1. NCZ foundation construction method with basement which is disaster resilient and strengthens the community.

(2) Ensuring comfortable living space and strengthening community ties

Can accommodate various family types and lifestyles

Possible Maximum space 160m²

Floor space: 138m² (約41坪)

2F: 46m²

1F: 46m²

Basement: 46m²

attic: 22m²
1. NCZ foundation construction method with basement which is disaster resilient and strengthens the community

2. **Ensuring comfortable living space and strengthening community ties**

**Solves the problems of basement rooms**

- **dew**
- **Underground percolating water**
- **humidity**

- **Heat insulating frame**
- **ferroconcrete**
- **sand** (depth 30mm)
- **Polyethelene sheet**
- **Heat insulating material** (厚 50mm)

**Crushed stones and exhaust pipe**

- **Prevent humidity and water penetration**

**Heat insulating from both sides**

地下室内外の温度差を極力減らし、結露や湿気を防ぐ手段

Solves the problems of basement rooms

**2400**        **2000**

**2730**

**250**

**4800**

**1500**
1. NCZ foundation construction method with basement which is disaster resilient and strengthens the community

Master plan

Total property area 2699.18㎡ (817坪)

NCZ Housing Units (Townhouse type)

<table>
<thead>
<tr>
<th>No of houses</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>House space</td>
<td>1,840㎡</td>
</tr>
<tr>
<td>Road and parking space</td>
<td>242+217 = 459㎡</td>
</tr>
<tr>
<td>Park space</td>
<td>400㎡</td>
</tr>
<tr>
<td>Common house</td>
<td>30㎡</td>
</tr>
</tbody>
</table>

Water and green park space 約400㎡
1. NCZ foundation construction method with basement which is disaster resilient and strengthens the community

(2) **Ensuring comfortable living space and strengthening community ties**

① formulate the basic plan
② locate the housing so that residents would be able to communicate
③ place the pedestrians, not cars, at the center of the property
④ secure common space, and not space for individuals
One of largest size rainwater underground harvesting tank, developed jointly with Kyushu University

Covered with soil

Crushed stone layer

10m50cm

3m85cm

80cm

延長16m30cm

体積214㎥
One of largest size rainwater underground harvesting tank, developed jointly with Kyushu University

【Process flow of construction】①Excavation→

①Excavation
2. An easy method to store clean rainwater and use; ‘The Rainwater Underground Tank’

【Process flow of construction】①Excavation → ②placement of water shielding sheets → ③water catchment pipe installation
【Process flow of construction】
①Excavation → ②placement of water shielding sheets → ③water catchment pipe installation → ④fill crushed stones → ⑤back filling dirt
2. An easy method to store clean rainwater and use; ‘The Rainwater Underground Tank’
2. An easy method to store clean rainwater and use; ‘The Rainwater Underground Tank’
① Excavation (214 m³)
② guard sheets and water shield sheet installation
③ Water catchment pipe installation
④ Filling crushed stones
Filling crushed stones: completed
⑤ Backfilling dirt; surface compaction
Completion
June 2012 at the center garden
2. An easy method to store clean rainwater and use; ‘The Rainwater Underground Tank’

Features of underground rainwater harvesting tank

(1) Construction is easy and construction period is short
   1/3 time compared to concrete tank, ½ cost

(2) Able to capture 50% of rainwater at the excavated area
   Stone content: 214 m³ × 0.5 = approx 107 m³ (実際112 m³)

(3) The water is not exposed to direct sunlight and therefore
   the water quality and temperature is very sustainable

(4) Water intaking can be done easy by manual pumps

(5) The surface land can be used

Cost is 450 Million Yen
$500/m³
※ when using heavy machinery

Cost

Rainwater Underground Tank

Water intake

Crushed stone layer

Backfilled dirt

10m50cm

80cm

3m85cm

延長16m30cm

体積214m³
Thank you for your attention

Daiken