RAINWATER HARVESTING SYSTEM IN IPOH CITY

MR. WONG KAM LEE
IPOH CITY COUNCIL, MALAYSIA

IPOH CITY

LOCATION

IPOH

Size

643 square km

Population

658,000 people

Location

Bettween Penang and Kuala Lumpur

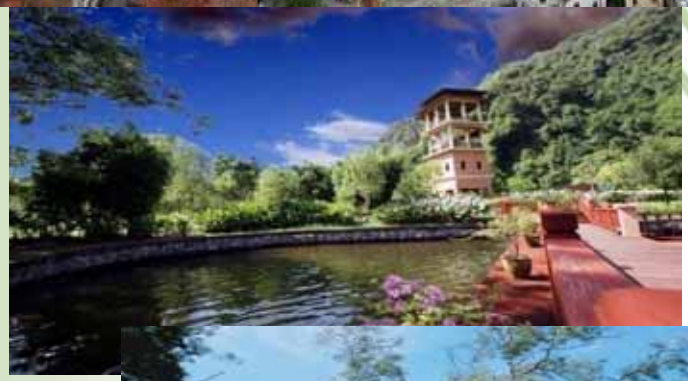
Known as

“The City That Tin Built”

IPOH CITY COUNCIL

1893	*Ipoh Sanitary Board*
1897	*Kinta Sanitary Board*
1905	*Kinta Sanitary Board North*
1916	*Kinta District Board*
1941	*Japanese Occupation*
1945	*British Military Administration*
1946	*Town Board, Kinta*
1954	*Ipoh & Menglembu Town Council*
1957	*Ipoh Town Council*
1962	*Ipoh Municipal Council*
1988	*Ipoh City Council*

CLEAN



GREEN

PROGRESSIVE

TIN HERITAGE CITY

BOUGAIVILLEA CITY

OUTLINE

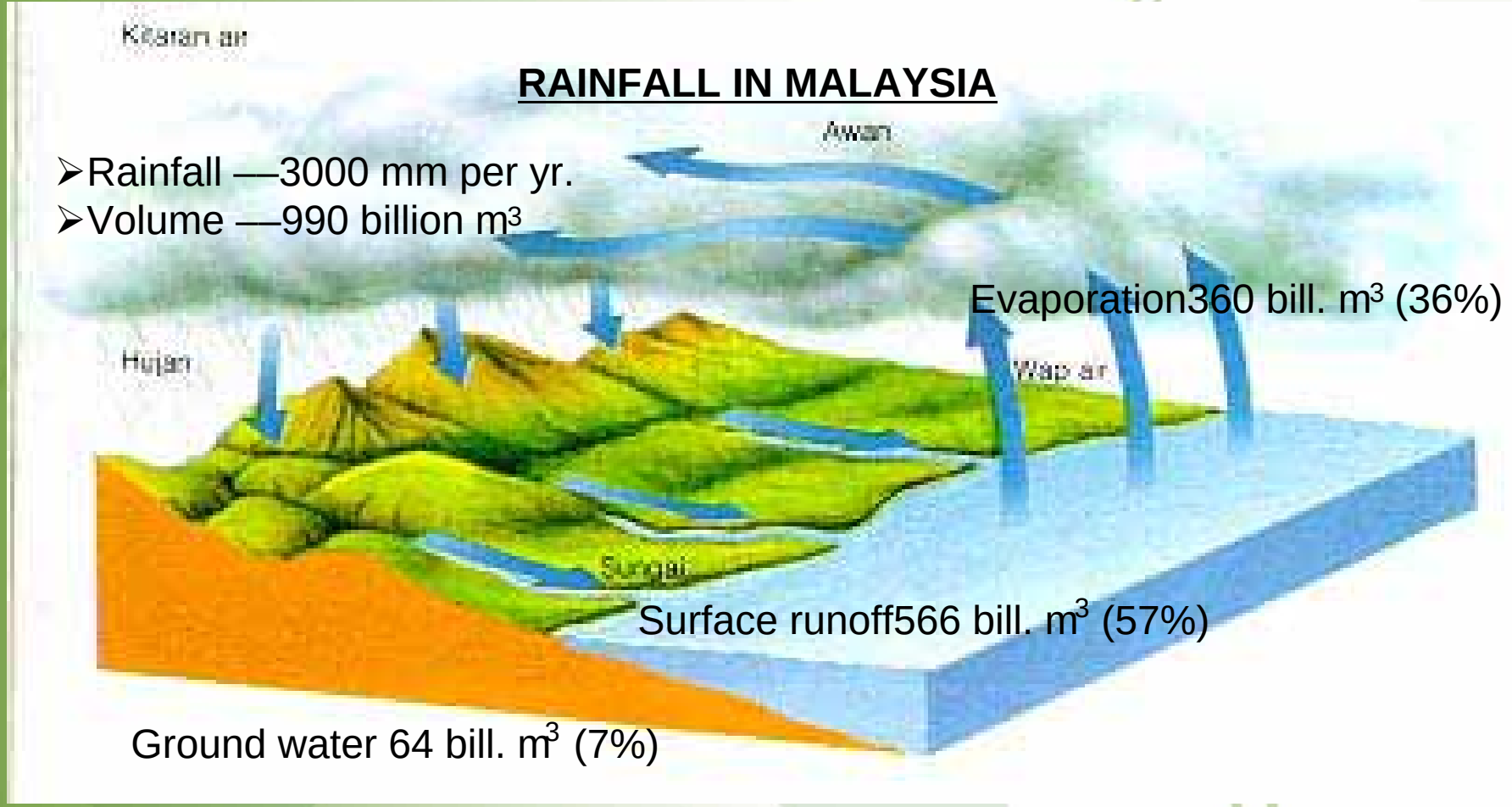
- Introduction
- Understanding Water Issues
- Concept of Rainwater Harvesting
- Current Policies & By Laws
- Rainwater Harvesting Project
- Conclusion

WATER SCARCITY

- A United Nation study has indicated that by 2025, two-thirds of the world's population will be affected by moderate-to-severe water shortages (Appan, 1999).

- Increasing water demand as a result of population growth and industrialisation has called for the need to manage the finite water resources efficiently and effectively.

RAINFALL IN MALAYSIA



- Rainfall —3000 mm per yr.
- Volume —990 billion m^3

Evaporation360 bill. m^3 (36%)

Surface runoff566 bill. m^3 (57%)

- Ground water 64 bill. m^3 (7%)

- Annual rainwater approximately 990 billion cubic meter. (Area = 330,000km square with Average Annual Rainfall 3,000mm).
- 566 billion meter cubic becomes surface runoff
- 360 billion meter cubic evaporated
- 64 billion meter cubic discharges as groundwater
- Water consumption approximately 12.5 billion meter cubic (year 2000) only about 2.2% of the surface runoff. –

WATER ISSUES

- **National Water Resources Committee (2007) chaired by Datuk Seri Abdullah Ahmad Badawi highlighted pertinent aspects of Rainwater Harvesting in the context of urban development :**

  - ✓ ***Install rainwater harvesting system – save the usage of treated water***
  - ✓ ***Need comprehensive study on our water resources***
  - ✓ ***The importance of Integrated River Basin Management***
  - ✓ ***Certain policies need to be amended and presented to the National Council***

THE DEFINITION

Rainwater harvesting is the gathering, or accumulating and storing, of rainwater. Rainwater harvesting has been used to provide household drinking water, water for livestock, water for irrigation and a way to refill aquifers in a process called groundwater recharge.

(source: http://en.wikipedia.org/wiki/Rainwater_harvesting)

Rain Water Usage

Pipe Water

- Drinking Water
- Kitchen
- **Toilet Water (Bathing)**

Rain Water

- Toilet Flushing
- Retention Pond
- Gardening/ Landscaping/ Vehicle Washing/ Urban Agricultural (individual or community level)

Rain Water Harvesting

RAINWATER HARVESTING

- **Rainwater harvesting has been practised long time ago in Malaysia like using the ‘tempayan’ for washing-up feet, cleaning-up bathroom, gardening and others.**

- **In the third world countries, harvested rain is their water supply.**

- **In our modern living today with high technology, rainwater harvesting is nearly forgotten and we totally depend on the clean water supply by the government**

TRADITIONAL METHODS OF RAINWATER HARVESTING

Tempayan

Traditional Well

Johad Pool in Thathawata

"Rain Chain" in Japan

CURRENT POLICIES & INITIATIVES

- **“Guidelines for Installing a Rainwater Collection & Utilization System” (1999 by Ministry of Housing and Local Government).**
- **9th Malaysian Plan – Rainwater Harvesting as an alternative in sustainable water resource management.**
- **27 April 2011 – Government want to make rainwater harvesting compulsory for each housing development & government building.**

News statement on 14.6.2011

Rainwater harvesting is compulsory on Sept. 2011.

Dato' Wira Chor Chee Heung
Ministry of Housing and Local Government

Wajib pasang sistem kumpul air hujan

Peraturan baru untuk pemaju hartanah

Oleh Zanariah Abd Mutalib
zanariah@bharian.com.my

KUALA LUMPUR: Semua pemaju hartanah diwajibkan memasang sistem pengumpulan air hujan (SPAH) sebelum pelan pembangunan mereka diluluskan pihak berkuasa tempatan (PBT), berkuat kuasa September depan.

Menteri Perumahan dan Kerajaan Tempatan, Datuk Chor Chee Heung, berkata peraturan itu yang diperuntukkan mengikut Undang-Undang Kecil Bangunan hanya akan digunapakai bagi bangunan, banglo serta rumah berkembar bagi memastikan pemaju sentiasa mengekankan aspek persekitaran hijau dalam projek mereka.

Katanya, Kabinet dan Majlis Negara untuk Kerajaan Tempatan sudah meluluskan undang-undang itu Mei lalu dan kini sedang dalam semakan kementeriannya sebelum diwartakan PBT.

"Jika perancangan (pembangunan) yang tidak mempunyai ciri SPAH, ia tidak akan diluluskan oleh PBT, jadi ia memang akan menjadi syarat wajib.

"Melalui sistem ini, bangunan dan rumah boleh memuliharа air hujan dan tenaga dan kita sentiasa menggalakkan pemaju untuk menerapkan (ciri) mengurangkan pemanasan, lebih hijau dan mengalakkan daripada penjenayah daripada menggembil kesempatan."

katanya pada sidang media Persidangan Penyelesaian Hijau dan Pembangunan Hartanah 2011 di sini, semalam.

Chee Heung berkata, bagi bangunan dan rumah sedia ada, pemilik digalakkan membina SPAH atas dasar sukarela.

Sementara itu, beliau berkata, persidangan dengan tema 'Bandar Lebih Hijau' yang dianjurkan Pertubuhan Serantau Timur Untuk Perancangan dan Penempatan Manusia (EAROPH) dan Persatuan Pemaju Perumahan dan Hartanah Malaysia (REHDA) pada 28 Julai ini dijangka dihadiri kira-kira 500 wakil kerajaan, pemaju, ahli akademik dan badan bukan kerajaan (NGO) dari serata dunia bagi mencari penyelesaian lebih praktikal berhubung pembangunan hartanah yang lebih hijau.

Katanya, persidangan itu yang membabitkan tujuh pembentang kertas kerja dari dalam dan luar negara sejajar dengan komitmen Perdana Menteri, Datuk Seri Najib Razak yang mensasarkan pengurangan 40 peratus Gas Rumah Hijau (GHG) menjelang 2020.

AMENDMENT UNIFORM BUILDING BY LAW 1984 (UBBL)

- **Buildings are compulsory to put rainwater harvesting system , the design and structure must follow the following requirement :**

i. **Rainwater is not allow to enter the treated water supply tank; however the water from treated water supply is allow to enter the rainwater tank with aid of one way non back flow valve or water level must be at least above 225mm from the over flow level in rainwater harvesting system storage tank.**

AMENDMENT UNIFORM BUILDING BY LAW 1984 (UBBL)

ii. Out flow of rainwater harvesting system must be clearly labeled "NOT FOR CONSUMPTION OR BATHING PURPOSE".

iii. Gutter that is used must have sufficient gradient to avoid stagnant water.

iv. Rainwater's pipe must be green in colour.

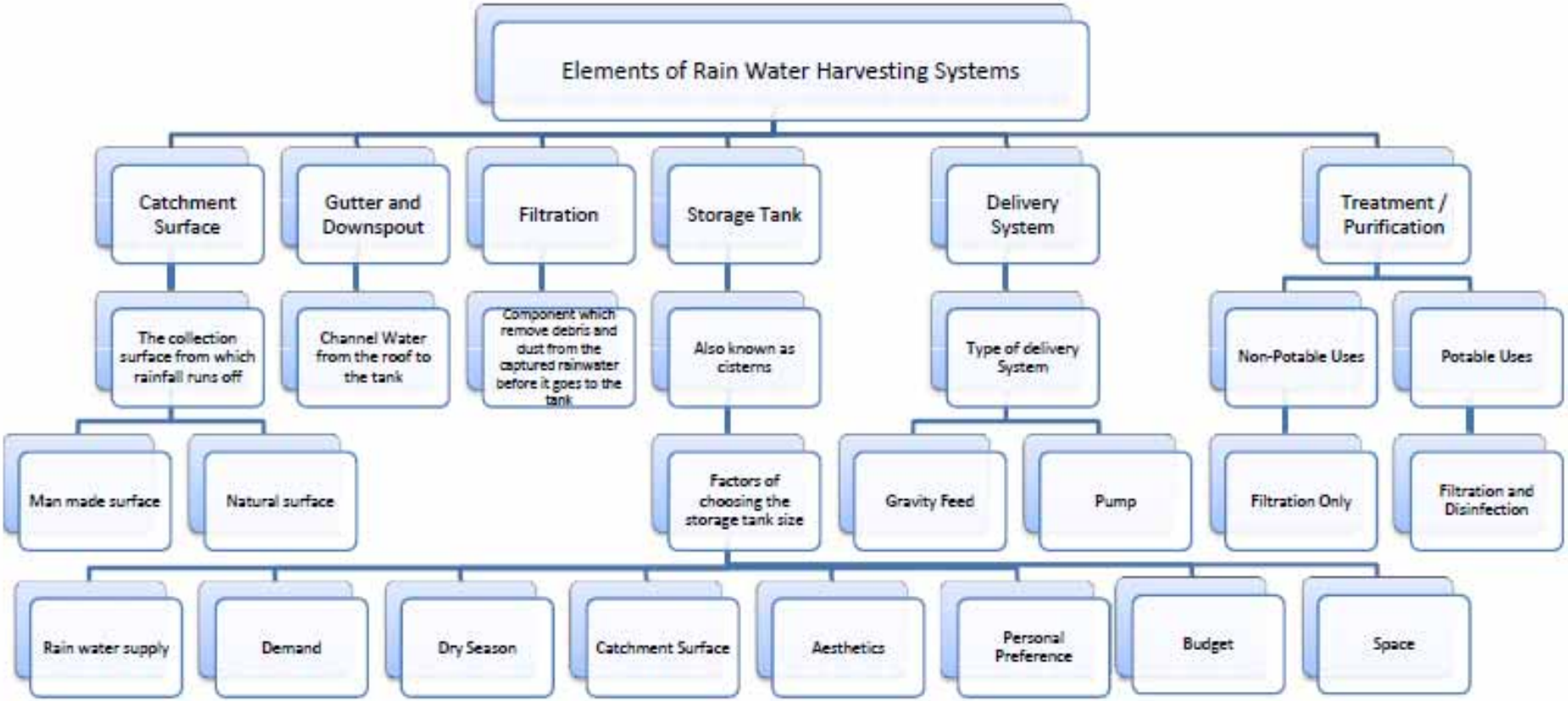
IMPLEMENTATION OF RAINWATER HARVESTING SYSTEM

The installation of rainwater harvesting system is compulsory under Uniform Building By Law

i.Installation of rainwater harvesting system must be taken into consideration during the design process which will be verify as a condition for building plan approval.

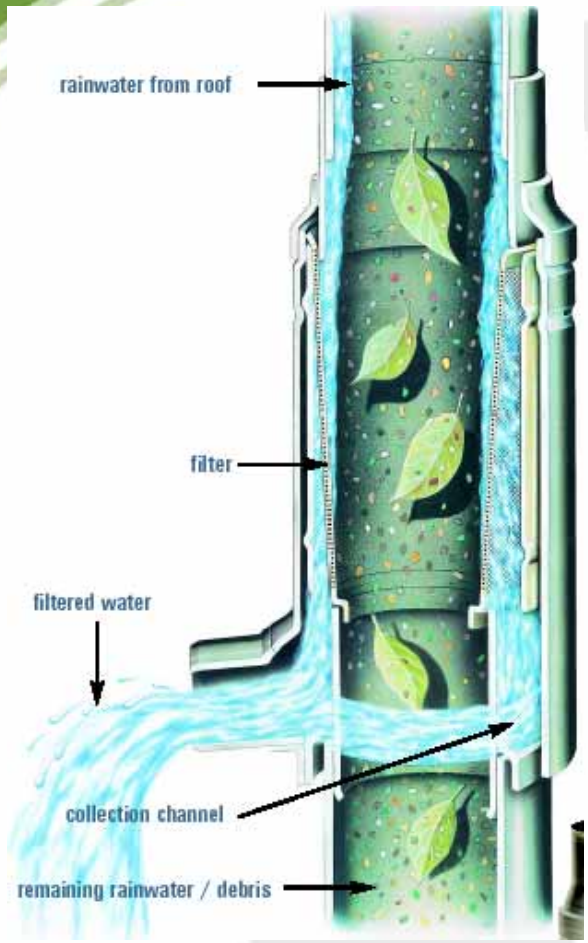
ii.Not incurred high cost

ELEMENT OF RAINWATER HARVESTING SYSTEM



GUTTER, DOWNSPOUT AND STORAGE TANK

RAINWATER FILTER

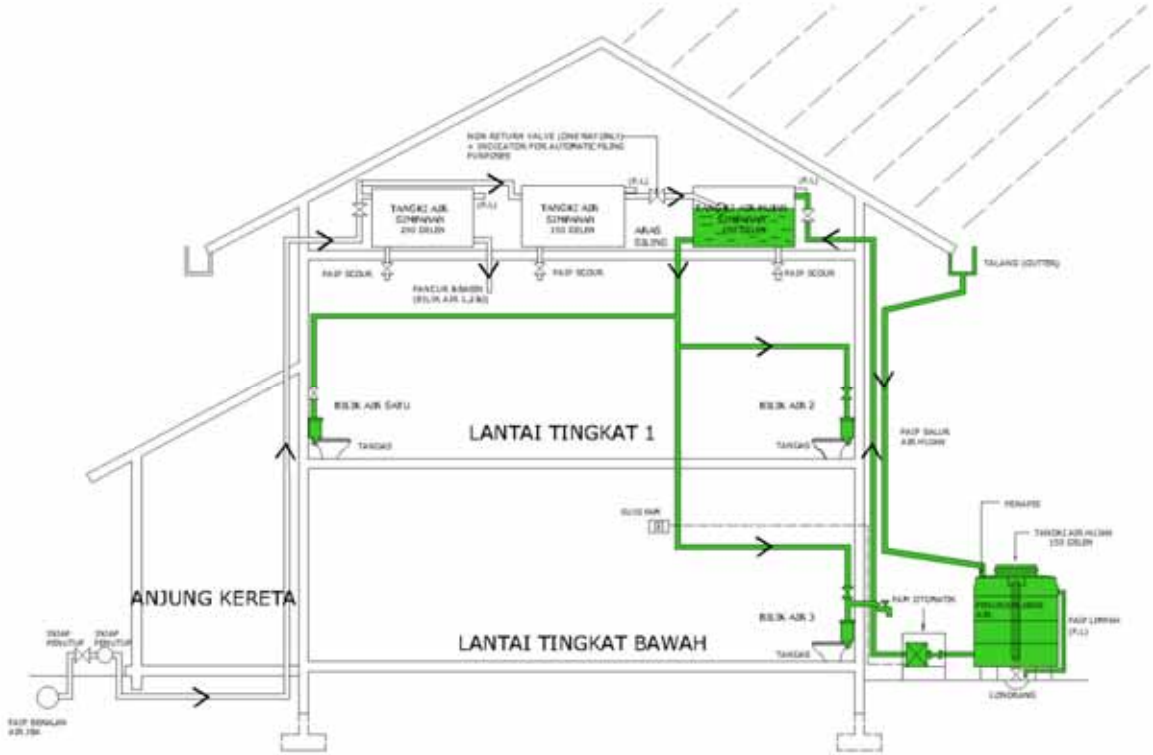


Down pipe Rainwater Filter

Down pipe Vortex Rainwater Filter

RAINWATER FILTER SYSTEM

RAINWATER HARVESTING SYSTEM



ADVANTAGES OF RAINWATER HARVESTING SYSTEM

- To reduce dependant on treated water.
- To reduce the risk of flash flood.
- To preserve limited clean water source.
- Usable for car wash, floor cleaning, watering plants, flushing wash room etc.
- As a aid during treated water crisis (drought season).

ADVANTAGES OF RAINWATER HARVESTING SYSTEM

- Free
- Sustainable
- Protect underground water – reduce the risk of landslide
- Protect river by reducing the water runoff capacity
- Easy methods, environmental friendly

RAINWATER HARVESTING PROJECT IN IPOH CITY

THE HAVEN

Kota Baharu
George Town
Kuala Terengganu
Ipoh
Lumut
Strait of Malacca
KUALA LUMPUR
Kuantan
Kelang
Port Dickson
Melaka
Kepulauan Anambas (INDONESIA)
Johor Baharu
SINGAPORE
INDONESIA

THE HAVEN

FACTORS THAT CONTRIBUTED TO IMPLIMANTION OF RAIN WATER HARVESTING

i. Weather –Rainfall and Humidity

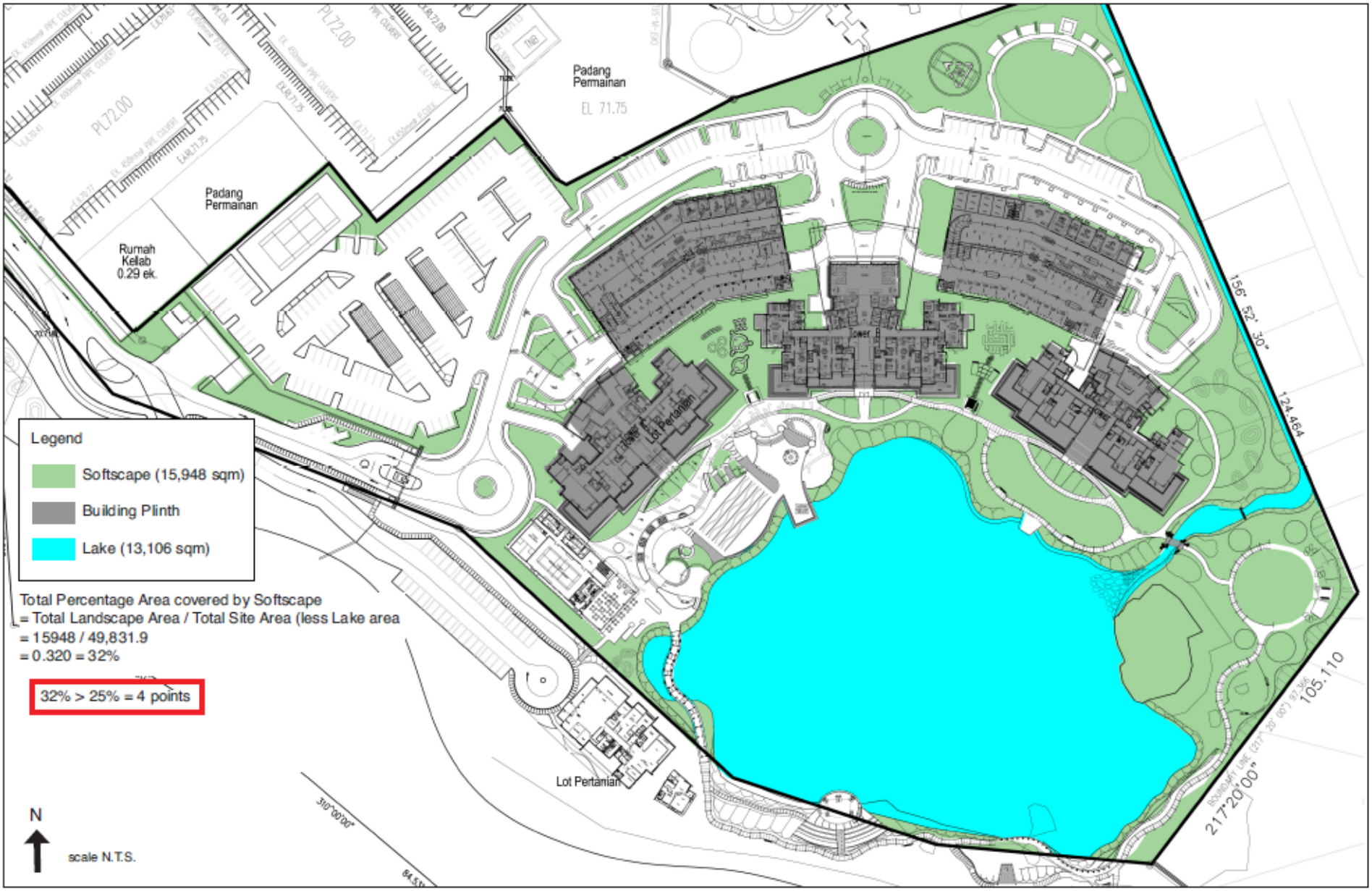
	2007	2008	2009	2010	2011
Rainfall	2913.1mm	3534.6mm	3110.3mm	3189.1mm	2582.3mm
Humidity	81.5%	81.15	83.0%	82.1%	82.5%
Temp	26.9°C	26.6°C	27.3°C	27.4°C	26.9°C

(Source : Malaysia Meteorologi Department)

ii. Treated water consumption in Ipoh City

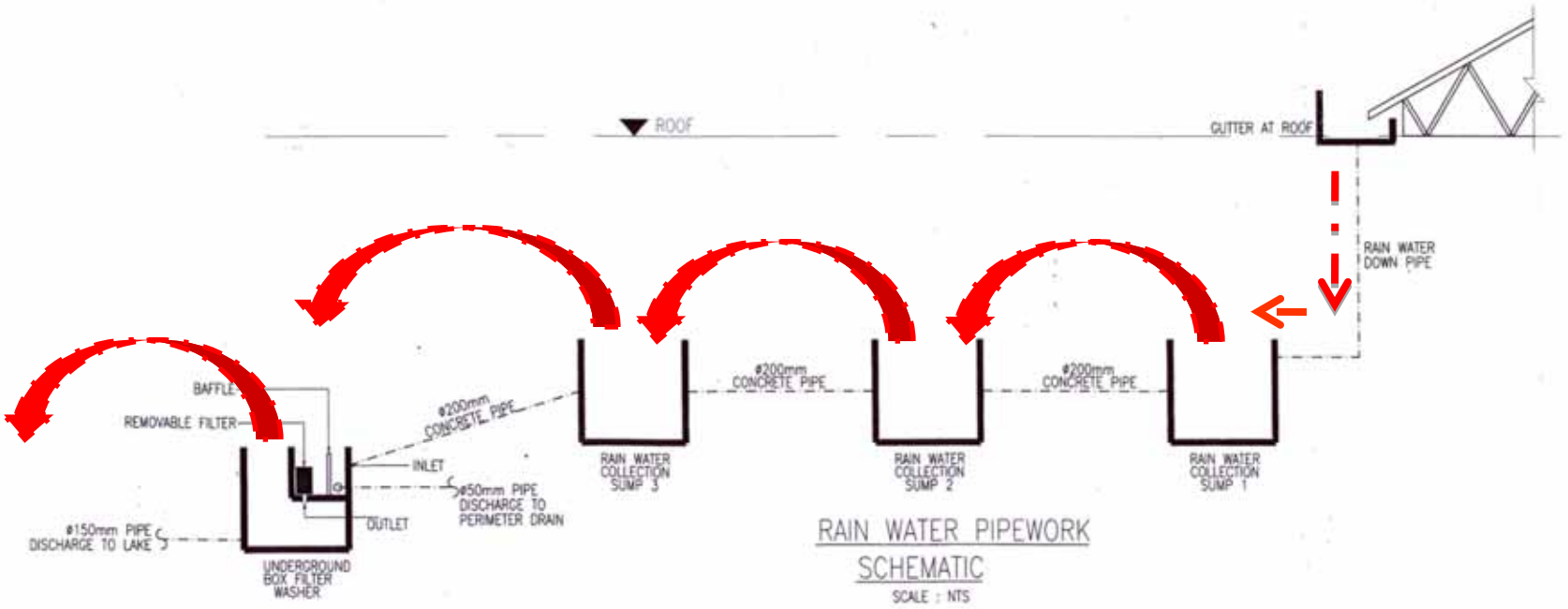
Water treatment plant(place)	Hulu Kinta	Kinta River	Sultan Idris Shah	Tapah River	Total
Amount treated water (m^3)	37,284,485	24,182,757	79,847,110	1,000,000	142,314,352

(*Source : Perak Water Board)*

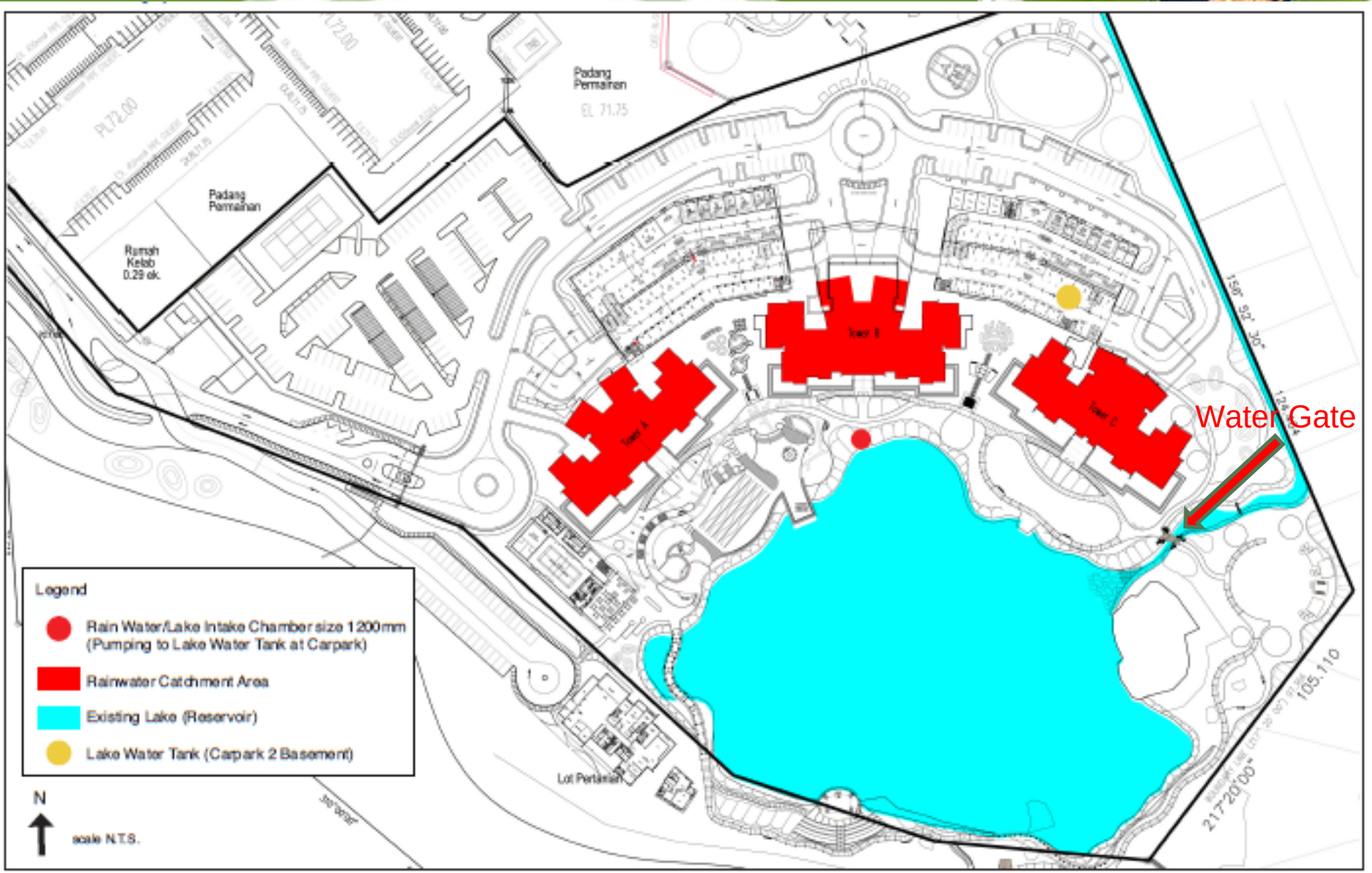

Padang Permainan
EL 71.75
Padang Permainan
Rumah Kelab
0.29 ek.
Lot Pertanian
Lot Pertanian
156° 52' 30"
124.464
105.110
217°20'00"
Legend
Softscape (15,948 sqm)
Building Plinth
Lake (13,106 sqm)
Total Percentage Area covered by Softscape
= Total Landscape Area / Total Site Area (less Lake area
= 15948 / 49,831.9
= 0.320 = 32%
32% > 25% = 4 points
N
scale N.T.S.

THE HAVEN

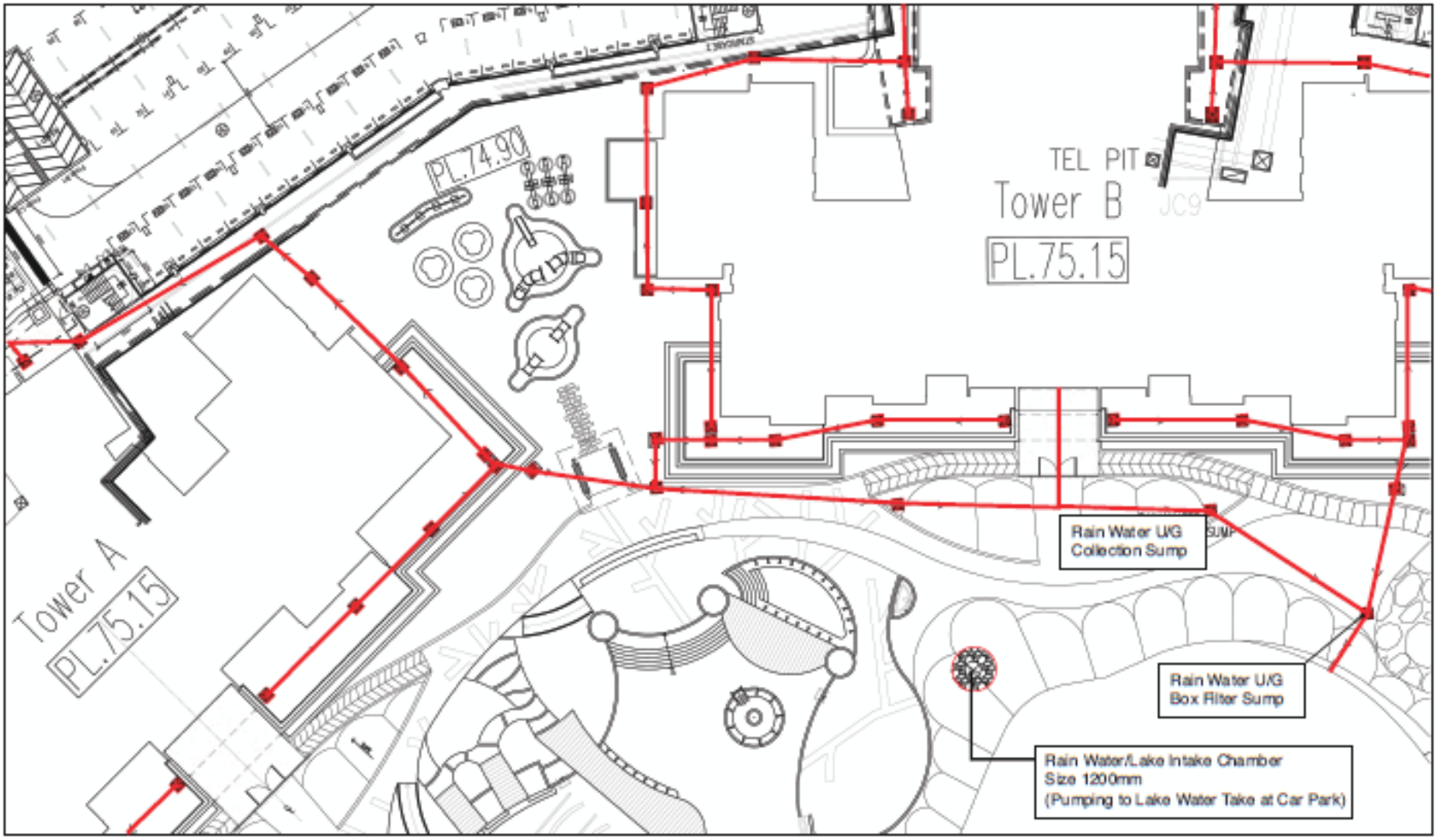
RAIN WATER PIPEWORK



RAIN WATER HARVESTING SYSTEM PLAN



DETAILED RAIN WATER HARVESTING SYSTEM PLAN



Rainwater Harvesting as An Alternative in Sustainable Water Resource For Irrigation

THE HAVEN

CONCLUSION

- **During development plan preparation, have to identify and preserve existing water catchment areas.**
- **At community level, rainwater storage has to be included in the neighborhood area (preferably at elevated location).**
- **Increase water use awareness through programmes.**
- **Rainwater management and rainwater harvesting is cost effective over the long term and eventually benefiting the environment as a whole.**

Thank you!
Terima kasih!