Design and Operational Data of Several Rainwater Harvesting System in Korea

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Multi Purpose and Proactive Rainwater Management

Multi-player strategy!
Water Management

- Flood
- Dry
- Eco-friendly
- Prevent Disaster
- Participation
- Saving Energy
- Water Cycle
- Water Resource

Ideal Management
Small Scale
Mass Balance of Rainwater Harvesting System

Before Rainwater Harvesting:
- Roof Rain: 100
- Sewage: 100

After Rainwater Harvesting:
- Roof Rain: 100
- Sewage: 20
- Use: 40
- Infiltration: 40

Effective! Effective!
Rainwater Piggy Bank Microcredit Project

- Gutter
- 3P Filter Collector
- Rainwater Piggy Bank
- Infiltration Facility
- For Flood Control
- For Water Saving
- Infiltration

Rainwater Piggy Bank

Infiltration Facility
Decentralized Rainwater Management Projects
Decentralized Rainwater Management Projects
Rainwater harvesting facility in SNU
Rainwater Harvesting System in SNU Dormitories

- Total Roof Area: 2098 ㎡
- Mean demand per day: 6.6 ㎥/day
- Tank volume: 200 ㎥
Rainwater Harvesting System in SNU Dormitories

- Rainwater use

Water Saving Efficiency: 62.3%
Rainwater Harvesting System in SNU Dormitories

- Quality - turbidity

Roof Runoff: 10.6~207 NTU
Stored Rainwater: 1.29~2.35 NTU

Natural Sedimentation
Rainwater Harvesting System in SNU Dormitories

• Quality – pH

Drinking water standard: pH 5.8~8.5

Roof Runoff: pH 6.5~9.0

Stored Rainwater: pH 6.8~8.4
Rainwater Harvesting System in SNU Dormitories

- Quality – Heavy metal

Drinking water standard

Satisfaction of drinking water standard

Heavy metal will be removed by natural sedimentation
<table>
<thead>
<tr>
<th>Completion Date</th>
<th>Oct. 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catchment area</td>
<td>3,652 m²</td>
</tr>
<tr>
<td>Rainwater Tank</td>
<td>250 m³</td>
</tr>
</tbody>
</table>
Rainwater Harvesting System in Building 39

Main tank

Small tank

MH

Sewage pipe
Rainwater Harvesting System in Building 39

- Remote monitoring and control
Rainwater Harvesting System
in Building 39

- Rainwater use

Average use: 80 ~ 90 tons (Mon – Fri)
  40 tons (Sat)
  20 tons (Sun)
Budlgol Project

Installation Site
Budlgol Project
Budlgol Project

Q- bic
Rainstation
Budlgol Project

Precast Concrete
Infiltration

Budlgol Project

Sampling (φ200)
## Description of Star-city

<table>
<thead>
<tr>
<th>Location</th>
<th>Jayang-dong, Gwangjin-gu, Seoul, Korea</th>
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</thead>
<tbody>
<tr>
<td>Area</td>
<td>Total: 62,500 m²</td>
</tr>
<tr>
<td></td>
<td>Building: 16,867 m²</td>
</tr>
<tr>
<td>Usage</td>
<td>Residual &amp; Commercial Complex</td>
</tr>
<tr>
<td>Completion date</td>
<td>Nov. 2006</td>
</tr>
</tbody>
</table>
Schematic of Circulation System

Circulating Rainwater in complex

Tap water

Gardening

Infiltration

Re-collect

Rainwater tank from surface

Rainwater tank from rooftop

Rainwater tank for emergency
Star City Project

Location: Jayang-dong, Gwangjin-gu, Seoul

- Total Area: 62,505.2M²
- Building Area: 16,867.729M²
- Area: 7,729M²

Usage: Apartment, Officetel, Commercial & Cultural facilities

Construction duration: October. 2003 ~ March. 2007

Features:
- For Flood Control
- For Water Saving
- For Emergency

Diagram showing water management systems.
Creative Rainwater Management

Star City RWHM, Seoul

| 2007 Usage | 40,000 |
| RU Ratio   | 66%    |

Korean RU Ratio 27%
<PLC : PROGRAMEL LOGIC CONTROL>
Star City Project

• Quality - turbidity

Turbidity

Below 2 NTU

Stored Rainwater: 0~1.5 NTU
Star City Project

- Quality – pH

Stored rainwater is neutral
Star City Project Technical Tour

International Rainwater Leadership Workshop, May 2007

People for Rainwater Delegate from Japan, March 1, 2008
Operational strategy of rainwater tank in SMG
Operational strategy of rainwater tank in SMG

Remote Rainwater Tank Monitoring system

For Flood Control

For Water Saving

City office

Internet

Weather forecast from Korea Meteorological Administration

Gu office A

Gu office B

Rainwater reservoirs

calling for operation

monitoring data
Operational strategy of rainwater tank in SMG
Multifunctional Administrative City

For Flood Control

For Eco-friendly

Water supply from outside (reducing by using rainwater)
Internal water supply (self-sufficiency) rainwater
Separation and treatment of wastewater reclamation and reusing system sewage (to be recycled)
preparation for the climate change introducing natural purification
Demonstration of Rainwater Piggy Bank

At: Banda Aceh, Indonesia
On: Jan 2007, Jan 2008
by: SNU Rainwater Research Center and Students
Effect of Tsunami in Banda Aceh, Dec 26, 2004
Rainwater Piggy Bank Project 2
2.3 Activities of 2007
2.3 Activities of 2007
2.4 At the Chief’s House
2.4 At the Chief’s House
2.4 At the Widow’s House
2.4 At the Fisherman’s House
Education and Capacity Building
Education and Capacity Building

* Cara Menggunakan/Perawatan *
* Water Tanker *

1. Periksa Saringan Air.
   - Putar Tutup Saringan ke Arah Kiri untuk Membuka.
   - Putar Tutup Saringan ke Kanan untuk Menutup.

2. Cara Mengisi Water Tank atau Memindahkan Selang Air ke Water Tank yang Lain.
   - Putar atau Lepaskan Selang Air dari Saringan ke Water Tank ke Dua yang Lain.

3. Cara Memperbaiki Water Tank Jika Bocor:
   - Pakailah Potongan Karet yang Tersedia dan Menggantikan Lem yang Sudah Tersedia sebagai Suku Cadang:
     1. Gantung Metal/Cincin pada Pengikat.
     2. Satu Set Lem dan Potongan Karet Tempel Utk Bocor.
Thank You !