TOWN PLANNING

INTRODUCTION

Township refers to an urban or rural settlement which consists of group of people living within close vicinity. The group of people shares the privilege of the common utilities available, economically. The design of such township is a process encompassing a number of civil engineering aspects.

The main objective is to gain the practical knowledge about

1. Feasibility studies
2. Government approvals-environmental impact assessment
3. Planning and design of various infrastructures of the layout like Residential units, Commercial units, Water supply lines, Sewerage lines, Roads networks, Rain water harvesting units etc.

In orders to promote public health, safety and general social welfare of communities, it is necessary to apply reasonable limitations of land and buildings. This is to ensure that the most appropriate economical and healthy development of the proposed city or townships or layouts or any other purpose takes place in accordance with the land use plan i.e. Comprehensive development plan (CDP).

For these purpose, classification of land in to various uses or developments that are permissible are divided into following zones.

A. Residential

B. Commercial

C. Industrial

D. Public and Semi public

E. Utilities and Services

F. Parks and open spaces, playgrounds (including public recreational area)

G. Transportation and communication

H. Agricultural land and water sheet

METHODOLOGY

In the design of the township, the work may be divided broadly into two categories, Field work and Office work.

FIELD WORK – Field work includes the survey of the township and its surrounding area which is carried out using a total station. Co-ordinates and elevations of the critical points

marking the boundary of the township are collected. Additionally, road points, tree points and other significant permanent points (such as ponds, electric poles) are also recorded.

OFFICE WORK – Office work includes the plotting of field data, design of the various township components, such as the layout, individual floor plans, water supply system, sewerage system and rainwater and roof top harvesting systems. The data from the total station is obtained and organized. Required contours, cross sections and longitudinal sections are obtained using suitable software tool.

Based on these contours, the position of important components of the township are determined and the layout are finalized. Individual floor plans are then developed.

Based on the expected population and contours and road alignment, the water supply system and sewage system are designed.

Referring to the codal provisions in Building Bye-Laws 2003(Bangalore Mahanagara Palike), planning of the layout amenities along with water supply system, sanitary supply system and rain water harvesting is carried out. The Development Plan shall ensure continuous and quality power supply to the township area. It may source the power from any existing supply system or may go in for captive power generation with the approval from competent authority. If power is drawn from any existing supply system, the developer shall, before development, procure a firm commitment of power supply for the entire township from the local electricity supply company (ESCOM).Figure 1 shows layout of township with various amenities. Table 1 shows detail information about amenities provided in proposed township.

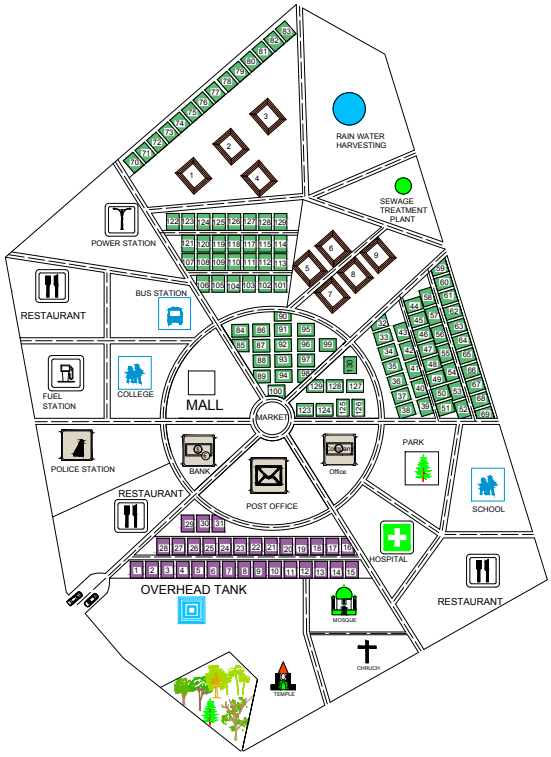

Figure 1: Layout of township

Details of proposed township

1. The proposed Township has a total Township area of = 134386.7m^2
2. Residential area consists of 25% of total Township area = 33596.6 m^2
3. Civic amenities of area consist of 10% of total Township area = 13438.67 m^2

Table 1: Details of amenities provided in proposed township.

SL NO	LANDUSE	Distribution of Area(m^2)	% Distribution of Area
1.	COMMERICAL	33596.6	25%
2.	CIVIC AMENITIES	13438.67	10%
3.	RESIDENTIAL	40315.95	30%
4.	PARK AND OPEN SPACES	20158.0	15%
5.	OTHERS	26877.3	20%

SL NO	DIFFERENT LAYOUTS	AREA (m^2)
1	RESIDENTIAL	40315.95
	30'*40' (130 HOUSES) 40'*60' (33 HOUSES)	
2	WATER TREATMENT UNIT	3441.2
3	SEWAGE TREATMENT UNIT	3030.6
4	RAIN WATER STORAGE UNIT	5463.7

WATER SUPPLY SYSTEM

The Development Plan shall be required to identify adequate and suitable source for drinking water and shall include firm commitments from appropriate water supply agencies/ authorities for meeting the daily potable water requirement of minimum 70 litres per capita per day (lpcd), exclusive of requirement of water for industrial/ commercial uses, firefighting. gardening and other miscellaneous uses. The overall requirement shall be estimated in the range of 180-235 lpcd inclusive of both residential and non-residential demands. The storage capacity of the same shall be at least 1.50 times of the actual required quantity as determined by expected population (both resident and floating). The developer would be required to develop proper internal distribution and maintenance systems. Figure 2 shows layout of township with water distribution system.

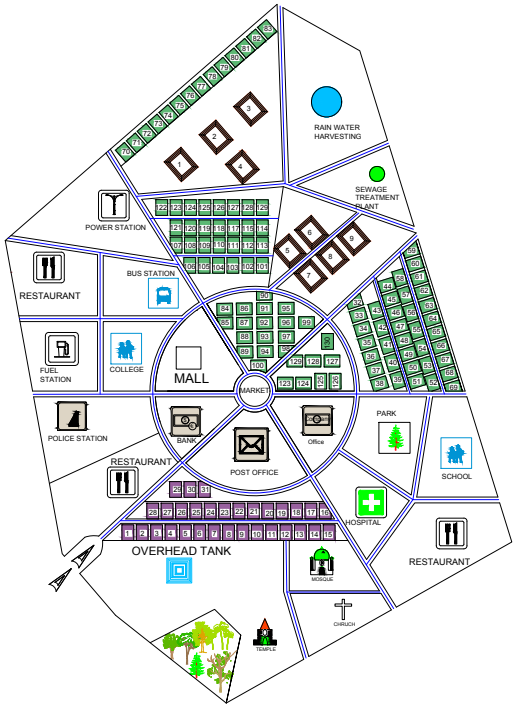

Figure 2: Layout of township with water distribution system

POPULATION OF A TOWN

No of small houses (30'*40')= 130

Assume 4 persons per house

Number of people=130*4=520

No of bigg houses (60'*40')= 33

Assume 6 persons per house

Number of people =33*6= 198

TOTAL NUMBER OF POPULATION =718

Assuming 5%excess population =718*5%=36

FINAL POPULATION OF A TOWN= 718+36= 754

CAPACITY OF OVERHEAD TANK

Population of town plan	754	People
Per capita demand of water	240	lpcd
Total water supplied	180960	Litres
Maximum daily demand	180.960	m^3
Area of OHT	100	m^2

Provide circular OHT of AREA=100 m^2

Dia of circular tank =11.28=12m

Total water supplied for a town=180.96m^3=180960 lts per day from the OHT.

TOTAL AREA RESERVED FOR WATER TREATMENT UNIT =861.66m^2

SANITARY LAYOUT

The Development Plan shall provide for suitable and environment friendly arrangements for the treatment and disposal of sewage and solid waste as per norms of the Karnataka State Pollution Control Board (KSPCB).

The Development Plan shall provide for supply of recycled / treated sewage for non-potable uses such as gardening. The developer shall put in place an efficient and eco-friendly solid and liquid waste disposal system by adopting the recycling. The main objective of a sanitation system is to protect and promote human health by providing a clean environment and breaking the cycle of disease fig-3 shows the layout of township with sanitation system.

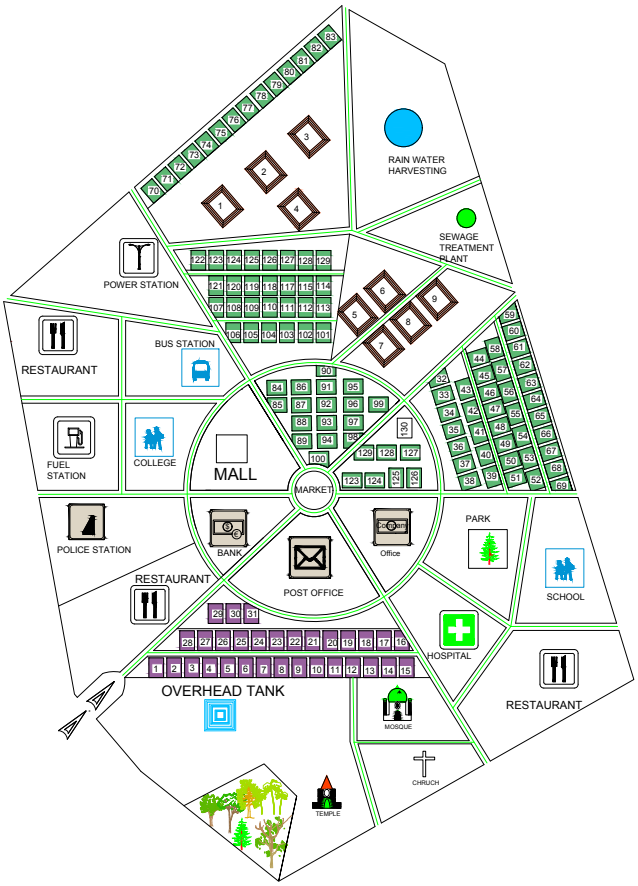

Figure 3: Layout of township with sanitation system.

CALCULATION OF CAPACITY OF SEWAGE GENERATE

Population of Town	754	People
Rate of Water Supply	240	lpcd
Water to be supplied (Approximate) daily	180960	Litres
Sewage Generated (80% of water supplied) daily	144768	Litres

Total sewage water supplied for a sewage treatment plant is 144768 litres

TOTAL AREA RESERVED FOR TREATMENT UNIT IS 545.11m^2

RAINWATER HARVESTING

Rainwater can be collected from rivers or roofs, and in many places the water collected is redirected to a deep pit (well, shaft, or borehole), a reservoir with percolation, or collected from dew or fog with nets or other tools. Its uses include water for gardens, livestock, irrigation, domestic use with proper treatment, and indoor heating for houses etc. The harvested water can also be used as drinking water, longer-term storage and for other purposes such as groundwater recharge.

Rainwater harvesting provides an independent water supply during regional water restrictions and in developed countries is often used to supplement the main supply. It provides water when there is a drought, can help mitigate flooding of low- lying areas, and reduces demand on wells which may enable groundwater levels to be sustained. It also helps in the availability of potable water as rainwater which is substantially free of salinity and other salts.

Application of rainwater harvesting in urban water system provides a substantial benefit for both water supply and wastewater subsystems by reducing the need for clean water in water distribution system, less generated storm water in sewer system, as well as a reduction in storm water runoff polluting freshwater bodies. There has been a large body of work focused on the development of Life Cycle Assessment and Life Cycle Costing methodologies to assess the level of environmental impacts and money that can be saved by implementing rainwater harvesting systems. More development and knowledge are required to understand the benefits of rainwater harvesting which can be provided to agriculture.

Many countries especially those with an arid environment use rainwater harvesting as a cheap and reliable source of clean water. To enhance irrigation in arid environments, ridges of soil are constructed in order to trap and prevent rainwater from running down hills and slopes. Even in periods of low rainfall, enough water is collected in order for crops to grow. Water can be collected from roofs, dams, and ponds can be constructed in order to hold large quantities of rainwater so that even on days where there is little to no rainfall, there is enough available to irrigate crops and makes potable water for developing countries a potential application. Other applications of this free-standing rainwater collection approach are sustainable gardening and small plot farming.