

Integrated Township Proposal for Fast Growing Industrial City, Surat

¹Nisha Gajjar ²Rana Amitkumar ³Darshan Mehta

^{1,2,3}Assistant Professor

^{1,2,3}Department of Civil Engineering

^{1,2}B. Planning, BMCA, Surat, Gujarat, India ³SSASIT, Surat, Gujarat, India

Abstract

The emphasis is given to study & analyses of the different integrated township principles, features, norms & objectives, to design an ideal integrated township. Accordingly proposal for integrated township of medium density has been proposed in fastest growing city Surat. The study deals with the site selection, analyzing & interpreting the same in various forms in all respects. This gives preparation of conceptual development layouts as per the need & demand of the site. Layouts for different dwelling units of different income group synchronized with each other, well integrated road network, with public buildings with sufficient open spaces & other basic necessities, amenities with better infrastructure facilities.

Keyword- Common open plots (C.O.P), Building forms, Geometry & road pattern

I. INTRODUCTION

Integrated town is a self-contained town having all the modern civic amenities required by city-dwellers like power, water, roads, garbage management, hospital, parks, swimming pools, recreation centre, Gym, ground for outdoor games, restaurant, hotel, shopping mall, auditorium, transport facility, etc, etc. It would not depend on the Govt. for the amenities. The integrated planning can make a valuable contribution towards the creation of community spirit & properly balanced population structure. Integrated townships are rather complex with lower FAR, more open areas and an emphasis on creating a sustainable living ecosystem with residential and commercial spaces, supported by an infrastructure backbone of power, roads, water, drainage and sewage. With urban areas getting more crowded and falling increasingly short on future development potential, integrated townships have been identified as a potential solution.

II. AIM OF STUDY

The main aim of developing an ideal integrated township can be summarized into the following points:

- 1) To study Gujarat Govt. policy for integrated township.
- 2) To study URDPFI, TCPO & integrated township norms for planning implementation.
- 3) To prepare township infrastructure as follows:
 - a) water supply
 - b) drainage
 - c) gas supply
 - d) internal roads
- 4) To develop community open space.
- 5) To provide local shopping facilities.

III. OBJECTIVES OF STUDY

The main objectives of the Township Policy are:

- 1) To promote economic development
- 2) To facilitate the creation of efficient, equitable, sustainable urban settlements.
- 3) To facilitate public private partnerships in urban development
- 4) To facilitate capacity building in the private sector and in government for urban development.

IV. STUDY AREA

Proposed integrated township site is located at Jahangirpura (21°14'18.08" N 72°47'21.12" E). To Olpad Road, TP Scheme No. 46 of Surat proposed by SUDA (Surat Urban Development Authority). This proposed TP is bounded by 3 main Roads Jahangirpura

to Olpad road 45m wide main C.C. Road which is one of the main entry of Surat city from Olpad which is known as state highway, second main road is proposed 36mt. wide road Jahangirpura to Variyav Road and third Main road is proposed 60mt. wide road Variyav to Hazira which is also proposed ring road. Fly over connects these Olpad road with Olpad.

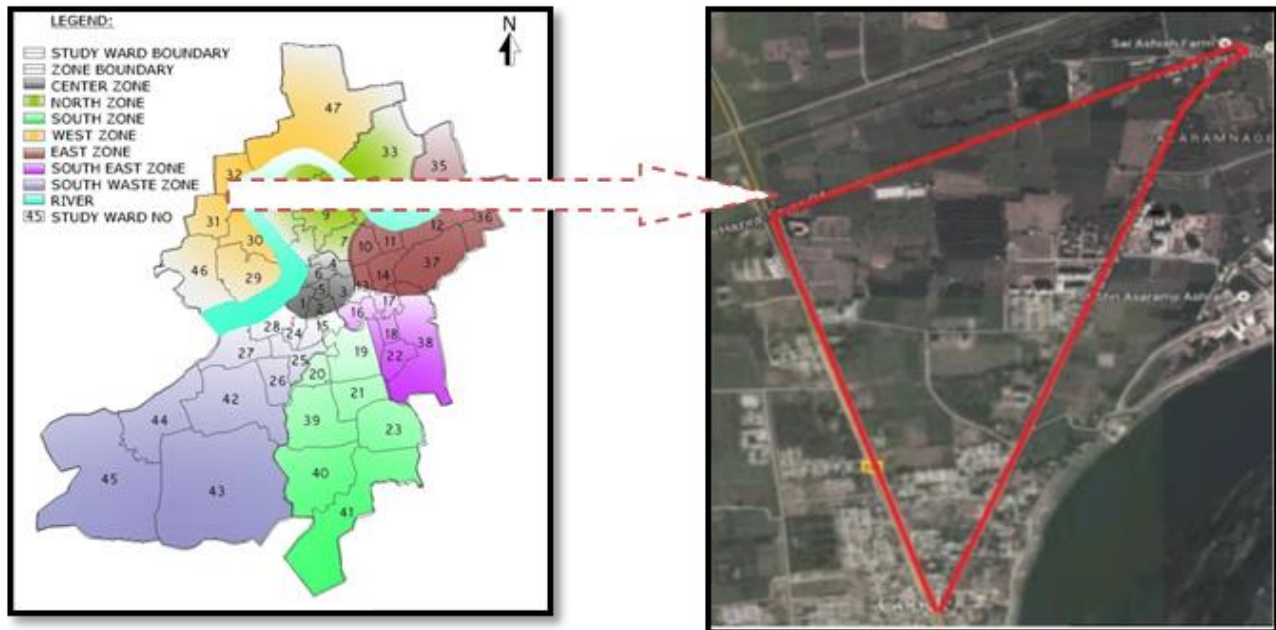


Fig. 1: Study Area

V. METHODOLOGY

Following steps are followed to achieve the goal of the study:

- 1) The township planning is put into place as per the data given in the problem.
- 2) The aims and objectives of the exercise are listed and the design tries to satisfy most of the conditions.
- 3) The site selection is done as per the proximity to the industry and the workplace.
- 4) Field Studies are carried out during the initial site visit.
- 5) Relevant data collection is done as per existing site conditions and also the data interpretation from the given problem.
- 6) Data analysis of the particular income group with the number dwelling units and building forms is done at this stage.
- 7) Conceptual sketches are prepared by each team member and the positives of each of the conceptual sketches are included in the final design.
- 8) The final layout of the site is decided and drafting is done on Auto-CAD.
- 9) Suitable Conclusion is drawn up from the exercise.

VI. EXISTING SCENARIO

A. Zone Scenario

The site is situated in the west zone of Surat city. It is under T.P. scheme no. 46. Ramnagar is the closest junction which is around 4 km and most developed. There is state highway which connects site to the Surat city from its western side. The land use pattern of the zone indicates a large lumps of green open agriculture land with less densely located residential and commercial building. The zone has good infrastructure development in the form of roads, fly over, gardens, recreational areas with all basic amenities.

Area	51.279 sq.km.
Population	3,61,946 (in 2011)
Decadal Growth Rate	126.05 %
Density	6000 persons / sq. km.
No. of Sanitation Wards	11

Table 1: West zone statistics

Source: suratmuniciplecorporation.gov.in

B. Site Scenario

Site is located at Jahangirpura Road, (21°14'18.08" N-72°47'21.12" E) on the bank of river Tapi, well connected with river bridge Jahangirpura to Dabholi, covering an area of 90.85 hectares. It is surrounded by roads on all sides. The site is mainly approached by 45 meter wide road on its west side going to Olpad ended with fly over. On its north 60 meter wide proposed ring road connecting to state highway. On its eastern site 36 meter wide road connecting to Variyav. It is further approach by 24 Meter wide proposed road from 60 meter road and 15 meter wide road from 36 meter wide road. The climatic condition of site is Warm and Humid with Black cotton soil as land. The major transportation services like Railway and Central Bus Depot is almost 10 km away from site, Airport is at 19.5 km. from site. CBD of Surat is at 6.6 km from site.

VII. TOWNSHIP PLANNING APPROACH

Area of the site= 90.85 hectares

Population density= 150 ppHa

Total Population to be accommodated= 13627.5 approx 13700 persons

Total Population: 13700			Persons per family	No. of Units
HIG	25%	3425	4	857
HMIG	25%	3425	4.5	762
LMIG	25%	3425	4.5	762
LIG	25%	3425	5	685
Total	100%	13700	-	3066

Table 2: Household Structure

Sr. No.	Particulars	HIG	HMIG	LMIG	LIG
1.	Population	3425	3425	3425	3425
2.	No. of units	857	762	762	685
3.	Unit Types				
	(A) Bungalow	343	-	-	-
	(B) Duplex	513	-	-	-
	(C) Row house	-	305	197	-
	(D) Low-Rise Apartments	-	58 buildings (P+4). 2 flats on each Floor. Units= 464	48 buildings (P+4). 4 flats on Each floor. Units=768	buildings (P+4). 4 flats on Each floor. Units=685

Table 3: Proposed Township-housing units Distribution

Form of Buildings.	Unit	PLOT	Area in sq.mt.	Floor Area Sq.mt.	Ground coverage in apartment Sq.mt.
H.I.G (857)					
Bungalow	160	346.5	55440	130	
	183	336	63318	136.5	
Duplex	513	231	118503	104	
			237261		
			=23.72 ha		
H-M.I.G (762)					
Row House	305	228	69540	132	
L-Apt. (P+4)	58 (4 clusters of 14 each)	10591.85 (each cluster)	42367.4	133.59	267.18
			111907.4		
			= 11.19 ha		
L-M.I.G (762)					
L-Apt. (P+4)	48 (5 clusters of 10 each)	10425.95 (each cluster)	52129.75	104.27	417.08
			52129.75		

			=5.21 ha		
<i>L.I.G (685)</i>					
<i>L-Apt. (P+4)</i>	<i>43 (5 clusters of 8 each)</i>	<i>6044.78</i>	<i>30223.9</i>	<i>47.46</i>	<i>189.84</i>
			<i>30223.9</i>		
			=3.02 ha		

Table 4: Allotted Residential Area Structure

Income Group	Area Coverage of Plot (hectares)	Percentage of land parcel (%)
HIG	23.72	31.27
HMIG	11.19	14.75
LMIG	5.21	6.87
LIG	3.02	3.98
Future Expansion	3.32	4.38
	Total=46.46 ha	61.25

Table 5: Total Residential Area

Sr. No.	Particulars	Proposed	
		%	Area in ha
1	Residential.	61.25	46.46
2	Road Network	19.26	17.49
3	Common Open Plot	6.5	5.87
4.	Water Tank & Sub- Station	2.29	2.08
4	Shopping Arcade	1.39	1.26
5	Entertainment & Recreation Zone	9.09	8.25

Table 6: Adopted land use pattern

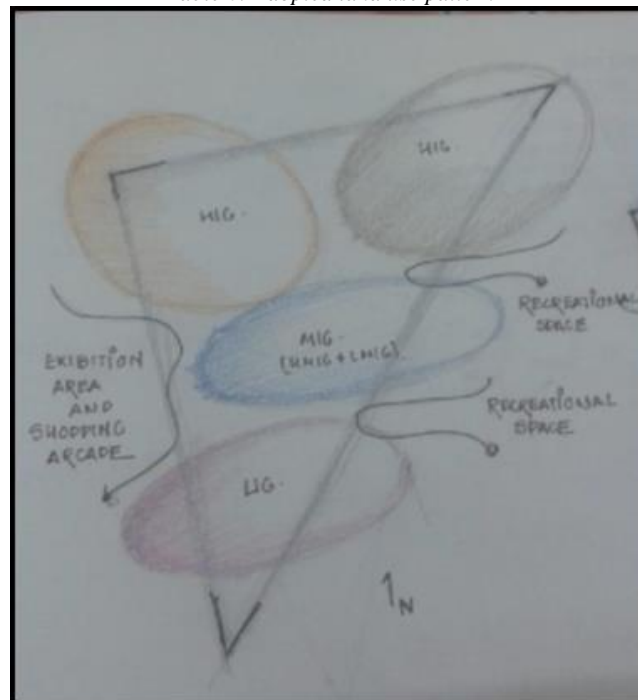


Fig. 2: Conceptual Drawing

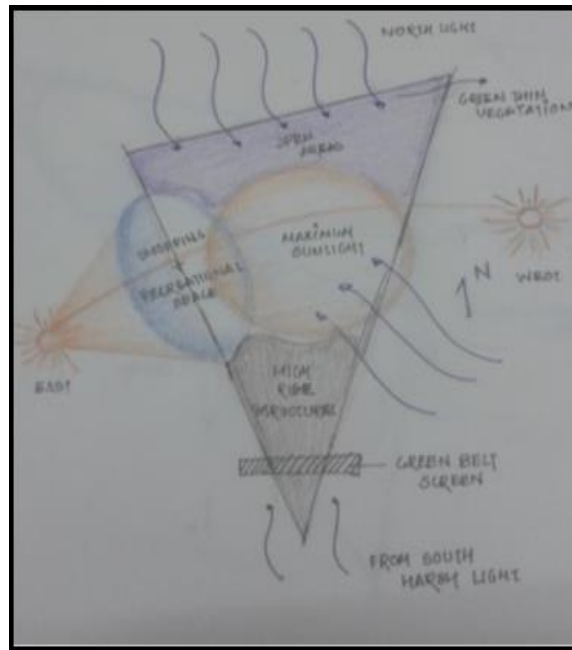


Fig. 3: Sun-path diagram

- North light on the shopping area and recreational area is as projected in the sun-path diagram.
- Due to low-rise on the periphery, maximum light is effected upon the centre of the site.
- On the North side, the thin green vegetation blocks the harsh light by providing green belt there.
- As the centre of the site has the maximum site the clusters of the various apartments are planned on the centre of the site.
- This gives minimum blockage of the light to the bungalows, duplexes and row-houses.
- As the breeze direction is south west the apartments are placed in northern sides there by good ventilation throughout.

VIII. PROJECT DEVELOPMENT APPROACH

A. Geometry & Road Pattern

The basic idea is to develop township layout based on integrated township concept, i.e. to have a grid-iron road pattern, with various widths intersecting & dividing the plots into eight parts. Giving 8 distinct groupings of plots, arranging according to the order of the income groups and breeze direction advantages.

Commercial Spaces are provided in symmetry to the adjacent main roads to take advantage and generate revenue

B. Zoning

The zoning of site is done with considering the existing localities on the road & to match with them accordingly the different income groups are placed .On majorly active Olpad road H-MIG row-houses & Commercial spaces are placed with shopping Centre. On the north side HIG are placed and on internal roads LIG, LMIG, HMIG apartments are placed.

C. Wind directions

For better ventilation the apartments are placed in the north directions mainly allowing the south –west wind flow with in township.

D. Building forms

The majority of building forms are low rise structure to maintain the low sky line from the point of affordability & better light & ventilation.

E. Common Open Plots (C.O.P)

After providing triangular COPs in the northern side, the rest cop is divided throughout the township evenly adjacent to the grouping of every income group, breaking monotonous effect of row house. These green spaces are laid in the triangular patterns such that it gives maximum green spaces in front of alternate rows. Few cops are covered in clusters.

Few cops are converted in to underground water tank for rain n water harvesting system.

F. Shopping Arcade

Shopping arcade is provided in the form of quadrilateral plot adjacent to the busy 45 m wide Olpad-Surat Road which has temporary tensile structures for the assembly of weekly markets. This generates revenue for the township.

G. Recreational Zones

Two recreational zones are provided adjacent to the two main roads. The themes for the zones are mainly entertainment and religious based given the proximity of the site to religious centres.

IX. CONCLUSION

It is very difficult to achieve any planning with all the requirements, benefits & satisfaction.

The planner's main role in designing a township is:

- To create social cohesiveness & integration of different communities.
- The provision of the shopping arcade in the adjoining portion of the main road provides for common market for people of the township as well as outside the township.
- Entertainment and Recreation spaces along the Olpad-Surat road are provided for the purpose of generating revenue when leased to commercial enterprises on PPP-basis.
- Party plot is provided on the Variyav road with proper landscaping which can be rented to generate revenue for the township.
- To provide better infrastructure in all respect with ease of maintenance.
- To create social community spaces.
- Roads provided are of 15m, 12m, and 7.5m as per relevant bye-laws.
- HIG plots are provided in the northern portion of the land in view of the green spaces adjoining them to get sufficient ventilation.
- MIG row-houses are arranged in the north-central portion which is second in the hierarchy.
- MIG, LIG apartment clusters are arranged in the remaining spaces subject to the individual income-level priority.
- To create balanced environment by applying proper land use planning
- To provide the amenities at safer & easier location for everyone.
- To maintain the natural existing features.
- To provide better road network & suitable building forms.
- Provision of future expansion along the southern corner of the land parcel.
- Provide for commercial zones like shopping arcade to satisfy the requirement of the township population.
- Provide for recreation and entertainment zones with respect to generating revenue by ticket collection from the township population as well as from the outsiders.

X. PLANNING PROPOSALS

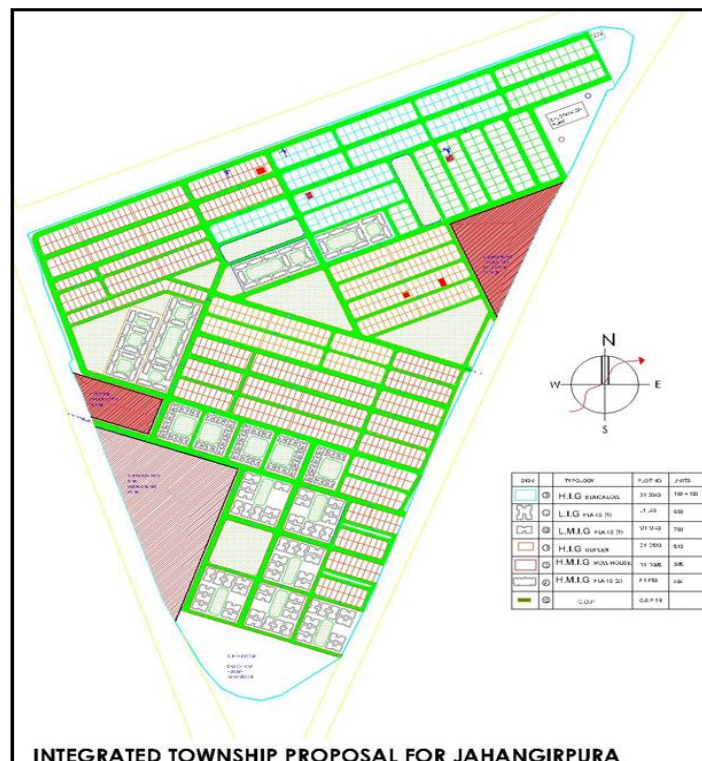


Fig. 4: Township Planning Proposal

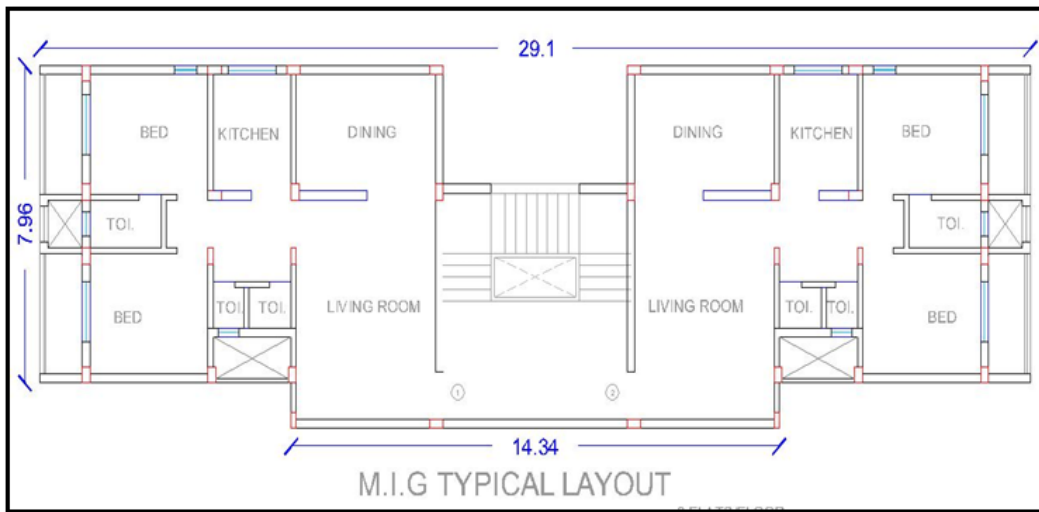


Fig. 5: Typical Layout Plan for MIG

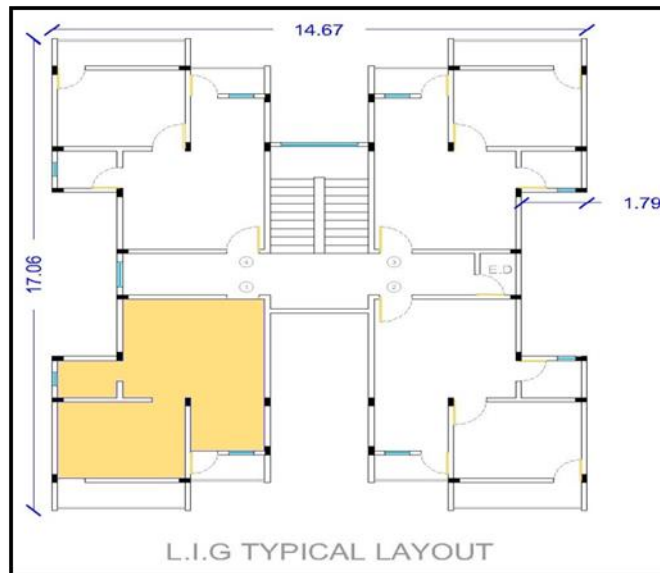


Fig. 6: Typical Layout Plan for LIG

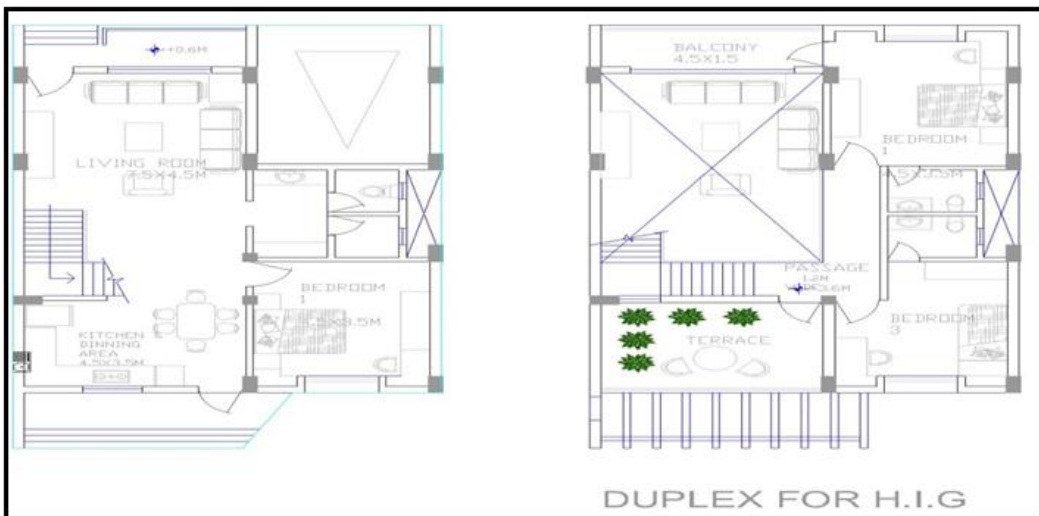


Fig. 7: Typical Layout Plan of Duplex for HIG

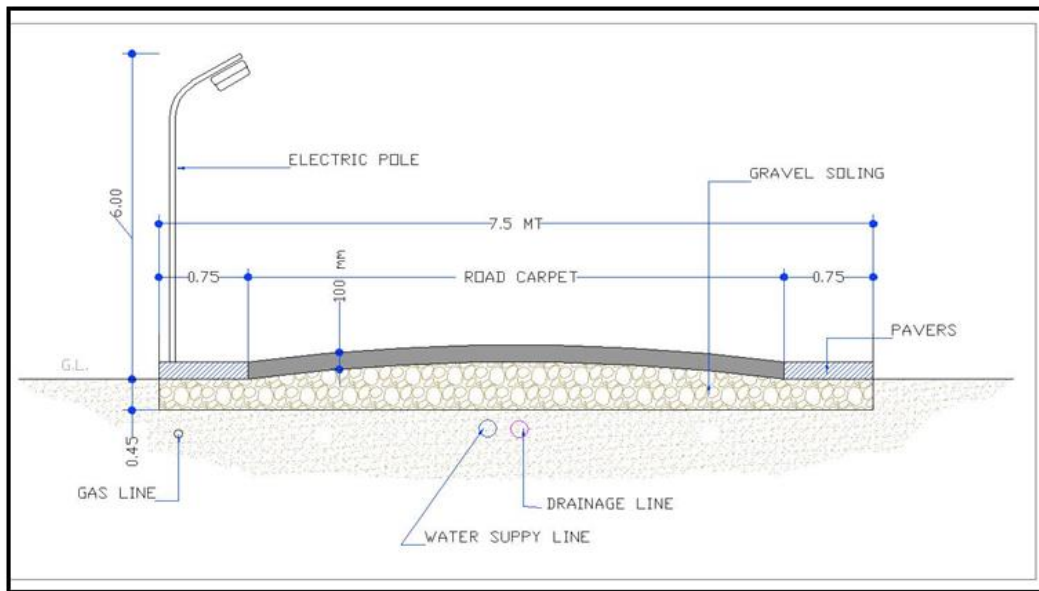


Fig. 8: Typical Layout Plan for Road, Water Supply, Drainage

REFERENCES

- [1] Gujarat Integrated Township Policy, August 2007, Pub. Urban Development & Urban Housing Dept., Government of Gujarat.
- [2] TCPO Norms, 2004, Pub. Town & Country Planning Organization, Ministry of Urban Development, Government of India.
- [3] General Development Control Regulations-Gujarat State, 2008, Pub. Surat Urban Development Authority.
- [4] Stamp Duty-Annual Statement of Rates (Jantri), 2013, Pub. Superintendent of Stamps & Valuation Department, Gujarat State.
- [5] Construction Indices, 2013, Pub. Construction Industry Development Council, Ministry of Industries, Government of India.
- [6] www.suratmunicipal.gov.in
- [7] www.urbanindia.nic.in
- [8] www.gicl.in