3

Pack Volume
478\text{m}^3

Furniture:
- 32x Bed
- 76x Chair
- 32x Office Chair
- 48x Table
- 32x Book Shelf
- 20x Coach
- 24x Coffee Table
- 18x Shelf
- 32x Wardrobe
- 14x Fridge
- 14x Kitchen Set
- 14x Bathroom Set

[Total pack volume compared to normal mode volume] 10.0%
1.2.8 Pack of the Block

_Furniture pack volume for 246 inhabitants_

Packing Volume: 3824m³
1.3 Potential of PACK
Extra activities and quality
1.3.2 Dwelling Activity Possibilities

Space Configuration

- Sleeping
- Napping
- Internet
- Couple Sleeping
- Reading
- Teatime
- House Party
- Couple Dinning
- Family Dinner
- Group Studying
- Group Discussion
- Bar Kitchen
- Gathering Dinner
- Dinning
- Studying
- Kitchen
- Bathroom

Dwelling Activity Possibilities:

- 1x Sleeping
- 1x Napping
- 1x Internet
- 1x Couple Sleeping
- 1x Reading
- 1x Teatime
- 1x House Party
- 1x Couple Dinning
- 2x Family Dinner
- 2x Group Studying
- 2x Group Discussion
- 2x Bar Kitchen
- 1x Dinning
- 1x Studying
- 1x Kitchen
- 1x Bathroom
1.3.3 Collective Activity Possibilities

Space Configuration

- Sleeping
- Living
- Dinning
- Studying
- Kitchen
- Bathroom
- Party House
- Office Working
- Restaurant
- School Room
- Lecture Room
- Restaurant Kitchen
Toward to extra quality in density

*Maximum PICK*
2. PICK

2.1 PICK Parameters
2.2 PICK with Neighbours
2.1 PICK Parameters
What we need for picking a activity?
2.1.1 Activities Space Timeline

Picking of activity

Living Room (4hr05mins)
- lunch & reading
  12.45pm-1.55pm
- chit-chat
  5.20pm-6.30pm
- home movie
  9.00pm-10.45pm

Dinining Room (1hrs30mins)
- breakfast
  9.15am-9.45am
- dinner
  7.30pm-8.30pm

Bed Corner (6hrs45mins)
- sleeping
  2.00am-8.45am

Study Corner (2hrs45mins)
- studying
  11.15pm-2.00am

Bathroom (55mins)
- shower
  8.45am-9.00am
  10.45pm-11.15pm
- toilet break
  5.15pm-6.20pm
  12.10pm-12.15pm

Kitchen (2hrs)
- cooking
  9.00am-9.15am
  12.30pm-12.45pm
  6.30pm-7.30pm
- dishes washing
  8.30pm-9.00pm
2.1.2 Pick of Activity over 24 hours

*Volume change with pick and pack*
2.1.3 Spacial Parameters

*Spacial condition for picking activities*

---

**Volume**
The size of activity, amount of space required

**Privacy**
Request of privacy of sound and visual contact

**Daylight**
Request of daylight and view
2.1.4 Volume Slider

Activity volume demand calculation

Total Volume: **90.2m³**

PICK Volume: **29.8m³**
2.1.5 Privacy Slider

*Activity privacy demand calculation*
2.1.6 Daylight Slider

Activity daylight demand calculation
2.1.7 Demand Change Timeline

Picking with parameters
2.2 PICK with Neighbours
PICK over one day in the block
2.2.1 PICK Over One Day
Scenarios of 32 inhabitants

06.00
Volume:
1147.4m³
23.9%
2.2.2 Demands Changes of One Floor

Demands for 32 inhabitants

Average Volume Demand of one day: 18.9% (Highest 24.8%)
Average Privacy Demand of one day: 5.5/10 (Highest 9.1/10)
Average Openness Demand of one day: 2.0/10 (Highest 6.1/10)
2.2.3 Volume Change Over One Day

Maximum Used Volume of one day:

24.8% (average 18.9%)
2.2.4 Reduce to Two Floors

*Maximum volume we need for one day*

MAX Picking Volume: $9523\text{m}^3$
2.2.5 Four Times Density
Maximum inhabitants on one floor

14 Household
32 Inhabitants

56 Household
128 Inhabitants
3. CONFLICTS

3.1 Conflicts in Density
3.2 Vertical Relationship
3.1 Conflicts in Density
Conflicts when the density raised?
3.1.1 Finding the conflict moments
Scenarios of 128 inhabitants

06.00
Volume: 1147.4m³
23.9%
3.1.2 Conflict Moments Over One Day

Dis-satisfaction over one day

Volume Satisfaction of one day: -6% (Highest 24.8%)
Privacy Satisfaction of one day: -15% (Highest 9.1/10)
Openness Satisfaction of one day: -12% (Highest 6.1/10)
3.1.3 Crash of Daylight

View/Daylight

Edge Zone: Activities with high openness demands

Floor Central: Activities with low openness demands
3.1.4 Crashes of Privacy


Over Density:
Conflicts:
Over density and conflicts on privacy when demands of openness raise.

Lower Density:
Conflicts:
Lower density cause of isolated condition
3.1.5 Pick for the Daylight

*Picking follow condition*

P1 move over the floor
3.1.6 Pick for the Privacy

Stable picking location

P2 settle on the corner
3.1.7 Condition vs Movement

Problems of horizontal movements

Daylight

VS

Privacy
3.2 Vertical Relationship
How to solve the conflicts?
3.2.1 Extra Condition

*Condition in vertical relationship*
3.2.2 Personal Platforms

Cut up the floor

12 x 12
144 platforms per floor
3.2.3 Introduce Vertical Movement

Movement of personal platform
3.2.4 Move for Daylight and Privacy

*Share the extra condition*
06.00
Volume: 23.9%
4. SYSTEM

4.1 Tower Arrangement
4.2 Block Transformation
4.3 Pack Units & Pick Platforms
4.4 Units Transformation
4.1 Tower Arrangement
Arrangement with different households
4.1.1 Vertical Gradient Zone

*Introduce the Living Tower*

**Change of activities**
Activity change over one day with different demand on daylight and privacy based on the parameter slider set up.

**Living Tower**

- **Public Zone**
  - Public & Collective activities
  - Good daylight and view
  - Low privacy control

- **Share Zone**
  - Neighbourhood activities
  - Good daylight and view
  - Less privacy control

- **Household Zone**
  - Household & Multi activities
  - Average daylight and view
  - Good privacy control

- **Personal Zone**
  - Personal & Private activities
  - Low daylight and view
  - Good privacy control
4.1.2 Pick Gradient Zone

*Pick and Pack of Living Tower*

- **Public Zone**: Public & Collective activities
- **Share Zone**: Neighbourhood activities
- **Household Zone**: Household & Multi activities
- **Personal Zone**: Personal & Private activities
4.1.3 Household Configuration
Joining Living Towers for households

1 person Household

2 person Household

3 person Household

4 person Household
4.1.4 Structure and Accessibility

Introduce Infrastructure Tower

One Infrastructure Tower connects to 4 households, 14 Infrastructure Towers for 56 households per floor.

Lifing Platform
Collective accessibility for 4 households
4.1.5 Floor Distribution
Arrangement of the Floor

- Infrastructure Tower x14
- Total Household x56
- Living Tower x130
4.2 Block Transformation
Tower interlocking network
4.2.1 Structure Hierarchy

*Interlocking towers network*

- **Permanent Structure**
  - Stable

- **Primary Connecting Towers**
  - Movable

- **Interlocking Towers**
  - Movable
4.2.2 Interlocking Logic

Constraint with neighbours
4.2.3 Maximum Height

Testing the height requirement
4.2.4 Define the Limitation

Infrastructure Tower height difference
4.2.5 Maximum View & Sunlight

Chasing the individual demands
4.2.6 Maximum Neighbourhood

Live with the neighbourhood
4.2.7 Maximum Mix

Variety of activities
4.2.8 Maximum Collective

Work out collectively
4.2.9 Transforming Public Space

Roof and ground public space
4.2.9 Transforming Public Space

Roof and ground public space
4.2.9 Transforming Public Space

Roof and ground public space
4.2.9 Transforming Public Space

Roof and ground public space
4.2.9 Transforming Public Space

Roof and ground public space
4.3 Pack and Condition

Materialization of pack and condition
4.3.1 Grouping of Packs
Defining packs with vertical zones

PUBLIC ZONE
- Good view and light, Low privacy control

SHARE ZONE
- Good view and light, Less privacy control

HOUSEHOLD ZONE
- Average view and light, Good privacy control

PERSONAL ZONE
- Low view and light, Good privacy control

1 PERSON HOUSEHOLD
2 PERSON HOUSEHOLD
3 PERSON HOUSEHOLD
4 PERSON HOUSEHOLD
4.3.2 Pack Units and Pick Platforms

Pack of furniture and condition

PACK OF FURNITURE

Kitchen Pack
Kitchen, Fridge, Washing Machine

Shared Pack
Tables, Chairs, Coach, Coffee Table, House Storage

Bathroom Pack
Shower, Toilet

Personal Pack
Wardrobe, Book Shelf, Personal Storage

PACK OF CONDITION

Green Platform
(Public Zone)

Wood Platform
(Shared Zone)

Rubber Platform
(Household Zone)

Soft Platform
(Personal Zone)
4.3.2 Pack Units and Pick Platforms

Pack of furniture and condition

- LIVING TOWER PLATFORM
- COUNTER-BALANCE WATER TANK
- LIFTING PLATFORM
- PACK UNITS
  - Front roll
    - Kitchen Pack
    - Bathroom Pack
  - Back roll
    - Shared Pack
    - Personal Pack
4.3.3 Pack Unit

Pick and pack of Kitchen Pack

Pack Volume

3.8m\(^3\)

- Fridge
- Movable Shelf
- Kitchen Set
  (water and gas connection)
4.3.3 Pack Unit

Pick and pack of Bathroom Pack

Pack Volume

3.8m³

Sliding Curtain
Bathroom Set (water and gas connection)
4.3.3 Pack Unit

Pick and pack of Shared Pack

Coach Unit

Foldable Table and Chair

Pack Volume

2.2-3.9m$^3$
4.3.3 Pack Unit

Pick and pack of Personal Pack

Pack Volume

1.6-4.1m³

Movable Wardrobe

Pillow & Quilt

Movable Bookshelf

1 Person

2 Person

3 Person

4 Person
4.3.4 Pack Volume of Pack Units

Packing the furniture

1 Person Household

2 Person Household

3 Person Household

4 Person Household

Pick Volume

11.4 m³

12.6 m³

14.4 m³

15.6 m³
4.3.4 Pick Platform

Condition of Green Platform

- Good view and light
- Low privacy control
- Temperature: 0°C - 30°C

Floor
Grass on top floor, lower floor change to artificial grass since there is no stable daylight
4.3.4 Pick Platform

Condition of Wood Platform

- Good view and light
- Less privacy control
- Temperature: 15°C - 25°C

Facade
Transparent curtain with framework, open view and light

Floor
Wooden flooring as hard & stable surface
4.3.4 Pick Platform

*Condition of Rubber Platform*

- Average view and light
- Good privacy control
- Temperature: 18°C - 23°C

**Facade**
Translucent curtain with framework, light can pass through with privacy remains

**Floor**
Playground rubber tiles for multi-use of household activities. At the same provide sound insulation for personal zone below.
4.3.4 Pick Platform

*Condition of Soft Platform*

- Low view and light
- Good privacy control
- Temperature: 20°C - 23°C

**Facade**
Blocked curtain with framework provide better indoor condition control and isolation

**Floor**
Inflatable floor as soft ground for personal activities, also as insulation for the space
4.3.5 Pack Volume of Living Tower

Packing the condition

Pick Volume

176.4m³
[15.0m³ of soil for green]

Pick Volume

127m³
[15.0m³ of soil for green]

Pick Volume

77.6m³
[15.0m³ of soil for green]

Pack Volume

26.5m³
[15.0m³ of soil for green]
4.4 Units Transformation
Counter-balance movement system
4.4.1 Transformation Hierarchy

*Level of movement*

1. **Picking Activities**
   - Pack Units

2. **Forming Space**
   - Pick Platforms

3. **Finding Position**
   - Living Towers
4.4.2 Water Tanks as Counter-balance

Building service water tanks as movement support

Pulley/Counter-weight Camera Slider
design by Varavon

Zero-carbon Elevator
design by Matthew Lloyd
4.4.3 Transforming with Counter-balance

Limitation by hanging cables
4.4.4 Pick with Manual Power

Control of pick and pack
5. INHABITING

5.1 Mix and Match
5.2 Life the PackCity
5.1 Mix and Match
Catalogue of Activities with Pick and Pack
5.1.1 Mix & Match on One Living Tower

Pick and pack on Green Platform

- Summer Kitchen
- Rooftop Shower
- Sunbath Field
- Urban Picnic
- Open Forum
- Sunny Day Reading
5.1.2 Mix & Match on One Living Tower

Pick and pack on Wood Platform

Dinning
Quick Shower
Daily Study
Football Watching & Bar
Gathering
Afternoon Nap
5.1.3 Mix & Match on One Living Tower

*Pick and pack on Rubber Platform*

- **Tea House**
- **Concentrate Study**
- **Indoor Playground**
- **Walkin Closet**
- **House Concert**
5.1.4 Mix & Match on One Living Tower

Pick and pack on Soft Platform

Sleeping

Mid-night Toilet

Kung Fu Fighting

Friday Movie & Bar

Bed Reading
5.1.5 Mix & Match on Multi Living Tower
*Pick and pack with Max Platform*

- **Garden Bedroom**
- **Neighbour Courtyard**
- **Sky Net**
- **Tea Pavilion**
- **Bed Reading**
5.1.5 Mix & Match on Multi Living Tower

Pick and pack with Max Platform

- Mini Cinema
- House Party
- Long Dinner
- Fight Club
- DJ Show
5.2 Live the PackCity

Pick and Pack over one day
23.00-23.30